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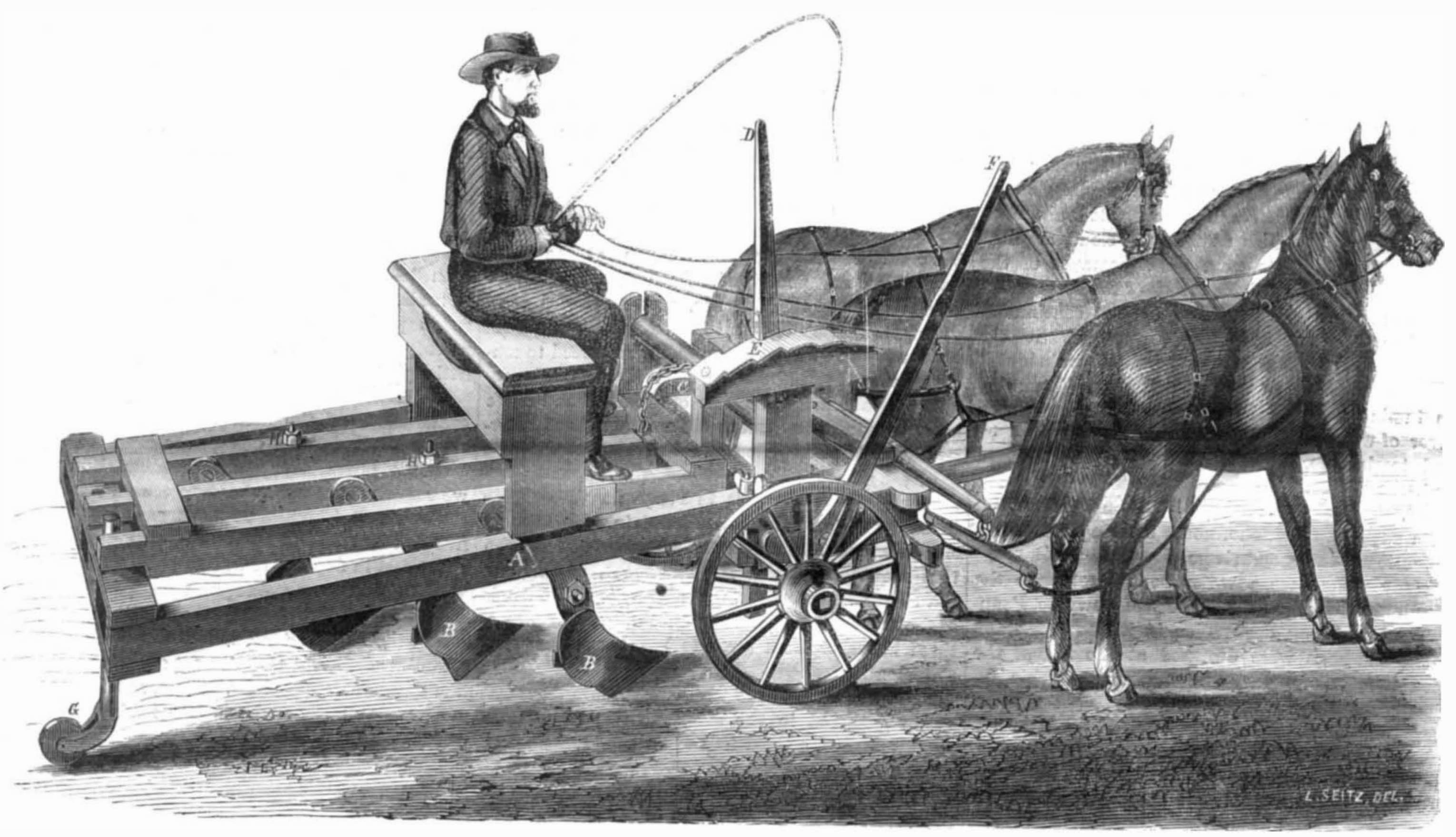
Improved Gang Plow.

Gang or combination plows are now frequently used, usurping the place of the single plow in large fields, and where the labor of horses can be more easily obtained than that of men. Of course, they require more power, but then the work is done much more rapidly, and where neither stumps nor stones present obstacles, there is a great advantage in their use over that of the single plow. The engraving herewith presented shows, in perspective, an arrangement of gang plows which, while they thoroughly turn up the soil, yet enable the driver to ride and turn three furrows, where the user of the single plow does one, and gives him the control of the plows by the devices which enable the driver to elevate one or more of the shares, or all, to accommodate the "lay of the land," or to use the contrivance as a vehicle.

As seen in the engraving, the device is a rectangular frame, A, having two wheels in front, the axle of which is secured rigidly by forked bars extending down on each side the axle. To the frame, A, the driver's seat is fastened at any point most convenient. A frame, consisting of three longitudinal bars, secured in position by cross-bars, carries the plows, B. At the rear end this frame rests upon the cross piece of the main structure, and at the other is held by a chain passing over and secured to a roller furnished with a lifting cam, C. By means of the lever, D, the plow frame can be raised and held at any hight by the toothed segment, E. The lever, F, is employed to raise the main frame in a diagonal position, which will elevate the plows so they can be adapted to ground which is sloping instead of level. The turning of the vehicle is readily effected by the broad wheel, G, which acts as a common furniture truck or caster, turning freely in all directions.

The depth of the plowing can also be determined by means of bolts with nuts, seen at H, by which the nose of the share can be elevated or depressed. These bolts have a check-nut under the bars as well as a lifting nut on the top, so that the plowshares can be held rigidly in any required position. The engraving represents three horses abreast. In this case the "off" horse walks in the furrow last made, but by a peculiar arrangement of the whiffletrees—not clearly shown in the engraving—it is claimed there can be no side draft, each horse exerting an equal amount of power.



HUTCHINSON'S PATENT GANG PLOW.

The plowshares are made of sheet steel, and can be readily removed and replaced by others, so that the machine may be called a "universal gang plow." Two, three or four horses may be used, as desired. It was patented through the Scientific American Patent Agency by Samuel Hutchinson, Aug. 7, 1866. For further particulars address Augustus Winchester, 706 Chestnut street, Philadelphia.

WATER-SPOUTS IN THE MOUNTAINS.

According to the writers on the subject, moisture exists in the atmosphere, in an invisible state, at all temperatures. It sustains itself there in the intervals that exist between the particles of air. These intervals are either partially or wholly filled with vapor, constantly arising from the earth. When they are wholly filled with vapor, the atmosphere is said to be saturated. An increase of temperature, by dilating the air, increases its capacity for moisture; while a diminution of temperature is followed by contrary effects. But the capacity increases at a faster rate than the temperature, so that the air, at thirty-two deg. Fah., can contain only the one-hundred-and-sixtieth part of its own weight of vapor; at one hundred and thirteen degrees it can contain the twentieth part of its weight. Thus it appears, that while the temperature advances in an arithmetical series, the capacity is accelerated in a geometrical progression. A considerable increase of temperature, therefore, will enable even a saturated atmosphere to receive a greatly augmented amount of vapor, and, as it were, to swallow the clouds that may pass into it, without any diminution of its own transparency. On the contrary, when the temperature is diminished by the rapid union of two currents of air, saturated with vapor, the one being warm and the other cool, the average temperature is so reduced that an excess of vapor exists, which is incapable of sustaining itself in the diminished capacity of the air, and is necessarily precipitated in the form of rain. But when two currents of air, not fully saturated with vapor, are brought into contact, the precipitation of moisture is slight, and mists, only, are produced. When the mists, thus precipitated are near the earth, they are called *fogs*, but when they are high in the air they take the name of *clouds*.

Another fact must be noted. The temperature of the air diminishes with the altitude, but the law of decrease is very irregular, being affected by latitude, hours of the day, and a diversity of local circumstances. It may, however, be assumed as a general rule, that a loss of heat occurs to the extent of one degree, Fah., for every three hundred and forty-three feet of elevation. But this is an average result, for the rate of decrease is very rapid near the earth, after which it proceeds more slowly, and at the loftiest hights is again accelerated.

From this brief statement of the general principles governing the production of fogs and clouds, it will be apparent that the higher portions of mountains must be refreshed by frequent rains. At present we refer only to those of the western section of North Carolina. The more elevated portions of these mountains, ever clad in mantles of cool air, stand, as so many custom-house officers, to exact tribute from all the currents of air laden with vapor, from the warmer regions below, which attempt to sail over their summits. These currents of air cannot but pause, when richly freighted, to divide their treasures with the thirsty soils and mountain-springs. And even when they are lightly burdened with vapor, and no rain can be condensed from them, these passing currents often yield copious clouds of fog, covering the vegetation, by contact, with moisture, and promoting its more vigorous growth. Nor are the mountain summits alone in the exactions they make upon the moving atmosphere for its vapors. The mountain bases, all along the rivers and larger creeks, cool the surrounding atmosphere during the night, while the waters of the streams, retaining their warmth, send up a plentiful evaporation. The vapor which is thus formed, rising into contact with the over-hanging colder air, is condensed into fog, and floats above the streams till the morning sun sets it in motion, or dissipates it by increasing the temperature of the air along the mountain sides.

But fog and rain are not the only meteorological phenomena occurring in mountain regions. Others of a less peaceful nature, and terrific in the extreme, have been witnessed.

Once in a generation or two, perhaps, a *water-spout*, so called, bursts upon some elevated portion of a mountain. Previously to its descent, the clouds are seen moving to and fro, and commingling in a confused manner, somewhat as the circling eddies of a vast whirlpool. When concentrated above or around the mountain's summit, the cloud acquires such a density as to wear the appearance of the blackness of darkness. The roll of the accompanying thunder is deafening, and almost continuous, shaking the eternal hills to their base; while the flashes of lightning, following each other in quick succession, afford a glare of glimmering light nearly as luminous as that of the sun. Then comes a river of waters, dashing down the mountain-side, and tearing up, in its resistless progress, earth, rocks, and trees, so as to create, in its course, a deep canal. The amount of water at times discharged from such clouds is enormous, swelling inconsiderable streams into great rivers.

Many years since, a water-spout burst upon the North Mountain, to the westward of Newville, Pennsylvania, carrying destruction in its course. Many cattle and hogs were drowned at the foot of the mountain, where they were confined within inclosures, preventing escape. The largest rocks were torn from their beds, and a deep chasm excavated from the top of the mountain to the valley. Its course can now be traced by the difference in the trees within the channel from those on either side —a growth of pines occupying it, instead of the oaks and hickories of the surrounding forest.

Another water-spout fell upon the western end of the Chilhowee Mountain, where it faces the Little Tennessee River, about the date of the first settlement of the country. Its course is marked, like the one at Newville, by a large growth of evergreen trees. Again, on the west side of the same mountain, not far from Tuckalechee Cove, and near Little River, a water-spout fell, not many years since, carrying away a distillery, around which, the day previous, being the Sabbath, the young men of the vicinity had met, in a frolic, and perpetrated some enormous blasphemies—in their drunken revelries undertaking to make a mock of religion, by the administration of its sacraments. Monday was ushered in by as clear a sun as ever shone. In the course of the day, however, the thunder pealed forth a signal, startling the neighborhood into fixed attention: there they beheld, gathering upon the mountain's brow, the ominous cloud, that soon burst out into one vast deluge of water, which, descending down the mountain side, laid desolate the very spot where the profanation of Heaven's ordinances had occurred. The terror created by this celestial phenomenon was such as to produce a religious revival, accompanied by the conversion of many of the thoughtless fellows who had taken part in the iniquities of the preceding Sabbath.

Having seen the traces of all the water-spouts noticed, and having heard the descriptions of eye witnesses to the accumulation of the cloud which produced the rain-fall, in one case so furious in its descent, I concluded, as usual, that there had been a concentration, to one point, of nearly all the water yielded by the cloud, through the agency, probably, of a whirlwind motion of the air controlling it; but this theory had to be abandoned, as soon as I had completed, for myself, the investigation of the facts connected with the great fall of water-spouts upon Tusquitta Mountain, on July 8, 1847.

An intelligent professional gentleman, who visited the locality soon after the storm, described to me the effects produced. The chasm excavated in the earth, he said, had a depth of several feet, with its sides cut out as vertical as if dug with a spade. The roots of the trees and plants beneath the surface, were cut off as squarely as if done with the knife. At the surface, close up to the sides of the chasm, nothing seemed to be disturbed. The shrubs and grass, and even the fallen leaves upon the soil, remained unmoved, as though no running water had come into contact with them. This was the condition of things where the water-spout first struck the ground; and as the excavation, at the point of origin, had a width of but a few yards, the whole volume of the descending water, he concluded, must have been concentrated within that space, and continued thus contracted till the contents of the cloud were exhausted. In descending the mountain, along the line of the widening chasm, evidences existed that the torrent produced had attained, in places, a depth of sixty feet, uprooting in its course the largest trees, and removing immense rocks from the gulch created in its descent to the valley below.

In all the descriptions given, I had inferred that but a single water-spout had fallen, at the same time, from any one cloud. Such seemed to have been the case in the old ones, grown up with ever greens. But very different indeed had been the result on Tusquitta Mountain, as I was forced to conclude, when I examined the facts for myself, in relation to the fearful character of the elemental strife accompanying the descent of its hundreds of water-spouts, which had fallen at the same moment.

In the month of May, 1859, I called upon Robert Martin, Esq., who resides in Tusquitta valley, near the spurs of the Tusquitta Mountain. He had resided there in 1847, when the water-spouts fell upon that mountain. From his statement, and that of Mr. Pierce, his neighbor, who also noticed the whole of the movements of the clouds, during the space of three hours, or from first to last, I make up my statement.

The clouds were some two hours in forming. One group gathered in the southeast, another in the southwest, and a third in the south. The unusual commotion among them, as they were forming, attracted the attention of these gentlemen, and riveted them to the spot, where each one stood, near their own doors, a half mile apart.

When nearly fully formed—a process which will be described in another article—the clouds commenced moving rapidly, in eddies of many whirls, toward Tusquitta Ball. Salutations of thunder, from the first, passed between them, as though cloud called to cloud, in organizing for the coming conflict. The play of the lightning, at first occasional, became almost continuous, as the constantly accumulating masses began to move swiftly toward a common center; while the thunder, increasing in equal frequency, soon became terrific. In addition to the thunder, and just before the rain began to fall, there came a succession of sharp, keen, cracking sounds, lasting for ten or fifteen minutes, which resembled a sharp crack of the electrical spark, and then came a crash as if ten thousand pieces of artillery had been discharged. The earth fairly trembled with the concussion. There was also a loud roaring sound, independent of all other sounds, for some minutes before the clouds came into contact; and when they did meet, they shot instantly upward, with great velocity, like an arrow shot from a bow—the forests, a few rods distant, becoming so dark that nothing could be seen.

The rain now began to fall in torrents. In a few minutes the small spring branch, at Mr. Martin's, having its rise a mile or so further up the mountain, was swollen into a river.

In an hour the rain was over, and the sun again appeared as bright as ever. The gentlemen named then commenced an examination of results. About three hundred feet above the head of the spring branch, a water-spout had fallen, which excavated a canal ten feet deep, and seventy-five feet wide at its head. The side-walls, at this point, were perpendicular, while further down, it varied both as to depth and width; the vast body of water, of course, obeying the general laws controlling the descent of that fluid down a steep inclination. This torrent, in rushing down toward the spring branch, at an angle with the line of that stream, could not make a sudden turn, but dashed across, rising on the opposite side to the top of a spur of the hill, thirty feet high, when, from the further side, it naturally fell into the channel of the branch, swelling it into the proportions of a river.

Upon more extensive examination, the water-spouts were found to have been very numerous, nearly a hundred canals existing within an irregular area, not exceeding three miles in extent. The largest one was eighty feet in width, and others not more than eight or ten feet.

But these excavations were not the only effects produced during this hour of awful sublimity. Many forest trees had been struck by the lightning, and explosions of electricity, from the earth, had thrown out large masses of clay and rock, in several places producing rounded excavations of sufficient depth and width, often, to bury a common hogshead; the vegetation all round these spots being scorched and withered by the electrical fluid.

The seat of these water-spouts lay about four miles from the summit of Tusquitta Mountain. Two gentlemen were upon its summit when the cloud reached that point. One of them—Mr. William M. Martin—described the rain-fall as so dense as to almost suffocate him. The sensation was such as is experienced when under water; and the only remedy was to lean the body over, so as to have a little space of air to breathe from, beneath the breast.

On the 23d of May, 1859, I commenced a personal examination of the area upon which the water-spouts had fallen; being accompanied by Dr. McCoy, of Fort Hembre. In ascending the mountain we could see, at one time, more than a dozen of the excavations. The first one measured about twenty-five feet in width at its head, and was from six to eight feet in depth. It was only twenty yards from the top of the mountain-spur, upon which the water had fallen. There was only a slight concavity where the spout first fell, and wholly insufficient to accumulate sufficient water to cut such a canal, within the space of twenty yards. Then, as there had been no washing away of the surface rubbish above the point of excavation, it would appear that the agency which produced the cutting must have begun its work at that spot.

The next excavation examined was where two spouts had fallen, close to each other, being separated, at the head, by about three rods of unbroken ground. Each of these canals measured forty feet in width, and when united, a few rods below, the channel was sixty feet in width. These two are not in a trough, or concave portion of the mountain, but naturally fall into one some distance below their junction. The heads of both are only twenty yards from the top of the mountain spur, and could only have been cut out by the force of a descending sheet of water.

The same general features were presented in the other excavations, and additional descriptions are, therefore, not necessary.

One remark only need be ventured, in relation to the agency which cut out these channels. That it was water, none can doubt. But that the water was concentrated to one point, by a whirlwind-like action of the cloud, compressing its falling rain-drops into one compact sheet, capable of cutting away all the mere clays and fragmentary rocks upon which it might fall, is disproved by the multiplicity of excavations upon Tusquitta Mountain. The only remaining solution of the mystery, then, in relation to the manner in which the rain becomes condensed, in what are called water-spouts, on land, is to be found in the statement of philosophical principles upon a preceding column. When two clouds meet, of different temperatures, the result is a more copious discharge of rain than either, separately, s capable of yielding. The clouds at Tusquitta, upon meeting, were observed, at once, to ascend swiftly, as if doubling upon each other. This of course, brought more cloud surface into contact than would have been the case had the clouds, on meeting, blended together at once. May I not suggest, therefore, that this sudden folding of the clouds upon each other, by their upward motion, might have produced an almost solid sheet of water, at the main points of contact, which, upon descending to the earth, would be capable of cutting its way down through any extent of clays and decomposed rocks, so as to bear them away, and leave an open canal as the result? That the descending water sheet remained stationary for a few moments, so as to limit the excavations to the spot first struck, is supposable from the fact that the motion of the clouds may have been momentarily arrested by their collision with each other. But I must leave this whole question to the philosophers. D. C.

THE NEEDLE GUN.

The merits and defects of this celebrated breech-loader were detailed by Mr. Norman Wiard, before the Polytechnic Association, recently, in an interesting comparison between this weapon and those of this class more familiar to us.

The Prussian needle gun is not to be commended as a finished piece of mechanism, but, in the opinion of the speaker, it combined advantages that render it in many respects far superior to any weapon of like character heretofore constructed. The most noticeable peculiarities of this gun are its length and weight toward the muzzle. According to our received ideas, these features should be looked upon as disadvantages, but in reality great accuracy and steadiness of aim are thereby attained, and when pointed, the weight and length make it easier to hold, and the end of the muzzle is not deviated by the recoil.

The peculiarity of placing the charge nearer the muzzle of the gun than has been customary, is an advantage which the speaker believed might be still more improved upon, for the further forward the powder is placed the less force is wasted in overcoming the friction resulting from contact of the ball with the barrel, and by igniting the cartridge at the front end the whole power is employed simply in propelling the ball. In this gun all the expansive force of the powder, and also of the fulminating gases, are utilized, but in the Sharps rifle, the propulsive power that might have been obtained from this latter force is lost, and a portion of the other force escapes through the nipple orifice.

The breech of the Prussian gun is nearly on a line with the muzzle, while in the ordinary musket a considerable angle is formed, and, in consequence, a muscular effort is required to bring the gun into position for taking aim, and the force of the recoil is not so easily resisted. The certainty of becoming foul, after a number of charges have been fired, limits the capacity of the Springfield rifle to twenty rounds, hence the superiority of breech-loaders in this respect, for every ball acts as a swab in cleansing the barrel of the solid residue from the powder.

In conclusion, Mr. Wiard presented some curious statements furnished in an official report on the battle of Gettysburg, stating that 27,574 guns were picked up on the field after the engagement, 24,000 of which were loaded. Of this number one-half had two loads each remaining unfired, one-quarter had three loads, and the remaining six thousand contained over ten loads apiece. Many were found having from two to six bullets over one charge, in others the powder was placed above the ball, one gun had six cartridges with the paper untorn, in one Springfield rifle twenty-three separate charges were found, while one smooth-bore musket contained twenty-two bullets and sixty buckshot rammed in promiscuously.

Japan.

Dr. McGowan recently delivered a lecture in San Francisco, upon "Japan and the Japanese," in which he said: The geological formation of the mountains is generally igneous in character, with the superimposition of limestone, sandstone, and coal measures. Gold is found in abundance, and when the speaker went there it could be obtained for its weight in silver. The Japanese, however, soon saw that the gold was leaving their country in large quantities so rapidly that they increased its value. Japan is pre-eminently a copper country. So plentiful is it that the traveler will find their boats, inside and out, lined with it, as also the shutters and roofs of their houses. They have spades and cooking utensils made of it. There is one of these islands which contains nothing else but copper ore. Conversely iron is met with in only limited quantity. You will see the Japanese washing it out of the sand in the beds of rivers, after the fashion of the placer miners of California, who pan out their gold. Coal is found all over the country, though the mines are not much worked, nor is there a great deal of demand for it, as the people dress very warmly and use chafing dishes in their houses to keep them warm. But when one line of steamers gets established this will come in very conveniently, and the supply will be quite equal to the demand.

New Safe Lock.

The London *Engineer* gives the following account of a new lock which seems to be constructed upon new principles:—"It is composed of neither more nor less than steel wires—call them needles if you like—strung together on two stumps, attached to the running bolt upon which they revolve, and they require to be lifted by the key to a position to admit of their being passed through certain holes in a plate of brass, and thus passing, carry the running bolt with them, which carries the real bolt. The needles move obliquely, perpendicularly, laterally, and, indeed, in any direction; hence the difficulty in raising all the needles with an instrument, simultaneously, to their required positions to run through their own apertures, and escape the many traps set for them in the shape of a number of holes, pierced nearly half way through the fence plate, of the exact size to fit the needles. In the more expensive latches, as we have only been describing the cheapest ones, there are protectors and detectors."

Statistics of Photography.

The rapid growth of new and special industries, says the *British Quarterly Review*, is a fact so characteristic of the present day, that the statistics of photography can scarcely be regarded as wonderful, viewed merely as a question of economies. Nevertheless, some of the facts are sufficiently startling. Twenty years ago one person claimed the sole right to practice photography professionally in England. According to the census of 1861, the number of persons who entered their names as photographers was 2,534. There is reason, however, to believe that these figures fall short of the real number; since then it is probable the number has been doubled or trebled, and that including those collaterally associated with the art, it is even four or five times that number. But these figures fall far short of the number interested in photography as amateurs. We are informed that eight years ago, in establishing a periodical which has since become the leading photographic journal, a large publishing firm sent out twenty-five thousand circulars—not sown broadcast, but specially addressed to persons known to be interested in the new art-science. The number of professional photographers in the United States is said to be over fifteen thousand, and a proportionate number may with propriety be estimated as spread over continental Europe and other parts of the civilized globe.

But a more curious estimate of the ramifications of this industry may be formed by a glance at the consumption of some of the materials employed. A single firm in London consumes, on an average, the whites of two thousand eggs daily in the manufacture of albumenized paper for photographic printing, amounting to six hundred thousand annually. As it may be fairly assumed that this is but a tenth of the total amount consumed in this country, we obtain an average of six millions of inchoate fowls sacrificed annually in this new worship of the sun in the United Kingdom alone. When to this is added the far larger consumption of Europe and America, which we do not attempt to put in figures, the imagination is startled by the enormous total inevitably presented for its realization.

In the absence of exact data we hesitate to estimate the consumption of the precious metals, the mountains of silver and monuments of gold which follow as matters of necessity. A calculation based on facts enables us to state, however, that for every twenty thousand eggs employed, nearly one hundred weight of nitrate of silver is consumed. We arrive thus at an estimate of three hundred cwt. of nitrate of silver annually used in this country alone in the production of photographs. To descend to individual facts more easily grasped, we learn that the consumption of materials in the photographs of the International Exhibition of 1862, produced by Mr. England for the London Stereoscopic Company, amounted to twenty-four ounces of nitrate of silver, nearly fifty-four ounces of terchloride of gold, two hundred gallons of albumen, amounting to the whites of thirty-two thousand eggs, and seventy reams of paper; the issue of pictures approaching to nearly a million, the number of stereoscopic prints amounting to nearly eight hundred thousand copies.

The Breweries of Chicago.

The Chicago *Republican* has an article upon this subject, describing the process of brewing, and giving the history and statistics of the business in that city. Beer, porter, stout, and the numerous kinds of ale, are manufactured in nearly the same way, the difference lying in the malting and fermenting. The most approved grain is barley, of the species called "Rath." The grain must be full, and must contain a large proportion of starch. In malting, the first process is to steep the barley. This occupies about forty-eight hours. When taken out, the grain has increased in weight about forty-seven per cent. It is next dried, and "conched." This process is simply piling the grain upon the malt floor, in rectangular heaps, from twelve to sixteen feet in hight. After a short time the grain becomes moist and hot, and germination begins. This is checked as soon as the stem begins to grow, and the grain is spread on the floor and turned two or three times a day. In this process it becomes white and crumbly. It is then placed in the kiln, and is gradually heated, first to 90 deg., and then to 140 deg. This takes from two to three weeks. It is at this point the character of the liquor is determined, ale being made from the palest, and porter from the brownest malt.

The malt is next ground and thrown into water at 160 deg., where it is thoroughly soaked. At the end of half an hour more water is added, increasing the temperature to 167 deg. After a few hours the "sweet wort" is run off into the "undertack." This wort is a clear, sweet liquor, of the same color as the malt from which it was made. The same process is repeated, the second solution being mixed with the first. The third solution becomes small beer. The liquor is boiled in copper vessels, at 212 deg., strained through the "hop-buck," and cooled as rapidly as possible to prevent souring. Lager-beer is cooled by the application of ice water. The liquor is then let into the fermenting vats, cleansed by isinglass, and barreled for use.

Dundas Cultivator Reissue.

We publish on another page an important decision of the Examiners-in-Chief in the above case, which is one of great public interest. A petition, with some eleven thousand signatures, was presented to Congress last winter desiring it to prevent the grant of the reissue; and a resolution passed that body requesting the Commissioner of Patents to suspend action until the matter could be investigated. The application was consequently suspended, but as Congress adjourned without making the investigation, the Commissioner allowed the case to proceed. The Secretary of the Interior has received many letters since from Members of Congress, and others, asking that action be delayed until Congress meets again, but after mature deliberation, he decided to let the case go on. The report, therefore, is one of unusual interest.

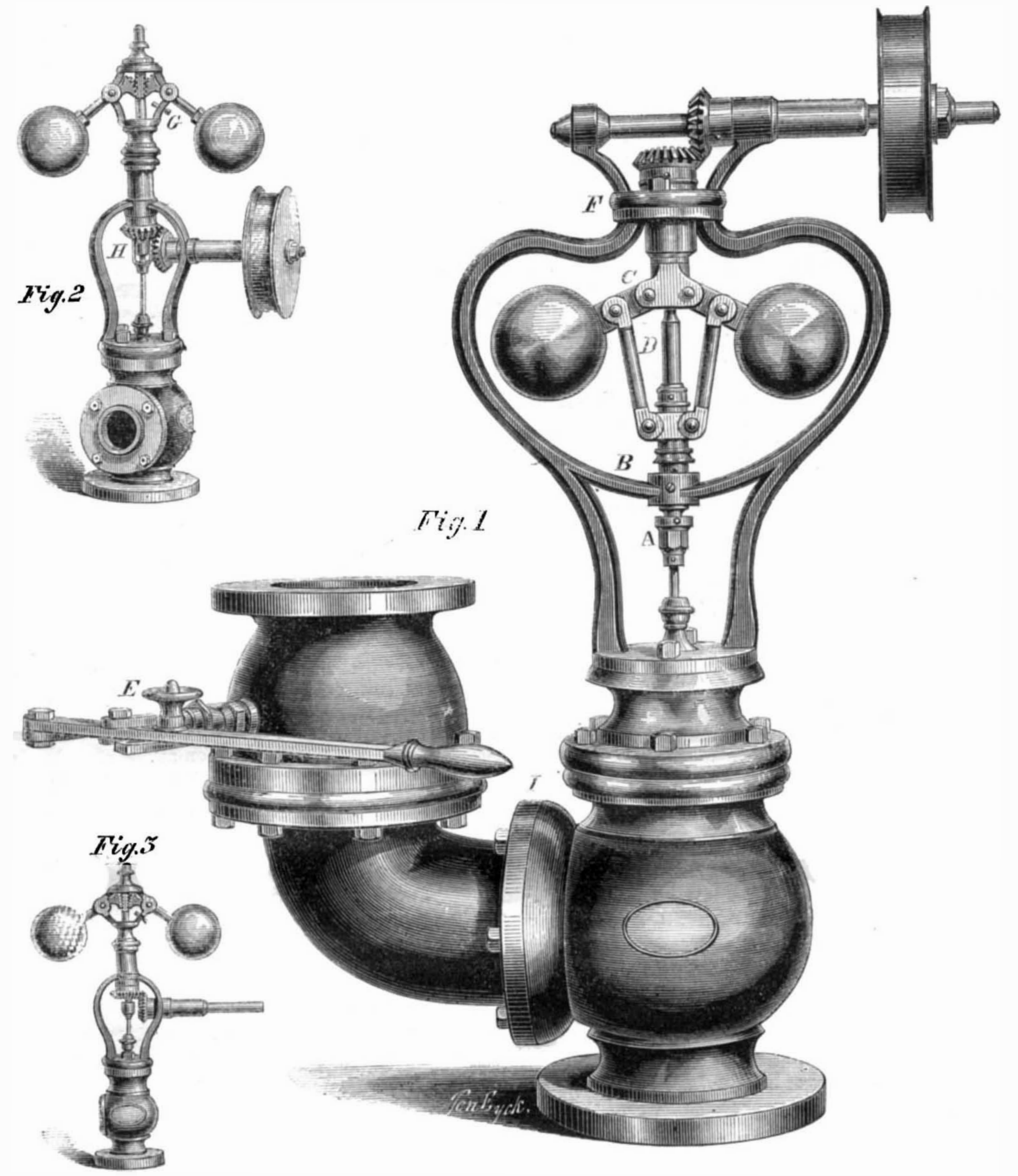
ERRATA.—On page 320, article "Porcelain," fourth paragraph, for "oxide too" read oxide of tin. On page 335, article "Inclosing Electricity," thirteenth line from top, for "glue bottle" read glass bottle. These typographical errors provoke the editor much more than they do the reader. The poor printer often has a narrow escape of well-merited chastisement.

Improvement in the Snow Governor Valve.

Those who have used the Snow governor valve will recognize at once the value of the improvements herewith illustrated. They consist, first, in an outside adjustment of valve and governor combined. The adjustable nut, A (Fig. 1), screws on to the spindle, D, which passes through and is centered by the bar, B, and extends up through the head, C. When the top of the nut, A, strikes the bottom of the bar, B, it determines the highest plane in which the balls revolve, when the engine is running at the speed required—which is first determined by the size of the driving pulleys. The valve, being attached to the bottom of the nut by the small rod, is lifted up toward its closing point, till the nut strikes the bar, which determines the proper position of both valve and governor; the valve at this point being held open the fiftieth part of an inch, or enough to allow the engine to run nearly up to speed with the highest pressure of steam and no load upon the engine. Lowering the nut, A, upon the spindle allows the balls to rise to a higher plane of revolution, and it also drops the valve correspondingly, thus involving an increase of speed of the engine. Screwing the nut up on the spindle causes the engine to run slower, because it stops the governor in a lower plane, and raises the valve correspondingly. Thus it will be seen that the speed of the engine can be varied from the fraction of one revolution to ten or twenty, either faster or slower than the speed first arranged by the pulleys. The spindle does not revolve, and hence the engineer can change the speed of the engine as well while in motion as when at rest. Next in importance is the substitution of a locomotive slide valve, E, with lever and quadrant in place of the common wheel and screw. Third, flanging on of the elbow at I, in place of screwing it into the valve cylinder, as before; and, fourth, the flanging the yoke, F, on to the frame instead of the collar and set screw, as before used. The throttle valve is adjustable, so that the lever can be put in the most convenient position, as also the frame upon the valve cylinder, and the yoke upon the frame.

Fig. 2 is a cheaper modification with the same valve and cylinder, and an improved head, the spindle revolving with segments on the end of the arms working in a rack on top of the spindle with an adjustable screw, G, by which the governor is prevented from rising above the most available point, attaining a nicety by governing, so essential in all establishments driven by steam power, and a swivel, H, to prevent rotation of the valve spindle. When the segment touches the screw, it determines the highest plane the balls are allowed to assume when the valve is at or near its closing. This governor is fitted with a throttle like that represented in Fig. 1, or with pipe flange as seen in the engraving. Fig. 3 is the same, intended for portable and small stationary engines, with valve cylinder tapped to receive the pipe.

For further particulars address G. W. Lasell, 437 Broadway, New York, or H. D. Snow, Bennington, Vt.



SNOW'S GOVERNOR VALVE.

BANQUET TO CYRUS W. FIELD.

On the evening of the 15th inst., the New York Chamber of Commerce gave a grand testimonial banquet, at the Metropolitan Hotel, to our fellow citizen, Mr. Cyrus W. Field, in acknowledgment of the signal service rendered by him in bringing about the successful laying of the Atlantic cable. The large dining hall was artistically decorated by emblems of the science of telegraphy, and about three hundred gentlemen participated in the banquet. Among them were some of the most prominent men of the nation.

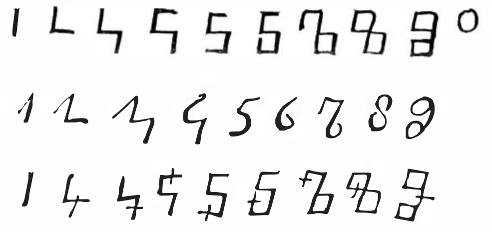
In response to a toast, Mr. Field gave a very interesting and graphic account of the history of the submarine telegraph, which was listened to with deep attention. In reference to the recovery of the lost cable, he remarked:—

"After landing the cable safely at Newfoundland, we had another task—to return to mid-ocean and recover that lost in the expedition of last year. This achievement has perhaps excited more surprise than the other. Many, even now, 'don't understand it,' and every day I am asked 'how it was done?' Well, it does seem rather difficult to fish for a jewel at the bottom of the ocean 2½ miles deep. But it is not so *very* difficult when you know how. You may be sure we did not go a-fishing at random, nor was our success mere 'luck.' It was the triumph of the highest nautical and engineering skill. We had four ships, and on board of them some of the best seamen in England, men who knew the ocean as a hunter knows every trail in the forest. There was Capt. Moriarty, who was in the *Agamemnon* in 1857–8. He was in the *Great Eastern* last year, and saw the cable when it broke; and he and Capt. Anderson at once took their observations so exact that they could go right to the spot. After finding it, they marked the line of the cable by a row of buoys; for fogs would come down, and shut out sun and stars, so that no man could take an observation. These buoys were anchored a few miles apart. They were numbered, and each had a flagstaff on it, so that it could be seen by day, and a lantern by night. Thus having taken our bearings, we stood off three or four miles, so as to come broadside on, and then casting over the grapnel, drifted slowly down upon it, dragging the bottom of the ocean as we went. At first it was a little awkward to fish in such deep water, but our men got used to it, and soon could cast a grapnel almost as straight as an old whaler throws a harpoon. Our fishing line was of formidable size. It was made of rope, twisted with wires of steel, so as to bear a strain of 30 tuns. It took about two hours for the grapnel to reach bottom, but we could tell when it struck. I often went to the bow, and sat on the rope, and could feel by the quiver that the grapnel was dragging on the bottom two miles under us. But it was very slow business. We had storms and calms and fogs and squalls. Still we worked on day after day. Once, on the 17th of August, we got the cable up and had it in full sight for five minutes—a long, slimy monster, fresh from the ooze of the ocean's bed, but our men began to cheer so wildly, that it seemed to be frightened and suddenly broke away and went down into the sea. This accident kept us at work two weeks longer, but finally, on the last night of August we caught it. We had cast the grapnel thirty times. It was a little before midnight on Friday that we hooked the cable, and it was a little after midnight Sunday morning when we got it on board. What was the anxiety of those 26 hours! The strain on every man's life was like the strain on the cable itself. When finally it appeared, it was midnight; the lights of the ship, and in the boats around our bows, as they flashed in the faces of the men, showed them eagerly watching for the cable to appear on the water. At length it was brought to the surface. All who were allowed to approach crowded forward to see it. Yet not a word was spoken, only the voices of the officers in command were heard giving orders. All felt as if life and death hung on the issue. It was only when it was brought over the bow and on the deck that men dared to breathe. Even then they hardly believed their eyes. Some crept toward it to feel of it, to be sure it was there. Then we carried it along to the electricians' room to see if our long-sought-for treasure was alive or dead. A few minutes of suspense, and a flash told of the lightning current again set free. Then did the feeling long pent up burst forth. Some turned away their heads and wept. Others broke into cheers, and the cry ran from man to man, and was heard down in the engine rooms, deck below deck, and from the boats on the water, and the other ships, while rockets lighted up the darkness of the sea. Then with thankful hearts we turned our faces again to the west. But soon the wind rose, and for 36 hours we were exposed to all the dangers of a storm on the Atlantic. Yet, in the very hight and fury of the gale, as I sat in the electricians' room, a flash of light came up from the deep, which, having crossed to Ireland, came back to me in mid-ocean, telling that those so dear to me, whom I had left on the banks of the Hudson, were well, and following us with their wishes and their prayers. This was like a whisper of God from the sea, bidding me keep heart and hope. The *Great Eastern* bore herself proudly through the storm, as if she knew that the vital cord which was to join two hemispheres, hung at her stern, and so, on Saturday, the 7th of September, we brought our second cable safely to the shore."

Correspondence

The Arabic Numerals.

MESSRS. EDITORS :—After reading a communication in your paper of the 20th of Oct., in relation to the probable original form of the Arabic numerals, I am disposed to adopt the writer's theory, that originally there were as many characters as the number intended to be represented. The writer is, I think, substantially correct in relation to the way in which these separate characters became merged into one by a gradual change. His general ideas in relation to the upward hair stroke, and as to the tendency of the right lines toward the curvilinear form, are quite satisfactory. His details, however, on the subject of the probable original form of these characters, and as to the *quo modo* of this change, I think, can be much improved upon. I therefore send you what seems to me a more probable conjecture as to these details, in order that "Dominus," or some one else, may improve upon my conjectures as much as it appears to me that I have upon those of "Dominus." After considerable reflection I have imagined that the following, in the first line of the diagram, were the original characters of the distinguished Arabian inventor.



I think that all the original characters used were right lines except that of the 0 or naught, and that the upward hair stroke became attached to the first three only because they were the only ones in the formation of which it would probably occur. Now let us see how, with those hair lines becoming attached and with the manifest tendency to convert a right line into a curved one, the change took place from the original to the present form of the figures. This is seen in the second line on the diagram.

The 4 may have been originally added to the 3 by a terminal or bottom line, and the 5 may have received also a bottom line; but I consider this less probable than that the fourth line was added to the top of the 3, although the continuity of motion would be broken; but as this continuity could not have been carried through the series, I have proposed to break it at the 4. The upper horizontal line of the 6 is placed on the left instead of the right of the 1. The 8 is the 7 with one added line, and the 9 the 8 with a line added. The changes from the 1 and from each succeeding character, as the work progressed, may be noted by the crossed lines in the third horizontal line of characters in the diagram.

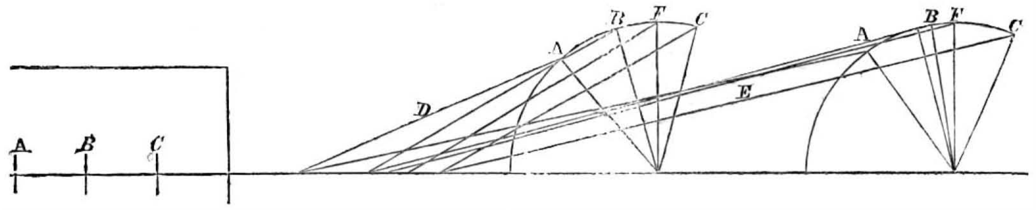
E. S. L.

Ottawa, Ill., Oct., 1866.

[We have also a communication on this subject from E. S. Weld, of Marathon, N. Y., which seems to give a clearer and more probable hypothesis than either that of "Dominus," or of any we have received; but having prepared, the foregoing ingenious theory for our columns at some expense, and being pressed for room, we can do no more than allude to it. His idea is that the hair line of the 1 was originally one arm of an angle, and that each figure had as many angles as the number it was intended to represent.—EDS.

Position of the Piston when the Crank is Vertical.

MESSRS. EDITORS :—Your correspondent, P. H. Vander Weyde, M. D., in his article showing the error of a prior correspondent, A. S., in relation to the "Place of the Piston when the Crank is Vertical," has himself given a rule which is not correct. It is, take the length of stroke as 4, connecting rod, 8, and crank, 2. By his rule you will find the distance traversed by the piston, when the crank is vertical, to be 2·54. But by trigonometrical calculation it is 2·254. Again, take the length of connecting rod as 4, and the other measures same as before, the distance traversed by the piston when the crank is vertical will be found to be 2·536, or nearly 2·54, which is the same as by his rule—which only works right when the connecting rod and stroke of piston are of the same length. Again, take the extreme case he mentions: that is, take the connecting rod same length as the crank, 2. In this case the piston will have moved the whole length when the crank is vertical, as he truly says, and yet in all three cases his rule will give exactly the same result. The truth is, no formula can be given for all cases, but a diagram is easily made which will be practically as correct as a trigonometrical calculation. I have calculated the different angles at which the crank will stand, when the piston is at different definite parts of the stroke, and they are as follows:—Taking the stroke, 4; connecting rod, 8; crank, 2. When the piston is at one-quarter stroke, the angle is 54 degs., 11 min., 50 sec.; at one-half stroke, 82 degs., 49 min., 10 sec.; at three-quarter stroke, 112 degs., 8 min. When the crank is vertical the piston has moved 2·265.



Let A, in the diagram, represent the positions of the piston and crank at one-quarter stroke, B their positions at the half-stroke, and C at three-quarters. D represents the connecting rod equaling 4, and E the rod equaling 8. F is the vertical position of the crank. The reader can readily understand the diagram by a reference to the lettering and carefully tracing the lines.

H. W. S.

Cincinnati, Oct., 1866.

[The importance of a correct knowledge of the relative positions of the piston and crank of an engine will be conceded by those who have to set the valves on steam engines. We think our correspondent has thrown some light on the subject by his diagram. An old and experienced engineer told us, the other day, in speaking on this subject, that of several hundred engines he had indicated, the valves, in nine-tenths of them, were wrongly set to get the maximum amount of power for the steam used. In some cases the loss was nearly thirty-three per cent. It is, therefore, important to know the exact relative positions of piston and crank in different points of the stroke.—EDS.

Scientific Blasting---Nitro-Glycerin.

MESSRS. EDITORS:—In my letter of the 20th ult., I referred to a few conditions to be observed in using nitro-glycerin for blasting purposes. Since then I have received many letters asking for further details respecting my experiments at the Hoosac Tunnel, and in order to spread the information to the greatest number with a view to accomplish the most good, I address you further upon the subject.

When I visited the Hoosac Tunnel in August, I had not witnessed the explosion of nitro-glycerin in rock of the hardness of the Hoosac Mountain. The Tunnel is penetrating through solid massed mica and quartz. The strata lie against the progress, and there are but few seams and slips. It tears roughly and in no instance quarries. Every cubic inch must be blasted.

The "heading" is 6 feet high and 15 feet wide. Below is the "bench" or bottom enlargement, 4½ feet deep, the width of the heading. In the west shaft it was about 300 feet in the rear of the heading. The further enlargements are to be above and at the sides. My experiments were in the west shaft, "bench" and "heading," proceeding eastward.

Prior to my arrival, good miners had been making from 2 to 3 feet per day with the "bench." The holes had been set from 15 to 20 inches back, drilling 4 holes to make the width of the tunnel. These 4 holes were drilled 4 feet deep, charged with powder and well tamped. After blasting the 4 holes, about 5 short holes, averaging 15 inches, had to be drilled in order to make an even bottom. According to these figures the number of inches to be drilled to make $60\frac{7}{10}$ feet lineal, would be 9,612. Two men can drill about 100 inches per day of eight hours, and wages are $2 25 per day. The expense for miners, tools, and incidentals, amounts to about $6 per eight hours, for each 100 inches, making a total of $566 72 for drilling. The time required to make $60\frac{7}{10}$ would be at least 20 days. There would be about 144 long holes, 180 short holes, and at least 36 blasts. This is the rate of progress that had been made with gunpowder.

My first experiment was in the "bench" as above described, and within three days I advanced $60\frac{7}{10}$ feet. I used nitro-glycerin, exploded by the aid of electricity. If the rock could be removed after each blast, I can make 70 feet in that time. I had 9 blasts and 28 holes, five feet deep, total inches drilled, 1,680. The cost of the nitro-glycerin was less than the price of gunpowder for the same number of feet.

My next experiment was in the "heading" for a period of three days. The average speed per month with powder had been 64 feet, blasting every two hours holes 20 to 30 inches deep. When I commenced my experiment the rock was excessively hard and the trial was very severe against me. I blasted 15 holes every eight hours, holes 30 to 36 inches deep. Within the three days I made 14½ feet. The next three days the rock happened to be better for blasting, and powder was used, making $6\frac{4}{10}$ feet. Number of nitro-glycerin holes 132 and about 4,356 inches for the 14½ feet. Number of powder holes 180 and about 4,500 inches drilling, making $6\frac{4}{10}$ feet.

In the same class of rock I am of opinion that I can make at least 35 feet per week in the heading, and in a month of 27 days about 158 feet, making 94 feet per month more than can be accomplished with gunpowder.

From these figures the Hoosac Tunnel can be finished in less than half the time and for less than half the expense by using nitro-glycerin. From eight to ten years has been the estimated time for completing the work, and the expense, several millions of dollars. For these economic considerations the very able Chief Engineer of that great enterprise is encouraged to believe in the early completion of the work by his adopting nitro-glycerin.

Before closing my letter I wish to give a warning to the Nitro-Glycerin Company. It has the patented monopoly for its use for 17 years, and an evasion of the patent is not possible. To attain great success, large sales and small profits is mercantile practice. It is to be hoped that their present price, $1 75 per pound, will not be increased. I refer to this because the Company has, through its Board of Directors, on account of the great demand for nitro-glycerin, passed a resolution not to sell any more of the construction stock for a sum less than par.

In my next, I will give more important information in regard to charging and tamping nitro-glycerin blasts.

TAL. P. SHAFFNER.

Circulation in Steam Boilers.

MESSRS. EDITORS :—Permit me to submit for your consideration the results of a number of experiments made a few months since, the objects of which were to increase the economic efficiency of steam boilers, and also to test the effect of circulation of the water in boilers on the generation of steam. My boiler was of about three horse-power and of plain cylinder form, the fire being applied under it in a brick-work furnace in the ordinary manner. The fuel was wood, about three pounds per horse-power per hour being the maximum consumption, and the pressure averaging 60 lbs. per square inch by the steam gage. In order to make the water circulate throughout the boiler, I conceived the idea of introducing an iron plate into the boiler, placed about two inches from the bottom sheet, and slightly depressed toward the rear end, where the products of combustion passed up the chimney; the plate being about three inches shorter than the boiler, that is, there were three inches of space between each end of the plate and the ends of the boiler, so that the water could pass between. The fundamental principle being that the water between the plate and the bottom of the boiler would be heated first, and the water being lighter than the colder water above, would flow along in the direction of the highest temperature—that part just over the grate bars, and where the plate has the highest altitude; thus a revolving current would be formed of which the plate would be the focus.

When this was done the fires were started, and, by means of a man-hole at the top, I was able to note the effect on the water, which had a temperature of 50 degs. As soon as the temperature began to rise, a movement in the water became perceptible, and as the temperature increased, became more and more forcible, forming a current flowing from end to end of the boiler with tremendous rapidity, and boiling furiously. In one minute the entire mass of water had acquired an equal temperature of 200 degs. throughout the boiler. In half a minute more steam began to evolve from the end of the plate over the grate bars (the water, of course, flowing away at right angles to the direction of the steam), and in a solid mass entirely free from bubbles of steam. I now shut down the man-hole and made fast steam; pressure quickly formed; all ebullition ceased, and in five minutes the gage gave 19 lbs. pressure per square inch! By the old method fifteen minutes were required to reach the boiling point. In ten minutes more the pressure was 60 lbs. per square inch, when the safety valve was thrown wide open and the steam, transparent and perfectly dry, rushed forth to a distance of three feet.

By the old way the steam was very wet, and drenched everything around for some distance. So rapidly was steam formed, the swiftly-flowing current constantly sweeping the bubbles of steam from the highly-heated surface of the boiler, that twice the usual quantity of water was evaporated in a given time, while the consumption of fuel—dry pine—came down to one pound per indicated horse-power per hour, by night, and the same rate of economy was obtained in the use of coal, when that fuel was subsequently used.

After having made this highly-satisfactory experiment I concluded to try tubular boilers on the same plan, the plate being placed just above the tubes and slightly inclined upward toward the fire-box end of the boiler, so as to send a constant stream of water through the tubes and maintain equal temperature throughout the boiler. The results obtained were still more satisfactory, steam being formed with astonishing rapidity. Under such circumstances I consider it as conclusive that circulating water in steam boilers is in every manner advantageous, yielding the maximum of economy with the minimum of fuel.

ALBERT J. HASTY.

Waterville, Me.

Small Electric Machine Wanted.

MESSRS. EDITORS:—The Lenoir Gas Engine Company is in want of a cheaper, but equally effective, electric apparatus, than the clumsy Ruhmkorff coil and acid battery now used. If a "thimble battery" will send a spark over the cable, why will it not give our little engines, with 20 feet of wire, a good spark?

I am prepared to contract to-day for one thousand suitable electric machines for the Lenoir Gas Engines. Cannot some of your host of inventors supply them?

We are indebted to the SCIENTIFIC AMERICAN for inquiries for our Engines from every nook and corner in the United States—the result of a very modest little advertisement, carried upon the wings of your industry and enterprise.

JOHN B. MURRAY, President, New York City.

Notes & Queries.

O. K. L., of N. H.—Your question is hardly appropriate for our columns, but as you failed to give your name we cannot address you by mail. Naval apprentices are appointed by the Secretary of the Navy. The candidate must be sixteen years old, pass an examination in the ordinary English branches, spend two years in the school at Annapolis, and two as a cadet in the workshop, when, if competent, he can graduate as third assistant engineer.

W. W. and N. G. H., of Texas.—The question propounded is this. "Is there any more power in an engine, the piston of which is twelve inches diameter, having four feet stroke, than in one of the same diameter having but one foot stroke, the steam pressure being the same?" The question is not one of the relative value of long or short levers, but simply one of motion from pressure exerted on the piston. If the pressure on the piston is sixty pounds to the square inch, the six-inch crank would make four revolutions while the twenty-four inch crank made one. The amount of power exerted would be the same. But even if the question was confined to a part of one revolution, thus using the cranks as simple levers, the result would be the same. In one case the short lever would exert its force through a less distance than the long lever would have to travel in performing the same work. The reason for using different lengths of stroke for cylinders of a common diameter is adaptability to the kind of work to be performed.

F. D., of Pa.—You say the grate bars of your boiler, twenty feet long, by thirty-six inches diameter with one fourteen-inch flue, are only ten inches from the boiler. The space is too little. Better be fifteen or eighteen inches if you wish to utilize the combustion of your fuel. For such a boiler we think a stack thirty inches diameter is full large. Two gage cocks, if properly placed, are as good as three; but for convenience and economy you should have a water indicator. It will save the time of the engineer, and the continual wear of the gage cocks. The direction the grate bars run, relatively to the boiler, will not effect its efficiency.

M. J. S., of Ill.—Polished iron will retain heat longer than if it be rough. If the iron of your apparatus is not to be subjected to a higher temperature than 250 deg. we suggest that you paint it or varnish it of a light color.

N. C. T., of Ill.—We are not aware of any composition used to coat polished steel, giving it a blue color which will not be removed by use. The blueing of steel is effected by exposing it to a charcoal fire, or to heated plates of iron, until the requisite color is obtained. The heat required is not sufficient to soften hardened steel. A transparent varnish can be applied hot, but will not last for your purpose. One part gum copal, one oil of rosemary, and two or three of alcohol is its composition.

J. O. M., of N. Y.—Refer to our reply to W. L. F. of Ill., in our issue of Oct. 27th. Or, if you prefer a cheap process of bronzing, paint your castings of the shade required and varnish. Before the varnish is quite dry, while "sticky," dust it with a copper or bronze dust and rub it on with a linen pad or a paint brush. Then varnish. Muriate of copper dissolved in water will give a copper coating to articles of cast iron, but they must be preserved with a coat of varnish.

D. M., of Pa.—You will see in this issue that we have published an article, illustrated with a diagram, which meets your ideas on the relative positions of the crank and piston.

EXTENSION NOTICES.

John James Greenough, of New York City, having petitioned for the extension of a patent granted to him the 17th day of January, 1854, for an improvement in machines for pegging boots and shoes, and reissued the 4th day of July, 1854, and again reissued on the 16th day of April, 1859, in six divisions, numbered 698, 699, 700, 701, 702, and 703, on which divisions extension is now prayed for for seven years from the expiration of said patent, which takes place on the 17th day of January, 1868, it is ordered that the said petition be heard on Monday, the 1th day of February, 1867.

George W. Brown, of Galesburg, Ill., having petitioned for the extension of a patent granted to him the 2d day of February, 1853, for an improvement in seed planters, and reissued Feb. 16th, 1858, and again reissued Sept. 11, 1860, in five divisions, on four of which extension is now prayed for, viz., numbers 1036, 1037, 1038, and 1039, for seven years from the expiration of said patent, which takes place on the 2d day of February, 1867, it is ordered that the said petition be heard on Monday, the 21st day of January next.

Harvey Murch, of Lebanon, N. H., having petitioned for the extension of a patent granted to him the 14th day of June, 1853, for an improvement in mop heads, for seven years from the expiration of said patent, which takes place on the 14th day of June, 1867, it is ordered that the said petition be heard on Monday, the 26th day of May next.

NEW INVENTIONS.

The following are some of the most prominent of the patents issued this week, with the names of the patentees:—

BOX FOR FORMING METALLIC NUTS.—JOHN TURNER, Richmond, Va.—This invention has for its object to furnish an improved die or box for punching metallic nuts, which can be reduced or enlarged, to adapt it to nuts of different sizes; and by means of which the position of the center may be changed as desired within certain limits.

CORN PLANTER.—R. M. YORKS, Schoolcraft, Mich.—This invention relates to a portable device for planting or dropping corn, and it consists of a novel arrangement of parts, whereby two rows of corn may be dropped simultaneously, and with a greater or less number of grains or kernels in a hill, as may be desired.

COAL-OIL LANTERN.—J. O. HARRIS, Reading, Pa.—The object of this invention is to simplify the construction of the lantern render it more compact, especially as regards weight, and at the same time retain all the advantages of the original lantern.

BOOT JACK.—H. N. DEGRAW, Newburgh, N. Y.—This invention relates to a boot jack of that class which are provided with movable or pivoted jaws, and it consists in a novel and improved manner of applying the jaws to the foot piece and arranging certain parts therewith, whereby the jaws may, by the pressure of one foot on the foot piece, be made to grasp the heel of the boot on the other foot, so that it may be readily withdrawn.

INDICATOR FOR RAILWAY.—E. B. VAN WINKLE, New York City. This invention relates to an indicator for railways and is designed to indicate to the conductors of trains on arriving at a depot, or at any point on the line of the road where the invention is placed, the exact time a preceding train passed said depot or point, so that collisions which not unfrequently occur in consequence of the slow motion or delay of one train on a track and the rapid motion of a succeeding one, will be avoided.

HORSE HOLDER.—WM. B. CHAPMAN, La Salle, Ill.—This invention relates to a horse holder to be attached to the hub of a wheel of any vehicle, for the purpose of securing or making the lines or reins fast to it.

SPIKE-DRAWING MACHINE.—NATHAN ADAMS, Altoona, Pa.—This invention has for its object to improve the construction of the spike-drawing machine patented by the same inventor, September, 1865.

HOLLOW ARBORS.—JOHN BURT, Sturgis, Mich.—This invention consists in so constructing hollow arbors for rounding square sticks that only the knife or bolt which cuts the wood, shall touch the stick.

HORSE HAY FORK.—T. H. ARNOLD, Troy, Pa.—This invention relates to that class of horse hay forks which are provided with hooks or prongs connected with certain mechanism which admits of their being adjusted in line with a bar so that they may be readily thrust into the load or mats of hay to be elevated and then turned outward from the bar so as to catch into the hay and take up a quantity when the device is elevated.

DRILL.—NOTTINGHAM AND DUNCAN, Vinton, Iowa.—This invention relates to a tool or drill, for enlarging the bore of a well, at and about the lower end; for this purpose it is so connected to the lower end of a rod that by rotating which in any proper manner, the tool will be brought to bear against the sides of the well and cutting the same, produce the enlargement desired.

PULLEY SUSPENSION HOOK.—D. B. BAKER, and P. S. MILLER, Rollersville, Ohio.—This invention is designed to furnish an improved means by which the pulley of a horse hay fork may be suspended from a rafter or other support of difficult access, and for similar uses, without the inconvenience and danger of clambering to the desired point of suspension and suspending the pulley by a chain or rope.

SASH FASTENER.—DE LANCE COLE, Marshall, Ill.—This sash fastener and supporter is of such a construction that the sash can be fastened and supported at any desired hight.

GOVERNOR VALVE AND VARIABLE CUT-OFF.—J. L. DICKINSON, Dubuque, Iowa.—This invention relates to a steam engine and consists in certain improvements in governor valves and in the variable cut-off, whereby many of the obstacles which have been met with heretofore are overcome.

WRENCH.—W. EVANS, Forestville, Conn.—This invention consists in the manner employed for locking the movable jaws to the bar of the wrench which has the said movable jaw fitted to slide upon the bar, which latter has its back serrated or toothed.

TAG OR LABEL, G. W. STORER, Portland, Conn.—This invention relates to a tag or label especially intended to be used upon trees, shrubs, vines, and other plants, although it can be employed for other purposes; the invention consists in so forming the tag or label, made either of sheet metal or other suitable flexible material, that it can be secured to and around the tree, or other plant or article, without requiring the use of an additional or extra fastening device, and without the least injury to the article to which it is applied.

BEEHIVE.—MOSES GUTHRIE, Clifton, Iowa.—The nature of this invention consists in so constructing a beehive that the bees may be kept in different apartments or may be allowed to work in one apartment, as may be desired.

COMBINED STOVE AND FURNACE.—H. G. DAYTON, Maysville, Ky.—This improvement consists in the arrangement of a reverberating chamber directly above the fire box, in which the heated air is first received and wherein it serves to impart heat to the air contained in an annular surrounding chamber which is supplied with air at top, and serves in part to heat air in the main radiating chamber, which incloses both the reverberating and the secondary air heating subdivisions.

BAKING PAN.—STEPHEN WEST, Trenton, N. J.—This invention relates to an improved pan for baking fancy crackers, and it consists in forming the bottom of the pan with a series of semicircular corrugations, grooves or channels, to receive and hold the cracker material during the baking operation, thus preserving their round or cylindrical shape.

SORGHUM SKIMMER.—W. B. SEWARD, Bloomington, Ind.—This invention has for its object to furnish an improved skimmer, by the use of which the operator will be able to skim both sides of the pan with equal facility, and it consists of a skimmer open at both ends so as to permit either end to be used to lift or remove the scum.

COUPLING FOR CULTIVATORS.—SILAS M. WHITNEY, Galesburg, Ill.—This invention consists of an adjustable rectangular frame, two eye bolts, and a connecting bar, in combination with each other and with the plow beam and frame or axletree of the cultivator, for the purpose of connecting two double or single plows to cultivate corn.

CORN PLANTER.—JOHN CONRAD, Centralia, Ill.—This invention relates to an implement for planting corn, and consists of an automatic device for dropping the seed and a novel arrangement of the shoes and parts applied thereto, whereby the shoes may be raised or lowered, to suit the depth required for the corn to be covered, and raised when not required for use.

WHEAT DRILL.—JAMES F. HARCOURT, Moscow, Ind.—This invention relates to a new and improved device for sowing wheat and other grain in drills, and it consists in a novel construction and arrangement of parts, whereby a very simple and efficient implement for the purpose is obtained, one that may be turned within a limited compass, and which will admit of having the seed planted at a greater or less depth, as may be desired.

LOCK.—E. LAWSHE, Atlanta, Ga.—By this invention a lock is produced which is especially applicable for use upon freight cars, although it can be applied to other and various purposes, the object being to combine with the lock a tablet or other suitable means in such a manner that by the locking of the lock such tablet will be so operated by the key used or through the locking mechanism, as to expose such portion of its face to view as is marked to correspond to the destination which the freight car is to have upon which the lock is used, as, for instance, whether its freight or load is "Way" or "Through," or for this or that station along the line of the railroad over which the car may be run.

MEASURE AND FUNNEL.—E. GRATTAN, Williamstown, Mich.—This invention consists in a graduated measure and ventilating funnel; the body of the funnel, which is the measure, is provided with feet on which to rest it when used as a measure, and with a nozzle when it is to be used as a funnel; it is also provided with a valve at the bottom of the nozzle operated by a valve stem rising above the top of the apparatus, the valve stem having a spiral spring applied to it for keeping the valve always closed, and also with pins or graduated marks along its length to indicate the quantity of fluid contained in the body of the device.

VEHICLE.—WILLIAM ASHLEY JONES, Dubuque, Iowa.—This invention has for its object to furnish an improved means by which the brake may be applied to the wheels with exactly the necessary amount of force; by which the wheels may be locked upon an up or down grade; and by which the horses may be disengaged from the wagon whenever necessary.

CLOTHESPIN.—GEO. F. BARDEN, Dover, N. H.—This invention consists in a novel manner of arranging a rubber spring or cushion in connection with the clothespin.

LOADING-ROPE DEVICE.—JOHN GIFFORD, JR., Watertown, N. Y.—This improvement consists of a means of gripping the loading rope and fastening it to the tubular socket which is suspended from the rope which passes to the pulley.

QUARTZ CRUSHER AND PULVERIZER.—C. W. STAFFORD, New York City.—The principal object of this invention is to avoid the danger of clogging which results from the excessive motion imparted to the upper in comparison with the lower part of the reciprocating jaw, and for this purpose the inventor avoids the use of a fixed pivot or fulcrum for the moving jaw, and mounts it upon guides and imparts to it a reciprocating rectilinear motion by means of eccentrics.

AXLE BOX.—CALEB M. OLIVER, Port Carbon, Pa.—In this case the weight of the car instead of devolving upon the lubricating axle box, is sustained directly by the axle; the axle box being thus prevented from wearing away and becoming leaky by use.

CHURN.—WM. M. COOK, Lyons, Iowa.—This improvement consists in the arrangement of the churn upon the pivoted arms which vibrate in vertical planes, a flat spring fastened to the frame and engaging with a block on the bottom of the churn, restoring the latter to its normal position after being vibrated in either direction.

WRENCH.—WM. M. OWEN, Homer, Iowa.—In this wrench the shank of the movable jaw has holes, and the handle has a spring plug, which latter engages with such one of the holes as may secure the desired relative adjustment of the jaws. A lever placed conveniently for the thumb is the means for the withdrawal of the plug for readjustment.

HIDE-FLESHING AND STONING MACHINE.—JESSE S. WHEAT, South Wheeling, West Va.—This invention has for its object to furnish an improved machine for fleshing hides, and which may also be used for stoning glazed paper.

ROLLING PIN, STEAK HACKER, ETC.—A. WILLIAMSON and A. RICHARDSON, Alleghany City, Pa.—This invention consists in the combination of a rolling pin, steak hacker, grater, beetle, and butter print into one instrument.

CURING AND PACKING CHEESE.—WM. B. NICKELSON, Lowville, N. Y.—This invention consists in curing cheese within a wooden hoop, which may be removed at will for inspection and rubbing The advantages are, that the cheese may be turned with greater ease and safety, the cost of cloth bandages is saved, the symmetry of the cheese is better preserved, and the excessive thickening and hardening of the rind on the sides and corners, by exposure to the atmosphere, is prevented, and when the cheese is cured the addition of covers to the top and bottom of the hoop completes the box for transportation to market.

WEATHER BOARDING, SPACING, AND HOLDING CLAMP.—D. M. MOURLAND, Little York, Ill.—This invention relates to an instrument or device for the use of carpenters in putting up horizontal siding or weather boarding on houses, the object of it being to gage and set the spacing of the siding, mark the ends for fitting up against the "finish" or corner plate, and hold up the siding in place while it is fastened.

PIANOFORTE.—G. C. MANNER, New York City.—This invention relates to certain improvements in the metal frame of a pianoforte, and it consists in filling the metal bridge which forms an integral part of the metal frame, with ivory from below, so that the strings bear against said ivory filling, and the disadvantages are avoided which arise if the strings bear against the bare metal. This metal frame is placed entirely in front of the tuning pins, whereby the wrest plank is firmly supported and the tuning pins are prevented from working loose. A slot in the metal frame allows of placing the damper lifters behind the point supporting the string, and the application of French damper levers over the bridge is rendered practicable. A bar extending parallel to the lower strings and under the upper strings serves to strengthen the metal frame.

LANTERN.—LEWIS F. BETTS, New York City.—This invention relates to that class of lanterns designed for being used with a coal-oil lamp, and will admit of the glass globe being detached, whenever required for cleaning purposes, or when broken or cracked, so that a new one may be adjusted in its place.

CULTIVATOR AND STALK CUTTER.—W. W. PHILLER, Port Byron, Ill.—This invention relates to a device for cutting corn-stalks, and cultivating or plowing corn, and marking the ground for planting the same. It consists in a novel construction and arrangement of parts, whereby the desired work may be done expeditiously and in a perfect manner.

BEEHIVE.—T. EISENHART, Doylestown, Pa.—This invention relates to an improved manner of hanging the comb frames in the body of the hive, whereby the frames are rendered perfectly accessible, and any one frame may be removed from the hive without disturbing the others.

FEED APPARATUS FOR THRASHING MACHINE.—GEO. W. CARPENTER, Medina, Mich.—This invention relates to improvements in a grain thrashing machine, and consists in a self-feeding apparatus to be attached to cylin er thrashing machines of ordinary construction, for the purpose of cutting the bands of the bundles and spreading the straw evenly, which is then conveyed and fed regularly to the thrashing cylinder.

WASHING MACHINE.—J. HINDMAN, Olathe, Kansas.—The object of this invention is to construct a machine by which the labor is reduced and the operation of washing clothes is made more perfect.

MANUFACTURE OF SALTPETER.—VINCENT E. KEEGAN, M. D., Roxbury, Mass.—This invention relates to a process for the manufacture of nitrate of potassa or saltpeter, wherein the process is imitated which is employed by nature in producing saltpeter in caves, and which consists in placing potassa under the influence of an abnormal condition of the atmosphere, produced by the absence of all electric power of the sun's rays.

WINDMILL.—DANIEL STRUNK, Janesville, Wis.—This invention consists in an improved mode of constructing windmills for regulating the motive power of the wings or sails, by means of self-acting apparatus connected with them, operated upon by a weight which rises and falls according to the strength of the wind, and opens and shuts the sails, thereby changing the angle at which the current of air passing through deflectors strikes them, and modifying their power of resistance.

ESCAPEMENT FOR TIMEPIECES.—S. W. ROBINSON, Detroit, Mich.—The object of this invention is to impart to the balance impulses which sha l be equal to each other in the amount of force, a single impulse being given at each double vibration of the balance. This purpose is effected by a lever acted upon by a spring and applied in combination with the escape wheel, the balance, and two detents, in such a manner that the force required for unlocking the detents is derived entirely from the hair spring of the balance and lever, while the power of the hair spring acting on the lever imparts to the balance the desired impulse at each double vibration of said balance.

CHURN.—J. D. PARROT, Morristown, N. J.—This invention relates to an improvement in that class of churns in which the tub is connected to a pendulum and suspended in such a m nner that an oscillating motion can be imparted to it, whereby the churning operation is effected.

INDIA-RUBBER ROLLERS.—JAMES B. FORSYTH, Roxbury, Mass.—This invention relates to a roller made of india-rubber or other vulcanizable material, the outside of which is soft and elastic, and the core or inside semi-elastic, said core being compounded of india-rubber, ground rubber rags, sulphur, oxide of zinc, calcined magnesia, and lampblack, in such a manner that the cost of the roller is reduced, and furthermore a core is obtained which will expand when warm and contract and become firm when cold, and which will give a firm hold to the roller on its shaft.

HORSE HOE.—JOHN GIFFORD, Jr., Watertown, N. Y.—This improvement consists of a pair of wings applied to and extending laterally in the rear of the share, and made adjustable as to depth and breadth of furrow by means of braces, etc., extending from the standard beam and handles to the said wings.

CARRIAGE.—G. H. and E. MORGAN, Edgeware Road, London.—The claims for this invention were published in our last number, and are embraced in two patents obtained through this office. It is an English invention relating to improvements in pleasure carriages for raising and lowering the tops by means of a system of levers, all of which are hid out of sight within the frame and lining of the vehicle, and are operated readily by the driver while remaining in his seat, instead of the old-fashioned method of outside rods and knee-joints, which not only disfigure the carriage but often cause danger to the occupants by requiring the driver to leave his box and abandon control of the horses. Messrs. R. Hoe & Co., Printing-press Builders, No. 31 Gold street, N. Y., are agents for the Patentee.

HAT-BLOCKING MACHINE.—SETH BOYDEN, Newark, N. J.—This invention relates to a machine for the blocking of hats, in which the "hat-cone," so called, is placed upon and over a block that is then of a shape or form corresponding thereto, but is so constructed that it can be changed or made to assume the ordinary form of a hat-block.

POLISHING MACHINE.—JOHN MOORE, Gardiner, Me.—This invention relates to an improved polishing machine for smoothing the faces or flat sides of doors, and consists in the combination of a carriage for supporting a table on which the door is to be laid flat for polishing, with rails and rollers for moving the table longitudinally and transversely under a revolving rubber or polisher, so that every part of the face of a door may be brought under the polisher and be made smooth.

SULKY PLOW.—J. J. REED, Polo, Ill.—The nature of this invention consists in constructing a sulky plow, so as to stride the rows of plants, and operate in such a manner that the driver can, by means of a walking beam pivoted to the rear end of the pole, impart a lateral motion to the plows, and by means of a lever can elevate the plows so as to pass over obstructions or move the machine from one place to another.

SHOE AND OTHER BRUSHES.—F. M. CARNES, New York City.—This invention relates to brushes which are used for applying to articles a substance to be polished, and afterward polishing the substance by rubbing or friction produced by the brush, such as shoe brushes, stove brushes, etc.

CIDER AND WINE MILL.—JOHN H. WILLIAMS, Sandusky, Ohio.—This invention relates to a mill for grinding or crushing fruit for the purpose of expressing the juice therefrom for the manufacture of wine. It consists of two rollers of iron, wood, or other hard material, in connection with a roller of india-rubber or other elastic material, so arranged that the juice will be expressed from the fruit, and the former separated from the crushed fruit or pomace.

SEEDING MACHINE.—HENRY THOMASON, Lafayette, Ind.—This invention relates to a seeding machine, provided with adjustable or expanding bars, to which the seed boxes are attached for the purpose of planting the seed in drills at a greater or less distance apart, as may be desired.

DOUBLE-SHOVEL CULTIVATOR.—A. F. GROVE, James Creek, Pa.—This invention consists in attaching the plow or shovel beams to the main beam of the implement, so that the plow may be moved longitudinally, and the two plows or shovels reversed in position, so that either plow may be placed foremost as occasion may require, and the implement thereby rendered capable of working back or returning in the same furrow with the foremost plow or shovel in both cases nearest the row of plants.

FIRE ALARM.—EUGENE FONTAINE and OSCAR SIMONS, Fort Wayne, Ind.—This invention relates to certain improvements in that class of fire alarms, the operation of which depends upon the expansion of a wire. This wire is stretched over a series of roller studs secured in a board or bed-plate, to which the entire mechanism is attached, and it is strained to such a degree that it retains a plunger which is exposed to the action of a spiral spring in a certain position. If the temperature rises, causing the wire to stretch, the plunger follows the action of the spring, and by pushing against a pair of toggle arms, throws them out of their balance, and allows a spring to act on a rod whereby an alarm is sounded.

REVOLVING HORSE HAY RAKE.—CURTIS SATTERLEE, Paris, Ill.—This invention has for its object to furnish an improved revolving hay rake, so constructed that the rake may be operated from the driver's seat.

MAGIC ALPHABET BLOCKS.—S. L. HILL, Williamsburgh, N. Y.—This invention consists in the use of triangular blocks, which, when properly combined, show on their faces different letters, in such a manner that when the blocks are separated and mixed up considerable skill and patience are required to put the appropriate blocks together, and when the blocks are put together they produce a novel and striking effect.

SPOKE DRIVING MACHINE.—ELI KEITH and DELL BIRD, La. Fontaine, Ind.—This invention consists of a very simple machine, in which the hub is keyed, gaged, and adjusted so that the spokes may be driven in with regularity and with any required dish.

SMOOTHING ATTACHMENT TO COMBS.—THEODORE SCHREIBER, Wheeling, W. Va.—This invention consists in the arrangement of a vertically-sliding spring pad in combination with the teeth of a comb, in such a manner that by the action of the spring pad the hair in combing is pressed down smooth and in good condition, and the use of a hair-brush after the comb can be dispensed with.

RAILROAD CAR AXLE BOX.—F. LEPPEUS, Hartford, Conn.—In axle boxes for railroad cars it is important to protect the contents of the oil chamber from dust, etc., which by this invention is secured.

RIBS FOR UMBRELLAS.—WILHELM HUGO, Celle, Hanover.—This invention consists in a T-shaped rib for umbrellas, each rib being provided with a longitudinal groove or depression on its outer surface, in such a manner that the same, on account of its peculiar shape, combines strength and lightness, and by the longitudinal groove room is obtained for the seam to lodge in, so that the rib does not injure the fabric which constitutes the covering of the umbrella or parasol.

NEEDLE PRESERVER.—G. L. TURNEY, London, England.—This invention relates to a novel mode of arranging needles for sale, the object being to dispose of them in packages of a more convenient construction than heretofore, so that the danger of spilling and loosing the needles will be removed, while at the same time said needles will be more easily accessible than at present, and they can be taken up one at a time for use without disturbing any of the other needles in the same package.

CONSTRUCTION OF BUILDINGS.—ANDREW TANNER, Hoboken, N. J.—This invention relates to a building, the outer frame of which as well as the internal partitions, is made of rough boards placed one on top of the other, in such a manner that recesses are formed on both sides of each wall, which serve to support the plaster, and suitable gutters in these recesses afford an additional hold for the plaster. The boards which compose the walls or partitions are provided with vertical and horizontal air channels, in such a manner that the air is free to circulate through said walls, and the formation of dry rot in the boards is prevented.

SOAP COMPOUND.—J. K. ANDREWS, Antrim, Ohio.—This invention relates to a soap compound which contains carbonate of ammonia, benzine, sal soda, saltpeter, ordinary soap or opodeldock, and fresh potatoes, mixed together in such a manner that a cheap soap is obtained of superior detergent qualities.

SPRING BEDSTEAD.—DANIEL PUNCHES, Plymouth, Mich.—This invention consists in a spring frame, one end of which is attached to the end of the slat, and the other to the end rail of the bedstead at both ends; the spring frame consisting in detail of a quadrilateral frame, around each of whose side strips a spiral spring is coiled, and a sliding frame working with the quadrilateral frame, and operating in such a manner that on depressing the slat of the bedstead the spiral springs will be contracted, and the slats receive the required springing motion.

WINDOW SASH.—J. E. HOOD, Springfield, Mass.—This sash requires neither putty nor glazier, and has several important advantages. It is made in two sections, which are secured together on the inside, the glass being held firm by a thin packing of india-rubber between it and the outer half of the sash. It is but a few minutes' work to glaze an entire sash. The sash is handsomer than the old style, varnished or painted wood only being seen on the outside. The glass can readily be taken out for cleaning, or for painting or varnishing the sash, and the convenience of resetting when a pane is broken is obvious. With this sash every man may be his own glazier. It is peculiarly adapted to car windows and show cases, and in all dwelling houses making pretensions to elegance it must soon supersede the old style. Further information may be obtained of the patentee as above.

Improved Turntable Pivot.

The ordinary turntables for railroads, and the swing bridges for streams, usually have a central shaft embraced by a box, which guides the rotation of the frame, while the weight rests mainly on the circumferential trucks. Of course, when weight is on the turntable, as that of a locomotive and tender, it requires the expenditure of much power to move the mass. It is difficult, also, always to keep this central shaft properly lubricated, and to do this it is necessary to descend into the pit.

The improvement herewith illustrated is simply a device for transferring the weight from the circumference to the center, thereby greatly diminishing friction, and to insure perfect lubrication at all times. The pit for a railroad turntable is constructed in the usual manner. In the center is the pedestal, A, the top of which is hollowed to receive a sphere of solid metal. This is the pivot, and upon this rests the weight of the bridge. A cap, B, also hollowed, sits on this ball and is bolted to the bridge. Through its top is an oil hole which may be covered to keep out dirt and dust, and the under side of the cup is channeled to carry the oil to the cup-like receptacle at the top of the column, A. It will be seen that so long as any oil whatever remains in this receptacle, it occupies the proper place for effective lubrication. The weight of the bridge is concentered at the point of least resistance, and the friction is so little that the inventor states one man can turn the heaviest locomotive and tender with perfect ease. It seems to be equally applicable to swing bridges, which in many places are superseding the ordinary drawbridges. It has been in use on the Lehigh Valley Railroad two years with perfect success.

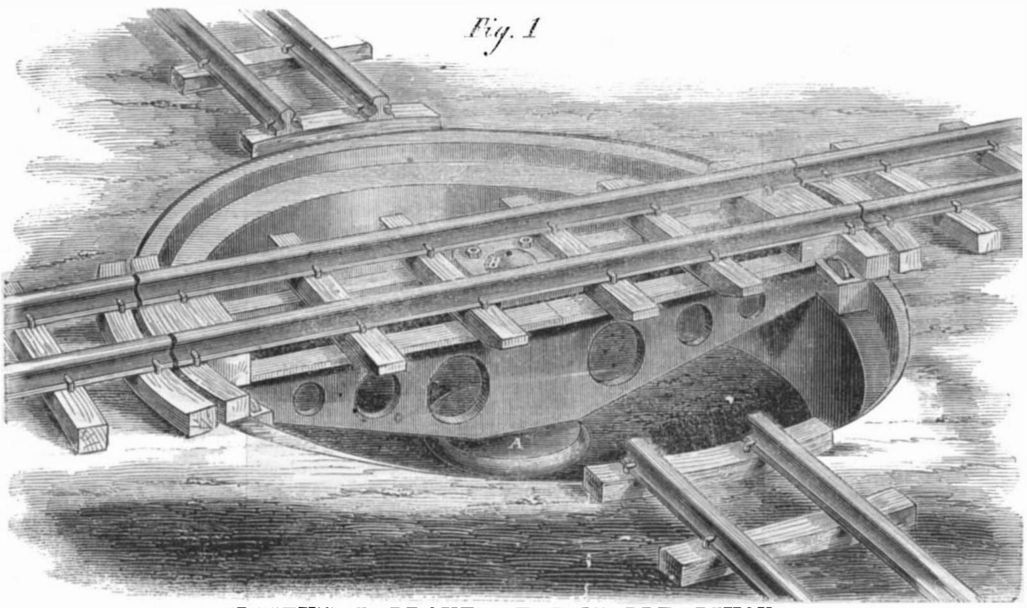
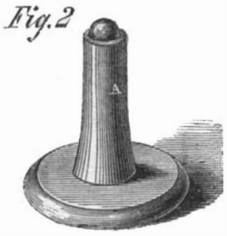


Fig. 2



KINSEY'S IMPROVED TURNTABLE PIVOT.

Patented through the Scientific American Patent Agency, Nov. 28th, 1865, by John I. Kinsey, South Easton, Pa., to whom apply for additional facts.

ERIE BASIN DRY DOCK COMPANY.

It appears from English papers that the misfortunes of the *Great Eastern* have not yet ended. Returning from her cable trip, it was necessary to have her overhauled, but no dock could be found sufficiently large for her accommodation, and at last accounts she was idly lying in the river Mersey.

The length of the dry dock at Birkenhead, where the leviathan essayed to enter, is given as 600 feet, the width and depth corresponding. The dimensions here stated, according to the best information at hand, make this superior to any dock in this country—longer by some 240 feet than the granite dock at the Brooklyn Navy-yard, hitherto considered the largest in the country. The new dry dock lately finished in Brooklyn surpasses the Government dock in its dimensions, but cannot be ranked as a rival of the Albert basin at Birkenhe d.

The Erie Dry Dock Company, composed of Boston and New York capitalists, have obtained, by purchase, a large property situated on Elizabeth street, South Brooklyn, having a valuable water frontage on the Erie basin of fourteen hundred feet. The dry dock itself measures at the top 550 feet in length by 120 in width, and 476 by 61 feet at the bottom. The depth of water at the sill is eighteen feet, while inside a depth of twenty-four feet is secured. The gate is a caisson, built with keel and stern, and has all the appearance of a vessel in itself. The beveled edge is designed to fit into corresponding grooves on either side of the dock, and is sunk to close the opening by pumping water into the lower sections by a small engine on board.

The dock is emptied by two of Hibbard's centrifugal pumps driven by a horizontal engine of one hundred horse-power. The escape pipes are two in number, twenty-four inches diameter, each capable of discharging 30,000 gallons of water per minute.

When a ship needs repairing, she is warped into the dock, centered, and stayed with ropes to the shore; the caisson is then placed in position, and the donkey engine set to work. In the course of half an hour, the inclosed space is water-tight, and the water discharged by the large pumps in from two to three hours.

An inconvenience arises from having but one dock; for if several vessels, needing more or less repairs, are docked together, neither one can be discharged till all are finished. On this account the company contemplate the building of another basin, smaller in superficial area, but four feet deeper than the one just completed. The erection of an extensive range of warehouses, and other improvements are being carried forward and will add to the perfection of the enterprise. Connected with the dockyard, the Erie Basin Iron Works furnish unsurpassed facilities for repairing and renovating disabled vessels and refitting them for active service.

WILLIAMS'S POTATO WASHER.

Devices for lightening the labors of the housewife form no insignificant part of the business of the Patent Office, and although, at times, it may seem as though the contrivance was too simple to be made the subject of a legal claim of proprietorship, yet many of our most valuable discoveries derive their merit from their simplicity.

The annexed engraving illustrates one of those simple improvements which appeal to the tidy housekeeper. Every one who has pared potatoes knows that the fingers acquire a dark tinge from contact with the tubers. This is to prevent in part the handling of the roots. A is an ordinary wooden pail, having a bar across its upper surface, with slats extending to a semi-diameter, which form a grate. In the center of the bar is an upright shaft, extending to the bottom, furnished with arms connected with a sweep that revolves by means of the crank, B.

The potatoes, or other vegetables, are placed in the pail with water enough to cover them, when the handle, B, is turned, which passes them rapidly through the water. The water is then drained off through the grating, and the potatoes can be emptied without the operator wetting his or her hands. No further description or recommendation is necessary for understanding and appreciating this improvement.

It was patented through the Scientific American Patent Agency by Joshua H. Williams, July 24, 1866. For territorial rights and other information apply as above at East Craftsbury, Vt.

"Time will Tell."

The interest, even enthusiasm, drawn forth by the predicted meteoric display of the past week, is worthy of being placed on record. The excitement was wide spread, and our local exchanges detail the arrangements universally made for witnessing the display.

The observatories had each a full corps of enthusiasts, and anxious star-gazers on watch-towers improvised on house tops and commanding points waited impatiently for the promised shower. In most of our cities the authorities had arranged for the heralding of its beginning by public signals. that all might witness the extraordinary phenomenon.

That the fall was far from equalling anticipation, it is needless for us to say, but it is equally certain that the display, in the number and brilliancy of the meteors, surpassed those of previous years. Unfortunately for the astronomers, a storm gathering from the south caused some indistinctness toward the close of the second night, and in this section heavy clouds upon the following evening entirely precluded observation.

In a short time we shall know whether other lands have been favored with showers of greater magnitude, and from the data, theories and calculations may show how possible perturbations have caused unexpected variations in time and place.

Progress of the Pacific Railway.

The Central Pacific Railway, now in progress from Sacramento City to the California State line, is in course of rapid completion.

The iron horse now runs on this line a distance of 93 miles, and 10,000 laborers, chiefly Chinese, are now at work. This road has used up for their drills in this rocky path, over 100 tuns of cast steel, and have ordered 150 tuns more for this purpose. They use 250 to 300 kegs of powder per day for blasting rock—these two items show great work. There are now on the road 14 engines of the very first class, and two more of extra power now landing; they have over 200 freight cars and 100 more on the way. This company now own their road—already a good paying institution—and they own the Sacramento Valley Road, and also the adjoining roads, and by their liberal offers to purchasers of land and to shippers of freight, they are winning public favor every day.

The progress of the western divisions, which are intended to connect with the Central Pacific at the State line, are also progressing rapidly, and much sooner than many supposed it possible, the iron bands will stretch from the Atlantic to the Pacific.

A COMPANY has been organized in Milwaukee, Wis., with a capital of $100,000, for the purpose of starting a cotton mill. Several Massachusetts capitalists are interested in the enterprise. A monster woolen factory is also contemplated there.

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VOL. XV., No. 22, [NEW SERIES.] *Twenty-first Year.*

NEW YORK, SATURDAY, NOV. 24, 1866.

Contents:

(Illustrated articles are marked with an asterisk.)

ENLARGEMENT OF THE SCIENTIFIC AMERICAN FOR 1867.

On the first of January, 1867, the SCIENTIFIC AMERICAN completes its Twenty-First Year. The first number of this journal, a folio of four pages, appeared in the Summer of 1845, under the editorial management of Rufus Porter, a scientific enthusiast, who still lives in anticipation that, sooner or later, he may fly to the uttermost parts of the earth in a balloon. That volume abounded in the editor's peculiar scientific and spiritual theories and visions, and was adapted to a very narrow circle. It was, however, the basis upon which the present Editors and Proprietors entertained the notion that a Journal of Popular Science might be built up, which would supply a want seriously felt by the Mechanics, Manufacturers, and Inventors of this country. Upon assuming the management of the paper we determined, upon the commencement of a new volume, to enlarge it and change its form to eight pages. Our expectations were not disappointed. Our patrons responded generously, and the circulation of the paper rapidly increased, and from that time onward the SCIENTIFIC AMERICAN has been a recognized power in the development and extension of every interest bearing upon the Industrial Arts and Sciences.

In 1859, still further encouraged by the success that crowned our labors, and to meet the great pressure upon our columns, we felt obliged to double the size of the paper to sixteen pages. Even this enlargement, however, has proved inadequate to the wants of our readers and advertising patrons, and now, in spite of the greatly enhanced cost of paper and all other materials, we propose—now that the SCIENTIFIC AMERICAN has become of age—on the first of January to enlarge and improve it in every respect. The proposed enlargement will give our readers an increase equivalent to seven additional pages of reading of the present issue, and will enable us to enter more extensively into the important details of American and Foreign Industry, Art, Science, and Discovery, than our space, hitherto, has permitted.

This contemplated change will involve an additional cost for editorial talent, mechanical labor, paper, etc., of nearly twenty thousand dollars per year; but we have fully decided to undertake it without increasing the subscription price. The fact is indisputable that the SCIENTIFIC AMERICAN will be, by far, the cheapest and most valuable paper of the kind ever published. Its circulation is now more than the combined weekly issues of all similar journals in this country and Great Britain, which fact alone attests how it is appreciated by its intelligent readers. The position it now holds will not be relinquished if industry, talent, and a liberal expenditure of money can produce a journal worthy of public confidence and a wide-spread circulation.

Under the new arrangement the SCIENTIFIC AMERICAN will contain more reading matter, at one-half the cost, than the largest scientific journal published in England.

WROUGHT SCRAP IRON FOR FORGINGS.

The breaking of so many shafts of our sea-going steamers—instance those of the steamers *Atlantic* and *Pacific*, several years since, in the Collins Liverpool line, and, more recently, several shafts as well as cranks, of the Pacific Mail Company's ships—has led us to examine the subject, and inquire of what material these shafts, cranks, etc., were made.

From the most reliable information we have gathered, we find they were made of wrought scrap iron, of which it appears there are several kinds.

The first is the "common scrap of commerce," which is gathered from the thousands of smiths' shops throughout the country.

The second is what is known as "railroad scrap," which consists of old rails, bolts, plates, etc., that have been used in ordinary railway operations.

The third is "boiler scrap," which is composed of sheets and rivets from condemned steam boilers.

The fourth is what is called "selected scrap." This consists of old horseshoes, horseshoe nails, and the clippings from the tack-plate mills of the country.

The first two of the kinds of scrap iron above enumerated are made up of all and every kind of iron manufactured in this country and in England, from the most inferior of Welsh bars up to the best American brands in market. Russia, Swede, and Norway irons, are not generally used for ordinary purposes, on account of their high price.

The third class of scrap iron ought to be of the best iron that can be made; but unfortunately such is not the case; an evidence of which is the frequent boiler explosions from one end of the country to the other; consequently there is no certainty of getting a sound, uniform piece of forging, even if boiler scrap is used.

As for the fourth class—selected scrap—its quantity is so inconsiderable that any discussion of its merits or demerits will avail nothing in the object sought to be obtained by our remarks on the subject under consideration. As for old horseshoes and nails, they are scattered over such a vast extent of country, that to make them a specialty would cost more than their value, after re-manufacture into the kinds of forgings we refer to; and as for tack-plate scrap, we feel safe in saying, the very nature of the tack manufacture—the cutting the plates into articles so small as carpet tacks for instance—precludes the possibility of any large quantity of "scrap" remaining after the tack maker has used every delicate little piece that his machine will cut.

The results of our investigations convince us that at least ninety per cent, if not more, of all scrap forgings are made from the first three kinds of scrap mentioned; it is practically impossible to make, with certainty, any piece of forging, and more particularly large shafts, cranks, etc., which shall be reliable, and which can be depended upon for strength and tenacity, where scrap iron, composed of such great varieties and qualities as we have shown, is used. The various kinds of iron will not unite—will not weld thoroughly, heat and hammer them as much as you may.

From the examination we have given this subject, we are of the opinion that the only reliable and safe course for our forge-masters to pursue, is to make their forgings of one kind of iron. Let them test the various brands of foreign and American irons, and use only the strongest and most tenacious that can be procured; and we feel confident we shall hear no more of broken steamer shafts, endangering a loss of life and property.

We are well aware that a judicious mixture of cast irons often improves the quality, and gives a stronger and better casting than otherwise; but such is not the case with wrought iron. We would as soon think of making a railway bridge of oak, pine, and whitewood, and expect it to be as strong as though it were made exclusively of the best of white oak, as to suppose that a steamer shaft made of mixed scrap iron would be as strong and reliable as it would be if made of one quality, and that the best iron that can be manufactured.

CHANGE IN THE STYLE OF PATENTS.

But few are aware of the fact that all letters patent issuing from the United States Patent Office on and after the 20th of this month, will be in an entirely new dress, on different material, smaller, neater, and containing a printed specification. The patent proper, or grant, instead of containing the design of the Patent Office building, will have an engraving intended to show the progress of invention, the details being quite clever, and which, by way of comparison and contrast, will always appear fresh and pleasing to the eye. This beautiful design is original with Mr. Theaker, our present courteous and efficient Commissioner of Patents.

Place of the Counterbalance on Saw Mill Sashes.

A writer, G. W. P., Ogdensburgh, N. Y., doubts the propriety of placing the counterbalance of vertical saw mills opposite the crank. He says, the gate, brought to a stand-still at the extremity of its stroke, offers heavy resistance to the motion of the wheel, suddenly checking its velocity, the centripetal as well as the centrifugal force being instantly counteracted. Now, considering the wheel truly balanced and the counterbalance an adjustable weight, capable of exerting its force upon a given point on the wheel; and supposing the momentum of the wheel to be thus suddenly checked, the counterbalance will exert its power, not in a vertical line opposing the shock, but in the line of flight, should it then be detached from the wheel.

This shows that the counterbalance does not so much tend to counteract the vertical shock as to give a horizontal shock to the pillow blocks.

He recommends placing the counterbalance at a point in advance of the crank, as when the crank pin is at its lowest point, the counterbalance at a point a little above a line drawn through the axis of rotation, so that it precedes the crank's motion about one-third of the circumference. He thinks the subject is worthy the attention of scientific mechanics and practical men.

Practical Hints.

Under this title we shall communicate to our readers a series of short articles, containing such useful information as has been proved by experience of practical men to be reliable, and, therefore, desirable to be more universally known and applied. We ask contributions to this column from our readers.

No. 1. TO PREVENT RATS FROM DAMAGING LEATHER BELTING.—It is not an uncommon occurrence in factories where steam power is used, that during the night, or periods that the machinery is stationary and the shop abandoned, the rats will eat the leather belting, where it is accessible to them; for instance, where it passes through openings in the floor; cases have even happened that they gnawed holes in the floor just over the place where a belt was running horizontally in order to reach and eat pieces out of it.

Now, it is a singular fact that rats will not touch anything containing castor oil, or even only covered with it, and, therefore, to guard belting against the voracity of these animals, all we have to do is to touch it at every placewhere belting is exposed to their attacks with a brush previously dipped in castor oil.

The antipathy of the rats against this useful oil is really strange. Probably their instinct teaches them that it is injurious to them; but it is useful for men to know this in order to guard many substances against their voracious appetite. V.

PATENT OFFICE DECISION---CULTIVATORS.

BEFORE THE EXAMINERS-IN-CHIEF ON APPEAL.

Application of James Dundas for a Reissue of the Patent for a Cultivator granted to him February 8, 1859.

The implement contemplated in this invention consists of the well-known straddle-row cultivator for corn, mounted upon wheels. There are two cultivator shares, or spades, on each side, and the inside one of each pair is attached to a stock which can be vibrated from side to side, and the two are so connected that they work together. A seat is provided upon the frame for the driver, who is thus enabled to guide the middle spades by means of a lever, so as to avoid such hills as are out of line in the row he is operating upon. A mechanism is also provided by which the plows can be raised from the ground and sustained.

The original application was filed Aug. 9, 1851. The specification was so framed as to monopolize the arrangement for giving the inside shovels a lateral movement, and nothing more. The patentee now asks for an amended grant, which shall vest in him the exclusive title to seven different combinations of devices, each to be embodied in a straddle-row cultivator. The first embraces the two wheels, the frame, and the plows arranged in two gangs, with a central space between them. The next five all include the same elements in combination with other devices. The second adds a seat for the driver. The third the arrangements for shifting the central plows laterally, the depth of the furrow being limited by the wheels. The fourth the movable stocks and the driver's seat. The fifth the driver's seat and the connection between the movable stocks. The sixth the mechanism for raising the plows. The seventh is for arranging the two inside plows in front of the axletree and of the driver.

The slightest glance at these claims will show their momentous bearing on the agricultural interests of the country. They have consequently received a long, most careful, and even anxious consideration on the part of the Board. After a thorough examination of all the references, and all the objections upon which it was rejected, it was sent back for a renewed investigation, and another independent search was instituted for examples of the previous employment of the devices. After a long delay, and the maturest reflection, the result is that we find the Board agreed that the applicant is legitimately entitled to all the combinations specified, except the first and last; and the majority are compelled to hold that he has made out his right to the first.

The first of the objections raised against this application is founded upon the long period which has elapsed since the patentee brought his invention before the Office. It derives great weight from the very extensive use, into which the machines have been introduced meanwhile, and the enormous tax to which a monopoly of it would subject the farming interests of the country. The applicant cannot be held responsible, however, for the entire delay which took place in the Patent Office from the 9th of August, 1851, till the 8th of February, 1859. There was no rule of law during all this time, which warranted the rejection of an application on account of any delay which occurred in the proceedings after it was filed. Nor has any case been known where a patent has been denied on account of the time the application had been pending, except under the provisions of the Act of March 3, 1861.

That the patentee should lie by for eight years, and see his machine going into almost universal use on every side, without making claim to it, and then rise up and lay a restriction upon it, must strike every one as an intolerable grievance, and one that should not be allowed. But it has been so distinctly decided in Stimpson *vs.* The West Chester R. Co., 4 How. 402, that no use of an invention, not claimed in an original patent, is a bar to a renewed one embracing it, and this has been so unqualifiedly affirmed in Battin *vs.* Taggert, 17 How. 74, that the objection cannot be sustained. The very inconvenience and mischiefs growing out of such a reissue as this, were strongly presented and urged in those cases, but did not avail in the mind of the court. Their decision is authoritative and binding on this tribunal, and must govern our conclusions.

It was insisted further that the applicant was anticipated as to some, at least, of the features of his invention, by the rejected application of H. H. Marsh, filed 7th July 1851. In reply to this, Dundas produced evidence of his having devised it complete in July, 1850, and commenced the construction of the machine in the following winter; and of his having completed the woodwork in April after, and the whole machine about the 1st June. He also introduced Marsh's own affidavit that he first invented it in January, or February, 1851. At the instance of the office, Marsh made a further statement, under oath, that he conceived the idea in June 1850, and "arranged and perfected it" in January or February 1851. He means, of course, in his mind merely, as he does not appear to have made any drawing or model of it, and no machine until some time afterward. His travails were all subsequent to those of Dundas, and cannot be regarded as an answer to what the latter had achieved.

Several patents granted by the office before that of Dundas, were also adduced in bar of his petition. But all of them were founded upon applications filed long after his original one. They have no bearing upon the case, therefore, save upon the question of abandonment, and that has been already disposed of.

Several English patents and foreign publications were also referred to. The only machines described, which existed before Dundas's invention, are those of Kirkwood's grubber, and perhaps Coleman's cultivator, mentioned in Stephens's Book of Farm Implements, etc. page 229, etc. The structure of these is so different from that of Dundas as to destroy all inference from the supposed analogy. It is perhaps enough to say that they are mounted on three wheels. Others of the machines alluded to, like that of John White's, which bear a resemblance to the one before us, are suspended from the axle, are attached to it by flexible connections, and are drawn behind it. All beside are posterior in date, such as Poitevine's French Cultivator and Paterson's, Rogers's and Billings's are none of them intended for growing crops, any more than Schemerhorn's, Porter's and other machines.

The first paragraph, in which the applicant specifies what he claims to be his invention, has been the particular subject of our consideration, and is couched in the following language: "The combination in a straddle-row cultivator of the following instrumentalities, viz., the two wheels, frame, and a series of plows arranged in two gangs, with a central space between the gangs, so as to till the soil simultaneously at both sides of a single row of plants which the machine straddles, all of these operating in the combination substantially as set forth." The exception taken to this claim is, that it does not expressly include any of the other mechanism described, without which the machine would never have effected any important results. For it was the addition of that, especially of the laterally adjustable shares, which has given it such remarkable usefulness and immense popularity. Without them it would serve little or no purpose, and would never have emerged from the obscurity in which it was originated. It is argued, therefore, that they are an indispensable appendage of the combination, and that it should not be monopolized in a patent without embracing them.

The question thus raised must not be confounded with that which was so fully considered and determined in Case vs. Brown, 2 Wallace, 320, and Burr vs. Duryee, 1 Id., 553, and which has been more than once before discussed in the courts. In those cases it has been settled that, where devices have been employed to accomplish a certain result, such as the dropping of corn in a peculiar manner when planting, the result cannot be monopolized, but the patent must be confined to the devices. In this proceeding no claim is set up to the result aimed at and supposed to be produced; that is, the improved method of cultivating a row of growing corn on each side. But what the applicant challenges as his invention is certain mechanism, which he employs in conjunction with others to produce the desired result. The language specifies expressly certain portions of the mechanism, and he asks for property in nothing more.

It may be said, however, that all the several parts were old, and that no invention was exercised in combining them. This is by no means clear. In order to adapt a cultivator to this service, three things at least were requisite. The axletree and frame must be shortened so as to pass between the adjacent rows on each side of the row under cultivation. The center tooth must be removed to make room for that row, and the position of the remaining teeth must be adjusted so as to touch neither of the rows, yet till the ground between them. These modifications altogether exceed those which were held to constitute novelty in Newton vs. Vaucher, 11 Eng. Law and Eq. R., 589, and Earle vs. Sawyer, 4 Mass. R., 1.

There are one or two cases, such as that of Saunders vs. Alston, 3 B and Ad., 881, where it seems to have been held that, if two devices cannot be made to co-operate without the intervention of a third, a patent for a combination of the two without the third cannot be sustained. It will hardly be contended, however, that a straddle-row cultivator on wheels could not be managed by handles, for instance, even though it had no adjustable shares, as well as a straddle-row cultivator without wheels.

The objection then can amount to no more than this, that when it is necessary, in order to render a certain combination of devices effective and advantageous, it must have other devices united and co-operating with it, the combination first named is not by itself patentable. To render the patent valid in the eye of the law, the combination monopolized must include these auxiliary devices; and this is so, notwithstanding the original combination was before unknown.

The rule has very generally been understood to be different. Where two things have been combined together for a useful purpose, which have never been so combined before, it has been supposed that this constituted patentable novelty, provided invention had been exercised in joining them and making them co-operate. Invention may also be employed in rendering the whole more effective by additional expedients, as in this case; but it does not follow that these expedients should be so embraced in the specification as to form an essential element of the patented combination. The practice of the office has been constantly against this. Without appealing to the instances of this which fill the records, it is better to cite adjudicated decisions, since they are more authoritative, and are sufficient to determine the question.

In Earle vs. Sawyer, above cited, the invention consisted in the adaptation of a circular saw to a shingle machine already known. The defendant assigned, as one of his grounds for a new trial, that the Court had given the jury these instructions: "If the plaintiff were the first to apply or combine a circular saw with his original shingle mill for the purpose of making shingles, although the shingle mill were in common use, and the circular saw were in use, and there were nothing new in the mode or machinery by which it was applied, still the plaintiff is entitled to a patent." And the learned Judge (Story) said he saw no error in this, provided it was understood that the circular saw and shingle mill had been in use only separately, and not in combination, and that the combination itself was new. In another part of the case the Judge remarked that an objection had been taken to the patent because the machinery required in substituting a circular saw for a reciprocating saw demanded no invention. To this the Judge replied that there were suggestions and proofs given to the jury of difficulties encountered in effecting the substitution, and impliedly of expedients for overcoming them. The patent is lost. But it is obvious from the statement that it did not monopolize the expedients resorted to, but the simple combination of the saw and old machine. There could have been no occasion, if those expedients had been described in the specification, of going to the jury with proof respecting them.

In Pitts vs. Whitman, 2 Stor., 609, the following specification of the plaintiff's invention was pronounced sufficient, viz: "We claim as our invention the construction and use of an endless apron, divided into troughs or cells, in a machine for cleaning grain, operating substantially in the way described." It was objected that the endless apron was old, and that there was nothing new in the new application of it. This was not denied, but was considered of no importance. If nothing was requisite to the operation of the machine except the simple application of the apron, then it would be an authority for patenting the combination of the wheels and frame with the straddle-row cultivator, for there is no more evidence of a useful result following in one case than in the other. It is pretty clear that there were several other devices which contributed to the efficiency of the machine, and which are described in connection with the apron, as the patentee's invention. In this respect, therefore, the patent is precisely like the application before us. In both cases a combination is monopolized exclusive of devices which are necessary to render it practically useful. It is true, the first specification in the patent closes with this language: "operating substantially in the way described;" and this may be construed to refer to the accompanying mechanism. But the claim under consideration is qualified by terms precisely equivalent, "all of these operating in the combination substantially as set forth."

In Washburn vs. Gould, 3 Stor., 122, Woodworth's well-known patent for a planing machine was adjudged to be valid, although the first device, which he challenged as his own, was thus defined: "The improvement and application of cutting or planing wheels to planing boards, plank, timber, or other material." Such wheels were by no means new. In order to render the machine effective, many other devices were necessary, yet the simple use of the wheels for the purpose was made the sole ground of an exclusive grant. The language is not even qualified as in Pitts vs. Whitman. No objection was taken to the claim on this ground; the discussion was upon questions wholly distinct.

It would be multiplying cases for no purpose to cite any more. The objection has never been sustained in this country. No instance of its ever having been raised in the courts is remembered. It may well be doubted whether the principle upon which it is supposed to rest is a sound one; i. e., that a patent for a new combination, which will not operate successfully without something more, is not valid. In Gray vs. James, 1 Pet. C. C. C. R. 376, it was shown that the plaintiff's machine, as patented, had failed entirely, and had been virtually given up; and that the defendant had made great improvements upon it, which had rendered it successful, and that he also had obtained a patent. He was held, nevertheless, to have infringed the plaintiff's patent; and this decision has never been questioned, although some strictures were afterward pronounced upon the ruling of the court as to damages. On the contrary, the universal understanding is, that he who improves another's patented machine must always be subordinate to him, no matter how useless the patented machine may have been in itself.

The majority of the Board see no way, therefore, in which the applicant can justly be denied the first combination to which he lays claim. As to the succeeding five, the Board are unanimous in conceding their patentability. After the full consideration the first has received, it can hardly be necessary to discuss them at length.

The decision of the Primary Examiner rejecting the first six claims is reversed; as to the last, it is affirmed.

(Signed) S. H. HODGES, SAML. C. FESSENDEN, } Examiners in chief.

I fully concur in the conclusions to which a majority of the Board have arrived in this case, with the exception of their allowance of the first claim.

Previous to Dundas's invention, cultivators on wheels were in common use for putting in wheat and other crops. For cultivating corn the instrument was made to straddle the rows and had to be guided by hand. Handles like those of a plow were attached to it for that purpose and wheels were dispensed with. What Dundas did was to devise a mode by which a person riding upon the cultivator could guide it. And this he affected by so attaching the two front shovels that they could be vibrated laterally by means of a handle within reach of the driver. Wheels and a seat were provided and a great improvement was thus affected. The labor of following after the cultivator and guiding the whole instrument was avoided, and the same purposes effected by a person riding on a comfortable seat and easily guiding two only of the cultivator's shovels.

The testimony before us clearly shows that Dundas was the first inventor, and no valid or legal reason appears why he should not have the full benefit of it.

His second, third, fourth, fifth and sixth claims seem to me to fully cover his whole invention and to be all that he is entitled to. His first claim, I apprehend, extends his patent beyond the scope of his invention. It will reach any straddle-row cultivator on wheels, though not using Dundas's peculiar devices.

To merely put a straddle-row cultivator on wheels seems to me to have neither involved invention or to have been attended with any useful result. Simply omitting the front shovel of an ordinary wheel cultivator would have made the instrument that is now claimed, and we have no evidence that if made, it would have been desirable or useful for any purpose. On the contrary, the addition of wheels would evidently have made it difficult or impracticable to guide, and they were undoubtedly left off on that account. Wheels to cultivators being in common use, putting them on to one having a different number of plows, or a different arrangement of plows would hardly rise to the designation of mechanical skill and would not come within the objects or provisions of patent laws.

I am aware that many patents have been sustained for devices that, after they were made, seemed very obvious. But they were cases where important results were obtained by simple means. And the very simplicity of the devices afforded evidence of the highest grade of invention. It sometimes happens that a change of form or arrangement is attended with very important practical consequences, and such changes may have resulted from laborious and expensive experiments. Such improvements are undoubtedly entitled to protection. But no such features characterize this claim. It is for what no one wanted, and consequently no one used; but for what any one would have made if it had been desired.

The claim does not therefore appear to me to be adapted to protect what Dundas invented, but rather to extend his patent so as to cover what others may have devised. It seems to partake of what the Supreme Court have denominated and strongly condemned, "the enlarging process," by which a claim or reissue is expanded so as to embrace other inventions beyond the scope and object of the original device.

For these reasons I have been unable to agree with my associates in allowing the first claim.

(Signed) ELISHA FOOTE, Examiner-in-Chief.

ISSUED FROM THE U. S. PATENT OFFICE FOR THE WEEK ENDING NOV. 13, 1866.

59,534.—LAMP EXTINGUISHER.—Charles E. Abbott, Malden, Mass.

I claim the tube, c, with its lid or cover, d, operated by the lever, h, substantially as set forth.

I also claim pivoting the lid, d, at a point above its upper surface so as to insure its falling by its own weight, substantially as set forth.

59,535.—MACHINE FOR DRAWING SPIKES.—Nathan Adams, Altoona, Pa.

I claim the combination of the lever, B, fulcrum post, I, and guide pin, J, with the stock, A, guide plate and rod, D, and jaws or nippers, F, substantially as described and for the purpose set forth.

59,536.—PUMP.—M. J. Althouse, Waupun, Wis.

First, I claim providing the apertures, e e, leading to chambers, b, containing an expansible packing, with valves, g g, substantially as described.

Second, The combination of means for regulating the inflow of water through apertures, e e, with the spring, c, and expansible rings, a a, substantially as and for the purposes described.

59,537.—DEVICE FOR ATTACHING THILLS TO CARRIAGES.—M. J. Althouse and P. Reifsnider, Waupun, Wis.

We claim the thill iron, A, provided with the cross head, e, in combination with the clip, B, provided with the eyes, b, one of which has the notch and hinged piece, a, arranged to operate as set forth.

59,538.—COFFEE HULLER.—Albert Angell, Newburgh, N. Y.

First, I claim the combination with the roughened or serrated hulling cylinder, B, of independent spring strippers, D, arranged within a hollow segment or trough partly encircling the cylinder, substantially as specified.

Second, The divided spring strippers, D, constructed with roughened or serrated fronts, arranged side by side and in a series one in advance of the other within a hollow segment or trough, C, to which they are secured at their one end, for operation in combination with a serrated or roughened hulling cylinder, B, essentially as shown and described.

59,539.—HORSE HAY FORK.—T. H. Arnold, Troy, Pa.

I claim the slotted prongs, E F, in combination with the bar, C, arm, D, slotted bar, A, and arms, G, arranged and operating in the manner and for the purpose specified.

59,540.—BREECH-LOADING FIRE-ARM.—Joseph N. Aronson, New York City.

I claim the sliding breech, E, in combination with the firing pin or needle, O, the cartridge shell discharger, H, and lever, I, operating in the manner substantially as and for the purposes described and set forth.

59,541.—MACHINE FOR STAMPING REED PLATES.—Charles Austin, Concord, N. H.

I claim the combination and arrangement of the gage, l, the two sets of male and female dies and the adjustable die carrier to a bed and plunger, so as to operate substantially as and for the purpose set forth.

I also claim the combination and arrangement of the three adjustable die carriers, E G H, with the bed and plunger and its fixed or larger die, such die carriers being provided with mechanism for adjusting them, substantially as set forth.

59,542.—PULLEY SUSPENSION HOOK.—D. B. Baker and P. S. Miller, Rollersville, Ohio.

We claim an improved pulley suspension hook formed by the combination of the double hook, A, arm, B, stop D, and socket, C, with each other, the said parts being constructed and combined substantially as herein shown and described and for the purpose set forth.

59,543.—CORN PLANTER.—W. R. Baldwin, Phila., Pa.

First, I claim the reciprocating plates, p, in combination with a plow, N, tubes, g, and with the within described devices or equivalents for measuring and discharging the grain, the whole being constructed and operating substantially as and for the purpose described.

Second, The boxes, K, with their openings, i i, in combination with the slides, m, and their openings, n, when the latter are of the form described for the purpose specified.

Third, The frame, F, with its boxes, K K, plows, N N, crank shaft, P, and pinion, u, in combination with the frame, C, and cog wheel, w, the whole being constructed and operating substantially as set forth.

59,544.—MOUTH PIECE FOR CIGARS.—Ira S. Barber, New York City.

I claim a cigar mouth piece composed of a paper socket and a wooden tube having its longitudinal orifice, c, terminate at its inner end in a recess or chamber, a, bound by a shoulder, b, substantially as and for the purpose herein set forth.

59,545.—CLOTHES PIN OR CLAMP.—George F. Barden, Dover, N. H.

I claim the combination of the rubber cushion D, and double-headed spindle, G, with the arms, B, arranged in the manner and for the purpose specified.

59,546.—SPRING BED BOTTOM.—Benjamin F. Bennett, Lockport, N. Y.

I claim the special arrangement of parts as herein set forth, viz. the cases, C, screwing to the bedstead and inclosing the springs, g, the shanks, f, resting therein upon the springs, and the hooks, d, and loops, b, connecting with the slats, the whole operating in the manner and for the purposes specified.

59,547.—COMBINED POKER AND TONGS.—John Blair, St. Louis, Mo.

First, I claim a combined poker and tongs made substantially as herein shown and described.

Second, The combination with the rigid bar, B, of the movable jaw, C, rod, D, and lever, E, substantially as herein shown and described and for the purpose specified.

Third, The combination of the spring catch, F, with the lever, E, and handle, A, substantially as and for the purpose herein shown and described.

59,548.—AWNING.—James C. Bowe, Urbana, Ohio.

I claim the combination of the adjustable frame, sign board canvas, and roller with pulley and cords, constructed and working as herein described.

59,549.—Compound for Making Writing Ink.—A. D. Bowman, New York City.

I claim a compound for making writing ink composed of the ingredients substantially as herein specified.

59,550.—Device for Confining Cows while being Milked.—Levi Brown, Evans, N. Y.

I claim the stakes, D and D', placed and supported in suitable holes in the stable or stall floor, with or without the strap, F, and rope, G, for the purpose and substantially as described.

59,551.—Roofing Cement.—William H. H. Burnham, East Homer, N. Y.

I claim the within mentioned ingredients, coal tar, quick lime, quick sand and ashes, when mixed and used in the manner and for the purpose specified.

59,552.—Turning Lathe.—John Burt, Sturgis, Mich.

First, I claim a hollow arbor so constructed that only the cutter or bit comes in contact with the stick to be rounded.

Second, The hollow bearings, B and C, so arranged that one shall receive the square stick and hold it from turning while being rounded, while the other shall receive the stick after being rounded and hold it steady and true, substantial y as herein shown and described.

59,553.—Doors and Shutters.—Samuel G. Cabell, Quincy, Ill.

I claim, First, The arrangement of slats in the panels of a door or shutter either stationary or pivoted, so that they may form a series of V's slightly overlapping each other, substantially as and for the purpose set forth.

Second, In combination with the V-shaped slats, c, I claim the arrangement of woven wire inserted on a plane with the frame of the door or shutter and intersecting the angles of the slats, substantially as herein specified.

59,554.—Lamp Burner.—George J. Capewell, West Cheshire, Conn.

I claim, First, The combination of the slot, a, door, b, one or more, with the ratchet shaft, C, wick, D, burner, A, and cylinder, B, substantially as described for the purpose specified.

Second, The spring, F, for holding the wick tube, D, when arranged so that its lower end catches under the lower end of the tube when the tube is raised to its highest point, substantially as and for the purpose specified.

59,555.—Feed Apparatus for Thrashing Machines.—George W. Carpenter, Medina, Mich.

I claim the roller, A, and its band cutters, a a, the cylinder, B, and its spreaders, b b, the roller, C, and its teeth, c c, the thrashing belt, D, and the wing gate, E, combined, arranged and connected with a thrashing machine for feeding the same, substantially as herein described.

59,556. — Pessary. — Herman C. Christie, Herkimer, N. Y.

I claim the curved pear-shaped tube, a b c d, perforated at the upper end, a, and opened at the lower end within the flange or rim, e e, by removing the handle, g h, constructed and used in the manner described in this specification.

59,557.—Plow for Cutting Bogs.—John Coffey, Monroe, N. Y.

I claim the sole plate, D, provided with the prongs, a a', with the cutters, F F, attached in connection with the beam, A, substantially as and for the purpose specified.

I also claim the mold board, E, in combination with the sole plate, D, cutter, F F, and either with or without the cutter or colter, G, for the purpose set forth.

59,558.—Sash Fastener.—De Lance Cole, Marshal, Ill.

I claim the slotted plate, H, when hung upon a pin or stud, D, of a sash frame, as and for the purpose described.

59,559.—Corn Planter.—John Conrad, Centralia, Ill.

I claim, First, Operating the perforated seed slide, F, from the axle, C, through the medium of the lever, L, cam, K, ratchet wheel, J, pawl, d', and spring, I, arranged substantially in the manner as set forth.

Second, The adjusting or raising and lowering of the shoes or furrow openers, M M, through the medium of the rods, N N, bar, O, and lever, P, all arranged substantially as shown and described.

59,560.—Churn.—William M. Cook, Lyons, Iowa.

I claim the churn vibrating upon an axis in combination with a vertical reacting spring planted upon the frame and engaging with the churn, substantially as described.

In combination with the above, I claim the deflecting surfaces, G, and the bolt, K.

59,561.—Machine for Rolling File Blanks.—Perley D. Cummings, Portland, Me.

First, I claim the combination and arrangement of the wheels, A B C, spring, a, bolt, b, rod, k, shaft, i, crank, l, connecting rod, m, and sliding rack, o, all constructed and operating as and for the purposes hereinbefore set forth.

Second, In combination with the subject of the first claim, the combination of the sliding rack, o, geared roller, g', tracks, k' l', with the inclined channel between the same, as and for the purposes set forth.

Third, The combination and arrangement of the wheels, A B C, and rod, k, operating as described, cams, 1 and 2, with thrusting beam, r, toggle, s, jaw, t, levers, b' x, bolt, w, spring, z, and spring, v, all operating as and for the purposes set forth.

Fourth, The combination and arrangement of the screw, e', in the projection, y, with the screw, d', on the toggle, s, as and for the purposes set forth.

Fifth, The combination of the part, h, sliding rack, o, geared roller, g', tracks, k' l', and projection, 3, on the roller, for the purpose of submitting the blank to the necessary pressure.

59,562. — Dental Anæsthetic Instrument. — Ephraim Cutter, Woburn, Mass.

I claim, in combination with the tube, a, having its orifice directly in the end thereof, the tube, b, having its orifice opening laterally directly from the tube, substantially as described.

Also the bifurcated construction or arrangement of the nebulizing tubes, a b, substantially as described, when the orifices are arranged in the manner set forth.

59,563.—Coal Stove.—Henry G. Dayton, Maysville, Ky.

I claim the arrangement above the fire box, K, and within the air-heating chamber, C, of the reverberating chamber, A, supported upon the plate, B, substantially as and for the purpose described.

59,564.—Lining for Journal Boxes.—P. S. Devlan, Jersey City, N. J.

I claim lining journal boxes and other rubbing surfaces with pasteboard saturated with lubricating oil and then compressed, substantially as and for the purpose described.

59,565.—Valve Device for Steam Engines.—J. L. Dickinson, Dubuque, Iowa.

I claim the follower, E, the thimble box, F, and the sliding arm, K, constructed and arranged substantially as herein set forth, in combination with the governor valve of a steam engine.

59,566.—Lamp Shade.—James V. Dunlap, Hartford, Conn.

I claim the shade holder formed with wire springs that are made in pairs united at their upper ends, in the manner and for the purposes set forth.

59,567.—Machine for Making Plugs for Barrels.—L. H. Dwelley, Dorchester, Mass.

I claim in combination with the reciprocating hollow arbor, G, the cutting-off saw, O, brought up automatically at the required time by the means substantially as described.

I also claim the combination of the reciprocating toothed bar, J, carriage, H, pawls, u v, and stationary toothed bar, I, when constructed and operating substantially as and for the purpose set forth.

I also claim the carriage, H, provided with the automatic feed, constructed substantially as set forth, in combination with the reciprocating cutting arbor, G, and the cutting-off saw, O, all operating substantially as described.

I also claim the combination of the hollow post, M, with its spring catch, b', lever, x, with its catch, a', and pawls, u v, all constructed and operating substantially as described for the purpose set forth.

I also claim the cutters, S, in combination with the reciprocating hollow arbor, G, and feeding device, when operating substantially as set forth.

59,568.—Compound for Coating Ships' Bottoms, etc.—Charles James Eames, New York City.

I claim a compound made of the ingredients herein named, for the purpose described, substantially as specified.

59,569.—Beehive.—William T. Eisenhart, Doylestown, Pa.

I claim a beehive constructed with two fixed and two hinged sides with the comb frames connected together by hinges and the outermost frame at one side attached by a hinge to one of the hinged sides of the case, substantially as and for the purpose herein set forth.

59,570.—Hay Fork.—W. H. Elliot, New York City.

First, I claim the employment of support, c, in combination with and arranged under the fork and resting upon the ground, substantially as described.

Second, I claim the arrangement of support c, at an acute angle with the fork handle, substantially as and for the purpose specified.

Third, I claim the fulcrum, e, when permanently fixed in relation to the fork, by means of support, c, and brace, d, or their equivalents, substantially as set forth.

59,571.—Wrench.—W. Evans, Forestville, Conn.

I claim the arrangement of the catch, E, lever, b, and spring, c, when said parts are combined with the movable jaw, D, the serrated shank, A, and stationary jaw, B, substantially as described and for the purpose specified.

59,572.—Clamp for Wash Basins.—James Ewing, New York City.

I claim, as a new article of manufacture, the clamp, c, of sheet metal stamped to receive the form, substantially as set forth, for the purpose of securing basins to marble slabs by the nut, d, as specified.

59,573.—Composition for Paint.—Alfred Ferris, Benville, Ind.

I claim an improved composition for paint consisting of the materials in substantially the proportions and compounded in the manner described.

59,574.—Low-water Detector.—Thomas Firth, Cincinnati, Ohio.

I claim the combination and arrangement of the float and needle mounted upon opposite ends of a single bent rod whose outer end is made o. small diameter and inclosed in a stuffing box, all as herein specified and represented.

59,575.—Skate Fastening.—Moyer Fleisher, Philadelphia, Pa.

First, I claim the clamp, C, consisting of jaws, D, eyes, F, and arms, G, constructed in one piece and adjusted to the slotted connecting bar, B, so as to give a direct sliding motion to the clamps, substantially as and for the purpose specified.

Second, I claim the pivoted connecting bar, B, adapted to move the clamps, C, equally, thereby causing the center of the skate to be at the center of the foot, substantially as described for the purpose specified.

Third, The arrangement of the strap, c d, in combination with the eyes, F, of the clamp and guides, H, whereby they move in the same line with the clamps, as and for the purpose specified.

59,576.—Apparatus for Diffusing the Vapors of Medical or Aromatic Substances.—Anthony L. Fleury, New York City.

First, I claim the self-revolving retort, A, lid, E, pipes, I I, and strainer, K, when used in combination with the pin, C, and pin, G, and the lamp, I, or the flame of a gas burner, for the purposes specified.

Second, The apparatus, B, or its equivalent, when arranged and operating in the manner and for the purposes above specified.

Third, The combination of the lamp-shade supporter or gas-light shade supporter, v v, having the pin, c, with the apparatus, B, the thimble, F, pipes, E, stopper, D, the whole arranged and operating as set forth.

59,577.—Plow.—Frederic Fogelgesang, Canton, Ohio.

I claim the employment of two rods so bent and joined at the under side of the beam by a screw as to make them a continuous bolt through the beam and handle, and firmly fastened by nuts and washers on the outside of said handle, as hereinbefore described.

59,578.—Grouting Form for Wells.—W. S. Follensbee, Janesville, Wis.

I claim the combination and arrangement of the staves, a, ribs, b, hoops, f, and keys, d and e, substantially as and for the purpose set forth.

59,579.—Fire Alarm.—Eugene Fontaine and Oscar A. Simons, Fort Wayne, Ind.

First, We claim the toggle arms, C, and spring, D, in combination with the spring, c, rod, a, and wire, f, constructed and operating substantially as and for the purpose set forth.

Second, The studs, g, and tension device, h, in combination with the wire, f, bed plate, A, supporting the alarm mechanism, substantially as and for the purpose described.

59,580.—Manufacture of India-rubber Rollers.—James B. Forsyth, Roxbury, Mass.

I claim a roller for clothes wringers, etc., so made substantially as herein described, as a new article of manufacture.

59,581.—Hinge for Window Shutters.—William H. Foulds, Henderson, Ky.

I claim, in combination with a hinge so constructed that the weight of the shutter will close the same automatically, the arrangement of the recess, F, and catch, E, operating substantially as specified and for the purposes set forth.

59,582.—Pipe Tongs.—Moses H. Freeman, Somerville, Mass.

I claim the arrangement of the clasp, e, the tooth, c, and the series, d, of notches with the two levers, A B, and their jaws, a b, the whole being substantially as specified.

59,583.—Malt Kiln.—Joseph Gecmen, Chicago, Ill.

First, I claim in a malt kiln the arrangement of a series of perforated floors, operating substantially as and for the purposes shown and described.

Second, I claim, in combination with the above, the employment of a vertical passage, C, a series of openings, D, and one or more slides, E, arranged and operating substantially as specified and for the purposes set forth.

59,584.—Horse Hoe.—John Gifford, Jr., Watertown, N. Y.

I claim the reversible wings, I I, attached to and following the share and adjustably supported from the frame, A B, substantially as described and represented.

59,585.—Hay Elevator.—John Gifford, Jr., Watertown, N. Y.

I claim the combination with the socket, C, of the ropes, A B, and the pivoted detaining tooth, E, operating substantially as described.

59,586.—Mop Wringer.—W. and W. S. Gillett, Stowe, Vt.

We claim the arrangement and combination of the hinged perforated boards, C and E, when constructed with the side boards, B B, stays, H, and foot board, J, operated by the lever, G, as herein described and for the purposes set forth.

59,587.—Cigar Lighter.—Elliott P. Gleason, New York City.

I claim the self-adjusting gas cock, constructed substantially in the manner described for the purpose specified.

59,588.—Chimney Holder for Gas Burners.—Elliott P. Gleason, New York City.

I claim the equalizing spring for chimney holders, constructed substantially as described.

59,589.—Fog Signal.—George P. Goulding, Daniel Clark, and Thomas Dickinson, Buffalo, N. Y.

First, We claim the construction of an automatic air whistle in connection with an air pump or pumps and air reservoir, and the application and use thereof on ship board for the purpose of giving signals to indicate the course of the vessel and the "tack" she is sailing on, substantially as described.

Second, The combination of train of wheels, 1 2 3 4, levers, k1 k2 e3 f3, and connecting bar, g, or equivalents, with an air whistle, for the purpose of opening and closing the valves, E2 and F2, substantially as set forth.

Third, The combination of the wheels, o o', arm, p, levers, m and n, stop pins, j' and r', pawl, r, and ratchet bar, L (or equivalents), with a time piece and air whistle, for the purpose of regulating and controlling the intervals at which the signals shall be given, substantially as set forth.

Fourth, The cam, q', in combination with the dial plate, q, and bar, L, for the purpose of enabling the officer of the deck to set the mechanism so as to give any required signal.

59,590.—Combined Measure and Funnel.—E. Grattan, Williamstown, Mich.

First, I claim the funnel, A, having nozzle, a, feet, b, and cross piece, C, valve, c, lugs, d, the graduated perforated hollow stem, B, and spring, a, arranged and operating substantially as described and for the purpose specified.

Second, I claim the perforated graduated tubular stem, B, in combination with the funnel, A, herein described, as and for the purpose specified.

59,591.—Capping Wood Screws.—Charles T. Grilley, New Haven, Conn.

I claim, in the manufacture of capped screws, the method herein indicated, whereby the nicks in the cap and screw head are formed simultaneously, after the cap has been applied and closed upon the screw, as and for the purpose herein set forth.

59,592.—Cultivator.—A. F. Grove, James Creek, Pa.

I claim the sliding or adjustable plow or shovel beams, C C, applied to the main beam, A, of the implement, and arranged in connection with suitable levers, or their equivalents, to operate substantially as and for the purpose set forth.

59,593.—Beehive.—Moses Guthrie, Clifton, Iowa.

I claim the combination of the rabbeted sliding partition, B, perforated bottom, D, slats, E, perforated bottom, H, slide, F, and box, I, with box, A, substantially as described for the purpose specified.

59,594.—Step for Upright Shaft.—Abraham G. Hamaker, Eberly's Mills, Pa.

I claim the arrangement and combination of a round pointed spindle, revolving upon and with three balls as a revolving step, as herein described, and for the purposes set forth.

59,595.—Wheat Drill.—J. F. Harcourt, Moscow, Ind.

First, I claim the concave bottom, l, in hopper, E, provided with the holes or openings, m, in combination with the toothed wheels, n, fitted in inclosures, t, underneath the bottom, l, the yielding plates, u, and arms, v, attached to shaft, w, for adjusting the plates, u, substantially as and for the purpose set forth.

Second, The pivoted standard, c, in combination with the slotted arm, i, bearing the shaft, C, substantially as described for the purpose specified.

Third, The adjustable yielding plate, w, in combination with arms, v, shaft, w, and index arm, a', substantially as described for the purpose specified.

59,596.—Bridle.—S. B. Hartman, Millersville, Pa.

First, I claim the safety check lines, or reins, I, when such reins are arranged in connection with the bridle, and connected to the bit rings, or their equivalents, so as to operate upon the bit, substantially as and for the purpose described.

Second, I claim the double or looped check straps, A, in combination with the reins, I, substantially as described and for the purpose specified.

59,597.—Composition for Printers' Inking Rollers.—William Harvey, Portland, Me.

I claim the compound of ingredients for printers' rollers, substantially as herein set forth and described.

59,598.—Centrifugal Machine.—R. Hasket and W. B. Cox, West Milton, Ohio.

We claim the distributing device, E, when constructed with a plain concave surface as described and represented, or when wings, F, are attached in the manner as set forth, and arranged with reference to a centrifugal sugar mill, substantially as described.

59,599.—Coated Sheet Metal.—George H. Hazleton, Philadelphia, Pa.

I claim the use and manufacture of sheet copper, coated, substantially as herein set forth and described.

59,600. — Invalid Bedstead. — William Heath, Bath, Me.

I claim the combination for simultaneously operating or moving the leg and back portions, C and E, of the bed, the same consisting of the shaft, H, the gears, G G, the toothed sectors, F F, the arms, f f', and the spring or band, I, the whole being applied to the frame, A, and the said portions, C and E, and arranged therewith, substantially in manner and so as to operate as specified.

I also claim the combination and arrangement of the bands, K K, with the parts, B C D E, and the mechanism for operating the two parts, C E, substantially as described.

59,601.—Car Truck.—B. Heiderich, Brady's Bend, Pa.

I claim the supporting of the trucks from the bed or bottom of the car by means of the loops, F G, substantially as and for the purpose set forth.

59,602.—Injector.—Peter C. Heinz, Funkville, Pa.

First, I claim a gas injector for furnaces constructed and operating in the manner substantially as herein set forth.

Second, The valve, D', in combination with the steam pipe, E, and gas-supply pipe, A, for the purpose and substantially as described.

59,603.—Alphabet Blocks.—S. L. Hill, Williamsburgh, Mass.

I claim, First, The triangular blocks, A, having portions of a letter on the faces near their apex, and words on their centers adapted to form a square with a complete letter and a complete sentence, retained together, and operating substantially as described for the purpose specified.

Second, The grooves, b, in the edges of the blocks, in combination with the spring, a, constructed and operated substantially as and for the purpose described.

59,604.—WASHING MACHINE.—J. Hindman, Olathe, Kansas.

I claim the crank shaft, C, the vertical shaft, D, with its washer, J, the arm, E, and the rock shaft, F, in combination with the box, B, arranged substantially as described for the purposes specified.

59,605.—MACHINE FOR TENONING TIMBER.—Hugo Hochholzer and Frank Denver, Virginia City, Nevada.

We claim clasping, or clamping and turning the timber or log by the means and in the manner described, substantially as set forth.

We also claim holding and presenting the timber or log to be tenoned to the cutters by the means and in the manner substantially as described.

59,606.—MACHINE FOR CUTTING OFF CIGARS.—Frederick W. Hoffmann, Morrisania, N. Y.

First, I claim the construction of a plate, A, provided with a movable guide, B, and guides, C and D, at the forward end of said plate, in combination with a knife, G, fast to a rod or plunger, F, moving in an upright tube or pipe, E, attached to said plate, A, when the whole is arranged and combined in the manner and for the purpose substantially as described and specified.

Second, I claim the projecting piece, n, on the guide, D, acting in combination with the guide, C, on the flexible or feathering knife blade, G, in the manner and for the purpose substantially as set forth.

59,607.—EXTINGUISHER FOR LAMPS.—John N. Howe, Franklin, N. H.

I claim as an improvement in extinguishers for lamps, the tube, E, through which a current of air may be directed to the flame, substantially as set forth.

59,608.—DRILL OR WELL TUBE.—John Hutchins, Elmira, N. Y.

I claim the hollow conical drill point, A, of cast iron, provided with beveled holes or slots, a, with the spiral flange, c, flattened as described, the whole being constructed as described, and for the purposes set forth.

59,609.—FASTENING DOOR KNOBS TO SHANKS.—George Jones and Beverly E. Mead, Peekskill, N. Y.

We claim the fastening of a porcelain mineral or clay door or other knob upon its shank by means of a screw or rivet passing through the knob into the shank, substantially as set forth.

59,610.—VEHICLE.—William Ashley Jones, Dubuque, Iowa.

First, I claim the combination of the jointed rod or bar, K, with the tongue, J, reach, H, and brake bar, N, when said bar, K, is constructed and arranged substantially as herein described and for the purpose set forth.

Second, The combination of the bolt or pin, V, spring, Z, lever, W, cord or strap, X, and pulley, Y, with each other, with the tongue, J, and with the jointed bar, K, substantially as herein described and for the purpose set forth.

Third, The combination of the lever, T, rack, U, connecting rod, S, lever, R, and connecting rods, P, with each other and with the box, I, axle, G, and brake bar, N, substantially as herein described and for the purpose set forth.

Fourth, The combination of the bent bars, D', hooked rods, C', springs, F' and E', cords or straps, G', and pulley, H', with each other and with the whiffletrees, B', substantially as herein described and for the purpose set forth.

59,611.—MANUFACTURE OF SALTPETER.—Vincent E. Keegan, Roxbury, Mass.

I claim the within described process of producing nitrate of potassa by treating potassa substantially in the manner set forth.

59,612.—MACHINE FOR DRIVING SPOKES IN WAGON WHEELS.—Eli Keith and Dell Bird, La Fontaine, Ind.

We claim, First, The arrangement upon the standard, B, of the adjustable frame, K, and pivoted rest, I, operated substantially as described.

Second, The combination of the adjustable rests, I and D, lever, G, and mandrel, N, constructed and operating substantially as described.

59,613.—NARROW-WARE LOOM.—L. J. Knowles, Warren, Mass.

I claim the arrangement of the heddle-operating cams in circular disks, between which the levers extend, when the levers and pins, disks, cams and cam slots, have a relative disposition, substantially as described.

59,614.—BEEHIVE.—Edward Kretchmer, Pleasant Grove, Iowa.

First, I claim the reversible entrance protector, C, provided with swinging bars, V, supports, y y, and front, G, all arranged and operating substantially as and for the purpose set forth.

Second, Constructing and operating the moth trap, substantially in the manner and for the purpose set forth.

Third, Constructing and operating the sectional adjustable sliding swarming guard and entrammel regulator, substantially in the manner and for the purpose as above set forth.

59,615.—LOCK.—E. Lawshe, Atlanta, Geo.

First, I claim the bolts, C and M, in combination with the pawl, S, springs, P and F, guide plates, a a, and lever, I, all constructed arranged and operating in the manner and for the purpose specified.

Second, The combination with a lock constructed as described of a tablet or plate or its equivalent when arranged with regard to the locking mechanism of the lock so as to be operated by the key or keys for the lock, substantially in the manner and for the purposes specified.

59,616.—AXLE BOX.—F. Leppeus, Hartford, Ct.

I claim the combination of the sections, G H, extension piece, I, and spring, L, with the axle, B, with the ring, O, shrunk thereon, substantially as described, as and for the purpose specified.

59,617.—COMBINED GASALIER AND CIGAR LIGHTER.—William C. Lesster, New York City.

First, I claim the combination with a gasalier of a cigar lighter, the fonts of which are supplied with combustible fluid or spirit from a reservoir arranged within the stem of the gasalier, substantially as specified.

Second, I claim the arrangement within the stem of the gasalier of a close combustible fluid or spirit reservoir, leaving the gas pipe pass through a sleeve in it and communicating with the exterior by a supply pipe and font tubes, essentially as herein set forth.

Third, I claim the combination of the gasalier cigar lighter with its reservoir and jet cup, constructed and arranged substantially as shown and described and for the purpose specified.

59,618.—TICKET HOLDER.—Charles Mahon, Macon, Ga.

I claim a pocket case for postage stamps composed of the cylinder, c c', feed opening, o, guide plates, p p', and cutters, l l', the several parts being combined and arranged as and for the purpose herein described and represented.

59,619.—PIANO FORTE.—G. C. Manner, New York City.

I claim placing the damper lifters in a slot of the metal frame behind the point supporting the strings, substantially as and for the purpose described.

59,620.—FIRE PLACE.—Thomas McCleary, Blairsville, Pa.

First, I claim the construction of a grate, B, with open front and ends and with an open elevated back, having air spaces surrounding when such grate is supported by journals in such a manner that it can be upset at pleasure, or secured firmly in an elevated position, substantially as described.

Second, The construction of the oblong bearings, c c, for the flattened journals, b b, of the grate, substantially as described.

Third, Arranging the swinging concave reflector and damper, C, above the open grate, B, substantially as described.

Fourth, So constructing a grate and arranging it in a fire place that it can be upset at pleasure and at the same time, so that it can be locked in an upright position, by means substantially as described.

59,621.—FARM GATE.—Robert W. McFarland, Monticello, Wis.

I claim the V-shaped frame lever, H, pulleys, K, rope, T, sliding rail, N, when constructed and arranged in combination with the adjustable gate, as herein described, and for the purposes set forth.

59,622.—CASK, BARREL, ETC.—Joshua Merrill, Boston, Mass.

I claim the improved cask, substantially as described, having its joints made by matched grooves in the staves, and a separate tongue or key strip of wood driven in to fill the said matched grooves, substantially in the way and for the purposes described.

In combination with the joints of a cask made with matched grooved joints and a separate tongue or key strip, a coating or stuffing of glue, or similar gelatinous cement, between the members of said joints, applied substantially in the way and for the purposes described.

In combination with the joints of a cask made with matched grooved joints and a separate tongue or key strip, a coating or stuffing of shellac, rosin, or other similar resinous cement, between the members of said joint, applied substantially in the way and for the purposes described.

59,623.—TREE PROTECTOR.—Benjamin Merritt, Jr., Newton, Mass., assignor to American Tree Protector Company.

I claim the combination of two or more grooves of unequal size, when arranged in the segments of a tree protector, substantially as described.

Also, in combination with the segments, a, the outwardly projecting flange, f, arranged as and for the purpose specified.

And the bead, g, on the segments, a, when combined with a corresponding formation of the clamp, c, as seen at h, for the purpose of securely holding the parts of the protector together.

59,624.—STUMP EXTRACTOR.—Alexander Monroe, Watkins, N. Y.

I claim the arrangement of the clevis, D, constructed as described, moving vertically in the grooves, i i, with the lever, C, working through it, said parts being used in combination with the double sets of holes, m n, and pins, p p, the whole operating substantially as and for the purpose herein specified.

59,625.—MACHINE FOR POLISHING WOOD.—John Moore, Gardiner, Maine.

I claim the combination and arrangement of the carriage, C, mounted on the wheels, b b, upon the transverse rails, a a, with the table, D, mounted on the wheels, d d, upon the longitudinal rails, c c, or its reversed equivalent arrangement, when used in connection with a revolving rubber, G, supported by a sliding arm, F, for polishing doors, constructed and operated substantially as herein described.

59,626.—CLAMPS AND GAGES FOR WEATHER BOARDING.—D. M. Mourland, Little York, Ill.

First, I claim the within-described clamp, consisting of the adjustable gage and spacing rest, C, gage block, B, guide bar, A, the clamps, c c, and the marker, D, arranged and operating in the manner and for the purpose herein specified.

Second, I claim also the clamps, c c', in combination with the adjustable spacing bar and rest, C', for fastening to the studding of the heading of the siding, constructed and operating substantially as and for the purpose herein specified.

59,627.—SOFTENING DRY HIDES.—John M. Miller, North Becket, Mass.

I claim treating hides before tanning in a liquor which is composed of the within-described ingredients mixed together in about the proportions mentioned.

59,628.—LOCK.—A. B. Mullett, Washington, D. C.

I claim the plate, Fig. 4, and its corresponding key, Figs. 2 and 8, made and combined, substantially as herein set forth.

59,629.—REVOLVING FIRE-ARM.—Albert L. Munson, New Haven, Conn.

First, I claim the reversible cylinder, C, in combination with the detached ratchet, e, and plate or collar, o, or its equivalent, substantially as and for the purpose described.

Second, The center pin, d, in connection with the pin, m, operating substantially as and for the purpose described.

59,630.—HOOP FOR CURING AND PACKING CHEESE.—William B. Nickelson, Lowville, N. Y.

I claim the hoop as a covering for the circumference of the cheese, in lieu of bandages, in curing, and in connection with covers, serving as a box for the cheese during turning, storage, and transportation, substantially as described.

59,631.—DRILLS.—Morgan Nottingham and William Duncan, Vinton, Iowa.

We claim the rod, A, having fixed collar, C, and sliding collar, G, connected together through arms, E and F, with the latter, F, provided with cutting blades, H, substantially as and for the purpose described.

59,632.—AXLE BOX.—Caleb M. Oliver, Port Carbon, Pa.

I claim the bearing, B, and follower, E, in combination with the axle box, C, the former being arranged in relation to the latter so as to relieve the box of pressure, substantially as described.

59,633.—HORSE HAY FORK.—John K. O'Neil, Kingston, N. Y.

I claim suspending the lifting bar, D, and opening bars, C C, by the same straight or direct lever, B, all operating in combination, substantially as and for the purpose herein specified.

I also claim the tripping hook, H, provided with the tripper, k, pivoted thereto at their points, i, constructed and operating substantially as and for the purpose herein set forth.

59,634.—WRENCH.—William M. Owen, Homer, Iowa.

I claim the combination of the handle, A, the spring lever, G, and plug, F, with the perforated shank, D, of the movable jaw, substantially as described.

59,635.—SHIRT STUD.—Charles Padmore, Philadelphia, Pa. Antedated Oct. 27, 1866.

I claim the grouping together of three, four, or more, studs or buttons, as hereinbefore mentioned, and for the purpose described.

59,636.—CHEESE HOOP.—Edwin A. Palmer, Clayville, N. Y.

First, I claim the corner taken off the follower, as described in Figs. 3 and 6, at D and e.

Second, The little ring, D, Fig. 4, or an equivalent, substantially as described and for the purpose therein set forth.

59,637.—CHURN.—J. D. Parrot, Morristown, N. J.

I claim the combination of the tube, C, stirrup, B, pendulum, D, bulkheads, E, and frame, A, when arranged and operating in the manner and for the purpose herein described.

59,638.—WHEAT DRILL.—Charles W. Patton, Exeter, Ill.

First, I claim the shaft, Y, operated by the foot lever, Q, to press the spring, P, upon the drag bars, D, substantially in the manner set forth.

Second, In combination with the shaft, Y, lever, Q, and springs, P, I claim the hinged drag bars, D, teeth and cutters, U or G, substantially as set forth.

Third, I claim the agitator, N, when constructed as described.

Fourth, I claim the slide, H', operated by spring, P', and a lever, B, in combination with the bottom, H, when constructed substantially as and for the purpose set forth.

59,639.—SEEDING MACHINE.—Worden P. Penn, Belleville, Ill.

First, I claim sustaining the forward end of the chute, f, upon the brace, g', of the tooth, E, when said brace is arranged above the drag bar, F, substantially as described.

Second, The combination of the brace, g', with the drag bar, F, and tooth, E, said brace being located above the drag bar and pivoted to it and the upper end of the tooth, substantially as described.

Third, The bottom of the seed box or hopper, C, when this plate is moved back or forward, as the case may be, beneath said openings. The slide, c, serves the purpose of a cut-off for said openings, and it may be adjusted in any convenient manner. By means of the above-described combination of fixed and movable plates, constructed as shown, and applied to the bottom of the seed box, C, I can obtain a small square or rectangular opening, or an oblong opening with one part of such opening wider than the other part, and by this means I am enabled to vary the width as well as the length of the openings of the plate, a, according to the size of the seed or the flow required. The holes of plate, a, are so disposed or arranged that the decreasing offsets of the holes alternately come on opposite sides of the vertical axis of the hopper. The arrangement of the plates and form of the holes therein, enable me to exercise full control over the discharging mechanism for the seed, and to effect a rapid or slow flow of the seed.

59,640.—LADIES' SKIRT SUPPORTER.—L. C. Pennell, Portland, Maine.

I claim the attachment to the hoop skirt of tags to the tapes thereof and the cords as described, all constructed, arranged and operating as and for the purposes indicated.

In combination with the subject of the first claim, the arrangement of the rings, i i, on the skirt of the dress, as and for the purposes set forth.

59,641.—SEWING MACHINE.—Stuart Perry, Newport, N. Y.

I claim making one or both of the feeding disks or wheels adjustable upon the shaft by which it is turned, by means of a series of grooves of varied lengths, and a stud or pin, substantially as and for the purpose described.

59,642.—KINGBOLT FOR CARRIAGE.—James Phelps, Red Creek, N. Y.

I claim the projecting shoulders or bearings, B B, resting on the axle at the fork of the kingbolt, for the purpose herein specified.

59,643.—CULTIVATORS.—W. W. Philler, Port Byron, Ill.

First, I claim the pivoted draft pole, C, provided at its rear end with a curved or segment bar, D, having friction rollers or wheels, c, inserted within it, and working or resting upon a semicircular way or track, E, on the frame, A, substantially as and for the purpose set forth.

Second, The bar or lever, Q, attached to the rear end of the draft pole, C, substantially in the manner as and for the purpose set forth.

59,644.—MANUFACTURE OF BARS AND ARTICLES OF IRON AND STEEL COMBINED.—William M. Pickslay, Philadelphia, Pa.

I claim the manufacture of bars, and other articles, of iron and steel combined, by applying the steel in a molten state to the iron while the latter is at a welding heat, and subsequently rolling or otherwise working the combined mass.

59,645.—COMB.—Leonce Picot, Hoboken, N. J.

First, I claim strengthening the back and sides of a comb, by forming in the top of said comb a groove, and placing therein and upon said back a metallic brace, substantially as herein shown and described.

Second, As a new article of manufacture, I claim a comb to and in the top of which a T-shaped brace of metal or other suitable material for strengthening the same is fitted and held, substantially as herein described and set forth.

59,646.—COLLAR AND NECKTIE ATTACHMENT.—Charles W. Powell, Milford, Conn.

I claim a band, having clasps, loops, and spurs for the attachment of a collar and necktie, all arranged substantially as described.

59,647.—HORSE COLLAR.—Isaac A. Powell, Morrison, Ill.

I claim a horse collar when constructed with the lock, D, and plate, C, for securing the same when said parts are respectively constructed, attached and combined, substantially as set forth.

59,648.—CASE FOR MEDALLIONS.—James Powell, Cincinnati, Ohio.

First, I claim the hermetically sealed medallion case, constructed substantially as herein described.

Second, In combination with a medallion case constructed as specified, I further claim the flock or cloth dust coating of the face side of the back plate.

Third, I claim the combination and arrangement of concave convex back plate, A, groove, C, glass front, D, and ears, E, as and for the purposes specified.

59,649.—BED-BOTTOM SPRING.—Daniel Punchies, Plymouth, Mich.

I claim the combination of the frames, E F, with the springs, a a, when said frames are constructed as herein described, and attached to the ends of the slats and end rails of the bedstead, so as to be free to move in the direction of the slats under extension and contraction, as described and for the purpose specified.

59,650.—LOCOMOTIVE HEAD LIGHTS.—James Radley, New York City.

First, I claim the method of cooling the burning fluid as it passes from the tank to the lamp, by inclosing the connecting oil tube or tubes in a pipe or pipes, through which a current of air is made to pass around such oil pipe or pipes, substantially in the manner herein described.

Second, The method of cooling the body of the lamp within the reflector by means of vents adjacent thereto, in the air passages, substantially as herein described.

Third, The receiving aperture in front of the head-light case and the air passages inclosing the oil tubes, in combination with a locomotive engine, when so arranged and constructed as to cause the air entering said aperture to pass through said passages when the locomotive is in forward movement, substantially as herein described.

Fourth, The scattering vents through which the air escapes, in combination with the air passages and receiving apertures, substantially as herein described.

59,651.—CART-HARNESS SADDLE.—Henry A. Rains, Nashville, Tenn.

First, I claim the wooden housing, constructed and arranged as described, in combination with a metallic covering, with the molding rolled or wrought upon it, as set forth.

Second, Grooved framework for attaching the pads to the tree bars, constructed substantially as described.

Third, A belly-band fastening, constructed and attached as hereinabove set forth.

59,652.—RAILROAD CAR.—John R. Reader, New York City.

First, I claim the guard or fender, constructed with a frame, D, supported on the axles of the wheels, C, substantially as and for the purpose set forth.

Second, The combination with such guard or fender of the suspended supplemental plates, I, hinged to the bottom of the body, A, substantially as herein set forth for the purpose specified.

Third, So arranging the opposite parallel sides of the guard or fender that the upper edges thereof will be situated outside of the body, A, substantially as herein set forth for the purpose specified.

Fourth, The roller, n, combined with the brushes, s, and with the frame, D, wheels and body of the car, substantially as herein set forth for the purpose specified.

59,653.—DOOR FASTENING.—Frank Reed, Brattleboro, Vt.

I claim the combination of the cap piece, g, and coupling pieces, c c, with the shaft of the door knob, and with the arms, a a, rods, d d, and springs, e e, constructed and arranged as and for the purpose herein specified.

59,654.—SULKY PLOW.—John J. Reed, Polo, Ill.

First, I claim the walking beam, G, pivoted to the rear end of the tongue or pole, G, in combination with the stirrups, e e, yoke, J, and plow standards, K K, substantially as herein shown and described and for the purposes set forth.

Second, I claim the pivoted pendent bars, e2 e2, and bars, R R, in combination with the frame, c, substantially as shown and described and for the purposes set forth.

Third, I also claim the projecting bars, D D, in combination with the frame, substantially as herein shown and described.

59,655.—FRUIT PICKER.—L. Richards and D. Lincoln, Orangeville, N. Y.

We claim, First, A hollow cylindrical fruit picker, A, made conical at its upper end, and a large hole or opening and tapering slit near its upper end, with or without the removable bottom, B, substantially as described.

Second, The combination of a flexible bag or hose, C, with said cylindrical picker, for the purposes and substantially as described.

Third, Attaching the handle to the cylinder, A, by means of the staples, E, wedge, F, and notch, f', substantially as set forth.

59,656.—METHOD OF SECURING SHOE TIPS.—Philip Riley, New Bedford, Mass.

I claim securing tips to the toes of boots and shoes by stitching around and through the margins of the tips a loop or chain stitch, and sewing the upper side of the loop or chain stitch to the sole, as herein set forth and described.

59,657.—TOOL FOR DRAWING NAILS.—Daniel T. Robinson, Boston, Mass.

I claim constructing a nail-pulling device in the manner described, so that the jaws will clamp the nail by the action of applying force to the lifting lever in raising the nail from its position, substantially as described.

59,658.—ESCAPEMENT FOR TIMEPIECES.—S. W. Robinson, Detroit, Mich.

I claim the lever, B, and hair spring, H, in combination with the detents, I J, escape wheel, A, and balance, C, constructed and operating substantially as and for the purpose described.

59,659.—LOOP CHECK FOR SEWING MACHINES.—Peter Rodier, Springfield, Mass.

I claim the loop or thread check, C, constructed as described, when combined with and operated by a spring, B or B', and used in combination with the parts of a sewing machine, substantially as and for the purpose herein set forth.

59,660.—DEVICE FOR HITCHING HORSES.—Charles Roger, Bergen, N. J.

I claim the combination of the case, A, center pin, B, cap, c, spring, D, strap, E, rollers, G, staple, L, and hook, H, when these several parts are constructed and arranged substantially as herein shown and described and for the purposes set forth.

59,661.—PAPER-MAKING MACHINERY.—Stephen G. and George S. Rogers, Thetford, Vt.

We claim the arrangement as well as the combination of the auxiliary roller, D, with the rollers, A B, and the delivery apron or blanket, C, of a paper-making machine, the purpose of such auxiliary roller being as set forth.

59,662.—STANCHION. — Larkin S. Safford, Hope, Maine.

I claim the construction, arrangement, and combination of the parts, B F C D and E, so as to allow them to swing in toward or out from the crib on said pins or pivots, F, at the pleasure of the animal, when fastened as herein described. I claim nothing as my invention but the construction and arrangements of the parts which hold the animal, when tied up so that they may swing as before described on said pins or pivots, F, at the pleasure of the animal. The tie up is for horned cattle, and when they stand up fastened in the foregoing manner, they can easily turn their heads round to the right or left, as the case may be, and when lying down it allows them to turn the head round at pleasure, which gives them more ease, comfort, and freedom, which are the advantages and improvements I claim. When the aforesaid combination of parts which are to swing is made so as to swing the other way, as it is the design they may, the foregoing specification would need to be renewed or changed in some parts to meet the case. It is my design in the combination of parts, B F C D and E, may be made to swing either way, as the situation of the tie up or convenience may require.

59,663.—HORSE RAKE.—Curtis Satterlee, Paris, Ill.

I claim the combination of the pivoted lever, J, with its arm, K, pivoted lever, I, rake-head shaft, F, and bar, L, strap, T, lever, S, and post, P, constructed as described, and arranged to operate substantially as and for the purpose specified.

59,664.—COMB.—Theodore Schreiber, Wheeling, W. Va.

I claim the spring pad, B, in combination with the comb, A, constructed and operating substantially as and for the purpose described.

59,665 — SORGHUM SKIMMER. — W. B. Seward, Bloomington, Ind.

I claim an improved skimmer, A, open at both ends, a1 and a2, so as to operate when moving back and forth, substantially as herein shown and described and for the purpose set forth.

59,666. — FRUIT EXTENSION LADDER. — Erastus Slater, Girard, Pa.

I claim the arrangement of the sections, A B C, and clasps, D, as described, in combination with the windlass, F, pulleys, C H I, rope, J, and catches, K and L, and springs, K' and L', the several parts being constructed, and arranged, and operating as and for the purpose specified.

59,667.—MECHANISM FOR CLOSING DOORS.—Henry Smith, Salem, Mass.

The combination of a coiled spring, the power of which is equalized by a movable pinion working in a scroll gear, with the mechanism for closing a door or gate, all constructed and arranged substantially as described.

59,668.—EQUALIZING SPRINGS FOR CLOCK MOVEMENTS.—Henry Smith, Salem, Mass.

I claim the combination with a watch or clock movement of a coiled spring, the power of which is equalized by a scroll rack and movable pinion, substantially in the manner and for the purpose described.

59,669.—FOOT PRESS.—J. Nottingham Smith, Jersey City, N. J.

I claim the combination of two or more wedge drivers, operating at right angles or transverse to each other, substantially as and for the purpose herein specified.

I also claim either simple or compound levers in combination with two or more wedges acting at right angles or transverse to each other, substantially as herein specified.

I also claim such a combination of wedge power or of wedge powers and lever powers combined as to produce the final action in either direction for the purpose set forth.

I also claim a wedge or wedges adjustable in any direction, when applied substantially as and for the purpose herein specified.

59,670.—HYDRANT.—J. Nottingham Smith, Jersey City, N. J.

I claim the combination and arrangement of the spiral grooves, P P, projections, N N, and horizontal guide opening, v, substantially as and for the purpose herein specified.

I also claim the guide plate or disk, f, in combination with the hydrant body and discharge pipe, for the purpose set forth.

I also claim the arrangement of the duplicate valves, L and M, so as both to close fully against their seats, in combination with the hydrant reservoir and the discharge pipe thereof, substantially as and for the purpose herein specified.

I also claim the arrangement of the reservoir lining, I, in connection with the removable reservoir bottom, i, substantially as herein set forth.

I also claim the combination of the concave valve, the annular soft valve seat, and the ring metallic lining thereof, substantially as and for the purpose herein specified.

59,671.—HYDRANT.—J. Nottingham Smith, Jersey City, N. J.

I claim the combination and arrangement of the spout, G, weighted as described, reservoir, B, and valve, I, so that the water when flowing is conducted through said spout without communicating with the reservoir, but when the valve is closed and the water ceases to flow, a communication is opened between the spout and reservoir, substantially as and for the purpose herein specified.

59,672.—FAUCET.—J. Nottingham Smith, Jersey City, N. J.

I claim the spout, B, closing around the end of the barrel, A, and provided with a packing disk, d, in combination with the barrel, substantially as and for the purpose herein specified.

I also claim the wedge, c, either with or without the spring, i, in combination with the spout, B, substantially as and for the purpose herein set forth.

59,673.—BOLT CUTTER.—Othniel J. Smith, Wauwatosa, Wis.

I claim the combination of the lever, the eccentric, the adjustable slide, moved by a screw, the chisels, one stationary and the other movable, secured by bolts to the respective blocks, one chisel, with sharp shoulders, near edge, the spring, and the movable chisel block, all constructed and arranged as described.

59,674.—GRINDING MILL.—Thomas F. Smith, Elm Grove, W. Va.

I claim the employment of an air obstructor, substantially as described, in connection with the tube, n, hopper, o, and revolving upper millstone, a, by means of which a vacuum or partial vacuum is obtained between the upper and lower millstones, in the manner and for the purposes described.

59,675.—NUMBERING MACHINE.—Samuel W. Soule and C. Latham Sholes, Milwaukee, Wis.

First, I claim the application of the numerals, 1 2 3 4 5 6 7 8 9 0, to a series of plane reverse traveling columns or bars, the ten rings being arranged consecutively on each as described, for the purpose of producing by their combination any desired number.

Second, The construction and combination of the set dogs, g, and the slides, s s, by means of which the set dogs and moving dogs are raised from their ratchets, as described.

Third, The combination of a series of moving columns containing the numerals, 1 2 3 4 5 6 7 8 9 0, in numerical order with the slides, s s, moving dog, f, and set dog, g, by which they are operated to produce any combination of numbers as described.

Fourth, The attachment of the lug, o, whereby the moving dog, f1, is made to carry the other dogs, f2 f3, etc., for the purpose described.

Fifth, The construction of the moving colums, a b c, and ratchet bar, x, with the flange to keep the moving dogs from impinging on their ratchets, as described.

59,676.—ORE CRUSHER.—Charles W. Stafford, Saybrook, Conn.

I claim the reciprocating jaw, H, guided in a rectilinear path by the plate, a, and actuated by eccentric, G, and lever, D D', substantially as and for the purpose herein specified.

59,677.—BAG HOLDER.—W. H. Starry, Middletown, Ohio.

First, I claim the clamping jaws, E G, in combination with ratchet and pawl, b, co-operating for holding sacks and bags, when constructed and arranged in the manner substantially as described.

Second, The combination of the treadle mechanism for settling the contents of the sack or bag with the clamping jaws and ratchet and pawl, operating conjointly, when constructed and arranged substantially as described for the purpose specified.

59,678.—TAG OR LABEL. —George W. Storer, Portland, Conn.

I claim an improved tag or label, made and applied substantially in the manner described and for the purpose specified.

59,679.—ELASTIC BUTTONHOLE FOR CARRIAGE CURTAINS.—S. C. Talcott, Ashtabula, Ohio.

I claim the tin, A, or its equivalent, and the rubber, B, so arranged and in combination with the curtain, E, and lining, F, for the purpose and in the manner herein set forth.

59,680.—APPARATUS FOR CREASING PAPER COLLARS.—Temple Tebbetts, New York City.

First, I claim a curved gage, in combination with a curved creasing knife, constructed and operating substantially as and for the purpose herein fully described.

Second, I claim a doffer in combination with a creasing knife and gage, constructed and operating substantially as and for the purpose set forth.

59,681.—SEEDING MACHINE.—Henry Thomason, Lafayette, Ind.

First, I claim the lever, K, provided with the taper bar, L, at its lower end, in connection with the pendent elastic bar, F, having the bearing, a, of the shaft, E, at its lower end, the arm or rod, f, projecting from the inner side of the bearing, a, and the spring, J, all arranged substantially as shown, to admit of the bevel pinion, D, being thrown in and out of gear with the wheel, c.

Second, I claim the seed box, P, attached to bar, I, and cross piece, v, and notched bar, I*, so as to be independent of beam, A, in the manner specified.

Third, I claim the two bars, T T, in connection with the beams, S S, and seed boxes, R R, and bar, G.

Fourth, I claim the seed cups, u, in connection with seed boxes, R R P, arranged in the manner described.

Fifth, I claim the attaching of the seed-conveying tubes, W, to the beams, S S, by means of the pins, w, and clamps, w*, passing through blocks, a*, substantially as and for the purpose set forth.

59,682.—COMPOSITION FOR ROOFING.—J. P. Thompson, Kirkville, Iowa.

I claim a composition for roofing, compounded from the ingredients named, and substantially as set forth.

59,683.—WHEELWRIGHT'S MACHINE. — David S. Trout, Arcola, Ill.

I claim the arrangement of the adjustable reciprocating table, D, of a wheelright's boring machine, the plate, E, plates, b b, and segments, g g, when operated as and for the purposes described.

59,684.—VENTING CORE FOR FOUNDERY PURPOSES. —Hiram Tucker, Newton, Mass., assignor to the Tucker Manufacturing Company.

I claim the described improvement in the art of casting molten metals, by which the cores are better and more easily vented than heretofore.

59,685.—STATION INDICATOR FOR RAILWAYS.—Edgar B. Van Winkle, New York City.

I claim a train of wheels for operating or giving the proper movement to an index or pointer, K, which works over a graduated dial plate, L, a weight, V, or its equivalent, applied to said wheels and to the pulley, G, link or rod, F, and lever, D, for connecting the train of wheels with the lever, B, applied to one of the rails, A, all arranged to operate substantially in the manner as and for the purpose set forth.

59,686.—STEAM PROPELLER FOR BOATS.—Allexey W. Von Schmidt, San Francisco, Cal.

I claim, in combination with a propeller pipe, arranged either inside or outside the vessel, but below the water line, and one or more stationary steam pipes, the ends or nozzles of which are within, and point respectively towards the openings of the propeller pipe, one or more valves or cocks arranged so that a column of steam may be projected at pleasure through either nozzle, thus inducing a current of water through the propeller pipe, as and for the purpose shown and described.

59,687.—VESSEL FOR COOLING LIQUIDS.—H. Waldstein and M. Fauski, New York City.

We claim, as a new article of manufacture, a bottle or pitcher, provided with a hollow or chamber in its bottom for holding a refrigerating material, the chamber to be closed by a suitable cover or stopper, substantially as specified.

59,688.—APPARATUS TO BE ATTACHED TO STILLS TO PREVENT FRAUD ON THE REVENUE.—W. J. Walker, Baltimore, Md.

I claim the connecting of an inclosed vessel, having one or more transparent sides, to the worm of the still, into which the liquor passes, and where its proof is tested by one inclosed hydrometer and thermometer, and from thence passing into the high or low wine tank, as the case may be, so that no one can have access to the liquor from its passage from the worm to its respective tank.

59,689.—SUSPENSION DEVICE FOR LAMPS, ETC.—Harrison Weed, New Haven, Conn.

I claim retaining a lamp or burner, which ascends automatically in any position to which it may be adjusted, by the means and in the manner substantially as described.

59,690.—PRESERVING BEER WHILE ON DRAFT. —David Wernz, New York City.

I claim the combination of a flexible bag with a bung, provided with air passages, as described, where said bung and bag are applied at the underside of the cask or barrel, so as to cause the air to enter at the bottom, operating in the manner and for the purpose substantially as described.

59,691.—CHURN.—Henry P. Westcott, Seneca Falls, N. Y.

First, I claim affixing the adjustable dasher firmly to its own standard, which is separated from the standard which supports the lower dasher, substantially as and for the purpose described.

Second, Fastening the standards of the two dashers together, by a fastening located above the top of the churn, substantially as and for the purpose described.

Third, Providing a removable standard for the support of the outer end of the lever, substantially as described.

Fourth, So arranging and attaching the spiral spring as that it will hold the standard which supports the outer end of the lever in place, substantially as described.

Fifth, The combination of the spiral spring with the attachment, h, when said attachment is so formed and arranged as to allow the operator to vary the upper end of said spring at pleasure, and thereby to increase or diminish the length of the lever by which said spring is drawn out, substantially as and for the purpose described.

59,692.—APPARATUS FOR FLESHING AND STONING HIDES AND SKINS.—Jesse Wheat, South Wheeling, W. Va.

First, I claim the combination of the arm, M, pins, O, pitman, P, trip, R, and roller, S, with each other, with the sliding arm, G, with the treadle, T, and with the frame, A, of the machine, substantially as described and for the purpose set forth.

Second, The combination of the drop, U, with the treadle, T, substantially as described and for the purpose set forth.

Third, The combination of the strap, V, or equivalent, with the drop, U, and with the pivoted arm, M, substantially as described and for the purpose set forth.

Fourth, The combination of the screw, W, or equivalent, with the strap, V, and pivoted arm, M, substantially as described and for the purpose set forth.

Fifth, The combination of the line, Z, with the drop, U, substantially as described and for the purpose set forth.

Sixth, The combination of the cam, D, working beam, c', and slotted upright bar, I, with each other, with the treadle, T, crank shaft, c, and with the knife beam, H, substantially as described and for the purpose set forth.

Seventh, The combination of the set screw rod, D', or equivalent, with the working beam, G', and with the knife beam, H substantially as described and for the purpose set forth.

Eighth, Attaching the knife to a stationary, rigid, head shank, substantially as described and for the purpose set forth.

Ninth, The combination of the holding bar, J', constructed and operating as herein described, with the grooved edge of the table, E', and with the holding cam, K, substantially as and for the purpose set forth.

59,693.—PROCESS OF TREATING SULPHUROUS ORES OF COPPER.—J. D. Whelpley and J. J. Storer, Boston, Mass.

First, We claim the seven manipulations above set forth, in their order, and with the variations described, as a process for treating sulphuret of copper.

Second, The first, second, third and sixth manipulations and the variations described, as a process for treating sulphurous ores of copper.

Third, The first six manipulations and the variations described, as a process for treating copper sulphurets.

Fourth, The first, second, third, fifth, and sixth manipulations, and the variations thereof caused by omitting the third and sixth, and employing the method described after "seventh," as a process for treating copper sulphurets.

Fifth, The rearrangement of the equivalents of the ore by the heat generated by its own combustion, in presence of oxygen and without other fuel than that contained in itself, substantially as described.

Sixth, The employment for the lixiviation of minerals of the centrifugal drying machine, as described, and the arrangement of the felt lining upon its interior, substantially as described.

Seventh, The revival of iron from iron oxides, by diffusion of gases between carbon and the oxides, at a low degree of heat, and without currents of air, substantially as described.

59,694.—METHOD OF TREATING THE MIXED SULPHURETS OF ZINC AND LEAD.—J. D. Whelpley and J. J. Storer, Boston, Mass.

We claim, First, The first, third, and fourth manipulations, in their order, as a means or method of treating zinc blende.

Second, The first, third, and fourth manipulations, in their order, with the addition of the second, as a method or means of treating associated blende and galena.

59,695.—APPARATUS FOR FEEDING FUEL TO FURNACES.—J. D. Whelpley and J. J. Storer, Boston, Mass.

We claim, First, The construction of a machine containing a comminuting apparatus for fibrous fuel, substantially as described, in combination with the fan blower of an air blast, as and for the purpose described.

Second, The arrangement of cutting blades, O, and air wheel paddles, P, upon one or more revolving disks, L, in the cutting chamber, substantially as described, and the same in combination with crushing cylinder, N, substantially as described and for the purpose stated.

Third, The combination of a register, F F', with the air or fuel feed of the fan blower, as and for the purpose described.

59,696.—PROCESS AND MACHINERY FOR OBTAINING METALS AND OTHER PRODUCTS FROM ORES AND MINERALS.—J. D. Whelpley and J. J. Storer, Boston, Mass.

We claim, First, The construction of the tower in the form of a hollow truncated cone, for the purpose of securing perfect combustion and the exposure of all the materials, especially the fuel, to heat and oxygen.

Second, The construction of the head of the furnace dome and arched flues above the fire boxes, forming groins at their springs, substantially as described, for the purpose of forming a focus of combustion near the head of the furnace.

Third, The arrangement of the chimney, F, and telescopic slide, G, with its counterpoise and flanges as drawn, substantially as and for the purpose described.

Fourth, The arrangement of the feed apparatus so as to discharge the ore and coal to be supplied to the air blast, on the side of the fan blower, A, away from the furnace, as and for the purpose described.

Fifth, The division of the horizontal flue into chambers, substantially as described, to secure more perfectly the hot lixiviation of the ores, and the similar division of the conductor, L, into chambers, n, as and for the purpose described.

Sixth, The arrangement and combination of the settling tank, U, with the water bottom and pool by means of water exit and water entrance, and the further arrangement of the propeller or conveyer, M, in combination with said water bottom and poor as and for the purpose described.

Seventh, The employment of a wetting wheel, succeeded by a chemical wheel, to remove dust and gases from air, when said wheels are sufficiently separated to allow the effect of the first to be complete, before the air is purified comes under the action of the second, and the arrangement of a trap or valve in the intermediate conductor to balance the draft and projection of the two wheels.

Eighth, The arrangement of the inclined floor, h, of the spray chamber, in combination with the overflow, a, settling tubs, and their overflows, b, etc., and with the water chamber of the spray wheel, substantially as described.

Ninth, The employment of oxide of copper, or other reducible protoxides, fed into the head of the furnace, substantially as described and for the purpose stated.

Tenth, The means of brightening gold, herein described, by the employment of heat and instantaneous plunging in water or dilute acid.

Eleventh, The evaporating apparatus, substantially as described, consisting of shallow tanks or vats, forming the bottom of an air flue, through which is drawn or forced an artificial current of air, when employed to evaporate a heated solution of sulphate of copper, which cools as the operation proceeds, in order to effect the crystallization of the salt to its great st practical extent.

Twelfth, As a manufacturing process, to effect, from a solution of sulphate or chloride of copper or other metal, the precipitation of pure metal in quantity as distinguished from assay, by the substitution of another metal, such as iron, in the solution; the employment of heat and relative motion between the solution and the precipitating metal, and with or without auxiliary galvanic currents distinct from those of local action, substantially as described.

Thirteenth, The employment of heat and relative motion between the solution and the poles of a battery, to accelerate the action of the galvanic current in electro precipitation of metals, substantially as described.

59,697.—Rope-driving Machine.—Stephen B. Whiting, Pottsville, Pa.

I claim the use of two drums, inclined and arranged laterally in respect to each other substantially as and for the purpose described.

59,698.—Coupling for Cultivators.—Silas M. Whitney, Galesburg, Ill.

I claim the adjustable rectangular frame C, eye bolts D and E, and connecting bar B, when said parts are constructed substantially as herein shown and described, in combination with the plow beam, A, and axletree or frame, G, as and for the purpose set forth.

59,699.—Fruit Jar.—G. Williams, West Middleburg, Ohio.

I claim the combination of the can, B, socket, A, and screw, d, with the cap, c, tongues, b and c, and nut, e, for the purpose shown, and operating substantially in the manner herein set forth.

59,700.—Cider Mill.—J. H. Williams, Sandusky, Ohio.

I claim the combination of the two metallic or wooden rollers with the india-rubber or elastic roller, all arranged to operate substantially as and for the purpose set forth.

59,701.—Rolling Pin, etc.—Theodore A. Williamson and Charles A. Richardson, Alleghany City, Pa.

I claim, First, A combined rolling pin, beetle, grater, steak hacker, and butter print, substantially as herein shown and described.

Second, The combination with the rolling pin, of a beetle, a grater, and steak hacker, all constructed and arranged in the manner and for the purpose specified.

59,702.—Gas-pipe Joints.—Richard Wilson, Cold Spring, N. Y. Antedated November 1, 1866.

First, I claim the hinge, E, spiral spring, D, elastic sleeve, C, and swinging pipe, A, in combination with the pipe, B, substantially as and for the purpose set forth.

Second, I claim the rubber sleeve, C, spiral spring, D, and swinging pipe, A, in combination with the fixed gas pipe, B, substantially in the manner and for the purpose specified.

59,703.—Corn Planter.—Robert M. York, Schoolcraft, Mich.

I claim, First, The rods, G G, applied to the seed boxes, A A, in combination with the cylinders, F, straps, c H, and springs, J, all arranged to operate substantially in the manner as and for the purpose set forth.

Second, The disks or bottoms, h, in the holes or seed cells, g, in the cylinder, F, arranged in connection with the springs, J, and straps, K, substantially as and for the purpose specified.

Third, The straps, M, applied to the bars, J, when used in combination with the cylinders, F, and rods, G, substantially as and for the purpose set forth.

59,704.—Lamp Burner.—John K. Andrews, Antrim, Ohio, assignor to Joseph C. Tilton, Pittsburgh, Pa.

I claim a lamp burner composed of two perforated tubes, B C, with caps, G H, in combination with the perforated chamber, D, wicktube, F, and vent tube, I, constructed and operating substantially as and for the purpose set forth.

59,705.—Lantern.—Lewis F. Betts (asignor to himself and L. G. Huntington), New York City.

I claim the loose or detachable hand, F, arranged in connection with the globe, G, the annular base, C, and the lamp, D, substantially as shown and described.

59,706.—Breech-loading Fire-arm.—Pierre Bourdereaux, New York City, assignor to Joseph Merwin and Edward R. Bray.

I claim the breech, B, provided with a fixed center fire nipple, f, and a sliding firing pin or pins, c, in combination with the adjustable face piece, E, of the hammer, substantially as and for the purpose specified.

59,707.—Hat-blocking Machine.—Seth Boyden (assignor to Henry H. Jaques), Newark, N. J.

I claim, First, A block for the blocking of hats, so constructed that from a form, corresponding, or nearly so, to that of the hat previous to being blocked, it can be changed, or made to assume, or brought to their form of an ordinary hat block, by means substantially as herein described and for the purpose specified.

Second, In combination with the above, I claim a presser so constructed that when brought to bear upon the said block on which the hat has been placed to be blocked, it will change the form of such block, substantially as and for the purpose described.

Third, The movable block, E, having a double series of ribs, M and O, hung upon and around the same, one series above the other, in combination with the surrounding stationary or fixed flange or rest, L, for the outer ends of the lower ribs, M, and the center fixed cap or head, D, substantially as described and for the purpose specified.

Fourth, The presser, S, formed of two concentric rings, T U, connected together through a series of ribs, V, hung to the inner ring and passing through the outer ring, substantially as and for the purpose described.

Fifth, The weight or block, H2, in combination with the presser, S, when arranged and combined together, substantially as and for the purpose specified.

Sixth, The combination of the double-ribbed hat block, E, surrounded by a fixed raised flange, L, and pivoted with a fixed center cap or head, D, with the ribbed presser, S, having block or weight, H2, when combined and arranged together so as to operate substantially in the manner and for the purpose described.

59,708.—Pump.—James W. Cahill, Madison, Ind., assignor to himself and A. S. Davison, Cincinnati, Ohio.

I claim the arrangement of the plungers, L M, on the shaft, K, provided with valves and operating as described in the cylinder, A, which has its induction openings at its mid-length, and eduction openings at its ends, as described and represented.

59,709.—Shoe and Stove Brush.—F. M. Carnes (assignor to himself and B. F. S. Logendyke), New York City.

First, I claim the rotary brush, D, in combination with the polishing brush, A, arranged or applied substantially as and for the purpose herein set forth.

Second, I claim the movable plate, F, adjusted or operated by the screw, b, and nut, G, or their equivalents, in combination with the rotary brush, D, and cake of blacking, E, substantially as and for the purpose specified.

59,710.—Horse Holder.—William B. Chapman (assignor to himself, Davis L. Hough, and Wm. F. Keeler), La Salle, Ill.

I claim the arrangement and combination of the toothed collar, A, surrounding collar, B, having arm, c, and spring pawl, G, and ring, E, the whole being constructed and operated in the manner and for the purpose set forth.

59,711.—Hoop-skirt Wire.—T. B. De Forest, Derby, Conn., assignor to J. N. McIntire, Brooklyn, N. Y.

I claim wire coated with flocks and then "braided" with yarn, either with or without being afterward glazed, or sized and finished.

59,712.—Bootjack.—Henry N. Degraw, Newburgh, N. Y., assignor to himself and Henry Wright.

I claim the pendent frame, D, firmly secured to the foot rest, A, to which spring jaws, F, provided with pendants, H, are pivoted, operating with the slotted sliding frame, E, with its inclined bars, d, in the manner described for the purpose specified.

59,713.—Cement for Roofing, Pavements, etc.—Louis De l'Homme and Angelo Lazzaro (assignors to Joseph Arata), New York City.

We claim the preparation of the metallic lava, as above described, and its practical use in paving halls, hall-ways, basements, cellars, stables, coach houses, bath houses, yards, piazzas, sidewalks, garden pathways, terraces, etc., etc.

59,714.—Treating Sponge for Stuffing Mattresses, etc.—R. Ogden Doremus (assignor to the Elastic Sponge Manufacturing Company), New York City.

I claim the preparation of sponge by moistening it with a solution of the chloride of magnesium, or equivalent therefor, substantially as and for the purpose specified.

59,715.—Sewing Machine for Sewing Together the Soles and Uppers of Shoes.—William Duchemin (assignor to himself and Sullivan E. Clough), Lynn, Mass.

I claim, in combination with the machinery for sewing, as described, or its equivalent, the shoe supporter or arm, B, provided with mechanism for operating it, substantially as described, such arm being to be used in connection with the bottom piece of the last, in manner and for the purpose as hereinbefore explained.

I also claim the combination of mechanism for extracting the tacks, substantially as explained.

I also claim the combination of the loop advancer, M, and the loop twister, N, with the hooked needle, L, the feeder, O, and the thread carrier, K, each being constructed and provided with mechanism for operating it, substantially as described.

I also claim the combination of the loop advancer, M, the loop twister, N, the hooked needle, L, the awl, P, the feeder, O, and the thread carrier, K, each being provided with mechanism for operating it, substantially as specified.

I also claim the combination of the main and auxiliary gages, H and I, with the arm, B, and mechanism for swinging it, substantially as described.

59,716.—Hollow Pressure Plate.—John B. Fontaine, Philadelphia, Pa., assignor to Hoff, Fontaine, and Abbott.

I claim a hollow cast-iron die or plate, stayed and riveted in the manner and for the purpose described.

59,717.—Lantern.—John O. Harris (assignor to himself and Isreal S. Ritter), Reading, Pa.

I claim a square or quadrilateral lantern having a square base, A, with perforated sides and a perforated top with a conical chamber, B, attached, in combination with a top piece or cap, composed of a cylindrical chamber, D, perforated with holes or openings, e, and a jacket, E, encompassing D, and perforated at its upper and lower parts, substantially as and for the purpose set forth.

59,718.—Knob Hole for Carriage Curtains.—Charles W. Holland, Fredonia, N. Y., assignor to himself and H. L. Taylor.

I claim the application and use of the metallic ring, D, and strengthening piece, C, in combination with knob holes in carriage trimmings, in the manner and for the purpose substantially as herein described.

59,719.—Picture Frame.—A. J. Holmes (assignor to Wells L. Robbins), Saratoga Springs, N. Y.

I claim a new article of manufacture consisting of picture and similar frames, constructed substantially as herein described.

59,720.—Cultivator.—H. C. Hunt (assignor to himself and C. D. Vaughn), Amboy, Ill.

First, I claim the combination of the circular frame, A, and rectangular frame, C, when constructed and arranged substantially as and for the purpose specified.

Second, I claim constructing the two beams of a single piece of wrought iron or wood, bent in the form of the letter, U, or any equivalent form, provided with the draw loops, as and for the purposes shown.

Third, I claim the employment of the cams, P, arranged with respect to the plow beams and frame of a cultivator, substantially as and for the purposes specified.

Fourth, I claim the employment of the rollers, h h, when arranged with the cam, F, and beams, D, and operating as and for the purposes described.

Fifth, I claim the crank shaft, Q, arranged and operating with the cams, D, substantially as specified and shown.

Sixth, I claim the employment of a transformed spindle constructed and operating as herein shown and set forth.

Seventh, I claim in combination with said transformed spindles the arrangement of the arms, J, extending parallel with each other forward, so that the connecting bar, K, will not obstruct the view of the operator as and for the purposes specified.

Eighth, I claim the employment of the hooks, r, or their equivalent, for the purposes specified in the manner described.

59,721.—Gage for Determining Angles.—E. C. C. Kellogg, Hartford, Conn., assignor to himself S. F. Bennett and D. H. Burrill, Little Falls. Antedated Nov. 4, 1866.

I claim, First, The construction of a slide gage with scales such as are represented in Fig. 1, and herein described, for slabbing polygonal prisms.

Second, A slide gage with the several scales on its link, A, and fixed and movable arms, B and C, with points, g g, on the said arms and with a hexagon gage on its movable arm, all substantially as herein specified.

59,722.—Manufacture of Wash Boilers, Kettles, and other Vessels Made of Sheet Metal.—Edward M. Manigle (assignor to G. H. Hazelton), Philadelphia, Pa.

I claim the manufacture and use of bottoms for wash boilers, and other similar vessels made of sheet copper, sheet brass, or of other equivalent sheet metal, and coated substantially in the manner and for the purpose herein set forth and described.

59,723.—Breech-loading Fire-arm.—Wm. H Miller (assignor to Meriden Manufacturing Company), West Meriden, Conn.

I claim, First, The lever, M, constructed and arranged with the projections, d, in combination with a corresponding recess, f, and the latch, L, so as to operate substantially in the manner herein set forth.

Second, The vertical bar, R, in combination with the bolt, P, and the lever, M, constructed and arranged to operate substantially in the manner and for the purpose herein set forth.

Third, The combination and arrangement described of the lever, N, with the bar, R, and the barrel of the arm, substantially as and for the purpose described.

59,724.—Manufacture of Soap.—William B Milne (assignor to himself and Wm. Brophy), Chicago, Ill.

I claim, First, The mode of introducing the farinaceous materials by dissolving or saponifying them with the fats or oils without a separate alkaline treatment, substantially as specified.

Second, I claim as a new article of manufacture a soap made by dissolving or saponifying farinaceous substances and fats or oils with an alkali having a potassium base and mixed with a soap having its fats or oils saponified with an alkali having a sodium base, substantially as herein set forth and specified.

59,725.—Horse Shoe.—J. J. Peyton (assignor to J. P. Torbert), Washington, D. C.

I claim, First, Securing india-rubber or its equivalent, and the wearing portion of the shoe, in a groove in the main plate, substantially as described.

Second, Constructing a horse shoe substantially in the manner described, for the purpose of rendering the shoe elastic, and removing or replacing the wearing surface without removing the shoe from the foot of the horse.

Third, The combination of the shoe with the rubber, the yielding blocks or bar, and the screws, substantially in the manner and for the purpose set forth.

59,726.—Machine for Filling Horse Collars.—A. Schrick and H. Hildenbrand (assignors to themselves, F. C. Krayer, and C. R. Schrick), St. Louis, Mo.

First, We claim the combination of the bed plate, D, with the hopper, C, and also with the straining shaft, E, as described and set forth.

Second, We claim the nippers, G and E', when constructed and employed substantially as described and set forth.

Third, We claim giving to the hopper, C, a vertical motion for the purpose of enabling the plunger to reach new material at each successive stroke.

59,727.—Machine for Stretching Horse Collars.—A. Schrick and H. Hildenbrand (assignors to themselves, F. Krayer, and C. R. Schrick), St. Louis, Mo.

We claim the combination of the block, B, the stretching slide, C, the lever, E, and its pawl, E', and rack, e2, and the screw, D, when constructed and employed substantially as set forth.

59,728.—Carriage Shackle.—T. S. Smith (assignor to himself, S. A. Smith, and Henry Lines), New Haven, Conn.

I claim the combination of the ball and socket joint, provided with a packing, E, with a strap, H, or its equivalent, and constructed with a plate, B, so as to be attached to the axle, substantially as and for the purpose herein set forth.

59,729.—Windmill.—Daniel Strunk (assignor to himself and Franklin Strunk), Janesville, Wis.

First, I claim the ring governor or weight, B, in combination with the vertical shaft, A, and the connecting rods, e and g, the bent levers, f, and the brackets, h, fastened to the wings, b, constructed and arranged substantially in the manner and for the purpose herein described.

Second, I claim the combination of the weights, B, with the lever brake, k, the friction fly-wheel, l, lever, q, and check rope, o, substantially as described for the purpose specified.

59,730.—Mode of Constructing Buildings.—A. Tanner (assignor to himself and Henry J. Phillips), Hoboken, N. J.

First, I claim a building, the walls of which are produced by a series of boards placed one on top of the other, so as to form a zig-zag pile, substantially in the manner and for the purpose set forth.

Second, The gutters, b, in the recesses, a, substantially as and for the purpose described.

Third, The air channels, c d, in the boards, B, substantially as and for the purpose set forth.

59,731.—Adjustable Nut Box.—John Turner (assignor to himself and John G. Hunter), Richmond, Va.

First, I claim the angular slides, A, in combination with each other and with the block or frame, C, constructed and arranged substantially as herein described and for the purpose set forth.

Second, The combination of the steel slides, D, with each other, with the angular slides, A, and with the block or frame, C, constructed and arranged substantially as described and for the purpose set forth.

59,732.—Baking Pan.—Stephen West, Trenton, N. J., assignor to West and Thorn.

I claim a baking pan having a grooved or corrugated bottom, B, and notched end pieces, C, as and for the purpose herein described and represented.

59,733.—Broom.—Thomas Wright (assignor to himself and R. Vose), New York City.

I claim, as an article of manufacture, a wire broom, made substantially in the manner herein set forth.

59,734.—Metallizing Mirrors.—Edward Dode, Paris, France.

First, I claim the peculiar processes or modes of preparing a product to be employed in metallizing glass, with a view to the manufacture or production of looking-glasses, mirrors, and other reflecting surfaces, as hereinbefore described.

Second, The peculiar processes for extracting or removing the salts and acids from the metallizing product, as hereinbefore described.

Third, As a new article of manufacture, I claim a glass or mirror, metallized on its face by the application of platinum, in the manner substantially as hereinbefore described and set forth.

59,735.—Umbrella.—Wilhelm Hugo, Celle, Kingdom of Hanover.

First, I claim a T-shaped rib for umbrellas or parasols, as a new article of manufacture.

Second, Providing the T-shaped rib with a longitudinal gutter or cavity, substantially as and for the purpose described.

59,736.—Mode of Rendering Leather more Durable and Flexible.—Louis Gustave Sourzac and Louis Bombail, Bordeaux, Gironde, France.

We claim the improved process herein described for rendering leather more durable and flexible.

59,737.—Needle Case.—G. L. Turney, London, England, assignor to Samuel A. Harshaw, New York City.

I claim the method herein described of putting up needles, by wrapping them up in a paper or tinfoil, b, leaving their heads exposed, and inclosing said paper or tinfoil in a box, a, substantially as set forth.

59,738.—Magneto-electric Machines.—Henry Wilde, Manchester, England.

claim, First, The method of constructing magnet cylinders for magneto-electric and electro-magnetic machines, by making them of segmental iron concaves, with intervening strips of wood, brass, or other non-electric material, substantially as set forth.

Second, The combination of a magneto-electric and electro-magnetic machine, constructed and operating substantially as and for the purpose set forth.

59,739.—METHOD OF RECEIVING AND DELIVERING LETTERS, PARCELS, ETC.—A. Ely Beach, Stratford, Conn.

First, I claim the method, substantially as herein described, of automatically collecting letters, parcels, and other freight.

Second, I claim the method, substantially as herein described, of automatically delivering letters, parcels, and other freight.

Third, I claim the employment of the studs and rods, or their substantial equivalents, to operate the delivering and receiving mechanism, substantially as herein shown and described.

Fourth, I claim the employment of an electro-magnetic apparatus in combination with the receiving and delivering mechanism, substantially as and for the purpose herein set forth.

Fifth, I claim the means herein described, or their equivalents, for reducing the speed, substantially as described.

Sixth, I claim, in the collection of letters, parcels, and other freight, the employment of a moving box or receiver, U, or its equivalent, operating substantially as described.

Seventh, I claim the employment of the adjustable nose, or its equivalent, with the ear, substantially as and for the purpose herein shown and described.

Eighth, I claim the combination of a swinging valve with the freight receptacle, substantially as herein shown and described.

Ninth, I claim, in the collection and delivery of letters, parcels, and other freight, the employment of the several mechanisms herein shown and described, or their substantial equivalents, operating respectively or otherwise, substantially as herein shown and described.

REISSUES.

2,393.—STRAW CUTTER.—Warren Gale, Chicopee Falls, Mass. Patented September 12, 1854.

First, I claim the automatic mouth of a feed box, constructed by any means substantially the same as described, when used in combination with a revolving cutting cylinder armed with one knife, or with several knives, so arranged that one knife shall release its hold upon the material being cut before the following knife shall grasp it sufficiently to hold it, substantially as and for the purposes set forth.

Second, I claim the adjustable bottom mouth piece, M, or its equivalent, constructed and operating substantially as and for the purposes set forth.

Third, I claim combining a revolving cutting cylinder, armed with one knife, or with several knives, so arranged that one knife shall release its hold upon the material being cut before the following knife shall grasp it sufficiently to hold it, with a hinged bottom mouth piece of a feed box, substantially as and for the purposes described.

Fourth, I claim an automatically operating mouth piece to a feed box, in combination with a revolving knife cylinder, armed with one knife, or with several knives, so arranged that one knife shall release its hold upon the material being cut before the following knife shall grasp it sufficiently to hold it, when this cylinder is geared to a revolving pressure cylinder, substantially as and for the purposes set forth.

Fifth, I claim making those parts of the pressure cylinder, against which the knife or knives are made to cut, by having their edges brought into actual contact therewith, in sections or strips separate from the body of the cylinder, substantially as and for the purposes set forth.

Sixth, I claim a revolving cutting cylinder having one or more knives, in combination with a pressure cylinder, having one or more radial flanges, arms, or projections, so arranged that the knife or knives shall, as they revolve, meet the flange, arm, or projection, or either of them, in actual contact, so that the material to be cut is caught between the two, drawn forward, and cut off by the pressure between the knife on one cylinder and the flange on the other, substantially as and for the purposes set forth.

Seventh, I claim the flanged pressure cylinder, arranged and operated substantially as described, when the face of the flange is covered with suitable soft material, to protect the edge of the knife, when used in combination with a revolving cutter cylinder, substantially as and for the purposes set forth.

Eighth, I claim an automatically operating mouth of a feed box, or an adjustable mouth of a feed box, substantially as described, in combination with a revolving cutting cylinder armed with one knife (or with several knives so arranged that one knife shall release its hold upon the material being cut before the following knife shall grasp it), and a revolving pressure cylinder armed with one or more radial arms, flanges, or projections, substantially as and for the purposes set forth.

Ninth, I claim a pressure cylinder provided with one or more radial flanges, arms, or projections, and a revolving cutting cylinder armed with one knife (or with several knives so arranged that one knife shall release its hold upon the material being cut before the following knife shall grasp it sufficiently to hold it), when these cylinders are used in combination with a hinged bottom mouth piece of a feed box, substantially as and for the purposes set forth.

2,394.—RIDING SADDLE.—Lacey, Meeker & Co., of New York City, assignees of George H. Meeker. Patented May 16, 1865.

We claim the forming of the projections or calf and thigh supports on the skirts of a riding saddle by means of swaging, striking up, or embossing, substantially in the manner as herein shown and described.

DESIGNS.

2,504.—OIL CAN.—Charles J. Hauck, Williamsburgh, N. Y.

2,505.—TOBACCO PIPE.—Joseph Harvey (assignor to Harvey & Ford), Philadelphia, Pa.

NOTE.—In the above list of claims we notice SEVENTY-ONE patents which were secured through the Scientific American Patent Agency—the work of a single week. A few years ago, this number would have been considered an unusually large week's business for the entire Patent Office.—EDS.

PATENT CLAIMS.—Persons desiring the claim of any invention which has been patented within thirty years, can obtain a copy by addressing a note to this office, stating the name of the patentee and date of patent, when known, and inclosing $1 as a fee for copying. We can also furnish a sketch of any patented machine to accompany the claim, at a reasonable additional cost. Address MUNN & CO., Patent Solicitors No. 37 Park Row, New York.

RATES OF ADVERTISING :

FORTY CENTS per line for each and every insertion, payable in advance. To enable all to understand how to calculate the amount they must send when they wish advertisements published, we will explain that eight words average one line. Engravings will not be admitted into our advertising columns, except on payment of one dollar a line each insertion, and, as heretofore, the publishers reserve to themselves the right to reject any advertisement they may deem objectionable.

Improved Saw-mill Trestle.

The engravings represent an exceedingly simple, but thoroughly efficient means to prevent the "jumping" of a long log, or piece of timber, while in process of being sawed by the sash saw. It seems as though it might be equally effective in a circular saw mill. The heating and breaking of saws, and the uneven sawing of lumber, are to be attributed more to this sudden and unequal movement of the stock than to any other one cause.

As before remarked, the device is very simple. It consists of two uprights, into which is framed a cross bar. Inside the uprights are two bearing pieces, A, which receive the journals of the roller, B. These bearings can be elevated or depressed, by means of slots through which pass bolts that secure them in any position. Greater security can be afforded by blocks or wedges, C, under their ends. The lower ends of the uprights are provided with rule joints of iron, D, which allow the frame to be thrown into a horizontal position, but secure it from passing the perpendicular in the other direction. A strong spring, E, is used to keep the frame upright, and yet allow it to be depressed by the automatic action of the head and tail blocks of the carriage.

The *modus operandi* is as follows: The frame is secured beneath the log carriage, just in front of the saw, and is readily adjusted to allow the roller, B, to come in contact with the log, F, sustaining a portion of its weight. The log is thus held as firmly as the mill itself, and is not affected by the vibration of the saw. As the tail block approaches the frame it engages with one end of the spring, E, depressing it and allowing the trestle frame to be thrown from its perpendicular. When the pressure is released, the tension of the spring raises the trestle, and thus the operation is continued indefinitely.

This device took the first prize at the late State Fair at Dayton, Ohio, and is claimed to have given perfect satisfaction in all cases. It was patented through the Scientific American Patent Agency Sept. 18, 1866, by Geo. W. Coddington. For further particulars address Coddington & Doty, Middletown, Butler county, Ohio, or Dayton, Ohio.

Fig. 1

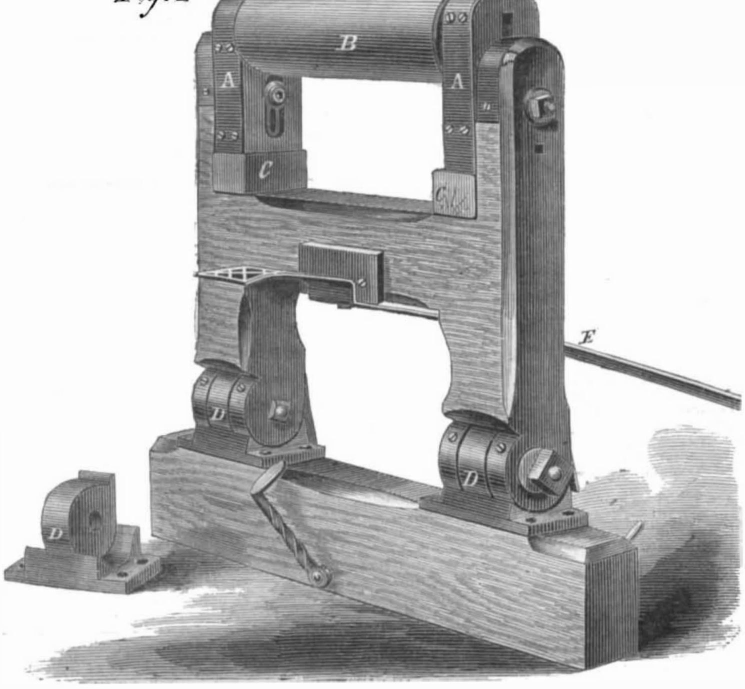
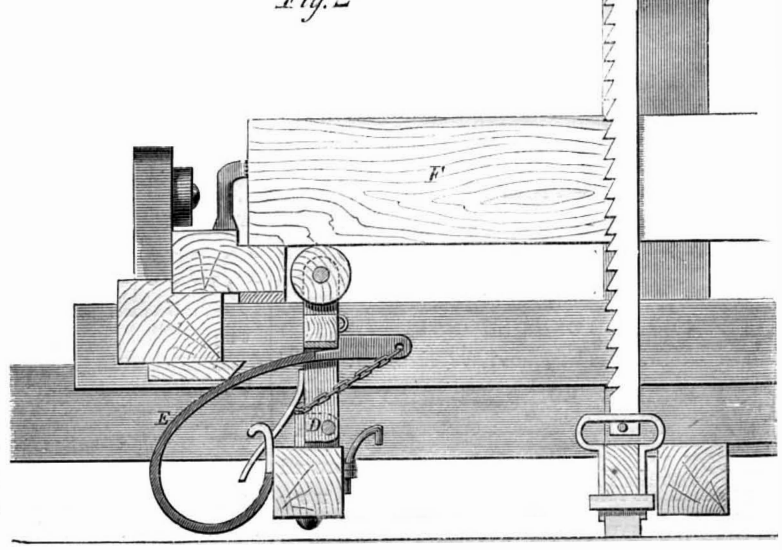


Fig. 2



CODDINGTON'S PATENT SAW-MILL TRESTLE.

Chilled Railway Wheels.

The practice with Major Palliser's shot against armor has shown what are the qualities of chilled cast iron, the chill, in this case, extending quite through the casting. It has been demonstrated that it is equal in hardness to hardened steel, and that it requires even greater force to break or deform it. It may be that the startling results obtained at Shoeburyness will serve, in some measure, to account for the universal use of chilled railway wheels in America, and for the leading wheels of engines, and often for the driving wheels themselves as well. It has always been the belief in this country that these wheels were used because they were cheap, and because the Americans could afford nothing better. These wheels, before the war, cost about 1½d. per pound, or rather less than £14 per tun, and one favorite pattern of 2 ft. 6 in. wheel, weighing nearly 4 cwt., was sold, ready for boring, for £2 10s. each. But so far from their cheapness having alone maintained them in use, they were long ago adopted, on the Grand Trunk Railway of Canada, because they were found, upon the whole, better than wrought iron. We have before us a letter, written in 1859, by the late Mr. A. M. Ross, engineer to the Victoria Bridge at Montreal, upon this subject, and which contains this statement, a statement which we know to have been confirmed by the subsequent experience of the engineers of the Grand Trunk Railway. In the International Exhibition of 1862 were a pair of chilled wheels, 2 ft. 9 in. in diameter, which had run upward of 150,000 miles under a heavy post-office van on the Grand Trunk Railway, and, although worn, they were still in good condition. We need not dwell upon the severity of a Canadian winter, nor explain how for months together the road bed—and there is seldom much ballast—is frozen as hard as rock. This, if anything, would be expected to try chilled wheels, yet they are regularly employed for the leading wheels of passenger engines, and breakages, although not absolutely unknown, are at least as infrequent as those of the best makes of English railway carriage tires.

It requires good iron for chilled wheels. That used in America for this branch of manufacture is mostly cold-blast charcoal iron, and it has to be selected and mixed with care, to obtain the proper qualities of strength and hardness of chill. The chill should be from ⅜ in. to ⅝ in. deep, and should cover the whole tread and the wearing face of the flange. Chilled wheels require especial provision for cooling, after being cast, so as to avoid internal strain from contraction. The wheels do not come out all of exactly the same diameter, but there is no difficulty in mating them in pairs of equal diameter, the greatest variation in the diameters of a thousand 2 ft. 9 in. wheels hardly exceeding ⅛ in. The machinery employed for boring is such that the hole is necessarily in the center, so that no eccentricity is possible. The wheels wear evenly and very slowly, until their diameter has been reduced by nearly ½ in. American iron, of choice quality for chilled wheels, is now being taken to St. Petersburg for casting here the wheels of all the carriage and wagon stock of the St. Petersburg and Moscow Railway. Heretofore the wheels for that line have been imported largely from the States. Our own size of wheel has never been adopted there, and as the weight of disk wheels increases in a higher ratio than that of the increase of diameter simply, we presume that a 3 ft. 6 in. wheel, instead of weighing but 5 cwt., as in English practice, would reach 6 cwt. We learn that iron of the proper quality for chilled wheels is likely to be introduced into this country, and that they will probably receive a fair trial.—*Engineering.*

American Railway Wheels in England.

The *Engineering* says:—We believe that five American chilled railway wheels have arrived in London, and that they will be broken experimentally, and that further wheels of this kind will be sent over for trial under English rolling stock. We have samples of the iron from which these wheels are cast, and it is of magnificent quality. The fracture is a rich dark gray, medium-grained, and shows great toughness, the particles appearing to have been irregularly torn, rather than broken short off. The specific gravity ranges from 7·25 to 7·3185, and the tensile strength from 32,000 to 35,102 lbs., or, say, 14½ to 16 tuns per square inch. The iron is that known as the Salisbury cold-blast charcoal iron, and is worth about £10 per tun in New York.

A CORRESPONDENT calls our attention to the fact that the Woodhead Tunnel, on the line of the Manchester and Sheffield Railroad, is 18,000 feet long, and, no doubt, the longest in England.

FROM THE STEAM PRESS OF JOHN A. GRAY & GREEN.