AGRICULTURAL PATENTS OF THE YEAR.

There is no object of more interest in Washington than the United States Patent Office, the repository of all the silent but eloquent memorials of the genius and efforts of our inventors, and there is no department of this vast institution more pleasing to the general visitor than that devoted to agriculture. The models are generally so simple in structure as to suggest their purpose without reflection or conjecture, as many of the more complicated machines do not. The hall containing the agricultural models is about two hundred and seventy feet long, and is provided with sixty cases (exclusive of those in the galleries), each case being about twenty-five feet long by five feet wide, and provided with four shelves, upon which the models are arranged as closely as they can be made to stand. • Of these sixty cases, thirty-one are devoted to agricultural models, systematically arranged in classes, each class being subdivided into years, and every model bearing a card having the subject of invention, the name and residence of the inventor, and the date of the patent on it.

During the year 1869, nineteen hundred patents were issued, in this department, which may be classified as follows:

Bee hives, houses, traps, etc.	62
Butter workers, tubs, etc.	20
Cattle ties, slaughterers, catchers, etc., chicken coops, nests, etc.	35
Churns and churning	130
Corn shellers, huskers, etc.	40
Cotton gins, pickers, etc.	30
Cultivators	150
Diggers and spaders	30
Drills	30
Egg carriers, detectors, etc	8
Fertilizers	6
Forks—hay, manure, pitch, etc.	100
Fruit boxes, crates, pickers, etc.	20
Garden implements	5
Grain bins, granaries, etc.	10
Grain cleaners	20
Harrows, drags, pulverizers, etc.	80
Harvesters and attachments	195
Hay spreaders	25
Hay tedders	10
Hedge trimmers, setters, etc.	6
Hoes	25
Markers	12
Milk coolers, safes, pails, and dairy apparatus	45
Mowing and reaping machines	30
Planters	150
Plows and attachments	252
Pruning	15
Racks	6
Rakes	90
Rollers	15
Sap spiles	5
Scythes	5
Seeding and sowing machines	80
Separators and smut machines	50
Stalk cutters	7
Straw, hay, and fodder cutters	30
Thrashing machines	35
Yokes	15
Miscellaneous	18

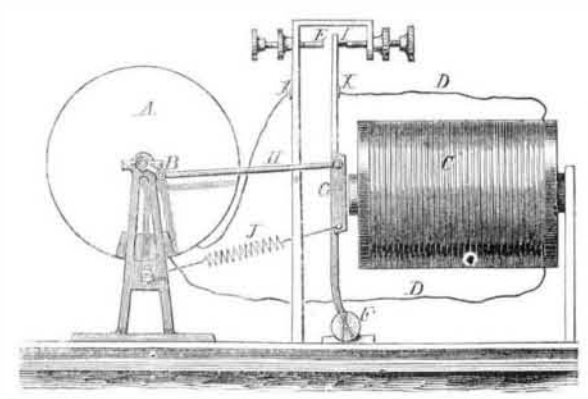
It will be observed that the plow takes front rank in numbers, as it does in point of importance. It is, of course, understood that a patent is not granted on every application as all inventions are not novel, and it is safe to say that applications for patents for improvements on the plow average one for each day. Notwithstanding this rapid increase, there is, apparently, as much room for improvement as ever. One of the examiners states that when he first entered the Patent Office, he considered the field of invention nearly closed; so much had been done that he could see little room for further improvements; but after an experience of nearly seven years, he concludes that there is no limit to inventive genius. Though a thousand improvements have been patented, the field is still open; and there are as many applications for improvements now as when there had been but five hundred patents issued.—*Commissioner Capron's Report.*

PERPETUAL MOTION.

NUMBER X.

Fig. 26 is an attempt to secure a perpetual motion by the application of electricity. It is the invention of a citizen of

FIG. 26.



Kansas. In his communication inclosing the drawing, he says:

"You will observe friction (the old enemy) is an ally in this. If a magnet of a certain power will not move the electric plate, the power could be increased without perceptible loss of tension, by decreasing the resistance which the magnet and conductor offer."

In the engraving, A represents a frictional electrical machine; B, a crank; C, an electro magnet; D, wire conductors; F, a trunnion; G, an armature; E, a circuit closer; H, a pitman; I, an insulating substance, and J, a spiral spring.

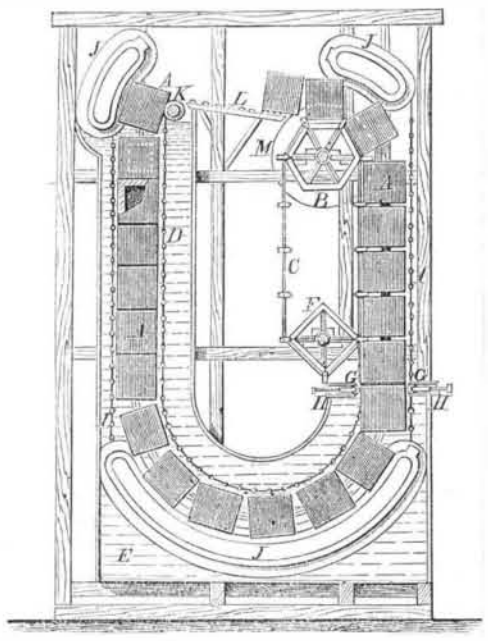
The device is expected to operate as follows:

The frictional electrical machine is started, which magnetizes the temporary magnet and draws the armature towards it. This breaks the circuit at the point, I, E, which demagnetizes the temporary magnet and allows the spring, J, to again close the circuit. By this means a continued motion is expected to be kept up.

To those not familiar with the science of molecular physics, this device may appear very plausible; a little reading, however, upon the subject of the correlation of forces, will serve to show its utter fallacy.

Fig. 27 is the invention of Jean Clunet, of Lyons, France, patented in England, 1869, under the name of "A New and Improved Motive power." It is thus described.

FIG. 27.



The invention relates to a new and improved motive power operating without noise and without expense. It consists in giving a rotary motion to a wheel, which is destined to transfer, by the ordinary means, the power obtained by the employment of any even, smooth blocks of stone, petrified mortar, iron, cast or wrought, or other heavy materials, in the form of cubes preferred, and of which the number and volume are governed by the amount of power desired, and causing them to descend in the ordinary atmospheric air, but to ascend in a liquid whose density is equal to their density, by which means their weight is annulled. For this purpose these blocks, when descending, are hung to hooks fixed to an endless chain turning upon the wheel receiving the motive power, which is of a shape of a hexagon, and placed on the top of a suitable framework, and upon another wheel of the shape of a square, which is placed at the bottom of said framework, and partially in a receptacle or tank of water, or any other liquid. When these blocks have arrived at the lower portion of their course, they detach themselves from the hooks on which hitherto they hung attached to the chain, which latter continues its ascending and rotary motion, and the said blocks descend and re-ascend within the tank, confined to their place and guided by an endless band and conducting wires stretched from supports for that purpose fixed on the top and bottom of the framework. They now, being thus guided, and following one upon another, find their way into another species of tank, placed vertically, likewise filled with a liquid similar to that in the first mentioned tank, and when arrived at the top of this second tank they tilt and slide along upon a horizontal shelf of rollers until they reach the hexagon-shaped wheel and the endless chain, when they recommence their descent. In order to prevent the liquid from running or descending from the second tank into the first, the blocks enter from one tank to the other between rollers and grooved pulleys pressed against the blocks by springs so as to shut off all way to the water. The detaching of the blocks from the endless chain takes place of itself, so to speak, from the position they find themselves in, in consequence of the rotary movement and of the turning over the said chain upon the lower wheel in the shape of a square. The endless band receives a continuous descending and rising motion from the weight of the blocks, which give every motion that the apparatus possesses, and which motion would be perpetual, if, upon the axle of the hexagon-shaped wheel transmitting the force obtained to the machinery by means of a driving pulley keyed to one of its ends, there were not keyed to the other end a break wheel with a hand crank, by means of which the movement may be stopped or modified. Instead of two receptacles it would perhaps often be better to have but one, the rollers and grooved pulleys already alluded to being placed at the entrance of the single tank instead of the second, the blocks acting in the same manner.

The engraving is a side section, in elevation, of the whole apparatus.

A represents the blocks; B is the hexagon-shaped wheel; C is the endless chain, which remains attached to the said wheel by means of its pointed hooks, which successively enter similar recesses made in the circumference of the wheel, the other end of said hooks being square, serving to keep the blocks in their place while descending in conjunction with the conducting wires, D, placed two in front and two behind each block, and one at each side; E is the receptacle; F is the square wheel from which the chain, C, at the bottom of its course is detached to re-ascend round the wheel, B; G, rollers, of which there are four, made of india rubber or other elastic material, placed at the entrance of the receptacle, E; and H is the india rubber or other suitable angle pieces, also placed at the entrance, between which rollers, G, and angle pieces, H, pass with slight friction the said blocks, after being disengaged from the chain, C. These blocks, A, angle pieces, H, and rollers, G, being in close contact, form a permanent stoppage, so that the water cannot issue, and said blocks, when in the receptacle, are placed in the middle of the same, where they are kept in equilibrium by the water, and are pushed and moved forward by the blocks which descend after them. I is the endless band, resting on supports, J, fixed to the inside of the receptacle, supporting the blocks and moving with them. The blocks, when in the vertical part of the receptacle, are conducted by four wires, one on each of their four sides. K is a roller upon which tilt the blocks, guided by the endless band when on the top of the receptacle to leave the same; L, friction rollers, on which fall and roll the blocks after having tilted, in order to reach the hexagon wheel, B; M, M, are the two pulleys on each side of the hexagon-shaped wheel, for applying the break and for transmitting the power obtained to other machinery. The equality in the density of the liquid and the blocks is obtained by hollowing the blocks so that they may easily rise to the top of the receptacle when therein. The desired result is obtained by the use of any other liquid, the volume of the blocks being proportionate to their density; also the weight of the blocks may be more or less than that of the liquid, but equality in weight is preferable.

Correspondence.

The Editors are not responsible for the opinions expressed by their Correspondents.

Ingrowing Toe Nails.

MESSRS. EDITORS:—The trouble and pain from this cause can be immediately and permanently relieved, without pain, in the following simple manner: Take a file, some four inches in length, bastard cut, flat on one side and round on the other, new and sharp. File down thin all the exposed part of the nail, till it is soft and pliable. This will immediately relieve the part pressing into the flesh, which need not be cut or extracted. The filing is not in the least painful, as the file will not take hold of the skin or flesh. In the course of several months, the nail will grow out thick again, when the filing should be repeated. The edges of the nail will never grow into the flesh so long as the top of the nail is soft and pliable; and there is nothing so simple, convenient, safe, and painless for keeping it so as a file.

Philadelphia, Pa. D. S.

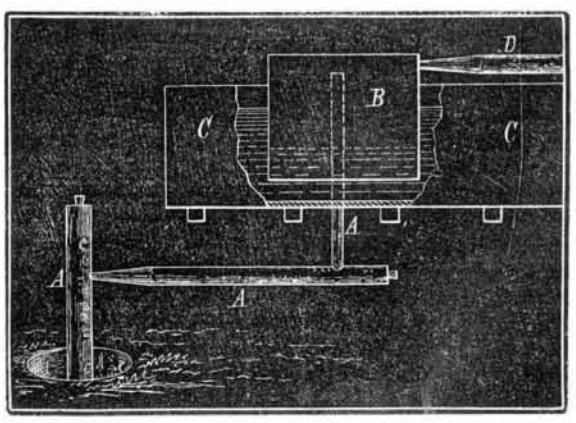
American Gas Wells.

MESSRS. EDITORS:—I have seen no account in any paper of one of the oldest and most remarkable oil wells there is in the United States, and will therefore write a short notice of it for the SCIENTIFIC AMERICAN. It was sunk in the winter of 1828–9, by Col. Rufus Stone, opposite McConnellsville, Morgan county, Ohio. The boring was for salt water, and when he found it he obtained all he needed to make salt, except "elbow, and a pinch of coal;" for, in drilling through a stratum of rock or clay, he not only found salt water, but hydrogen gas under pressure sufficient to lift the salt water to the surface. The well is, we believe, some three hundred feet deep, and has never ceased to furnish gas enough to lift water and evaporate it during the forty-two years of its existence.

The brine is lifted at irregular intervals into a large tank, whence it is drawn as needed. At times, it will rush through the pipes for a minute or more, but usually only flows for a few seconds at a time.

In the accompanying sketch, A A are the pipes, terminating at the top of the gas chamber, B. The brine falls to the bottom of the chamber, filling the tank, C, while the gas is carried away by the pipe, D, to the furnace, where a small coal fire is kept burning, to relight the gas in case the supply should cease during a long flow of water from the well.

It is seventeen years since I examined it, and the method of using the gas may have been improved since. The gas burns with a pale blue flame, and imparts no disagreeable taste to the salt.



Petroleum is found in the neighborhood in quantity, floating upon springs and the water of salt wells. It used to be called "rock oil," and was used for sprains, chapped hands etc. But no petroleum, or disagreeable smell of it, annoys the owner of the "works" described. J. B. GAGE

36 W. 16th st., New York city.

[In connection with the above statement, we will add tha

Mr. C. C. Peck, of Chicago, sends us an account of a remarkable gas well in West Bloomfield, Ontario county, N.Y. The well was sunk about three years since, for oil, a smell of petroleum and appearance of gas having manifested themselves on the banks of a small stream. The boring was stopped at a depth of 500 or 600 feet, for want of funds; but there has issued ever since a large volume of gas, having the odor of petroleum. Our correspondent states that the flow of gas is, by actual measurement, more than enough to supply the city of Rochester, and a company is now organized to supply the town of Lima, preparatory to supplying the city of Rochester, from this source. The illuminating quality of the gas is said to be superior to gas made from coal.

Another correspondent, Mr. George L. Benton, writing from Shambury, Venango county, Pa., states that about ten miles from where Oil Creek empties into the Alleghany river, at a place called East Sandy, there is a remarkable gas well. The gas from this well is conveyed 1800 feet, through a two-inch pipe, and then employed to drive three engines, of from ten to twelve horse power, the gas being used *in the cylinders, like steam*, instead of being burned to generate steam. The surplus gas burned would, it is stated, more than make steam for the engines. When the engines are running the gage shows a pressure of 80 lbs. Under this pressure the amount of gas delivered must be very great.—EDS.

What a Woman thinks of Modern Microscopists.

MESSRS. EDITORS:—Among the whole tribe of your scientific men, there are none who trouble me so much as your microscopists. I am a faithful reader of your paper, taken by my son, Dr. S. P. Duffield, and rejoice in the modern improvements of machinery of all kinds; but this microscopic information about what I eat and drink is most appalling to my sensibilities.

I have not a *modern* stomach, *that* having performed its duty for seventy-one years; consequently, cannot *imagine* (in these days when imagination does such wonders), that I have in it some patent filter that might catch the horrid creatures which these gentlemen say we take in by the wholesale.

How sweet was the recollection in former days that "a cup of cold water" presented to a good individual entitled us to "a reward" by a kind Providence! Now, alas! that pleasant idea is abandoned; as, according to these wise men, we may give him a horrid worm which may be his death—consequently, we deserve no reward—to say nothing of those creatures which accompany said worm. After reading one of your late numbers I was reduced to despair; as my last refuge of pure things in the eating line is swept away by these unmerciful microscopists.

Oysters—the pure delicious oyster, so nice when eaten fresh from the shell—we are informed, very coolly, have in them multitudes of small oysters swimming nimbly about in the juice "covered with shells;" and not content with making us put up with swallowing oysters, shells and all, they unmercifully add that the liquor contains a "variety" (listen to their audacity in telling us of *a variety*) of animalculæ; and, in their benevolent (?) love of modern science, they go on to say, "there are three species of worm also."

Were it not for my belief in Job's words, (poor Job would be informed in these days that he had a thousand worms in each of his boils) "After my skin, worms shall destroy this body," I should, I fear, die of inanition, as I never would be able to take the "food convenient for me," that the happy ignorant Agur prayed for.

Then, too, these amiable *savants* tell us, by way of reward for gulping down this nauseous dose, that if we take our oyster into a dark room we will see a "luminous star:" verily, I should rather do without the luminary than have it shine from such a verminose panorama.

I have tried to find relief from the old adage, "Where ignorance is bliss, 'tis folly to be wise," but having a learned professor for a son, of course I have acquired a little science myself, and find it more difficult to do so.

I look to these wise men for some relief. Cannot they make their "luminous star" less of a "blue" one?

ANTI-VERMICULE.

The Manufacture of Irish Poplin.

MESSRS. EDITORS:—Every civilized nation has some specialty of manufacture, Ireland being famous for poplins and linen. When in Dublin I visited the well-known establishment of Pim Brothers, the most extensive poplin manufacturers of the kingdom. The spinning is the only part of the work that is done by machinery. Every other part is performed in the most primitive manner by hand labor. Almost the first thing that meets your eye on entering is a number of old women sitting beside old-fashioned flax spinning wheels propelled by the foot, and winding the thread on spools.

In this establishment there are employed two hundred and thirty looms, of the rudest possible construction, in appearance resembling those of our great-grandmothers, manufactured during our colonial struggles. Every thread is put through with the old-fashioned shuttle by hand; and the treadles are worked by the operator's feet. The looms are all operated by men, ten yards being an average day's work, and fifteen yards the largest ever known to have been woven in one day. The greatest skill seems to be displayed in producing the colors, and their power of retaining their richness for an indefinite length of time.

Any one who will take the trouble of examining a piece of Irish poplin, will notice the irregularity in the size of the threads, and the imperfections in weaving. I asked one of the managers if he did not think that power looms could be used for weaving; his reply was that it was possible, but not practical, as labor was so cheap with them that it would probably cost more than to do the work by hand. Nearly all other parts of the work except weaving is done by female labor.

That the far-famed Irish poplins should be manufactured in so simple and primitive a manner was to me a matter of surprise. J. E. F.

Industrial Competition.

MESSRS. EDITORS:—I have read your notice, in No. 5, of my paper upon "International Industrial Competition," concerning which I beg to say that I by no means wish, as you express it, to "deal a death blow to commerce and trade."

It is very true that I prefer domestic commerce and trade to the comparatively insignificant foreign commerce, which arrogates to itself the exclusive right to be called commerce. The former is a sure indication of prosperity; the latter is far from being so, and may be the direct cause of national impoverishment.

What I insist upon is, that each nation which intends to be truly independent, must develop its own resources, so as to contain within itself the means of supplying its own wants. Here, I feel sure you agree with me.

If you would do me the honor to read the latter half of my pamphlet, you might probably reconsider your view that I am an extremist. That I love my own country more than England, Germany, or France, is most true, and I desire to see it resist successfully the trade assaults of those countries; to equal and to excel them in all the useful arts. That desire is shared in by yourselves and your readers; it may, in fact, be said to be the *raison d'être* of your valuable journal, as it was of my pamphlet. JOSEPH WHARTON.

Camden, N. J.

Luminosity of Cloth When Torn.

MESSRS. EDITORS:—About a month ago I read in your paper an extract from *Nature* mentioning the singular phenomenon, recently observed, of the evolution of light caused by the tearing of twilled cotton cloth into strips in a dark room. About seven or eight years ago, while in the dry goods trade at Victoria, Vancouver's Island, I repeatedly noticed this same phenomenon. Not only soft twilled cotton cloth, but stiff, smooth calico, containing a large quantity of lime dressing, will emit light when torn in a dark or even dimly-lighted room. In cold, dry weather the phenomenon is more noticeable than in warm or damp weather. In Montana, during an extraordinary cold spell in the winter of 1867-68, the thermometer ranging from ten to thirty-two degrees below zero, I noticed that common printing paper, when torn in a cold dark room, will emit light. I have always attributed the evolution of light in these cases to electricity. At the time I noticed the so-called phenomenon in Montana, the amount of electricity "knocking around loose" was really astonishing. One day, presenting my knuckle to the tip of a cat's tail, a spark flew out of it (the cat's tail) as large as that which comes out of a twelve or fifteen-inch electrical machine. Often, at night, when undressing for bed, as I was pulling off my woolen overshirt, I would hear a crackling noise, like that made by the breaking of thin glass stems, and while extracting my head and arms from it, I would see hundreds of little flashes at the points where the over-shirt and under-shirt were parting. In violently shaking my overshirt, after taking it off, I would see innumerable flashes of light, and hear a continuous crackling sound. When the cold spell was over, the pyrotechnics on my shirt ceased, the cat no longer gave forth sparks, and no matter how luminous the articles were in the newspapers which I tore, light refused to issue from them. G.

San Francisco, Cal.

Illustrious Inventors.

MESSRS. EDITORS:—It is with pleasure that I acknowledge the receipt of the beautiful engraving, "Men of Progress." You will please accept my grateful thanks, and rest assured that I shall use what influence I may have in presenting the claims of the SCIENTIFIC AMERICAN to my friends and to the public, not simply for the reward that I have received, but from my appreciation of a paper so full of useful information. J. F. LESLIE.

Haverhill, Mass.

[Concerning this group of illustrious inventors, whose portraits are faithfully represented in this picture, the following are among the dead: Thomas Blanchard, Samuel Colt, Charles Goodyear, Joseph Saxton, Isaiah Jennings, Henry Burden, and Wm. T. G. Morton.

We shall continue to give a copy of this superb work of art to any one who will send us ten new subscribers, at our club rates—twenty-five dollars.

J. F. Kingsley, Owego, N. Y., writes that he has received the engraving, and feels well paid for the trouble he has been to, in getting up the club.

JEWELLER'S CEMENT.—The following is a recipe for a strong cement, used by some oriental nations, for the purpose of attaching precious stones to metallic surfaces: Take six pieces of gum mastic, the size of peas, and dissolve in the smallest possible quantity of alcohol. Soften some isinglass in water, and saturate strong brandy with it, till you have two ounces of glue; then rub in two small pieces of sal ammoniac. Mix the two preparations at a heat. Keep well stoppered. Set the bottle in hot water before using. It is said by the Turks that this preparation will unite two metallic surfaces, even polished steel.

There has never been a successful advertising agency south of Baltimore. Several have been started in New Orleans, but proved failures.

The Old Confidence in Superstition.

That prosaic and coldly rational temper with which modern men are wont to regard natural phenomena was in early times unknown. We have come to regard all events as taking place regularly, in strict conformity to law; whatever our official theories may be, we instinctively take this view of things. But our primitive ancestors knew nothing about laws of nature, nothing about physical forces, nothing about the relations of cause and effect, nothing about the necessary regularity of things. There was a time in the history of mankind when these things had never been inquired into, and when no generalizations about them had been framed, tested, or established. There was no conception of an order of natnre, and therefore no distinct conception of a supernatural order of things. There was no belief in miracles as infractions of natural laws, but there was a belief in the occurrence of wonderful events, too mighty to have been brought about by ordinary means. There was an unlimited capacity for believing and fancying, because fancy and belief had not yet been checked and headed off in various directions by established rules of experience.

Physical science is a very late acquisition of the human mind, but we are already sufficiently imbued with it to be almost completely disabled from comprehending the thoughts of our ancestors. "How Finn cosmogonists could have believed the earth and heaven to be made out of a severed egg, the upper concave shell representing heaven, the yolk being earth, and the crystal surrounding fluid the circumambient ocean, is to us incomprehensible; and yet it remains a fact that they did so regard them. How the Scandinavians could have supposed the mountains to be the moldering bones of a mighty Jötun, and the earth to be his festering flesh, we can not conceive; yet such a theory was solemnly taught and accepted. How the ancient Indians could regard the rain clouds as cows, with full udders milked by the winds of heaven, is beyond our comprehension; and yet their Veda contains indisputable testimony to the fact that they were so regarded."

We have only to read Mr. Baring-Gould's book of "Curious Myths," from which we have just quoted, or dip into Mr. Thorpe's great treatise on "Northern Mythology," to realize how vast is the difference between our standpoint and that from which, in the later Middle Ages, our immediate forefathers regarded things. The frightful superstition of werewolves is a good instance. In those days it was firmly believed that men could be, and were in the habit of being, transformed into wolves. It was believed that women might bring forth snakes or poodle dogs. It was believed that if a man had his side pierced in battle, you could cure him by nursing the sword which inflicted the wound. "As late as 1600, a German writer would illustrate a thunder storm destroying a crop of corn by a picture of a dragon devouring the produce of the field with his flaming tongue and iron teeth."—*John Fiske, in Atlantic Monthly for February.*

The Hartford Steam Boiler Inspection and Insurance Company.

The Hartford Steam Boiler Inspection and Insurance Company makes the following report of its inspections for December, 1870:

During the month 457 visits of inspection have been made, and 866 boilers examined—845 externally and 274 internally, while 87 have been tested by hydraulic pressure. Number of defects in all discovered, 486, of which 88 were regarded as dangerous. These defects were as follows: Furnaces out of shape, 22; fractures, 30—14 dangerous; burned plates, 22—3 dangerous; blistered plates, 63—12 dangerous; cases of sediment and deposit, 78—14 dangerous; cases of incrustation and scale, 83—9 dangerous; cases of external corrosion, 23—2 dangerous; cases of internal corrosion, 20—5 dangerous; cases of internal grooving, 15—4 dangerous; water gages out of order, 22—2 dangerous; blow-out apparatus out of order, 22—12 dangerous; safety valves overloaded, 25—2 dangerous; pressure gages out of order, 50—2 dangerous; cases of deficiency of water, 3—2 dangerous; broken braces and stays, 9—4 dangerous; boilers condemned, 3—all dangerous.

During the month there have been seven explosions in the United States, namely: Locomotive, tug boat, pile driver, grist mill, brass foundery, iron foundery, and steamboat, one each. By these explosions 12 persons were killed, 14 severely wounded, and many thousands of dollars worth of property destroyed. It is safe to say that the greater part of these explosions, and the consequent loss of life and property, would have been avoided by a proper inspection of the boilers.

What an easy thing it is to drive a locomotive, says the *National Car Builder*. Pull a lever, away she goes; push it, she slacks up and stops. That's all. The quick eye, firm hand, prompt courage, the knowledge of every furlong of the road, the putting on steam on an ascent, or the shutting off on a down grade, the difference of expansion in the rails between hot and cold, wet and dry, and the perpetual risk of life and limb and property are matters unknown to the people who pay their fares, take their tickets, and get to their journey's end. All the while their lives have been in the hands of a grimy looking man, at the end of the train, whom, if they meet him on the platform, they avoid, lest they should soil their silks or kerseymeres by the contact. These men should be, and often are, scientifically educated; but they have no social position, and their wages are absolutely inadequate to their responsibilities. The gentlemanly conductor is a personage of consideration, the petted of passengers, and the respected of directors. The engineer is a mere mechanic. The world is full of irregularities and injustice.

Cement from Gas Lime.

We gave, a short time since, a description of a new English process for making cement from gas lime, invented by Mr. Prideaux. Of this new cement, a correspondent of the London *Builder* says: It bids fair to become an important manufacture. In Sheffield upwards of 700 tons of gas lime have been worked up. The larger part has been applied to walls and floors, hearths and mantelpieces. Of the latter, about 200 have been moulded and sent out. In four of the busiest parts of the town, causeways have been paved by laying the cement with a certain proportion of broken slags from the neighboring furnaces. These have stood the late rains very well, and are likely to come into close competition with the asphalte usually employed. Perhaps the most happy application of this new material is for floors and roofs. Old boarded floors of warehonses have been covered with about an inch layer, and even in workshops, where polishing machinery keeps everything in vibration, the Prideaux cement stands intact. I have daily inspected the roof of a shed which had been covered with the cement. Upon a light frame of wood the material was laid on and troweled to a smooth face, and in the space of twelve hours it was hard enough to bear standing upon. The rain water now washes over it without the slightest trace of white particles, nor is there any alkaline reaction to be discovered on the hardened surface. The smoothness of walls and plinths molded with the Prideaux cement is very striking, and must recommend it strongly to builders.

Now, it may be asked, what is the composition of a cement which possesses these useful properties? It is not a Portland or a Roman cement, although some hydraulic characters are very distinct. It does not set so quickly, but allows more time for finishing up the faces of molded work. It is far from common mortar; for without any sand it can be formed into blocks which set hard throughout. A piece of a mantelpiece, which had been made some six months, gave the following results upon analysis:

Carbonate of lime	69·08
Sulphate of lime (hydrated)	22·63
Calcic hydrate	1·36
Calcic sulphide	*trace*
Insoluble matter	6·50
Alumina and oxide of iron	·45

It is obvious, from the above, that the setting must at first be due to the combination of water with the dehydrated calcic sulphate, or, in other words, the plaster of Paris formed by the calcination of the cement. The quantity of caustic lime which is present in the cement, keeps the plaster of Paris always fresh, that is, dehydrated, until mixed with excess of water employed at the moment of using it. This will account for the fact that the cement does not lose its quality by keeping, as the hydraulic cements do. After the plaster of Paris is set, the caustic lime goes on absorbing carbonic acid, and thus indurating the mass in the ordinary manner of lime mortars.

This will be better understood by the following partial analysis of a sample of the cement ready for use:

Sulphate of lime (dehydrated)	17·46
Caustic lime	54·00
Alumina and oxide of iron	5·00
Insoluble residue	4·15
Hygroscopic water	·24

Now, when it is considered that such a material is made from a waste product of a most offensive kind, this invention deserves every fair trial of its merits. Gas lime is a necessity, if the best and purest gas be wanted. Only the expense and annoyance of its removal drove London gas companies unwillingly to replace it partly by the ferric hydrates. It is pretty certain that with a market for the waste product they would gladly return to lime purifiers, and it may be predicted that the Prideaux cement manufacture will surely bring on this revolution.

Fortunes in Scraps.

The "old junk" business is much more extensive than most people suppose. It includes refuse of all kinds, cotton waste, woolen rags, old newspapers, iron, tin, lead, etc., patiently gathered from all quarters, insignificant in detail, but valuable in the aggregate. It is believed that over $15,000,000 worth of old material is annually worked over in New England, and that at least $5,000,000 worth of this peculiar stock could at any time be thrown upon the market by the Boston dealers. The amount consumed by the mills is astonishing, especially of shoddy. Woolen mills could be named that purchase each year from $3,000 to $4,000 worth of the above stock, and this, too, in addition to flocks. Very many paper mills have standing orders with the largest paper dealers for thirty and fifty tons of stock per week. The Kingsley iron and machine company receive and consume from sixty to seventy five tons of scrap iron each week, and the Old Colony and Ames' shovel companies stand ready to take all the old wrought iron offered in the market. The war in Europe seems to have closed up the avenues for using a large percentage of the Mediterranean rags, and as a natural consequence, they have all drifted here. The immediate effect on our market is to put foreign stocks at the lowest quotable figure, while domestics are, and are likely to be for some little time a drug. There are firms in Boston each holding $100,000 worth of foreign and domestic, patiently awaiting a rising and a favorable market. The importation of old junk grows in importance each year. Old newspapers are brought from England and find a ready sale at remunerative rates; the rags from London and the Mediterranean average more in quantity and better in quality each succeeding year. It has been supposed that imported rags have been a source of epidemic diseases in many instances, but one of the largest dealers in Boston, who has been in the trade fifteen years, states that he has yet to learn of a single case of sickness occasioned by the opening or bundling of a bale of foreign rags. New England rags are worth more and will readily bring from one to three cents per pound more than those from any other section, the reason being that an almost universal custom prevails there, among the housewives, of washing the rags before putting them in their rag bags—so that time, labor and shrinkage are directly saved to the mills. One firm in Boston receives over $300,000 worth of paper stock per month from the South. New Orleans being the chief point of collection.

Steam Boiler Legislation.

The Manchester (England) Steam Users Association held a conference January 13th, to consider the subject of steam boiler legislation. Sir William Fairbairn presided, and the following resolutions were adopted:

1. "That the use of steam, as at present conducted, entails great suffering from the destruction of life and property occasioned by the constant recurrence of boiler explosions. That boilers are now to be found under the pavements over which the public walk, behind walls close to which they pass, in the basement of buildings crowded with busy workpeople, and that, in short, they are to be found everywhere. That many of such boilers have given rise to the most disastrous explosions, so that the lives of all those living near so dangerous an instrument as a boiler, or even casually passing by, are seriously jeopardized unless suitable precautions are adopted to ascertain whether the boiler be safe and trustworthy, and if not, to render it so. That most of those who have suffered from these explosions have had no voice in the management of the boilers, and thus were helplessly victimized, some being women in their own houses and others children at play. Further, that in the generality of cases those injured by the explosions of boilers at the works at which they earn their livelihood are in a similarly helpless position, and, as a rule, too poor and too ignorant to defend themselves. That the subject, therefore, becomes one of general and public interest, demanding immediate investigation, more especially as the use of steam is daily on the increase, and, notwithstanding any precautionary measures at present adopted, explosions still recur with the most persistent regularity and frequency."

2. "That boiler explosions are not a necessary consequence of the use of steam, but that they are, as a rule, preventible. That though complicated in result they are simple in cause, arising, in the main, from bad boilers—bad either in construction or bad in condition. That six explosions are due to bad boilers, through neglect of the boiler maker or boiler master, for every one due to the neglect of the boiler minder. That competent inspection is adequate to detect the badness of the boiler, and thus to prevent by far the greater number of the explosions now occurring."

3. "That notwithstanding the proved efficiency of competent boiler inspection and the publicity constantly given to the subject, yet that steam users refuse to protect the lives of their workpeople, or those residing near to their works, by having their boilers inspected. That it appears approximately that out of about 100,000 boilers in the country only 20,000 are enrolled either with the inspecting associations or insurance companies, so that out of every five boilers one only is enrolled. That a great number of boiler owners are totally ignorant of the risk to which they expose their own lives and those around them, and in many cases are undeceived only by the shock of explosion. That, judging from experience, there can be no doubt that there are now a number of dangerous boilers on the very verge of explosion, being worked on at the risk of all those living near them. That under these circumstances the public safety demands that competent periodical inspection should be enforced by law."

4. "That, although it is necessary in the interest of the public that inspection should be enforced by law, it is not advisable either in the interest of the steam user or the public at large that inspection should be undertaken by the Board of Trade, or any other department of the Imperial Government, as such a course would, it is feared, harass the steam user and hamper progress."

5. "That while the administration of a system of enforced inspection should not be committed to the Imperial Government, neither should it be committed to local authorities, nor to private inspecting associations, nor to insurance companies."

6. "To secure the purity of the inspection let the administration be above all local, party, or private interests, and let it be undertaken, not for profit, but to promote the public safety. To prevent the administration becoming arbitrary, stereotyped, and old-fashioned, and to render it capable of adaptation to the constantly altering and growing requirements of the boiler owner, let it be administered by district boards, constituted partly of gentlemen elected by the steam users themselves, and partly of ex-officio members to be chosen on behalf of the public, the boards having the power of making such laws, rules, and regulations from time to time as might be found necessary for the conduct of the service."

INSULATING COVERING FOR STEAM BOILERS.—The radiation of heat from steam boilers and engine cylinders may be effectually reduced to a minimum by the employment of a jacket of wood, and filling the space between the boiler and the jacket with gypsum. This plan deserves the suffrages of boiler tenders, whose health and comfort suffer so severely from overheated engine rooms. The gypsum (plaster of Paris) will harden in time, and can easily be removed. This material will be found superior to cork or felt, and can be universally applied.

The Use of Glue.

A correspondent writes to the *Coachmakers' Journal* as follows:

"To do good gluing, the work must be well fitted. We use a scratch plane and file, in fitting work for gluing. The shop must be warm, the parts to be glued well warmed, and a kettle of good glue in readiness, well cooked, and brought to the proper consisteney. Badly tempered glue is one great point of failure. If the glue be too thick or too thin the work is ill done. It is most frequently used too thick. In gluing panels for carriage work, etc., the work should be well run over a few times with the glue brush, until the pores of each part are well filled, and if the work be well warmed, the glue hot and of the right thickness, the first coatings will frequently strike in, or be absorbed by the pores of the wood. This striking into the pores is what gives a glue joint its great strength and durability. Now, having clamps, hand screws, etc., ready, put together immediately, bringing the parts firmly together, leaving no *body* of glue between, but do not get in a hurry. If you wish to hurry, do it in getting everything ready and at hand before you put on your glue. Use nothing but the best glue. If we do a bad job of gluing, screws will not cure it; it is a bad job at best, and will give out sooner or later. When glue joints open they begin at corners or ends, and work in by degrees. Screws at those points may stop the openings for a while, which is the most they can do. They are of but little use in panels to carriage bodies.

A California Railroad Pier.

The Central Pacific Railroad has erected at Oakland, on the east side of San Francisco Bay, a wharf 11,000 feet long, running out to a depth of 24 feet at low tide, and of 31 feet at high tide, having twelve railroad tracks upon its last 1,000 feet, a wide carriage way, a passenger depot and railroad offices, warehouses, and outside storage for 40,000 tuns of grain or other merchandise, and three large docks, one of which affords ample space for five of the largest steamers or clippers afloat. The extreme end of the main wharf is only three miles from the foot of Second street, where freight is landed in San Francisco, and is less than two and a half miles from the foot of Pacific street, where passengers are set down. The piles used, where the water deepens, are 65 feet long, and are 42 to 54 inches in circumference. The main wharf is 800 feet wide at the extreme or western end, and on it are pens for 500 cattle, two immense warehouses (one 50 by 500, another 50 by 600), and the passenger depot, 75 by 395 in size.

Obituary--The Late Henry Steinway.

Henry Steinway, the head of the well known firm of piano manufacturers, Steinway & Sons, died in this city on Tuesday, the 7th instant.

He was born in Brunswick, Germany, in 1797, and learned the business of piano-making thoroughly. He was a successful manufacturer long before he came to this country, which was in 1850. In this city he began business in Varick street, and then moved to Walker street, near Broadway, where, in a little old-fashioned house, formerly a dwelling, he won for his pianofortes the reputation which has made the Steinway pianos celebrated all over the United States. At the Crystal Palace in this city, in 1855, one of his instruments took the first prize. In 1860, the large up-town manufactory was built, and soon after, the splendid warerooms on Fourteenth street. Of late years, Mr. Steinway, Sr., has lived in retirement.

THE HUDSON RIVER RAILROAD ACCIDENT.—The daily papers have carried to every corner of the land, the news of the disaster which occurred at New Hamburgh on the night of the 6th inst. We need not, therefore, dwell upon its horrible details. An inquest is now in progress, and no doubt the blame, if any attach to the employés on the trains which collided, will be fixed upon the right persons. We shall defer further comment till the evidence is all taken.

SCIENTIFIC PERSONAL.—Baron Liebig writes to a friend in this city that his health is so far restored as to admit of his conducting the usual course of lectures at the University of Munich. Since he broke his leg, he has not been able to take as much exercise as usual, and the severe labors of the laboratory more readily tell upon him. We must also recollect that he is fast approaching the three score years and ten, which, the Psalmist tells us, is all that is allowed to man, unless by reason of unusual strength.

MANUFACTURE OF MUSTARD.—W. G. Dean, of New York, has obtained a patent for improvement in the manufacture of mustard flour, by which, it is stated, the unpleasant taste and smell of turmeric, as well as the natural bitterness of mustard, is entirely removed. The process completely destroys the disagreeable properties of the turmeric, and at the same time gives a sweetness to the flour, besides changing almost instantly the natural gray color of the mustard to a rich and beautiful yellow.

WE are in receipt of the annual report of Commissioner Capron, for 1869, upon the subject of Agriculture, which embodies much valuable information to our farmers. We intend to make several extracts from this report, such as exhibit the progress of inventions designed for agricultural purposes. These extracts will guide the minds of inventors into safe channels, upon which they may venture to push their ingenuity in search of other improvements.

Savannah has $20,115·15 worth of wooden pavements.

Improved Ore Washer.

The device illustrated herewith is an apparatus for washing ores. In its use, ore previously pulverized is thrown into a receiver, A, and falls thence into an inclined pipe, B. Here the ore is caught by jets of water forced upward into the pipe, B, through nozzles placed just below the juncture of A and B (not shown in the engraving), by means of a powerful steam pump.

The water jets carry the ore upward into a chamber, C, which is supported by the frame, E, and which has an inclined bottom, D. In the chamber, C, there is placed a perforated barrier (not shown in the engraving), extending downward from the arched roof of the chamber, and against which the mixed ore and water is forcibly dashed.

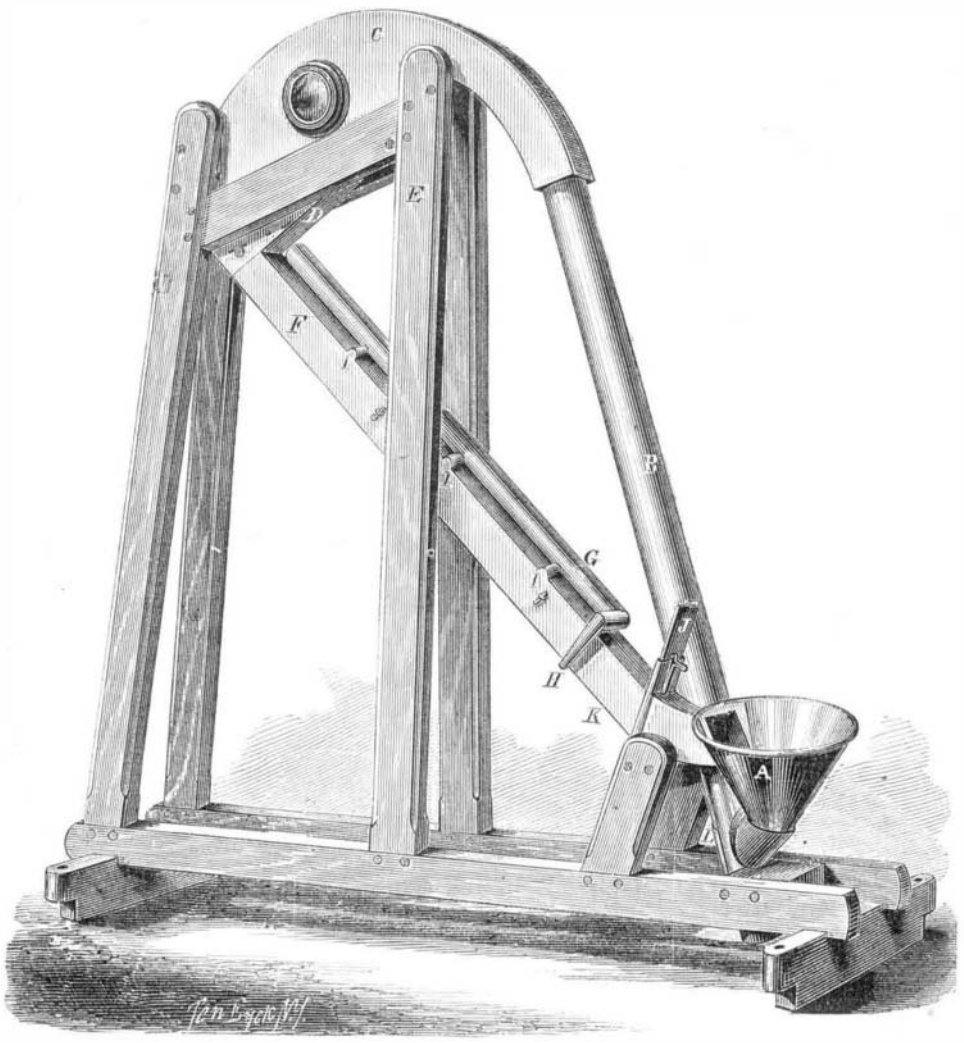
The perforated barrier does not extend entirely down to the bottom floor, D, of the chamber, C, but has beneath it a space left, through which the ore, after falling down the side of the perforated barrier, passes. A portion of the water, also, with some of the dirt, rushes through the perforations of the barrier, and the whole mass flows onward to the inclined trough, F, the upper end of which opens into the lower corner of the chamber, C.

The water now escapes through perforations in the bottom of the trough F, while the ore falls to its lower end, and is removed, if cleaned, through a gate placed at K, formed in the bottom of the lower end of the trough, F, and not shown in the engraving. If not sufficiently cleaned, which is ascertained by examining a small sample, the vertical gate, J, is raised, and the ore then falls through into the receiver, A, for a repetition of the process, or it may be passed through a suitable channel into another machine, for a second washing.

During its passage down the trough F, the ore is met by small jets of water from apertures, I, in the pipe, G, the water being forced in at H by a steam pump. Under each aperture, I, on the inside of the trough, F, there are formed lips which direct the jets upward against the descending stream of ore. The ore is by this means kept constantly agitated, and every part is acted upon by forcible jets of water.

A sliding gate, L, is used to remove the clogged ore or to relieve the pipe from a surplus of water.

Patented through the Scientific American Patent Agency, Oct. 4, 1870, by Edwin Platt, whom address for further information Charleston, S. C.



PLATT'S ORE-WASHING MACHINE.

Patent Weatherboard Bracket.

The operation of weather-boarding is tedious, and attended with many practical difficulties. The spaces for the lap of boards are generally taken with compasses, or some kind of marking gage, a mark made, and nails driven in to support the board, which must be held in place with one hand, while the workman clambers from end to end of the staging, scribing and handling tools with the other. The board must always be taken down to be sawed, and replaced to be nailed on, and the supporting nails must then be worked out with the fingers, or drawn with the claw hammer, more or less defacing the work.

Very often, when a board extends past a corner board to be scribed, a wind whisks it off the nails, tumbling tools and nails to the ground.

The simple and efficient implement, herewith presented, effectually obviates all these difficulties, and greatly shortens the work.

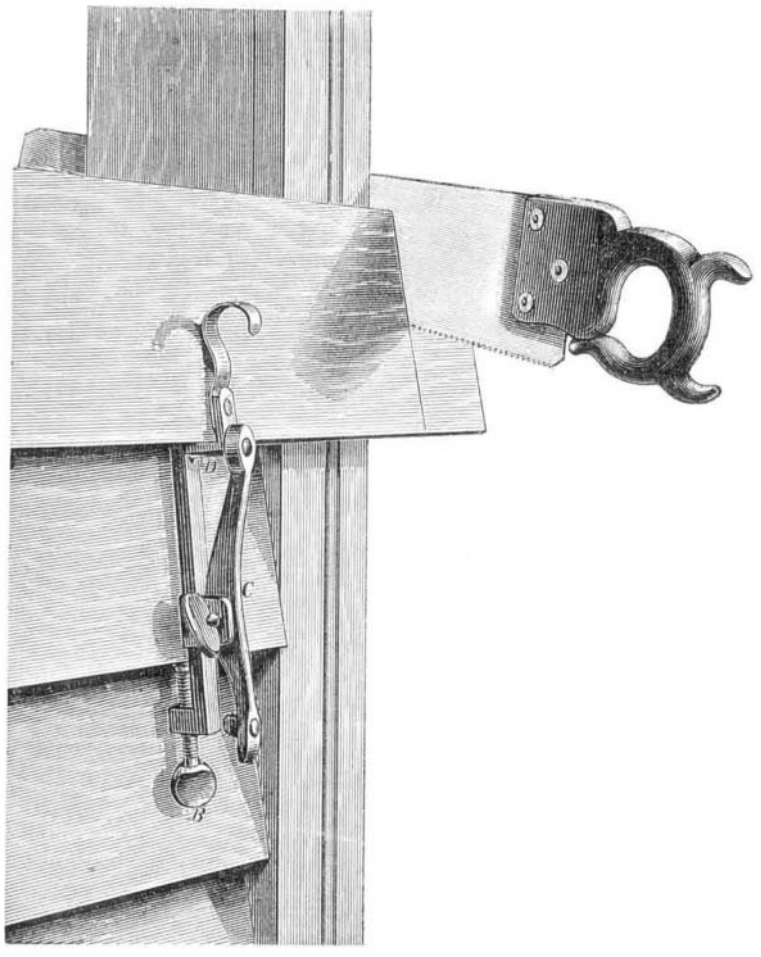
It takes the space, and, at the same time, offers a secure bracket, to receive the next board and hold it firmly, in exactly the right position, while it is scribed, sawn off (without taking it down), and nailed on, leaving both hands free to handle nails and tools throughout the operation.

It consists of an elbowed spacing bar, A, carrying at its lower end an adjusting screw, B, which travels over a graduated scale, cut on the face of the bar, and terminating at its upper end in a bracket carrying a light holding spring, to keep the board upright against the studs or sheathing boards.

The bar carries ears near its middle point, in which is pivoted the middle point of an oscillating lever, C, the upper end of which carries a spike, D, by which the tool is fastened to the wall. One bracket is used to support each end of the board.

The adjusting screw being turned to the proper division on the scale to allow for any required lap of boards, the tool is slid upwards across the last board nailed on, till the end of the adjusting screw hitches on its lower edge; then a tap with the hammer on the upper end of the lever secures the tool to the wall in exactly the right position. The board is then dropped vertically behind the hand, is doing duty in its place on the wall. The utility of this bracket as a time and labor-saving implement is obvious.

Patented through the Scientific American Patent Agency, October 18, 1870. The patent is for sale. For the entire right, or right to manufacture on royalty address the inventor, J. M. Milhollin, Champlin, Hennepin Co., Minnesota.



MILHOLLIN'S PATENT WEATHERBOARD BRACKET.

To Prevent the Adhesion of Gold Leaf.

Painters and decorators will find the following plan a good one to simplify a most troublesome part of their work: A small piece of ball liquorice, dissolved in water, applied with a flat camel's hair brush to the place intended to be left ungilt, will prevent the leaf adhering. The solution must be weak. Made thick and gummy, it is very useful to protect ornamental parts of work that is to be repainted. We have the authority of the *Coachmakers' International Journal* for the above facts.

Improvements of Plows.

In the matter of swing plows, it can scarcely be said that any decided and unusual stride has been made during the year; nor has any strikingly unique form of mold board, landside, standard, brace, colter, or clevis been patented in that period. Applications have been chiefly for improvements in those devices.

Quite a competition has sprung up in an attachment of plows known as a "fender," which, although invented years ago, has received, until recently, but little attention. While the position of the fender is about the same in all plows to which it is applied, viz: pendent from the beam, and slightly in advance of and removed from the mold board: its purposes differ according to the style of the plow with which it is employed. Thus, on a breaking plow, one intended for raising and turning over the unbroken sod, it is used for bending the weeds and other trash away from the mold board when likely to interfere with the plowing, or being down in such a way of to fall beneath the ridge of soil turned over by the plow. The fender is also used on cultivators, for the purpose of protecting the growing corn and preventing the heavy clods from falling on the young plants.

The majority of plows patented are those known as swing plows, by which is to be understood a plow unsupported by wheels, and the chief aim of the inventors has been, while otherwise improving their efficiency for general and specific purposes, to make them lighter and cheaper. In this respect, our American inventors have good reason to boast over their competitors in other lands, as may be readily appreciated by a comparison with foreign implements, of our light and jaunty-looking plows.

There is a strong tendency toward wheel plows, "gang" and "sulky," in the prairie country west. By "wheel plows," are meant those in which the plows are carried between a frame supported on two wheels, and having a seat for the driver. There seems to be no diminution of interest in this class of plows in any section where they have been introduced.

The points to which attention has been directed by inventors of wheeled plows, are various. They have mostly reference to the frame and its appurtenances, and rarely concern the construction of the mold board, or parts which have to deal directly with opening the furrow. Either lateral or vertical adjustability has generally been kept in view, while much has been done with reference to a diminution of the draft, and to a construction that will keep the plow in the ground firmly and uniformly, while permitting it to be readily raised above the surface.

It is worthy of note, that the patents granted on wheel plows, in 1869, to residents of California and Oregon, largely exceed in number those granted for inventions of a like character from all the other States of the Union.

The Curled Hair Trade.

This article, which to almost any casual observer would be of small moment, is, says the *Trade Journal*, really of very great importance to the nation, as, with all our ingenuity, we have never yet been able to find a substitute for it in the manufacture of bedding, furniture, and many articles of use which contribute to our comforts. The amount of business done in this article is something really astonishing when reduced to figures. We imported into this country, from the various ports in South America, during the past year, a little over 3,000,000 pounds, amounting to about $960,000. When imported, it is not curled, but in the natural state, just as it is taken from the horses, of which many thousands are killed every year on the vast pampas in Central South America, and it is made up into robes here, and afterwards picked by machinery and by hand, when it is ready for use. The business in curled hair is increasing every year, and although the manufacture of hair cloth has, in a great measure, died out, there is still a very great increase in the amount of hair imported each year for this one purpose of curling. Two or three large houses in this country do most of the business, and are situated in New York, Boston, and Baltimore. The raw material is worth from 32 to 34 cents gold, and, after manufacture, brings from 50 to 70 cents currency, but the cost of manufacture is a very large item, and employs a large amount of capital, and a great deal of skilled labor. The imports of hair into this country, this year, in the opinion of parties in the business, will be from one to two thirds larger than last year.

Of the 7,391 residents of New Orleans who died last year twelve were over 100 years old.