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NEW YORK, SATURDAY, MARCH 23, 1867.

Contents:

(Illustrated articles are marked with an asterisk,)

CAUTION.

It has become necessary for us to state very distinctly that the Scientific American Patent Agency Offices are at No 37 PARK Row, and not at No 39. Our reason for making this announcement will be made to appear by reference to a notice published on page 172, last number, under head of "Police Intelligence."

SPECULATIONS ON THE FUTURE.

The able Editor of *Engineering* follows up a review of the more recent achievements in the arts with an outline of those which seem to be indicated as next in order. Farming must become a branch of engineering, with its recognised professors and professional authorities, and advanced means of improvement. Little or no waste land must be left in England. Besides steam plowing, underdraining, sanding clay and claying sand, and sewage irrigation, the agricultural engineer is to saturate the soil with carbonaceous and nitrogenous elements by penetrating it with the products of the combustion of slack coal led through the land in flues. Land will yet be made to possess almost unlimited power of production.

We must dismiss the lumbering system of "trains" for high-speed traffic, and resort to a single vehicle combining engine, tender and carriage, in which fifty passengers may go at an average rate of sixty miles an hour at moderate cost, and with but forty or fifty tuns of total weight in motion. (The obstacle to rapid traveling on railroads at present, is the great weight and unsteadiness of the vehicles, involving an enormous waste of power and increase of risk at high speed). As for goods traffic, except express freighting, we must go back to and modernize water carriage, penetrating all parts of the country with a water system, of rivers and canals, for steamboats of 250 tuns burden. A new class of ocean steamers must be had, 500 to 600 feet long, twin-screwed, and driven at the rate of 16 miles an hour, making the Atlantic passage in an average of eight days. The only requisites wanting to success in such steamers, are a full line with regular and frequent departures, and a profitable reduction of fares. A single ship like the Great Eastern can never be filled up, because nobody wants to wait for her to the end of a month or six weeks, when inferior steamers are sailing every two or three days.

In regard to motive power, thousands of readers would be astonished if it were now published *who* has said that the days of steam are already numbered, and that hot air is to become the great motor (pending the subjection of electricity to the yoke).

Probably few have formed any conception of the immense change in building which is to follow the recent perfecting of artificial stone. It has been exposed to every conceivable trial, by boiling, freezing, acids and foul gases, with some four years practical use, and appears to be unalterable—an almost incomparable stone, in all the artistic forms and colors that may be desired, at a cost less than that of brick. Hydraulic elevators are referred to as destined to supersede the use of stairs, to a great extent and to a vast saving of weary, slow and unprofitable toil.

One of the grandest improvements that must now be imminent, is the perfection and general adaptation of the Bessemer process, for the conversion of all kinds of iron direct from the blast furnace into bars and castings of steel, with mechanical treatment of whatever character in the melted condition. Mr. Bessemer himself has made excellent tin plate sheets, which would fold like a newspaper, one fold across another, without cracking at the corner,—merely by pouring the contents of a crucible of melted steel between a small pair of rolls without any other working whatever!

In warfare, the day of piston shot and gigantic guns is coming. A 20-inch shot will be fired from a 40-inch gun; a shot of a tun weight, with an initial velocity of 1,600 feet per second from a charge of 450 lbs., with but little greater destructive strain upon the metal of the gun than in the old fashioned cast-iron ordnance, and with an effect of ninety-million foot pounds, sufficient to punch a 20-inch hole in a good wrought iron plate 28 inches thick, and to go through any now existing iron-clad like a wicker basket! There are (says the writer) clear and demonstrable principles on which such guns may be constructed. In the field also, great changes are before us, not only in rifles but in bullets, in which the explosive principle is yet to be applied with all its terrible efficiency.

THE RIGHTS AND WRONGS OF THE PATENT OFFICE.

The Report of the Commissioner of Patents, which we republish in this paper, is important enough and short enough to be read by everybody, and we could especially wish it read by every member of Congress. Eloquence could add nothing to the almost pathetic facts which make up this unadorned statement, or one would be tempted to wish the Commissioner had taken the opportunity to urge the just complaint of the Inventors more at large. In the first place, there is the tabulated history of the institution, in figures, for thirty years. And what does it show? Why, that the Inventors of the country, wealthy only in genius and enthusiasm—"poor, but making many rich"—have built up unaided this national monument, illustrious already in other lands, out of their own pockets have largely overpaid all its expenses and erected a magnificent building for its use, and at this day, with a surplus of $264,125 of their money in the hands of the Government, their important business lies neglected month after month, with fees pre-paid and interests often perishing by delay—because other departments have taken possession of the Patent Office building and crowded its legitimate business almost out of it, in a stifling corner where it cannot be transacted.

And this injustice and cruelty are aggravated every day with the increasing activity and beneficence of the inventive genius which is thus encouraged (!) by the United States. The cash received from inventors last year amounted in round numbers to half a million dollars: the application fees exceeded those of 1865 by nearly fifty per cent, while the caveat fees exceeded by nearly two hundred per cent, and the total receipts by more than forty-two per cent! At the present rate it is calculated that the applications the present year will rise to TWENTY THOUSAND. How is the business to be done? Without prompt provision for more room and force it *cannot* be done.

The plain question is: Gentlemen of the Senate and House of Representatives, do you intend to TAX INVENTION, and that retrospectively, for the benefit of the general treasury, or do you intend to give that great element of public welfare simply free and fair play, on paying its own expenses? But taxed or untaxed, inventors claim at least the common rights of men—that when services are agreed on and paid for, they shall be performed and not neglected. Name your price, gentlemen, but in the name of common honesty let the work be done.

MISTAKEN ECONOMY AND POOR MATERIALS.

Every successful manufacturer, particularly the builder of machinery, well understands that it does not pay to employ poor material any more than to turn out poor workmanship; yet it is too often apparent that men will jeopardize their reputations as workmen by using materials whose only advantage is a slightly reduced cost. In machinery this practice is reprehensible, for not unfrequently life as well as property is at stake, and not always is the end desired—diminished cost—reached, the poor material sometimes being really no cheaper than a better quality. The saving effected by the use of cast iron crank shafts and connecting rods on a small steam engine is very slight, while the danger of fracture and disaster is great. Strength, lightness, proportion, and durability are all sacrificed to the saving of a few cents or dollars. Even the reputation of the builder is risked and his character impaired for this paltry consideration.

A few days ago we saw a turbine wheel the upper boxes of which were held against the vertical shaft by wedges of cast iron. These wedges were perhaps ten inches long by two and a half wide and one inch thick at the heavy end. Certainly they cost a trifle less than they would if forged from wrought iron, but in moving the machine one of them had broken off and probably the other would follow on the next removal. The purchaser would be compelled to replace them by forged wedges or wooden ones, which really would be preferable to those of cast iron. The shafts of grindstones for shop and farm use may be well enough, if properly proportioned, made of cast iron, but who would not be willing to pay more for one forged from tenacious wrought iron? Many who purchase such articles do not know the difference between wrought and cast metal, and it is these who are imposed upon. Their confidence in the dealer or the maker once shaken, they shun them thereafter, and then the maker or seller suffers.

Undoubtedly there are many cases where cast iron is fully equal to wrought, where either may be used, but the practice so common of substituting the inferior material for that best adapted to the work to be done is carried to a ridiculous extent, sometimes the extra work on the inferior article making its cost fully equal to that of the better material. There can be no true economy in this, and neither is it goodeconomy to pursue this plan even when a trifle of the first cost may be saved. Sooner or later the wares of such workmen become a drug in the market, while the conscientious manufacturer will in time build up a reputation which will prove of more value to him than his money capital.

The market is full of miserable counterfeits "made to sell." So-called plated ware, revealing the base material before the gloss of newness has disappeared; brass jewelry, corroding at the first touch of moisture; tin ware, thin as vanity and soon eaten through and through; wooden ware gaily painted with evanescent water colors to go at the first handling; indeed, so common has become the practice of employing poor materials, that it is absolutely difficult to obtain a good article, as tin ware, for instance. Surely a reform is needed, and he who will in any of these departments of industry manufacture and put into the market a really good article at a fair price and profit, will find a return in the support of an appreciative and humbug-ridden public.

"OZONE."

This is one of the comparatively recent articles in the repertory of science, having been introduced thereto only about twenty-five years ago. As its name is more and more frequently occurring in chemical notes and disquisitions, to the mystification of most persons not professionally read in such matters, it has seemed good to us that the lay readers of the SCIENTIFIC AMERICAN should not be any more mystified in the matter than are the *savans*; and that is undertaking to give them only a very little knowledge indeed, with perhaps a slight addition of plausible conjecture.

That which may be said of this important but obscure substance, is included under three divisions—its history, its nature, and its uses. It was discovered by Schönbein, who named it from the Greek participle ozōn, *smelling*, by which property it first announced itself to us. The peculiar odor, like sulphur or phosphorus, attendant upon a copious evolution of electricity, natural or artificial, had been observed to be attended also by certain chemical effects, such as the decomposition of iodide of potassium. In 1840, Schönbein announced that precisely the same evidences of a mysterious chemical agent appeared at the positive pole of the battery (if of platinum) when water was decomposed by electricity, and moreover that he had intercepted the agent and confined it in a bottle. Ten years later, he had discovered that it was evolved in the slow combustion of phosphorus and of ether, and might be detected in the atmosphere as the result of electric changes. Faraday took it up, and subjected its supposed properties to a strict test by first passing it through a solution of potash to arrest any possible acid which might have been the chemical re-agent, and finding the chemical effect still the same, established its distinct character beyond suspicion.

We will describe the usual test, by which any one may measure the indications of ozone in the atmosphere at a particular locality or season, and thus obtain important evidence, perchance, on the question of salubrity. A strip of soft unsized paper, or muslin, after being starched in the common way, is dipped in a solution of iodide of potassium. No substance common in the atmosphere, except ozone, attaches itself to potassium energetically enough to break its union with iodine. But wherever the test paper is exposed to the influence of ozone, the potassium is attracted and united to the latter, so that the iodine is set free, and its native violet color appears in the starch, which first turns brown, and on being moistened shows different shades, from pinkish white and iron gray to blue, according to the amount of ozone in action. A standard chromatic scale, covering ten degrees of color, has been made, with which the tints of the wetted test paper may be compared, and the relative proportions of ozone in the atmosphere thus measured.

The wonderful delicacy of this chemical action is realized by considering that the characteristic odor is perceptible when the air inhaled contains but $\frac{1}{500\,000}$ part of ozone, and yet the four lower shades of the test, at least, are obtained from the ordinary odorless atmosphere! This effect from such inappreciable quantities suggests also the marvellous power of the agent, which impresses us still more forcibly on finding that (if we may credit a statement we have seen) an intermixture of $\frac{1}{5\,000\,000}$ part of ozone in atmospheric air renders it quickly fatal to animals breathing it. To the human respiratory organs it is highly irritating, and produces catarrh, in proportions far below the "smelling" point, and this, with its presence in all wholesome air, seems to intimate that it may be the true excitant of animal life.

To our second inquiry—what is it?—chemistry as yet answers vaguely. At first it was supposed to be a new element, afterward a superoxide of hydrogen, and it has been settled but lately that oxygen is another of those substances, as carbon and boron, which exist in a trinity; ozone being one extreme, antozone the opposite, and the common form of oxygen, the mean. In the peroxide of barium, for instance, it is found that the metal has been oxidized or rusted by ozone; while in the peroxide of manganese there appears evidence of antozone, or an oxygen which acts differently from both that combined with barium and that found in air or water. The most remarkable indication of the nature of this element, is the fact that pure dry oxygen is entirely converted into ozone by a silent current of electricity, and then, by a continued application of electric sparks, or by a moderate heat of 450 to 500 degrees, it is entirely re-converted to oxygen; as indeed it may be, in whatever manner it has been produced.

Finally, what are its uses? It is oxygen *par excellence:* that king among elements which subdues them to the pur-

poses of nature and life, exalted by electric force to a hight of aggressive energy which consumes decay and corruption, and seems to attack the sensitive tissue in living organisms with a stimulating power that imparts through every organ the sense of refreshment and invigoration attendant upon the "clearing [ozonizing] of the atmosphere" by a thunder storm. Its gradual disappearance from the atmosphere marks the approach of malignant epidemics, such as Asiatic cholera, and its appearance is the signal for their abatement. Dr. Moffat's observations of the ozone in the atmosphere before and during the cholera epidemics of 1853 at Newcastle and 1854 at London, established these coincidences with the greatest precision. The south wind that springs up at length, after such a stagnant and sickly season, and brings what we call purifying thunder showers, is proved to be an ozonized wind, and directly the starched paper in the wind feels the action of the liberated iodine and begins to change color, the epidemic begins to abate.

The putrid matter that may be collected from the exhalations of animal or vegetable decay, a very little of it, will kill a dog. The only conceivable way to neutralize this poison in its aëriform state (at least, without suffocating all creatures that breathe) is to oxidize it by the wonderful energy of an imperceptible ingredient of ozone. Its action, when it comes on the life-giving wind, is instantaneous, universal, and complete. The air of regions proverbially healthy, as highlands and seacoasts, and wherever the circulation of the atmosphere has freest course, is found to be the most abundantly charged with ozone. Its presence gives the night air its stimulating power, so much courted by writers and lovers of pleasure. The exhilarating breath of winter is laden with it above all seasons of the year except that of May; and autumn, when all nature begins to decline, parts with the ozone until its minimum is reached in cheerless November. What shall we do to woo back this Life-Angel, in the time and place of mortal need? We know how to warm a cold place, light up a dark one, moisten a dry one, fertilize a barren one, and provide ourselves in a thousand ways against defect or excess of the elements, and must advancing science still leave us dependent helplessly on the movements of nature for vital air?

VOLUNTARY POLICE ASSOCIATION.

The Society for the Prevention of Cruelty to Animals has indirectly extended its beneficence to a class of creatures whom railroad men at least appear to regard as strictly within the scope of its terms—the animal Man. The bill offered by the society to the legislature of New York, forbidding two-horse omnibuses to carry more than twelve, and two-horse cars more than twenty-four passengers, is a measure of mercy to man and beast.

We hope this kind of good work may go on, and branch into various development. Even in strongly governed European countries, it is found that many outrageous abuses, not directly taking life or property, can be brought to the bar of justice only by voluntary police association. In this country we are full of such abuses. We are strangers to the sensations associated with clean and orderly streets, unobstructed sidewalks, regulated and responsible public service, from government down to common carriers, and a hundred other things which older governments recognize among the ends of their existence, and "subjects" expect as their unquestioned right.

The London Street Reform Society has just issued its prospectus, proposing to collect and publish facts, expose abuses, agitate reforms, enforce and improve existing regulations, and take a general oversight of street arrangements, vehicles, traffic and sanitary matters. Such a society would find a magnificent field of public beneficence in the city of New York. We have our Citizens' Association, it is true, which has done and is doing incalculable good: but there is only too much room for others of less general character, besides the humane society to which we at first alluded. It seems evident that henceforth voluntary associations for public improvement and reform are to be the medium for the public spirit of our more thoughtful and influential citizens. They owe a participation in local public affairs, both to themselves and the public, and happily this way of getting at it is as effective as it is personally unobjectionable. Through such mediums they constitute themselves a "third house" to the legislature, and at the same time a third arm to the executive.

We should like to see an able, influential, deliberative and resolute street-reform society. Such a body might examine the subject of street franchises from top to bottom—from the highrailwaymen who claim to own the roadways in fee simple, down to the packing-box gentry, auctioneers, hucksters, builders, ash-boxes, etc., that maintain their "nine parts of the law" by immemorial custom on the sidewalks. Who knows but that the popular and legislative mind might in time be educated up to the principle that highways and all their appurtenances are naturally public property and must ultimately be free to all, for their proper purposes and therefore for no other?

Influence of Sound upon Flame.

Prof. Tyndall's recent experiments upon "sounding and sensitive flames," to which we referred last week, open a very interesting line of inquiry. Every one may have observed that a slack current of incandescent gas goes up from its outlet in slow combustion and smoke, with a diminishing diameter and a sluggish, wavy vibration, to a considerable relative hight, not apparently obstructed by the resistance of the atmosphere. On the other hand, a jet of the same gas under pressure impinges upon the atmosphere with a velocity which causes it to be thrown back and shortened vertically and widened horizontally, while its combustion is intensified, its brilliancy hightened, its smoke consumed, and its vibrations grow more violent—that is, become coincidently accelerated and shortened—as the velocity of the jet is increased by pressure, until they produce a roar. As the velocity further increases, the roar rises in pitch, and the vibrations are so intensified as to render the flame comparatively fixed and steady. If the jet be confined in a tube or lamp chimney, its velocity relative to the air is increased by the draft of the air through the tube, and the effect is in some respects similar to that of pressure, but its vibration may be so modified as to produce a tense, defined or musical sound. This naturally seems to be the result of embodying the vibration (so to speak) in a fixed and firm medium, the tube, from which it is given in definite and uniform waves to the external atmosphere. But the experiments of Prof. Tyndall suggest that the reflection of the vibration from the tube to the flame is the essential means, operating to re-inforce as well as to steady the primary vibrations to the sounding pitch: while the length of the inclosure gives them length, as well as a longitudinal current and impetus (as in the discharge of a shot through a tube) to sustain their passage or rather prolongation through the air. The evidence is this—and here is the fact of which Prof. Tyndall's curious experiments are phenomena—that the vibrations of a flame are re-inforced by coincident vibrations from other sources, as musical instruments and other sonorous objects, receiving an increase of energy which is manifested alike in the volume and sound of the flame. For instance, a jet in a tube, which is not up to the pitch of sonorous energy by itself, may be instantly re-inforced in its vibration either by the right note from any foreign substance or by changing its position in the tube, at once begins to sound the same or a harmonious note, and when thus started will continue to sound. At the same time, the extension of the flame is contracted by the re-inforced vibration, in a similar manner as by increased pressure, and sudden, *i. e.* short sounds, produce the short effect called a start or jump, in the flame. We quote the further effects exhibited in Prof. Tyndall's late lecture:—

Pass a steadily-burning candle rapidly through the air, you obtain an indented band of light, while an almost musical sound heard at the same time announces the rythmic character of the motion. If, on the other hand, you blow against a candle flame, the fluttering noise produced indicates a rythmic action. When a fluttering of the air is produced at the embouchure of an organ pipe, the resonance of the pipe re-inforces that particular pulse of the flutter whose period of vibration coincides with its own, and raises it to a musical sound. When a gas flame is introduced into an open tube of suitable length and width, the current of air passing over the flame produces such a flutter, which the resonance of the tube exalts to a musical sound. Introducing a gas flame into this tin tube three feet long, we obtain a rich musical note; introducing it into a tube six feet long, we obtain a note an octave deeper—the pitch of the note depending on the length of the tube. Introducing the flame into this third tube, which is fifteen feet long, the sound assumes extraordinary intensity. The vibrations which produce it are sufficiently powerful to shake the pillars, floor, seats, gallery, and the five or six hundred people who occupy the seats and gallery. The flame is sometimes extinguished by its own violence, and ends its peal by an explosion as loud as a pistol shot. The vibrations consist of a series of partial extinctions and revivals of the flame. The singing flame appears continuous; but if the flame be regarded in a mirror which is caused to rotate, the images due to the revivals of the flame are separated from each other, and form a chain of flames of great beauty.

A flame may be employed to detect sonorous vibrations in air. Thus, in front of this resonant case, which supports a large and powerful tuning-fork, I move this bright gas-flame to and fro. A continuous band of light is produced, slightly indented through the friction of the air. The fork is now sounded, and instantly this band breaks up into a series of distinct images of the flame. In this glass tube fourteen inches long, a flame is sounding: I bring the flat flame of a fish-tail burner over the tube, the broad side of the flame being at right angles to the axis of the tube. The fish-tail flame instantly emits a musical note of the same pitch as that of the singing-flame, but of different quality. Its sound is, in fact, that of a membrane, the part of which it here plays. Against a broad bat's-wing flame I allow a sheet of air, issuing from a thin slit, to impinge. A musical note is the consequence. The pitch of the note depends on the distance of the slit from the flame.

Before you now burns a bright flame from a fish-tail burner. I may shout, clap my hands, sound a whistle, or strike an anvil; the flame remains steady and without response. I urge against the broad face of the flame a stream of air from the blow-pipe. The flame is cut in two by the stream of air. It flutters slightly, and now when the whistle is sounded the flame instantly starts. A knock on the table causes the two half-flames to unite and form for an instant a flame of the ordinary shape. By a slight variation of the experiment, the two side-flames disappear when the whistle is sounded, and a central tongue of flame is thrust forth in their stead. Passing from a fish-tail to a bat's wing burner, I obtain this broad steady flame. It is quite insensible to the loudest sound which would be tolerable here. I turn on more gas: the flame enlarges, but it is still insensible to sound. I enlarge it still more, and now a slight flutter of its edge answers to the sound of the whistle. Turning on a little more gas, and sounding again, the jumping of the flame is still more distinct. Finally I turn on gas until the flame is on the point of roaring, as flames do when the pressure is too great. I now sound my whistle; the flame roars and thrusts suddenly upwards eight long quivering tongues. I strike this distant anvil with a hammer, the flame instantly responds by thrusting forth its tongues. Another flame is 18in. long, and smokes copiously. I sound the whistle; the flame falls to a height of 9in., the smoke disappears, and the brilliancy of the flame is augmented. Here are two other flames. The one of them is long, straight, and smoky; the other is short, forked and brilliant. I sound the whistle; the long flame becomes short, forked and brilliant; the forked flame becomes long and smoky. As regards, therefore, their response to the sonorous waves, the one of these flames is the exact complement of the other. Here are various flat flames, 16in. high, and about 3in. across at their widest part. They are purposely made forked flames. When the whistle sounds, the plane of each flame turns ninety degrees around, and continues in its new position as long as the whistle continues to sound. Here, again, is a flame of admirable steadiness and brilliancy, issuing from a single circular orifice in a common iron nipple. I whistle, clap my hands, strike the anvil, and produce other sounds, the flame is perfectly steady. Observe the gradual change from this apathy to sensitiveness. The flame is now 4in. high. I make its hight 6in.; it is still indifferent. I make it 10in., a barely perceptible quiver responds to the whistle. I make it 14in. high, and now it jumps briskly the moment the anvil is tapped or the whistle sounded. I augment the pressure, the flame is now 16in. long, and you observe a quivering which announces that the flame is near roaring. I increase the pressure; it now roars, and shortens at the same time to a height of 8in. I diminish the pressure a little; the flame is again 16in. long, but it is on the point of roaring. It stands as it were on the brink of a precipice. The whistle pushes it over. Observe it shortens when the whistle sounds, exactly as it did when the pressure was in excess. The sonorous pulses, in fact, furnish the supplement of energy necessary to produce the roar and shorten the flame. This is the simple philosophy of all these sensitive flames.

Here, again, is an inverted bell, which I cause to sound by means of a fiddle-bow, producing a powerful tone. The flame is unmoved. I bring a half-penny into contact with the surface of the bell; the consequent rattle contains the high notes to which the flame is sensitive. It instantly shortens, flutters, and roars, when the coin touches the bell. Here is another flame 20in. long. I take this fiddle in my hand, and pass a bow over the three strings which emit the deepest notes. There is no response on the part of the flame. I sound the highest string: the jet instantly squats down to a tumultuous bushy flame, 8in. long. Some of these flames are of marvelous sensibility; one such is at present burning before you. It is nearly 20in. long; but the slightest tap on a distant anvil knocks it down to 8in. I shake this bunch of keys or these few copper coins in my hand; the flame responds to every tinkle. I may stand at a distance of 20 yards from this flame: the dropping of a sixpence from a height of a couple of inches into a hand already containing coin, knocks the flame down. I cannot walk across the floor without affecting the flame. The creaking of my boots sets it in violent commotion. The crumpling of a bit of paper, or the rustle of a silk dress, does the same. It is startled by the plashing of a raindrop. I speak to the flame, repeating a few lines of poetry; the flame jumps at intervals, apparently picking certain sounds from my utterance to which it can respond, while it is unaffected by others. In our experiments down stairs, we have called this the vowel flame, because the different vowel sounds affect it differently. I utter the words boot, boat, and beat in succession. To the first there is no response; to the second, the flame starts; but by the third and fourth it is thrown into violent commotion; the sound Ah! is still more powerful, the vowel sounds characterised by the sharpest overtones being the most powerful excitants of the flame. If the most distant person in the room were to favor me with a "hiss," the flame would be instantly shivered into tumult. This hissing sound contains the precise elements that most forcibly affect the flame. The gas issues from its burner with a hiss, and an external sound of this character added to that of a gas-jet already on the point of roaring is equivalent to an augmentation of pressure on the issuing stream of gas.

AN ALLOY which exhibits a golden yellow color, is readily forged like iron, and easily worked by the file, consists of 4·06 parts iron, 55·33 parts copper, and 41·8 parts zinc

ISSUED FROM THE U. S. PATENT OFFICE

FOR THE WEEK ENDING MARCH 5, 1867.

Reported Officially for the Scientific American.

PATENTS ARE GRANTED FOR SEVENTEEN YEARS, the following being a schedule of fees:—

On filing each Caveat	$10
On filing each application for a Patent, except for a design	$15
On issuing each original Patent	$20
On appeal to Commissioner of Patents	$20
On application for Reissue	$30
On application for Extension of Patent	$50
On granting the Extension	$50
On filing a Disclaimer	$10
On filing application for Design (three and a half years)	$10
On filing application for Design (seven years)	$15
On filing application for Design (fourteen years)	$30

In addition to which there are some small revenue-stamp taxes. Residents of Canada and Nova Scotia pay $500 on application.

☞ Pamphlets containing the Patent Laws and full particulars of the mode of applying for Letters Patent, specifying size of model required, and much other information useful to inventors, may be had gratis by addressing MUNN & Co., Publishers of the SCIENTIFIC AMERICAN, New York.

62,517.—APPARATUS FOR WASHING FIBROUS SUBSTANCES.—William Adamson, Philadelphia, Pa.

First, I claim the use for washing fibrous material of two troughs and one supply of water, which first passes into and through the trough where the last washing is conducted, and thence into the trough where the first washing takes place, all substantially as set forth for the purpose specified.

Second, The adjustable pipe, j, arranged for the withdrawal of the dirty water from the trough beneath the perforated shield, F, substantially as described.

Third, The trough, B, with its rollers, P.

Fourth, The combination of the said rollers, P, with the endless band, T, of slats

Fifth, The endless band, T, in combination with the rollers, y y.

62,518.—SAND EMERY AND OTHER LIKE PAPER.—William Adamson, Philadelphia, Pa.

I claim sand or emery paper saturated with a solution of gum elastic or gutta percha and naphtha, or other equivalent solvent, and for the purpose described.

62,519.—PEAT MACHINE.—Edward Atkinson, Brookline, Mass.

First, I claim the combination of plowshares, a, cutting blades c, and conical screw, constructed and arranged to operate substantially as and for the purpose set forth

Second, The yielding or expanding outlet or delivery tube, arranged to operate substantially as and for the purpose set forth.

62,520.—BUTTON-HOLE SEWING MACHINE.—W. B. Bartram, Norwalk, Conn.

First, I claim reciprocating the plate, E, on a straight line, at right angles to the line of movement of the forward feed by means of the switch cam, A, switch, B, and jog bar, D, constructed, arranged, and operating as and for the purpose set forth.

Second, In combination with the sewing mechanism of a "Wilcox and Gibbs" sewing machine, the switch cam, A, switch, B, arm, C, jog bar, D, or their equivalents, and the plate, E, for the purpose set forth.

Third, The combination of the switch cam, A, switch, B, switch bar, C, and jog bar, D, substantially as and for the purpose set forth.

Fourth, The combination of the switch, B, jog bar, D, shoulder, I, and set stop screw, H, or its equivalent, for the purpose set forth.

Fifth, The combination of the switch, B, and jog bar, D, with the set screw, H, stud, L, or their equivalents, for the purpose set forth.

Sixth, The feeding dog, O, pivoted to the feed bar, as described, in combination with the reciprocating plate, E, substantially as and for the purpose set forth.

Seventh, The guide plate, U, in combination with the straining slide, W, and the serrated plates, V V', substantially as and for the purpose set forth.

62,521.—COMPOSITION FOR BUILDING MATERIAL.—Sylvester Bissell, Hartford, Conn.

I claim a composition for building materially as and in the proportions described.

62,522.—FEED RACK.—John W. Blanchard, Rutland, Wis.

I claim the arrangement of the board, n, for conveying the feed, and the roof of boards, o and p, opening in the manner described, in connection with the rocks, e and f, and trough, g, for the purposes described.

62,523.—BARBER'S CHAIR.—N. W. Bonney (assignor to himself and O. Davis), Lewiston, Me.

I claim the frame, b c, having the arm, h, projections, e, and pivots upon which the same is made to swing, as described, in combination with the spring, g, constructed as set forth, all arranged and applied in the manner and for the purpose specified.

62,524.—HORSE RAKE.—William L. Bostwick, Ithaca, N. Y.

First, I claim the combination of the three-forked lever, I, connecting rod, H, and hand lever, G, substantially as and for the purposes set forth.

Second, I claim the pressure bar, F, provided with the hanging staples, P, three-forked lever, I, connecting rod, H, and hand lever, G, all arranged and operating materially as and for the purpose set forth.

62,525.—HAND-PEGGING MACHINE.—J. Hamilton Brown, Watertown, Mass.

I claim, First, Operating all the moving parts of the machine, as well as the machine itself, when periodically fed along or over the shoe, from a single cam shaft, by which said movements are timed and regulated, substantially in the manner and for the purpose set forth.

Second, So combining and arranging an awl and peg driver as that both shall operate in a vertical line without lateral motion, and through separate holes in a nose piece at the base of the machine, and at separate times, by means of cams and springs, so arranged that the greatest resistance or force of the separate springs shall not be exerted at the same time, substantially as and for the purpose herein set forth.

Third, Feeding the machine over the shoe, and cutting off the peg from the strip or bolt of the peg wood by one and the same vibrating instrument, so that these two operations may be perfectly timed and regulated as and for the purpose set forth.

Fourth, The feeding mechanism for moving the machine over, on, or around the shoe or boot, composed of foot, through which a nose piece furnished with separate holes for the awl and peg driver, passes, in combination with a pivoted lever and point working through the awl hole to draw the machine along, substantially as described.

Fifth, Moving back or setting the feeding device preparatory to its feeding the machine along, and whilst the awl is in the sole, and allowing the feed to take place after the awl is withdrawn from the sole and is still rising, so that the force exerted in withdrawing or raising the awl shall aid in bringing the feeding foot close to the sole, and thus by impact make the feed more certain and accurate, substantially as described.

Sixth, The arrangement by which the feeding of the machine along the sole takes place after the awl hole is made, and before the peg driver descends substantially as and for the purpose described.

Seventh, The arrangement by which the driving of the peg takes place whilst the awl is ascending, and the machine close down upon the sole, so that the peg shall be driven entirely down, and not project above the surface of the sole, substantially as and for the purpose set forth.

Eighth, Combining with a portable hand-pegging machine that moves around the boot or shoe that is being pegged by it, a cup or box for carrying around with the machine a bolt or coil of peg wood that is fed into the machine by drawing upon the end of the strip or ribbon, and without the use of any pushing device, substantially as described.

62,526.—TOILET GLASS.—Robert H. Brown, Detroit, Mich Antedated Feb. 20, 1867.

I claim the combination and arrangement of glass, 3, the folding frame, 2, and the folding glass, 1, operating as and for the purpose specified.

62,527.—METALLIC STUFFING BOX PACKING.—Joseph F. Chuse, Litchfield, Ill.

First, I claim the packing, b, and its enclosing casing, b2, when constructed substantially as and for the purpose set forth.

Second, The combination and arrangement of the packing rings, b and b2, and the spring, c', substantially as set forth.

Third, The packing rings, b b2, in combination with enclosed perforated casing, B, substantially as set forth.

Fourth, The packing rings, D D', when constructed and arranged substantially as set forth.

62,528.—TWINE CUTTER.—James Madison Clark, Chester, Conn.

I claim the knife, K, in combination with the tongue, I, and spring, S, for the purpose herein set forth.

62,529.—WASHING MACHINE.—H. C. Covert, Fayette, N. Y. Antedated Feb. 23, 1867.

I claim, in combination with the rubbers, B C, having opposite reciprocating motions, and having plane rubbing surfaces, the arrangement of the jointed arms, a h, and levers, k, made to be inserted or removed from the box at pleasure, by means of the bearings, n, and buttons, o, the whole arranged and operating as herein set forth