Scientific American.

MUNN & COMPANY, Editors and Proprietors.

PUBLISHED WEEKLY AT
NO. 37 PARK ROW (PARK BUILDING), NEW YORK.

O. D. MUNN, S. H. WALES, A. E. BEACH.

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VOL. XVIII., No. 8....[NEW SERIES.].... *Twenty-third Year.*

NEW YORK, SATURDAY, FEBRUARY 22, 1868.

Contents:

(Illustrated articles are marked with an asterisk.)

CONCERNING STREET CARS.

Certain London capitalists, whom we might almost designate philanthropists, having at heart a desire for benefiting the masses, and at the same time being wise enough to foresee in the project a paying investment, are endeavoring to introduce our popular democratic and American institution, horse cars, into the English metropolis. For two successive sessions have these individuals petitioned Parliament for powers to carry their project into effect, but without having their prayer answered. Yet with a commendable pertinacity again have they published, according to law, the prescribed notices of their intention to once more apply for a bill, in the session of 1868. There is a certain proverb which assures success for the third trial, and if there is any trace of truth in this popular notion, the petitioners will this time come off triumphant.

If tested by the greatest amount of service rendered to the largest number of the community, the street cars in this country may be regarded as one of the greatest among public benefits, their general use upon the principal thoroughfares of all our large cities affording proof sufficient that they fill a wide-spread public demand. But these railways, it must be admitted, are not without their disadvantages, the presence of the "permanent way," as the English style it, proving a constant and considerable impediment to general traffic. It is needless to expatiate on the difficulty which ordinary vehicles experience in crossing and recrossing the tracks, our only purpose now being to give some suggestions relative to obviating this really serious annoyance. If rails could be entirely dispensed with except when actually in use, a great desideratum would be attained, but up to this time cars which are constructed to lay and take up their own tracks, of which there are many styles, all theoretically perfect and working well as models simply, have signally failed in actual practice. If then we must tolerate the iron rails in our streets, what form is least objectionable?

The London company before referred to propose to lay down a crescent rail which will be on a level with the street both on its outer side and between the rails, the only break in the surface being a groove on the inner side of the rail for the flange on the car wheels, such groove being too narrow to take in the tire of any ordinary street vehicle. By employing this rail, the company contend that the level of the street will not be broken nor the passage in any direction by ordinary carts and carriages obstructed, the whole width of the road being preserved for continued public use. Such a rail could never be used in this country for the groove would be continually choked up, in summer with dust and street waste, in winter by the more formidable snow and ice, and it seems hardly possible that the track would prove a success in England.

In our last issue we gave, on the authority of a newspaper correspondent, a short notice of the style of track adopted in the streets of Paris. The rails are simple metal plates spiked down, while the wheels running on them are without flanges. The cars are made to keep on the plates by means of a fifth wheel, which has a flange but half an inch thick, a mere disk, running in a grooved central rail, laid for the purpose. This extra wheel, being attached to the car by a lever, is to be raised at will and the car run off the track, a feature of the plan, we may remark, whose desirability is not so apparent, a short turnout being a preferable method of allowing cars to be run in both directions with but one track. The Paris plan, however, certainly embodies several and important advantages. Ordinary vehicles can in no way be inconvenienced, but on the other hand the permanent way may be of positive service. The same objection, however, can be urged against the central as well as all other grooved rails.

Now a simple modification of this Parisian idea, it seems to us, would furnish a track, if not perfect, yet a decided improvement upon any plan that has ever fallen under our notice. Let two extra wheels be provided, one at the front, the other at the rear of the car, both running on a central rail. The latter is merely a continuous iron bar slightly raised above the street level, the wheels themselves being grooved or made with double flanges. The advantages of such a method are too apparent to need particular mention, and if our street railways were laid out accordingly, the objections now existing, and which prevent the laying of tracks in some thoroughfares, we are confident would no longer exist.

GATHERING, DISTRIBUTION, AND UTILIZATION OF SEWERAGE.

The usual method employed in our cities of discharging the accumulations gathered at our water closets directly into street sewers, is not only wasteful but more or less injurious to health, the exhalations from fermentation and decomposition finding their way back to our dwellings and tainting the atmosphere we breathe, notwithstanding the precautions taken by means of gas traps and other similar contrivances.

The same objection will apply to the attempt to carry off the excretæ by a flow of water; the solid and liquid portions will be removed, while the gaseous components pass back, by their ascencive force, to the rooms.

Another system has been devised by Capt. Chas. T. Liernur, of London, from whom we have received a description with diagrams, which latter, however, we do not think are necessary to arrive at a correct notion of the nature of the invention. It is in use at the Hague, the capital of Holland, and has proved highly efficient. The plan is to connect the pipes leading from the rooms to air-tight reservoirs of boiler iron situated under the street crossings and of capacity sufficient to receive all the excrements which may accumulate during one, two or more days, as desired. These pipes are at least five inches in diameter and are provided with valves which may be operated from the sidewalk. The pipes are, of course, air-tight. Tho privies have each a pipe leading to the delivery pipe, and in case of one water closet being above the other, drooping lips inside the pipe compel the filth to follow the middle of the pipe, so that there may be no adhesion of the matter to its sides. From this delivery pipe one is carried up above the roof of the building acting as a chimney to carry off the effluvia to the upper atmosphere. The receiving pipe has a short upward curve just before it reaches the street reservoir, which receives the excrementitious matter until it is ready to be taken away.

Every night, or as often as may be necessary, a movable air pump driven by steam is brought to one of the reservoirs, a flexible hose is placed over the reservoir and connected by a coupling, when the air is pumped from the tank, the sidewalk valves being shut, and the contents of the pipe and tank are emptied by atmospheric pressure, or suction, into a movable tank accompanying the steam engine and pump. As soon as the vacuum has reached the proper point, indicated by a gage, the valve communication between pipe and tank being opened, the filth rushes into the tank, the air pump being kept in operation during the process, and thus aiding in effectually cleaning the pipes even to their upward openings, and compelling even the gases to accompany or follow the solid constituents. After being collected, the contents of the tanks are carried to some point outside the town where they are barreled and sent to the country. Capt. Lienur's plan comprehends, also, the method of application of the manure to lands, a subject which we reserve for another notice.

PROCESS OF SUGAR MAKING IN MAURITIUS.

There is no department of manufacturing industry in which more progress has been made during the last ten years than in the production of sugar. It is equally true that there is none in which so much remains to be done. The extraction of white sugar direct from the juice of the cane and beet, without refining, is now an accomplished fact. At the great Exposition in Paris, beautiful specimens from three estates in Mauritius were exhibited and took gold medals. Our Paris correspondent took pains to obtain specimens, which may be seen by application at our office, and every person interested in the subject of sugar will do well to call and examine these beautiful samples, produced without the use of a particle of bone black, and without the addition of any injurious chemical substance.

M. Pou in, one of the three enterprizing planters who received the gold medal as before stated, gives the following simple statement of the process employed:—

"The canes are crushed in very powerful steam mills, the cylinders of which turn extremely slowly, so as to squeeze out all the juice. The juice is received in troughs and a certain quantity of sulphite of soda (neutral and anhydrous, *i. e.* without water) is added to it. After this first operation, the object of which is to prevent the juice from fermenting in the defecating troughs, it is saturated with lime (the quantity varying according to the quality of the juice), and it is then drawn off into an apparatus called an '*appareil à triple effet*,' which is a set of vacuum pans three in number. It is then boiled at a very low temperature in these vacuum pans. When the sirup is concentrated to the granulating point, it is left to cool. When cold it is put into a turbine or centrifugal, which is made to perform 700 revolutions per minute. The sugar is 'clairced,' or clarified, by having thrown upon it a 'claire,' *i. e.* a sirup, which is ladled out of a jar or tub and thrown upon the revolving mass of sugar by a workman.

"The claire is simply a sirup of sugar, or molasses, into which has been previously introduced a certain quantity of water, so as to reduce the sirup to a density of 35 degrees (Baumè's aerometer, called also a *pèse syrop*). As the workman pours in the claire the sugar becomes white, and when the cleansing process is thus accomplished a jet of dry steam is let into the turbine. This jet is sent directly into the center of the turbine.

"A jar or tub for the claircing or clarifying sirup is attached to each turbine and bears a fixed proportion to its capacity. The workman pours this sirup upon the revolving sugar with a large iron ladle, about three-fourths pint; so that the contents of the turbine are clarified by a single jet of the sirup, and in from three to four minutes. The sirup usually employed in turbining the sugar is obtained from that part of it which flows from the turbine.

"In Mauritius the sirups from the turbine are usually reboiled a second and third time, so as to extract from them every particle of crystallizable sugar. The residuum of the third boiling is generally sent to the distillery and used for making rum.

"By means of this process canes cut in the morning may furnish sugar perfectly ready for packing and shipping by evening of the same day. But for the full practical understanding of all the niceties of the process, a visit to the Mauritius might be useful, for much depends on practice. For instance, the success of the claircing in the turbine depends in a great degree on the skill of the workman in charge of the ladle; and this skill is the result of practice and observation. So also in regard to the jet of steam sent into the turbine, and *which must be dry, i. e.*, heated to a degree where it ceases to be moist, as moist steam would cause the sugar to melt in the turbine, instead of drying, as happened in the beginning in Mauritius, where the planters began by using condensed steam, which is very bad.

"The very large and splendid crystals shown in some of the samples are easily obtained; but they cost more and are inconveniently slow in melting. Those samples in the Exposition were made simply to show what can be done; but they would be unsuitable for general use, as they would take a good half hour to melt in water.

"Let anyone desirous of ascertaining the relative qualities of European-made and Mauritian-made sugars, dissolve the latter in a glass of water and observe its delightful perfume. But in order to have this fine odor, the sugar must not have undergone fermentation, nor have been subjected to refining by bone black. All the Mauritian sugars made by this process have this perfume, and all are, strictly speaking, raw sugars, *i. e.*, they are purified by a mode of fabrication from the juice, which is not refining, and which makes no change in their natural savor.

"The Mauritian sugars are only admitted into France under the specification of "assimilated sugars," in order that they may be made to pay the same duties as "refined sugars." The scale of duties levied here and in England on Mauritian sugars practically excludes them from both markets. This exclusion is kept up simply in the interest of the refiners of both countries. The Mauritian sugars are mainly consumed by India and Australia, which admit them free.

"The flavor of anything made with these Mauritian sugars is said to be superior to that of things made with refined sugar. Preserves made with it are said to keep much longer, and it is considered much more wholesome."

We hope that our Louisiana sugar planters, and the enterprizing men who are preparing to introduce the manufacture of beet sugar into our country, will give these remarkable results of modern science an enlightened consideration.

IRON PUDDLING BY MACHINERY.

A correspondent writing from St. Johns, New Brunswick, on the above subject, says that as a general thing puddlers discourage all attempts to introduce machinery as an aid to the arduous and exhaustive labor to which they are now subjected. But, nevertheless, a number of attempts have been made to that end. "As far back as 1836, a patent was granted to Dr. Charles Schafhæutl of Dudley, England, for an 'improved apparatus to impart a compound motion longitudinally and transversely to the puddling tool.'" This invention was found to be imperfect, but no doubt has started numerous later inventions for the same purpose, among which I may mention Bennett's, Griffith's, Harrison's, and others, all secured in England during the last six years. Bennett's machine is placed on the top of the furnace, a lever through which the motion is imparted to the tool hangs down in front of the fire door. The power is taken from the engine by a long connecting rod, which moves backward and forward, sliding at the same time the lever which holds the tool around a quadrant to impart the side motion. It is rather a difficult matter to describe the machine without drawings, but probably the explanation I have given may enable some to catch at the idea I have endeavored to convey. Mr. Griffith's machine is, I believe, on the same principle. Mr. Harrison has placed a small cylinder, either for steam or water pressure, over the furnace, to furnish the movements for his machine. When started, it works the rubble backward and forward, and around the bottom of the furnace, but whether it is an improvement on the other two patents I have no means of knowing. Bennett's machine is now in operation at his works, and answers a good purpose,—so I heard from a workman last spring. I saw in the Iron Master's Association book of the United States, that Mr. Grove, of Montour Rolling Mills in the State of Pennsylvania, had introduced machine puddling in his works. Perhaps he would be willing to give some information on the subject.

In 1863, a patent was granted to Messrs. Walker & Warren of Wolverhampton, for a rotary puddling furnace. This patent was purchased and experimented upon by the Dowlais

Iron Company, under Mr. Menelaus (who wrote a paper on machine puddling, to be read before the Institution of Mechanical Engineers, of Birmingham). As this company erected several of these furnaces, with a capacity of sixty tuns a week each, it must have been considered a success, although I have never heard of its being adopted elsewhere. This patent furnace requires no assistance to puddle the iron. The iron is run in melted, the machine set in motion, and the charge boiled or balled, ready for the hammer or squeezers, without further assistance. The body of the furnace is a cylinder lined with probably something the same as the Bessemer retorts, and made to hold about five cwt. of iron. It is hung on large journals at each end of the cylinder. Through these journals the flame passes from the stationary grate to the stack. The operation of the machine keeps the fluid iron constantly in motion, and prevents it from adhering to the inside of the cylinder; and as it comes to "nature," it gets gradually rolled into a ball the shape of the inside of the furnace. The iron made by this furnace was said to be of a more uniform quality than could be made by hand or by the assistance of other machines. A bloom and specimens of finished iron made of it were exhibited at the same time Mr. Menelaus read his paper on machine puddling in Birmingham.

The Rusting of Iron.

Perfectly pure water will not rust iron until it is heated to redness, when the contact with the metal instantly forms a red-heat crust. If iron again be left for a very long time in water, a yellow envelope of hydrated peroxide will be formed. Water charged with atmospheric air will not rust iron, but oxidation will take place as soon as the air has constant access. According to Martell's and Hall's experiments, the rusty envelope is to be attributed to the presence of carbonic acid in the air, where, in its normal condition, it exists on an average of 4 in 10,000 volumes. Water charged with carbonic acid oxidizes iron with rapidity under visible evolution of hydrogen, the process being expressed by the following formula:

$$3HO+Fe+CO_2=Fe_2O_3\,CO_2+3H.$$

The temperature at which steam is decomposed by iron is at a red heat, but at the white heat the oxide loses partly its oxgen and forms the double combination of peroxide and protoxide, having the formula of magnetic iron.

The French chemist Gay Lussac holds that iron cannot be oxidized higher than 37·8 parts of oxygen to 100 parts of iron, answering very nearly to the above-mentioned double combination.

Water oxydizes iron more rapidly when it receives small quantities of mineral acids, while on the other hand an alkali or caustic lime destroys the oxidizing faculty of water, a fact which is easily explained when we consider what strong affinity carbonic acid has for those bases. We are indebted to Fayen for the determination of the limits of this veto power which alkalies possess over the oxidation of iron in water. He ascertained that a saturated solution of potassa lye diluted with from 1,000 to 2,000 parts of water could still protect iron, but not when diluted with from 3,000 to 4,000 parts. Saturated lime water, when diluted three times, protected iron, but not when diluted four times. Saturated carbonate of soda, diluted with from fifty to fifty-four volumes, protected iron, but not so when diluted with even fifty-nine volumes. The finest cast steel was protected perfectly by even less potash.

Iron is perfectly oxidized by being often sprinkled with pure water, and then on being exposed to red heat loses 1·74 per cent of water, having in fact been a hydrated peroxide with a formula, Fe_2O_3, HO. Moist air rusts the iron yellow, and Bergmann considers the rust to be a compound of 76 Fe_2O_3 and 24 CO_2; Hausmann, of peroxide and water—but it is, as Thompson and Karsten have shown, a true hydrated basic carbonate of peroxide.

Rust is porus, and like all porous bodies, absorbs gases. White pig metal scarcely oxidizes; gray iron with more facility, bar iron still easier, especially when red hot. Cold, short iron rusts least and slowest. Polish is the best preventive of rust, particularly when the article is kept in dry air. There are many recipes given of compositions designed to prevent oxidizing, but a coat consisting of common resin melted with a little gallipot oil and spirits of turpentine is generally considered to be the best. Bleaching also, in a slow fire, is a protective against rust, and this is constantly used for nails and tacks.

Improved Artificial Leather Belting.

Patented by Stephen M. Allen, Woburn, Mass.

I take ordinary scrap leather, though preferring the skivings or shavings of the cuticle, from tanneries, shoemakers' or curriers' shops, and soak and wash the same before or during the process of pulping, sometimes with pure cold or warm water, and sometimes using alkalies, or any other property which will separate the tannin from the scraps of leather, so that when pulped and dried the fiber will adhere strongly together, and be less likely to absorb moisture. I then prepare the untanned scraps of hides, sometimes in lime solutions, or solutions of salts, so as to remove the stiffness when dry, without destroying either the fiber itself or the adhesive properties of the glue or gelatine in the same. When the fiber is thus prepared, the tanned and untanned fiber will readily unite in combination, and will also unite with vegetable fiber, either with or without other gelatinous or resinous substances while pulping. I sometimes add to the combination of fibrous substances, when the same is being pulped, a proper quantity of bullock's or animal blood, which, with the previous preparation of the animal fiber, as before described, will make nearly a water proof sheet of artificial leather, and the same will not be susceptible of absorbing moisture, so as to cause a belt to contract or expand, either under the influence of heat or a humid atmosphere. When properly pulped, the same may be run off on an ordinary paper machine, or between rollers, and doubled to a proper thickness, and may be used either with or without further preparation, by printing, japanning, stitching, or water-proof applications. I usually subject the belting to a high temperature of heat, to set the gluten and other resinous properties, and sometimes vulcanize the same, though for ordinary use it is not necessary.

Bromo-Iodized Rubber.

The following process of treating rubber and other gums without the use of sulphur has lately been patented by J. B. Newbrough and E. Fagan, New York city: By adding to iodine one half its weight of bromine proto-bromine of iodine is formed, and this, when combined with rubber, or equivalent gum, will produce a composition which will harden on being subjected for about an hour to a heat of 250° Fah. Owing to the volatile properties of proto-bromide of iodine, it cannot be applied without difficulty to practical purposes. To obviate this difficulty, we treat both the bromine and iodine, prior to combining the same, with oil of turpentine, or similar oil, which has previously been mixed with about one fourth its weight of sulphuric acid, to prevent the formation of an explosive composition.

The pasty mixture, produced as above described, is combined with caoutchouc, or equivalent gum, in the proportion of about three ounces of the paste to a pound of gum, the proportion of gum being increased if a more elastic product is desired. After the gum and paste are thoroughly incorporated, the composition may be hardened by subjecting it to a dry heat (of from 200° to 320° Fah.), for from ten minutes to one hour and a half, the time being lengthened to increase the toughness of the product.

The product thus obtained may be applied to many useful and ornamental purposes, and any desired color may be imparted to the material by combining with the composition, before it is hardened, any suitable mineral or earthy coloring matter.

Manufacture of Carpets and other Fabrics from Jute, Flax, etc.

Thomas Crossley, of Bridgeport, Conn., has obtained a patent as above, the process being as follows:

"The cloth, after being woven from the raw jute, flax, or cotton, is immersed in a bath of water, at, say, from 90° to 120° Fahrenheit, in which has been mixed a certain portion of either wheat or corn bran, and sub or bicarbonate of soda. After remaining in this bath for a length of time sufficient to thoroughly dissolve the tannin in the jute or cotton, or the gluten or gum in the flax, I then remove the cloth and wash it thoroughly in clean water, and I afterwards immerse it in a bath of cold water, mixed with a solution of crystallized tin and muriatic acid, or strong muriate of tin, with twenty per cent of sulphuric acid, at a strength of from one to two degrees Twaddell. After impregnating the cloth with this bath, it should be again washed in clean water, and then submitted to a bath of weak solution of chloride of lime, after which the cloth is so washed clean and dried, and it is then ready for printing or dyeing.

"By these means I am enabled to produce a carpet or other fabric, dyed or colored in any colors or design, by the process of dyeing or printing, without weakening or injuring the strength of the fibers, and at the same time to produce a carpet or other fabric, having all the richness and style of woolen or worsted goods, with equally durable colors, but at much less cost."

Recutting Files with Acids.

There are many recipes for converting old files into new by means of acids, and among the latest is that recently patented as follows, by Albert I. Ferguson, of Sharon, Pa.:

"The files must be thoroughly cleansed in warm water containing a small quantity of potash, which readily removes any grease or dirt from them. After the files are thus cleansed, they must be washed with warm water and dried by artificial heat. Next, place one pint of warm water into a wooden vessel, and put into it as many files as the water will cover. Then add two ounces of blue vitriol, finely pulverized, and two ounces of borax, well mixed, taking care to turn the files over, so that each may come in contact with the mixture. To the above mixture now add seven ounces of sulphuric acid and one fourth of an ounce of cider vinegar, which will cause the files to assume a red appearance at first, but they will, in a short time, resume their natural color. Then they must be removed, washed in cold water, and then dried by artificial heat. When dry, they must be sponged with olive oil, wrapped in porous paper, and laid aside for use."

Improvement in Combs.

Elias Brown, of Wappinger's Falls, N. Y., has lately received a patent for a valuable improvement as above, which is coming into extensive use. The combs are stamped by a peculiar machine out of sheet steel, the mechanism being of such a nature as to leave the teeth of the comb rounded and smooth. The combs are then tempered and afterwards ornamented with an enamel which gives them a very soft and beautiful appearance. In weight they are about the same as rubber, over which they have several important advantages, such as freedom from odor, greater elasticity, cheapness, and durability. The agents are Noyes, Wilson & White, 98 Franklin street, New York. Mr. Brown's large factory for the manufacture of these new combs was lately burned down at Wappinger's Falls. But he is rebuilding with characteristic energy, and will soon be in full operation again. He is the first, we believe, to make a really superior comb from steel.

OFFICIAL REPORT OF PATENTS AND CLAIMS

Issued by the United States Patent Office,

FOR THE WEEK ENDING FEBRUARY 4, 1868.

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.*

73,942.—Cooking Stove.—Federal C. Adams and Joseph Peckover, Cincinnati, Ohio.

We claim, 1st, The horizontal concentrating plate, A, stationary or movable, and with or without fuel doors, substantially as and for the purposes described.

2d, The flap or guard plate, B, whether stationary or movable, substantially as and for the purposes described.

3d, The spaces between the fire back and sides and the front oven and side plates in combination with the plate, A, substantially as described.

4th, The chamber above the top oven plate and below the top flue formed by plates, C and C', substantially as and for the purpose described.

5th, The hollow or double fire-back, ●, substantially as described.

6th, The air chamber under the grate and ash pot formed by the false bottom, I, substantially as described.

7th, The chamber between the front oven plate and fire-back in combination with the open-grate frame and plate, A.

8th, The hollow side plates, S S', substantially as described.

9th, The register, R, in combination with the fire-back and front oven plate, substantially as described.

10th, The register, N, in combination with the open-grate frame, substantially as described.

11th, The sliding lid, A a, in combination with a cooking stove, substantially as described.

12th, The rolling hearth plate, D d, operating substantially as described.

13th. The hearth plates, E e, sliding laterally under the bottom plate, substantially as described.

73,943.—Printing Press.—Edwin Allen, Norwich, Conn., assignor to the Allen Manufacturing Company.

I claim the rotary press hereln described having one of its driving wheels, F1, provided with one or more adjustable segments or racks, F2, substantially as and for the purpose set forth.

73,944.—Vise.—Samuel S. Barnaby, Macon, Ga. Antedated November 23, 1867.

I claim, 1st, The combination of the sliding bar, H, ratchet-jaw shank or bar, E, and pawl, M, when arranged together substantially in the manner and so as to operate as and for the purpose described.

2d, The combination with the eccentric V and sliding sleeve, S, of the pawl, M, arranged together and connected with the jaw shank or bar, E, substantially as and for the purpose set forth.

3d, An improved vise constructed and arranged in its several parts substantially as described and so as to be operated as specified.

73,945.—Cultivator.—F. M. Barrier, Stevenson, Ala.

I claim the construction, arrrngement, and combination of the central beam, A, with its shovel or plow, the side beams, C C', with their shovels or plows, the U or arched-shaped brackets, E E, and braces, a a, all as and for the purpose described.

73,946.—Inkstand.—James Barwick, Silvertown, North Woolwich, England.

I claim, 1st, The combination with an ink reservoir and cup of a valve for holding and discharging the ink which the cup may contain said valve being arranged within the reservoir so as to close against the bottom or under side of the cup, substantially as herein shown and described.

2d, The combination with the ink reservoir, dipping cup and valve, arranged as above described of a valve or od passing centrally or axially through th esaid cup, substantially as and for the purposes set forth.

3d, The combination with the ink reservoir, cnp and valve ot a hollow valve-operating stem extending from within and near the bottom of the reservoir up through and above the bottom of the ink cup, substantially as and for the purposes shown and described.

4th, The combination with the ink reservoir, dipping cup and valve of a rubber sleeve or other device for holding the valve against its seat with a yielding pressure, substantially in the manner herein shown and specified.

5th, In an ink stand organized substantially as herein shown and described providing the valve stem, when hollow, with discharge openings within the capacity of the ink cup and above the intended level of the ink held in the same, substantially as and for the purposes shown and specified.

6th, The combination with the closed ink reservoir, the elastic bulb, or equivalent device for compressing the air within the same and the ink cup, of a tube or conduit opening from the reservoir into the cup at a point above the bottom of the latter and a valve for holding and discharging the ink contained within the cup, substantially as and for the purposes shown and specified.

73,947.—Drawing Clamp.—Jules Bouniol, Philadelphia, Pa.

I claim the wire and tube-drawing device consisting of the frame, A B, with rollers, C D, which have cams or jaws, e h, cog wheels, H I, double joint or hinge, E F, and hook, G, substantially as and for the purposes described.

73,948.—Photographic Printing Apparatus.—Edwin Brown, Roxbury, and Edwin W. Brown, assignors to Edwin W. Brown, Boston, Mass.

We claim, 1st, So connecting a frame suitable for sketching photographic prints to and with any proper operating mechanism that such frame will be moved over and across the picture as it is being printed, substantially as and for the purpose described.

2d, Also the rod, F, carrying the sketching frame and guide, M, or their respective equivalents, in combination with each other and when so arranged together and with reference to the operating mechanism as to impart to the frame the movement requisite for sketching, substantially as described.

73,949.—Stateroom for Railroad Cars.—William Brown, Duncannon, Pa.

I claim the combination of the hinged doors, c, with the passage way or entry, C, so that the latter may be inclosed and made to form a portion of the staterooms when desired, substantially as described.

73,950.—Car Brake.—John A. Campbell (assignor to himself and David Sharp), South Boston, Mass.

I claim the combination as well as the arrangement of the two screws, e f, of the transom-bolt, C, with such bolt, the bars, a c, and the two series of brakes applied to such bars and the wheels or to the same and the platform, A, substantially as described.

And in combination therewith the hand wheel shaft, m, its gear, l, and chain or belt, k, and the gear, i, on the transom-bolt, C, the whole being arranged substantially in manner and so as to operate as described.

73,951.—Steering Apparatus.—James L. Cathcart, Georgetown, D. C.

I claim the jointed propeller so arranged in connection with the rudder a to be capable of lateral motion for steering purposes in unison with the rudder by power transmitted through the latter and of being disconnected therefrom and secured in its normal position, substantially as herein described.

73,952.—Horse Rake.—Abner Chapman, Delta, N. Y.

I claim a grain head applied to the arms of a revolving horse rake, marked B, in the manner and for the purpose herein set forth.

73,953.—Case for Tooth Paste.—George F. J. Colburn, Newark, N. J.

I claim the case, D, to be used in combination with the tube, B, and with or without the sack, A, and the application of the whole, as and for the purpose specified.

73,954.—Lifting Jack.—John Coulter, Sen., Xenia, Ohio. Antedated January 31, 1868.

I claim the combination and arrangement of the standards, C C, horizontal sliding bar, B, vertical bars, d d, windlass, E, with its toothed wheels, F F, and ratchet lever, G, toothed wheel, I, and pawl, H, constructed substantially as shown and described

73,955.—Shuttle for Looms.—E. Cross, Southbridge, Mass.

I claim the combination with the tip and wood of the shuttle of an interposed shield, C, arranged with relation to the tip and the shuttle wood, substantially as and for the purposes set forth.

73,956.—Pen Wiper.—Samuel Darling, Bangor, Me.

I claim, 1st, A pen-cleaning apparatus so constructed as that the pen may be first dipped in water and then be cleaned against a brush hung free to revolve, substantially as set forth.

2d, The combination with a water cup or vessel of a circular brush free to revolve therein, as and for the purpose described.

3d, The combination with such a cup of a revolvable brush set at an angle with the cup, substantially as and for the purpose described.

4th, The removable cover having secured thereon one of the bearings or centers for the brush.

5th, The combination with a pen w asher of a wiping reel, as and for the purposes described.

6th, A pen cleaner having a brush, circular or otherwise, to be used wet or dry, in combination with a wiper made of wash leather, cloth, or their equivalents, for the purpose herein set forth.

73,957.—Gas Heater.—Samuel Darling, Bangor, Me.

I claim the combination with the tube of a "gas heater" of flame-confining guides, substantially as described.

73,958.—Safety Harness Hook.—J. L. Dickinson, Dubuque, Iowa.

I claim a safety harness hook for liberating horses from carriages, constructed and operating substantially as herein shown and described.