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.

☞ "The American News Company," Agents, 121 Nassau street, New York

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VOL. XVII., No. 8....[NEW SERIES.]....*Twenty-first Year.*

NEW YORK, SATURDAY, AUGUST 24, 1867.

Contents:

(Illustrated articles are marked with an asterisk.)

THE IMPORTANCE OF LEARNING A TRADE.

We do not intend, under this heading, to speak of the importance of becoming an apprentice to any mechanical business, but of the importance of learning—acquiring—a trade, of becoming a workman at the business chosen. It is not enough that a young man goes into a shop and works for a longer or shorter period as a neophyte, but that he becomes master of the rudiments of his business. The country is filled with unfinished mechanics, every trade is overburdened with the miserable hangers-on who, professing a knowledge of a business, bring it into disrepute by their incompetency. There is no bond in this country by which a master can control the time of an apprentice for a period sufficient to remunerate the employer for the losses sustained in the early stages of the apprenticeship, or to give the apprentice a proper knowledge of his business. The apprentice is free to leave his master and employment, whenever, in his opinion, he has collected scraps enough of superficial knowledge to set up as an independent worker. He becomes dissatisfied with the character of his work or the amount of compensation, and, finding other work and larger pay, he quits his master's employment just when his services have begun to be valuable, thus committing a fraud upon his employer and doing a great injury to himself.

In no case is the term required to learn a trade too long. According to the value and difficulties of the business, it varies from three to seven years, and the most faithful and observant apprentice, after having filled his full term of apprenticeship, finds he has much to learn before he can honestly claim to be entirely and thoroughly competent. For at least a few months the apprentice is a constant source of anxiety and expense. From want of experience, or from heedlessness, or dislike to the particular job given him, he breaks tools and ruins work enough in a week to cover all the profits of his work for months. The employer bears with this, patiently or impatiently as the case may be, in the hope that during the last part of the novitiate's apprenticeship he may reap some return from the profits of his work. Under such circumstances it must be very vexatious to have an apprentice leave just when he is becoming, in some measure, useful. Yet it is a common occurrence in this country. Apprentices seem too often to be devoid of conscience and wanting in the principles of common honesty.

Nor is such conduct of any real, permanent advantage to the apprentice He becomes the Bohemian of the workshop, a waif driven hither and thither, having a smattering of knowledge and yet understanding no one thing thoroughly. His services are not sought; he is only a "Jack-at-a-pinch," to be used merely to fill a space otherwise empty. Scores of such half-baked mechanics can be picked up any day; they infest shops, torment employers, and disgrace the business they falsely profess to understand. They are industrial vagrants, if such a term is permissible, to be shunned and despised by every honorable workman. "Unstable as water, they cannot excel."

The ambition of the apprentice to be ranked among journey men is a laudable one when properly directed, but it can only be realized by an honest and persistent sticking to his obvious and plain duties. If he ever expects to teach he must first be taught; if he desires to direct he should submit to direction. What this country needs in the industrial arts is finished workmen. They are scarce and always in demand. A competent and intelligent workman is seldom wanting a good job. When business is slack the incompetents are first discharged, while the valuable workman is kept, often at a serious pecuniary loss to his employer, simply because it is difficult to fill his place.

These considerations have nothing new in them, but because they are so trite and hackneyed they are not enough considered by apprentices. We earnestly invite their attention to the subject, believing it will be to their present and prospective advantage to deal honestly in this as well as other respects.

MEASURING MECHANICAL POWER---THE UNRELIABILITY OF BELTS.

Probably no one thing is provocative of more dispute between landlords who let power and tenants who use it, than the amount thus let and used. The landlord, assuming to know the actual power of his engine and the amount used by one tenant, concludes that another employs a larger proportion than he pays for. The tenant points to the width of his belt and bases the amount of power furnished him on that.

Now, scarcely anything can be more deceptive and unreliable. A belt running horizontally and another vertically, although of the same length and width, are two entirely different mediums for the transmission of power. The distance between the driving and driven pulleys is another disturbing element in the problem; the condition of the belt itself, the surface of the pulleys, whether the belt is a "quarter turn," a cross belt, or an open belt, are all difficulties in the way of a correct estimate of the amount of power transmitted by them. Neither do we know of any dynamometer to be applied to the shaft which is entirely reliable.

But the proper means of estimating power must be looked for in the prime mover; and in the measuring of the amount of power from it diverted to any portion of the work performed by the engine, may be seen one of the advantages of the steam engine indicator. This implement has not, as yet, attained the notoriety to which it is entitled. There may be doubts whether it can determine the absolute power of one engine when not compared with another, as some mechanics claim; but there is no reason for supposing it is not valuable as determining the relative powers of different engines and the power of the same engine under different circumstances. This being the case, it is a comparatively easy matter to ascertain what amount of the whole power of the engine is diverted to one point or another. All the work, except the driving portions—the necessary shafting—being thrown off, let "friction diagrams" be taken. These give the amount of power exerted to drive the intermediates. Then let Mr. Smith put on his average amount of work and have another set of diagrams taken. This properly noted, let Smith throw off his work and Jones put on his, and proceed as before. A comparison of the different diagrams will infallibly point out the exact, and the relative amount of power used by each tenant.

Every engine should be indicated. What is the use of talking about the "nominal" horse-power of an engine? One man building an engine with cylinders 7 by 10 inches and another one 8 by 10 inches, and another 8 by 8 inches, all claim for their respective engines the same horse-power. One may be right, but if so, the others must be wrong. Only the indicator can give the test. It is fortunate that it has come into use. It will decide and has decided disputes which might puzzle a "Philadelphia lawyer." It is the great friend of the engine builder, the engine runner, the hirer of power, and the furnisher of power; a benefit to the buyer and seller of engines, the manufacturer, and user. Its use is daily becoming more and more known and its benefits more and more appreciated.

THE EAST RIVER BRIDGE.

Operations upon the projected bridge which is to connect this city and Brooklyn, have actually begun. For several days past workmen have been engaged on the Brooklyn side of the river, in making borings to determine the character of the substratum where it is purposed to build the piers. The plans which have nearly been perfected, contemplate the erection of a structure of such proportions that a brief statement in regard to some of its important features, must be of more than merely local interest.

The narrowest part of the East river is between Fulton ferry slip, Brooklyn, and near Pier 29 on this side, and here will be located the towers. The initial point of the bridge in Brooklyn city will be, without doubt, at or near the intersecting of Sands and Fulton streets. For the other terminus three localities have been proposed, but the New York City Hall park will, in all probability, be the one selected, the total length of the bridge then being 5,862 feet. The bridge proper will be eighty feet wide, increasing for five hundred feet on either end, to a width of one hundred feet. There will be four roadways, two each for going and returning passengers, and two for cars or carriages. Above these roadways is to be an elevated promenade, sixteen feet in width: the center of the bridge will be 130 feet above high water mark. The towers for suspending the cables, each 150 feet high, are to be located inside of the pier lines established by the law, and at a distance apart from center to center of 1,600 feet. The grade of the bridge approaches will be 3½ feet in 100, and the company propose to utilize all the ground over which it thus passes, by making stores and warehouses beneath. Flights of stairs leading to the corners of cross streets, will do away with the necessity of obliging passengers to travel to the main entrances.

The lowest estimate of the cost of this bridge is $6,000,000, and the company who are to build it must have a capital of not less than $8,000,000. Many details of construction can not now be given, but will appear as the work progresses. The first year's work will be simply laying the foundations, and four or five more must pass before the undertaking will be completed.

The proposed bridge promises to be a magnificent structure; but the stockholders will pay dearly for the whistle. For the six millions which this one bridge is to cost, seven or eight tunnels might be laid down across the bed of the river, one for each of the principal streets of Brooklyn. Through these tunnels steam cars might run and carriages pass, affording quicker, safer, and better facilities for communication than a single suspension bridge.

THE CAREER OF A WORKING MAN.

We do not intend to select an exceptional case in noting a few facts in the life of the mechanic whose course is the subject of this paragraph: this case is chosen because it is *not* exceptional; there are hundreds of a similar character, and the encouragement to young and struggling mechanics is all the more valuable.

A short time ago the workmen employed by Mr. John Snowdon, the proprietor of the Snowdon Iron Works, of Brownsville, Fayette county, Pa., made him a presentation as an evidence of their respect and esteem for him as a man and employer. Fifty years ago Mr. Snowdon came from Yorkshire, Eng., and settled in Brownsville. He went to work as a blacksmith for one dollar per day. After a time he started business for himself, his bed the floor, his table a box, and his seat a block. He gained slowly, until he succeeded in erecting and putting in operation a foundery, machine, and pattern shop, employing two hundred hands. He has built the machinery for about three hundred steamboats, some to run on the Monongahela, on which Brownsville is situated, some for the Ohio, Missouri, Mississippi, the lakes, and gunboats for the Government to run on the Rio Grande and the sea. Iron bridges and all descriptions of engineering machinery have also formed a part of his manufactures. For more than forty years he has aided in building up his section of the country, and during a good part of the time furnished employment to a large number of workmen.

Many men have done greater things, met with more notable success and been better known in the world, but Mr. Snowdon's course is none the less instructive because unobtrusive. It is simply that which is open to hundreds of others who unite with common capabilities for business, industry, perseverance, and will.

COMPARATIVE WEIGHT OF ENGLISH AND AMERICAN SCREW ENGINES.

In the Paris Exposition there are the engines for the English sloop of war *Sappho*, built by Penn from designs of the Chief Constructor of the English navy. The *Engineer* gives their dimensions and weight, by which it appears that although calculated to work up to 2,000 indicated horse power the total weight of the engines is but 74 tuns. These engines are not exceptional; there are many similar ones in the English navy.

On the other hand, the engines of the *Lackawana* and other screw sloops of our navy are reported by the board of examiners—composed of such men as Copeland, Bromley, Wright, Hibbard, Everett, Coryell, Merrick, Bartol, etc.—as being of only 1,000 horse-power, yet they say if proper proportions had been observed 60 tuns of weight might have been saved! Query: is there no room for improvement in our naval machinery?

TRIAL OF STEEL RAILS---NOVEL RAILROAD OFFICE.

The New York and New Haven Railroad Company are testing the steel rail in a section between Port Chester and Greenwich. The President of the road, Hon. W. D. Bishop, formerly Commissioner of Patents, is an energetic, practical man, and we shall look to him for a report on the subject which will be conclusive of its practicability. Mr. Bishop is the first railroad president to adopt the plan of locating his office on wheels. His office is a neatly fitted car, and his head quarters may be truly said to be any where between New Haven and New York that his presence is required.

AGRICULTURAL ENGINEERING.

Once in four years the Royal Agricultural Society offers prizes for the best portable and fixed steam engines (of dimensions prescribed within certain limits) entered for trial at the Worcester show in 1863, and that for this year has just been concluded at Bury St. Edmund's. The various portable engine factories in the kingdom, perhaps forty or fifty in number, are now able, if fully employed, to complete upwards of fifteen hundred engines yearly; a fact sufficient to show both the extent of the trade and the competition which attends it. The Royal Agricultural Society's prizes are, therefore, keenly contested for, and, although the engines entered for trial are generally of a more expensive, and, possibly, less durable class than those ordinarily sold by the same makers—being in fact, what are known as "racers," only seldom bought for actual work on the farm—it is indisputable that these competitive trials have done, and are doing, much to raise agricultural engineering to the highest standards of efficiency and economy. There are many of our readers who can even now recall the time when, under the practice of the Liverpool and Manchester engineers—in the days of John Gray and John Dewrance, who were always encouraged by that paragon of railway secretaries, Mr. Henry Booth—locomotive engineering was refined and perfected almost beyond all previous expectation, the consumption of coke being diminished from 40 lb. or 50 lb. to 18 lb. per train-mile. There are many who can recall the time when the Cornish engineers, by emulation and the greater care which it inspired, were raising the duty of

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their engines from 30 or 40 up to 70 or 80 millions, and sometimes to even more. And we have more lately seen how, by increased attention to the conditions of marine-engine economy, a consumption of from 5 lb. to 7 lb. of coal per indicated horse power per hour has been brought down to from 2½ to 3½ lb.

Something like these reforms has been introduced into portable-engine practice by the agency of the Royal Agricultural Society's quadrennial trials, and we have this year an engine running steadily for nearly three hours with a consumption of but 2½ lb. of Welsh coal per effective or dynametrical horse power per hour, equal probably to about 2⅛ lb. or 2¼ lb. of coal per indicated horse power per hour, the measurement to which most engineers are better accustomed. Put into Cornish notation, 2¼ lb. of coal per effective horse per hour means a duty of nearly 88⅘ millions of foot-pounds for each hundredweight of coal, a result which, we need not say, has been but rarely surpassed even in Cornwall.

This result is, of course, a maximum result, obtained by the exercise of the greatest care in design, in construction, and in working. That in the working was perhaps the most remarkable of all, and we say, advisedly that it would have well paid any farmer employing steam power to any considerable extent, as many now do, to have sent his engine driver or drivers to Bury, even from a distance of 200 miles or more, and to have kept him or them in the show yard during the whole period of the trials, to study the wonderful jockying (and we do not employ the term reproachfully) of George Wilkinson with Clayton, Shuttleworth and Co.,s engine, of Robert Celles with Tuxford's engine, of John Bristow with Ransomes and Sim's, and of Whitcombe with the Reading Ironworks', engine, the latter when worked to 50 per cent. above its nominal power, giving the greatest economy of fuel yet recorded, Clayton and Shuttleworth beating on the trials at nominal power. Not perhaps that the care was so much, if at all, greater than that of railway engine drivers, when working, as they lately did on the Great Eastern Railway, by contract; but railway practice is not often accessible to portable engine drivers, nor, differing so much as it does from their own, does it so directly carry home its lessons of example. Even if they be not likely to be generally repeated in every day practice, it should be as interesting to the large farmer—the steam farmer we will call him—as to the engineer to observe the expedients by which a little engine, not working within a warm house, but in the open air, is nevertheless enabled to rival, in its dynamical results for a given weight of coal, the triumphs of Cornish and marine and locomotive practice. Not only is the boiler lagged, but it is sheltered from winds and rain, and there was rain and wind in plenty, and more than enough, last week and this, at Bury. The coal is broken into lumps hardly larger than dice; it is fed to a fire hardly three inches thick (plenty were told, and some, perhaps, believed, that some of the fires were not one inch thick). The distribution of coal upon the grate is as even as the utmost care can make it; the firedoor is never allowed to be open a moment longer than absolutely necessary; the ash pan is carefully cleared of cinders and bits of unburnt coal, to be added to the fire for the final effort when all the clear coal is gone; the ash-pan damper is regulated with the nicest care, and where not tight in all its joints, all openings except at the bottom are carefully stopped with rags, so as to compel the entering air to pass through the whole volume of heated air contained in the pan; the feed-water is heated by waste steam almost to boiling; the safety valves are screwed to slightly more than the working pressure, and the latter is maintained to half a pound at one fixed point on the gage; the slide and expansion valves are, in the best engines, set exactly to the intended work, and the regulater is kept wide open where this is possible, as in many cases it was; the brasses of the engine are left to run as freely as can be tolerated in respect of thumping; the piston packing is in the most perfect condition, neither tight nor loose, as drivers understand the terms; the oiling is assiduous and just sufficient, and everything is done that the driver, with all his wits about him, can think of to prolong the time of work with the quantity of coal so scrupulously weighed out to him. It is here that engine driving, or even boiler-stoking, becomes a profession; and there was a curriculum of technical education, in at least one of its important branches, in the week's trials concluded on Tuesday last. Could the large competing firms make drivers as well as engines, they would surely increase their trade in the latter, and it might even pay, in the way of business, or to educate the former gratuitously, for nothing would more hasten the adoption of steam upon the farm, both at home and abroad, than a general understanding and practice of the best principles of engine-driving, so splendidly exemplified in the trials at Bury.

It is difficult to point to any new feature of design which has attributed to the excellent results attained. It is even difficult to say what the results prove as to many questions of plan and proportions which are often discussed by engineers, and, now and then, by steam farmers. Clayton's double cylinder engine beat his own single-cylinder engine; but this could not have been because of this difference in the number of cylinders, since the double-cylinder engines were worked at 80 lb., while the single cylinders were limited to 50 lb.

This enabled the double-cylinder engines to work more expansively, and possibly it will be said with more expansion than a single engine would bear, and still work with uniformity. With 80 lb. steam, however, the single engines would have run well, cutting off at one sixth stroke, and but one only of the double-cylinder engines tried cut off as short as one-eighth, and only one other as short as one-sixth. The reason for the difference of pressure is, no doubt, that double cylinder engines are now oftener made for plowing, and are better made for this purpose than common portable engines, mostly with single cylinders, which would (not, however, because the cylinder is single) not be safe at 80 lb. As a matter of fact, the best result attained in the trials, the best perhaps on record, was had from a single cylinder engine working to one half more than its nominal power—the system of testing the engines not only to their nominal power, but, subsequently, to one half as much more, having been introduced for the first time at the trials at Bury. So, too, some of the engines, which were not doing particularly well, were observed to have strokes more than 12 inches long, and were hence called long-stroked engines. We heard some good judges assert that the long-stroke engines would be nowhere, yet the best result of all, and that when working to one half more than the nominal power, was obtained with the longest stroke of all, viz., 18 inches.

Without looking forward, at present, to better results than the best that have been booked at Bury, we must hope to see such results become more general, and that consistently with reasonably economical construction and working. At present ordinary portable engines burn, as they burnt at Bury, from 5 lb. to 9 lb. of coal per horse power per hour, or, on the average, twice what they ought. In other words working a 10 horse engine up to 15 horse, for ten hours a day, they burn 7 cwt. to 12½ cwt. per day, so that with coal at 1s. a cwt., the difference in the cost of fuel between the most economical and the most wasteful engine would amount to 9s. per day, and the average difference might be taken at 5s., equal, for even 100 days' working in the year, to the interest on £500, or to that on £350 even if 1s. 6d. extra were paid for a first rate driver. The means of economy lie in sound construction, thorough lagging of the boiler, heating the feed water, liberal expansion, in short, the most miserly care to prevent loss of heat, heat being the true representative of power. All this and the most careful firing and fettling of the engine are necessary to economy. And will other engine makers allow one or two, or even three or four, firms to run off with the great prizes of these Exhibitions? It takes a great deal of money to carry on business in these days of competition, but it is sound policy to expend the money judiciously in building better engines, and with this to keep in sight every means, even to the most refined to secure economy of working. And what wonderful results would be attained, too, by prizes for engine driving as well as prizes for engines. If bets were made on engine races, the winning jockeys would come in for handsome gratuites, as happens with the triumphs at Epsom, at Ascot, and at Newmarket; and, seriously, good engine-driving is just now most wanted of all on the steam farms of England

We are almost amused at reading the above from the *Engineering*. It seems strange, indeed, that such care must be used in the firing of the boilers and the distribution of the coal on the grate; that the "ash-pan should be carefully cleaned of cinders and unburnt coal;" that "all openings except at the bottom—the draft—should be carefully stopped with rags;" that the "feed water should be heated by waste steam almost to boiling; the safety valves screwed to slightly more than the working pressure! and the brasses of the engine left as free as can be tolerated in respect to thumping," etc., etc.

Surely the experiment should have succeeded under such circumstances, if there was any merit, whatever, in the engines. This extreme carefulness to details is impossible in ordinary work, then why should it be observed in competitive trials? The proper test for agricultural as well as for other machinery is simply to try it under the ordinary and extraordinary circumstances of daily use. The suggestion of prizes for engine driving is a good one, and we do not see why that and firing should not be made objects of competition.

The results of the trial referred to in *Engineering* were highly satisfactory, the consumption of coal per dynametrical horse power per hour being 2·54, 2·71. 2·98, and so on up to 7·99, We doubt if equal results have ever been attained in this country. There is no doubt, however, that everything was arranged even to the minutest details to this end. Such results give as much future promise as present gratification.

OFFICIAL REPORT OF PATENTS AND CLAIMS

Issued by the United States Patent Office,

FOR THE WEEK ENDING AUGUST 6, 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.

67,395.—Machine for Twisting Augers.—W. L. Aldrich, Norwich, Ct., and William Evans, Seymour, Ct.

1st, We claim regulating the twist of augers and bits by means of the rollers, g g, or their equivalents, arranged upon a slide rest, and operating substantially as described.

2d, The combination of end supports, a' b, with the regulating clamps, g g, substantially as described.

3d, The construction of the female back center, b, substantially as described.

67,396.—Screw Plate.—Walter Ashton (assignor to himself and Edward K. Quinn), Utica, N. Y.

I claim, in a screw plate, the chaser, C, gibs, D and E, and set screws, D1 and E1, or their equivalents, in combination, constructed and operating substantially as described and for the uses and purposes mentioned.

67,397.—Bedstead.—Wm. K. Bacall, Boston, Mass.

I claim the folding bedstead, or combination of the head frame, the door part, B, and the auxiliary frame, E, arranged and connected together, and with the case, A, substantially as specified.

I also claim the combination of the legged supporters, C and F, or their equivalent, with the door part, B, and the auxiliary frame, E, arranged and connected togeth erand with the case, A, as specified.

I also claim the combination of the head frame, D, the door part, B, the auxiliary frame, E, and the supporters, C F, arranged and connected together and with the case, A, substantially as described.

67,398.—Bench Plane.—Leonard Bailey, Boston, Mass.

I claim the arrangement of the two parts, A B, of the stock together and with slots, c d, and clamp screws, a b, as described, whereby such parts may be adjusted with reference to each and clamped together, as and for the purpose specified.

I also claim the combination as well as the arrangement of the adjusting screw, F, and nut, E, or the equivalent thereof, and the bent lever with the plane stock. Also the arrangement of the bole, K, in the cap iron, to operate with the adjusting lever, combined with the screw and nut, or the equivalent thereof, and applied to the stock, as set forth.

67,399.—Tweer.—W. W. Ball, Charlestown, Ill.

1st, I claim the combination of the blast tube, A, valve, d, and air chamber, all constructed and arranged as described.

2d, The disk, E, having the steps, e' e' e', operating in connection with the projections, f f f, on the inner surface of the plate, C, and having the series of holes around its margin, and the square central aperture, c, substantially as and for the purpose specified.

67,400.—Inking Apparatus for Printing in Colors.—Thomas L. Baylies and George W. Wood, Richmond, Ind.

1st, We claim two or more separate continuous inking fountains, B B1 B2, in combination with two or more intermediate adjustable sectional rollers, I I1 I2, and other distributing rollers, by which the ink of different colors is transferred from the fountains to, and properly arranged in bands upon, a common roller, substantially as set forth.

2d, The combination of two or more adjustable sectional inking cylinders with the soft intermediate roller, K, and the hard roller, L, substantially as set forth.

3d, The arrangement of two or more sets of adjustable sectional inking cylinders in relation to each other and to the roller to which they transfer their colors, substantially as set forth.

4th, The combination of the distributing rollers, the transferring rollers, and adjustable inking cylinders with the roller, K, substantially as set forth.

5th, In combination with an elastic roller, we claim so arranging the boxes of the latter that they may be locked so as to regulate the play thereof, substantially as set forth.

6th, The arrangement of the frame, G, rack, G1, pinion, N, pulleys, N1 h h1 and h2, and the connecting belts, substantially as and for the purpose set forth.

67,401.—Padlock, etc.—Wilson Bohannan, Brooklyn, N. Y.

1st. I claim, in combination with an oscillating plate, C, to which the notched slides, e, are suitably applied, the parallel moving plate or knife, f, attached to said plate or guide, substantially as described.

2d, The combination of the plate or knife, f, slides, e, and oscillating plate, C, with a vibrating lever arm, which is guided and controlled by a fixed stud, j, or its equivalent, substantially as described.

67,402.—Plate Lifter.—C. F. Bosworth, Milford, Ct.

I claim the combination of the two jaws, A and B, with their respective levers, D, arranged upon a handle, C, so as to operate in the manner herein described.

67,403.—Machine for Making Nuts.—John R. Bridges (assignor to himself and G. O. Faucett), Pittsburgh, Pa.

I claim, 1st, The annular semi-cylindrical or semi-oval recess on the face of the squre die, E, for forming a raised bead around the eye of the nut, all as described and represented in fig. 5 of the drawings.

2d, The bar, G, provided with pins, a a and c c, in combination with the die, E, and standard, I, for the purpose herein before described.

3d, The cutter, D D, when so arranged in a double operating nut machine as to pass the nut bar, from which the nut blank has been severed, to the proper position for feeding into the other end of the machine, substantially as hereinbefore described.

4th, The combination of the blocks, J J1, bottom plate, H, cutter, D, and bar, G, for forming a matrix or nut box to enclose the nut while it is being pressed and punched, and which shall open to release the nut on the withdrawal of the pressing die.

67,404.—Rolling Mill.—Pittman Bright, Philadelphia, Pa.

I claim, 1st, The shaft, D, its collar, i, enlargement, f, and adjustable collar, e, in combination with the shaft, F, its collar, i, enlargement, f1, and adjustable collar, G1, the whole being constructed and arranged substantially as and for the purpose herein set forth.

2d, The collar, G or G1, composed of the ring, m, with its corrugated or notched end and the ring, n, with its rim, q.

67,405.—Umbrella.—John Brown (assignor to William V. Brown), New York City.

I claim a woven umbrella or parasol cover having pockets for the ribs woven into or with the web of which it is formed, essentially as herein set forth.

67,406.—Folding Table.—Julia P. Brown, Boston, Mass.

I claim the combination and arrangement of the cammed shoes and the spring catches, the table top, and the two sets of legs, arranged and applied together and to the table top, substantially as specified, such shoes being made with holes or recesses in their sides to receive the hooks of the catches, as set forth.

67,407.—Marker for Sewing Machines.—Sarah F. Brown (assignor to Chas. W. Brunner), Savannah, Ga.

I claim, 1st, The adjustable bar, A, in combination with the pin, C, and tube, D, all made and operating substantially as and for the purpose herein shown and described.

2d, The toothed pin, C, and spring, E, when arranged as described, for the purpose of holding the tubular pencil holder, D, on the adjustable plate, A, in any desired angle of inclination, as set forth.

3d, The spring, E, when arranged on the side of the perforated tube, D, and when provided with a pointed or sharpened end, as set forth, for the purpose of holding the pencil in the tube and for fitting the same tube to larger and smaller pencils, as set forth.

4th, The plate, A, pin, C, and spring, E, in combination with the tube, D, and spring, E all made and operating substantially as and for the purpose herein shown and described.

67,408.—Soap Holder.—Richard Bush, South Brooklyn,

I claim, 1st, The soap holder with the revolving bottom, substantially in the manner and for the purpose set forth.

2d, The whole device, as an article of manufacture, when constructed substantially in the manner and for the purposes set forth and described.

67,409.—Seed Planter.—L. A. Butts, Ripon, Wis.

I claim the hoppers, J and L, seed distributers, a and l, seed cups, e and o, shaft, W, driving wheel, V, pullies, p p, conductor, q, lever, U, guide pins, r, guides, u, and rope, K, in combination with the vertically adjustable frame which carries the seeding devices, all arranged and operating as set forth.

67,410.—Telegraphic Instrument.—S. G. Cabell, Quincy, Ill.

I claim, 1st, Operating a telegraph instrument by means of a magnet consisting of a helix interposed between two concentric pieces of soft iron, the inner forming a central core and the outer one a covering for the helix, substantially as described.

2d, The combination of the electro magnets, A and B, with the connecting piece, h, arranged so that by moving it to and fro, the magnets may be connected or disconnected at will, substantially as described.

3d, The combination of the magnet, A, with its vibrating arm, I, and the magnet, B, with its vibrating arm, G, when arranged to form one instrument, and to operate as and for the purposes herein set forth.

67,411.—Razor.—Gouveneur Carr, New York City.

1st, The combination of a razor blade with the guiding gage, substantially as and for the purpose specified.

2d, The combination of the razor blade and guiding gage by means of a hinge joint and holding mechanism, substantially as and for the purpose set forth.

3d, The combination of the two guiding gages, or two-part case, with the razor blade by means of a three-part hinge, or the equivalent thereof, substantially as and for the purpose set forth.

4th, The combination of the razor blade, the stock to which it is hinged, the guiding gage, the connecting hinge, and the holding mechanism, substandally as and for the purpose specified.

67,412.—Sash Pulley.—Henry Cash, Newport, Ky.

I claim, as a new article of manufacture, the combination of the flat place, C, pivot, G, and sheave, F, the said plate being provided with bosses, B, and all constructed and adapted to operate as and for the purposes described.

67,413.—Steam Injectors.—Nathan L. Chappell (assignor to the Chappell Patent Steam Valve, Pump, and Bilge Ejector Manufacturing and Furnishing Company), New York City.

I claim the inlet chamber, B, constructed with a contracted throat, a, and arranged with reference to the steam inlet pipe, D, and chamber, C, substantially as herein set forth for the purpose specified.

67,414.—Last.—Aaron W. Cheever, Lynn, Mass.

I claim the block last, A B, constructed substantially as above described and for the purpose set forth.

I also claim making the draft line straight on the exterior surface of the last from a point near the heel to a point near the ball of the foot, substantially as and for the purpose set forth.

I also claim forming a projection, g, on the toe end of the block of the last, substantially as and for the purpose described.

I also claim increasing the width and reducing the length of the groove in the last proper, as and for the purposes specified.

67,415.—Stovepipe Damper.—Edwin Cox and A. W. Potter, Monroe, Wis.

1st, The shoulder pieces and pins for connecting the segments of a damper, substantially as shown and described.

2d, The collar or shoulder, K, for supporting the damper in combination with a damper in divider.

3d, The thumb latch attached to the end of the lever for opening and closing the damper without bringing the hand of the operator in contact with with heated metal, substantially as shown and described.

4th, The mode of securing the thumb latch and lever by means of pins, substantially as described.

5th, Combination of parts forming our improved damper, substantially as shown and described.

67,416.—Lid for Kettles, Pails, etc.—S. B. Cox, Buffalo, N. Y.

I claim the combination with the grooved india-rubber ring, the fasteners, and the vessel and its cover or lid, the whole arranged and combined substantially as herein set forth, of the flexible conductor pipe, C, secured to the said cover or lid by the screw joint, D.

67,417.—Pump Piston.—F. A. Cramblite, Petroleum Centre, Pa., assignor to himself and Joseph R. Dickey.

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