"fancy tools," made merely for experiment. It is only the practical advantages to be derived from an experiment that makes it valuable ; by the form of the chip taken in working his lathe, we can, in some measure, judge of a craftsman's skill.

A revolution in the shape of cutting tools is gradually taking place in our best machine shops ; ten years ago the "diamond point" was regarded as the *ne plus ultra* of roughing tools, but those now in use are very different in shape, and are difficult to describe without illustrations.

Every man, of course, makes his tools to suit himself, but as each handicraft is improved by individuals composing it, we ask the attention of our workmen to their cutting tools, and try what progress can be made in this direction.

CAN WATER BE USED AS FUEL?

It is quite a common belief that water thrown on a fiercely raging fire acts as fresh fuel to the flames, and makes the fire hotter. A little consideration of the nature of water, and the laws of combustion, will show that this belief is an error.

Water, for neutralizing heat, is far more efficient than any other substance. Thirteen pounds of water, at 212°, in changing into steam, will practically extinguish all the heat from the burning of a pound of coal ; a thermometer placed in the steam will not be raised a single degree, although, in fact, heat enough is generated by the burning coal to melt nearly ten pounds of cast iron. Nothing will put out a fire so quick as water.

But it is said that water may be decomposed when thrown on the fire, and that then it will burn ; this is nearly the truth. The water may be decomposed, but not in such a way that the oxygen of the water can assist in the burning of its hydrogen. The separation of the elements of water requires and consumes a great heat ; the oxygen of the water combines with its equivalent of carbon, and so much carbon is, in effect, taken from the fire and produces no heat. When the water is thus decomposed, an equivalent of hydrogen simply takes the place of its equivalent of carbon, and gives out in burning precisely the same amount of heat as is attainable from the carbon. Of course, as hydrogen is a gas and carbon a solid, the decomposition of water in a charcoal fire would give a flame where otherwise there would be none.

Now, if these facts be put together, we arrive at the practical conclusion that if water be thrown on a fire, in the first place a great deal of heat will be consumed in converting the water into steam ; and, in the second place, that if any of the steam is decomposed, the hydrogen set free will be at the expense of its equivalent of carbon, and can, in burning, produce no more heat than the carbon.

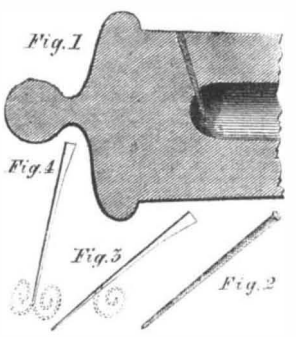
Manufacturing Iron Ship Plates.

The following graphic description of manufacturing the iron plates for the English war steamer *Warrior* is from the London *Engineer* :—

The tests which were applied to the plates furnished by the builders of the *Warrior* were of the most trying character. Some plates were fired at with 68-pounders, at 200 yards' range, and were literally cut in halves by balls fired one after another on a line drawn on the surface, each ball striking immediately below its predecessor. Upon some other plates the balls made a circular indentation upon the surface, nearly as deep as the plates, exactly of the form of the projectile, and as though a mold had been taken of it in some soft and yielding substance. It was only after repeated trials that it was decided that the plates should be of annealed scrap iron. The labor involved in building up these plates is enormous. In the first instance, small scraps of iron are thrown into the fires, and, when in a state of red heat, are subjected to severe hammering, under the steam hammer, until the whole is beaten and amalgamated into a solid mass of about half a tun weight. This lump is then placed on the top of a similar mass, the whole made red hot, and hammered and welded together. Repeated additions of this kind are made until about five tuns of metal are thus welded together in one huge shapeless body. This is then brought to a glowing white heat, and placed under the huge hammer, the thundering blows of which gradually reduce it into shape. Again and again the enormous slab is put into the furnace and hammered into one piece of 15 feet long, 3 feet wide and 4½ inches thick. From ten to a dozen men are engaged in the work of moving these ponderous masses of iron, which are moved about apparently with the most perfect ease. Powerful cranes swing the molten mass from the furnaces to the hammer ; a nicely adjusted balance is provided by a massive iron lever, one end of which is welded into and forms part of the metal, and this is provided with a dozen or more of horns or handles, by which the iron can be turned in any direction ; for the plates are not only hammered on the broad surface, but at the sides and at the top and bottom. The plates, after having been roughly fo med into shape, are completely planed and squared. Planing machines of enormous size hug these plates in their resistless arms, and bear them slowly and silently under the sharp cutting edges of the tools, and thin shavings of the metal, which, as they are cut, coil up in long bright ringlets of iron, attest the tremendous power of these noiseless and all but omnipotent machines. When the edges and surfaces are made perfectly smooth, like the finest work of the cabinet maker, the plates are placed on an end, gripped firmly by a mortising machine, and, as they travel slowly backward and forward in the framework against a small tongue of steel, a groove of about one inch in width and depth is formed, into which the corresponding projections formed on the side of another plate will fit with the most perfect accuracy, the plates all being made to dovetail on each of the four sides.

Mode of Spiking Cannon.

From the number of inquiries which which have been put to us since Colonel Anderson spiked the cannon at Charleston, as to the way "spiking" is done, we are led to believe that a large majority of persons are ignorant of the process. To enlighten such, we have had the annexed views engraved to illustrate the plans most usually adopted. Fig. 1



represents a longitudinal section of a cannon, with its priming hole spiked with a small rat-tail file, as shown in Fig. 2. The steel is driven hard down, as far as it can go, and then broken off even with the surface of the barrel. The steel is so hard that it cannot be drilled, and so rough that it cannot be forced out, and is, therefore, the best material used. Figs. 3 and 4 show two forms of wrought iron spikes, which assume the position shown by the dotted lines when used, and thus cannot be withdrawn without much difficulty.

The Mechanism of the Horse's Hoof.

The hoof of a horse is considered as an epidermic appendage—similar to nails and claws of other animals, and scales of fishes, which are produced, in the first instance, by the growth of cells, the contents of which gradually evaporate, so that the walls of ths same gradually approximate each other.

In the upper part of the hoof—near its matrix (mother)—these cells are to be observed; they are somewhat flattened against each other, but still retain a rounded form.

The hoof, nails and scales, are not traversed by nutrient vessels nor absorbents, as is the case in regard to the sensitive tissues; and the flattened cells, when fully developed, undergo but little change.

The chemical analysis of the constituents of the hoof are as follows;—

Carbon	52 parts
Hydrogen	7 "
Nitrogen	17 "
Oxygen and sulphur	14 "
Total	100

—*American Stock Journal.*

Water Gas and the Emperor's Heart.—Baron Gudin, the French marine painter, describing to the Liverpool Social Science Association a gas and water apparatus, happened to say: "The Emperor is my friend, and I know the very bottom of his heart." At these words, Lord Brougham, who was in the chair, smiled and shook his head ; and, at the conclusion of the Baron's remarks, while eulogizing his talents as an artist, added: "But, with reference to this great discovery—I don't mean that of the bottom of the Emperor's heart, but of the gas and water apparatus—I hope we shall soon hear more." These words, delivered in the noble Lord's dryest manner, excited roars of laughter, which seemed to puzzle Baron Gudin immensely.

Professor Newbury thinks that artesian wells cannot be bored to any advantage in Ohio. The well in the State House yard at Columbus has reached a depth of 2,775 feet (or over half a mile), and yet the water will not rise above the surface ; and even if water shall be got, the Professor says it will be warm and salt, and so unfit for use.

Our Correspondence.

A Sign of Prosperity.

Messrs. Editors:—In your issue of last week, you say "the mechanical and manufacturing industry of the country is at a standstill." This is no doubt the case to a considerable extent, more especially your way, but much less this way.

The factories are all quite busy in the "City of Spindles," having just made up their accounts and declared good dividends (payable on demand), and are buying large invoices of cotton at a low figure. Some of them have immense orders on hand. Our mechanical establishments are, as a general rule, doing more now than they were one year ago ; indeed, several of them are doing more than double. Some of them run three nights per week until 12 o'clock.

I learned of one business firm in your city who received, within a week or two, the largest order they have ever got, and find no difficulty in doing business except in the stringency of the money market. It seems to me that all ought to endeavor to do all in their power to restore confidence. The country was certainly never in a better condition—want of confidence alone excepted. Our farmers all through this section have raised unheard of crops of wheat, corn, rye, oats, potatoes, and fruits of nearly all kinds. Wages have been good, and are good now. Farmers are advertising for help, and everybody about here seems to be busy. A. M. S.

Lowell, Mass., Jan. 1, 1861.

[We are glad to learn that dullness in trade is not supreme in all sections of our country. If our political differences could be composed, joy would fill the hearts of all our people, and prosperity would crown the labors of all. Confidence will not, however, be restored until our national affairs are settled in some form.—Eds.

Prospects in Mississippi.

Messrs. Editors :—Inclosed I hand you $10 for five years' subscription to your valuable paper, which I cannot do without, even if the Union is dissolved. I was pleased to see the stand you took in regard to taking the notes of suspended banks in payment of subscriptions and money due you, and I shall tell everyone that I sent such money to you for five years' subscription. The Southern banks are as solvent as ever, and in a short time exchange on New York will be drawn at its usual rate, say from par to one cent discount, and I hereby proffer my services to you, if I can aid you, in getting such money as you may take converted into exchange on New York, at living rates, of which time I will advise you. Pardon me for intruding a long letter upon you ; but knowing that you do not dabble in political matters, and believing that political newspapers generally do not represent the true feeling of the people, is my excuse for writing thus much. The South is comparatively easy, being an agricultural people and raising enough to eat, an ample cotton crop selling at good prices, and, as a people, nearer out of debt than they ever were, they are snugly fixed up to secede from the Union without feeling it much.

Your friend and ob't servant, W. J. L.

Okalona, Miss., Jan. 1, 1861.

[It does us good, in these exciting times, to receive such solid and cheering evidences of kindly good will from our Southern friends. So long as the peace of the country is secured, our resources are ample and our people will be happy.—Eds.

The First American Locomotive.

Messrs. Editors:—An inquiry is going the rounds in relation to the first railroad built in the United States. A locomotive was placed on the eastern portion of the road from Carbondale to Honesdale, Pa., previous to 1830 ; but when the road was built, I do not know. I was there in the summer of that year, and saw the locomotive, which had been taken off on account of the road being so slenderly built. It was not a passenger road. A. H.

Schenevus, N. Y., Jan. 2, 1861.

At the Augusta (Maine) bridge, a novel mode of transit for winter teams has been adopted. A track is laid the entire length of one carriage way, and a large platform car placed thereon, so constructed that a loaded sled can be driven upon it and easily drawn over.

Recent American Inventions.

The following inventions are among the most useful improvements lately patented:

TYPE CASE.

The object of this invention is to render type cases capable of being made more portable than hitherto, or of much less dimensions, so as to economize in space, and, consequently, in rent and artificial light, and, at the same time, expedite the work of the compositor. Type cases constructed in the ordinary way require to be of such dimensions as to preclude the necessity of frequently supplying or replenishing the boxes with type, which would consume considerable time. This arbitrary size occasions much embarrassment. The hand of the compositor in the prosecution of his work necessarily travels over a great deal of space in a given time, and considerable artificial light is required to render visible all parts of the case. To obviate these difficulties, a type case is constructed of quite moderate dimensions, so far as area is concerned, but with the case and its boxes made quite deep, so that these boxes may hold a comparatively large quantity of type, the boxes being provided with movable bottoms, arranged so as to be readily adjusted or raised from time to time to compensate for the gradual exhaustion of the boxes, and keep the type at the surface of the same. This invention was patented by Thos. N. Rooker, of the New York *Tribune* office.

APPARATUS FOR ENLARGING PHOTOGRAPHS.

The object this invention is to obtain from photographic negatives of a given size, positive pictures of a much larger size. The invention relates to the employment of mirrors to reflect the direct rays of the sun through the camera containing the negative, and it consists in so applying and operating a system of mirrors or reflectors in combination with the camera, whereby, notwithstanding the movement of the earth upon its axis, the rays of light will continue to be reflected in the same direction for as long a time as may be necessary to obtain the print, and distortion of the picture be prevented. The credit of this invention is due to J. H. Whitley, of Owego, N. Y.

ISSUED FROM THE UNITED STATES PATENT OFFICE

FOR THE WEEK ENDING JANUARY 1, 1861.

Reported Officially for the Scientific American.

*** Pamphlets giving full particulars of the mode of applying for patents, 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.

1.—W. C. Berry, of Woodbridge, N. J., for an Improvement in Machines for Cutting Roots:

I claim the knives, G and H H, and the wedges, I I, arranged relatively with the cutter, F, and the finger plates, K K, to operate as and for the purpose set forth.

2.—Eliakim Briggs, of South Bend, Ind., for an Improvement in Feeding Mechanism for Spoke Machines:

I claim the arrangement of the screw, D, wheel, E, attached to block, G, the cord, N, attached to arm, I, and axis, F, of wheel, E, catch bar, T, and sliding clutch, H, all arranged for joint operation as and for the purpose specified.

[This invention relates to an improvemenl in that class of turning machines in which a pattern is used for giving the desired form to the work to be produced. The invention, although more especially designed for turning spokes, is applicable for turning all articles having a regular curved longitudinal profile as well as those having an irregular form circumferentially.]

3.—B. J. Burnett, of Mount Vernon, N. Y., for an Improved Refrigerator:

I claim, in combination with the provision chamber, the employment of an ice chamber, B, so constructed and arranged, as specified, as to have tapering spaces, f, on each side, as specified, for the purpose described.

I also claim the employment of the door or leaf, C, constructed and operating as specified, for the purpose set forth.

4.—J. M. Connel, of Newark, Ohio, for an Improvement in Water Elevators:

I claim the arrangement of means for actuating the spout, M, which is hinged to the cnrb, as set forth, for operating the valve, P, and controlling the quantity and the flow of water in connection with the aperture board, J, as and for the purposes described.

5.—A. L. Dennison, of Waltham, Mass., for an Improvement in Watches:

I claim, first, The intermediate wheel, I, in combination with the main gear, C, and central wheel, K, when the intermediate and central wheels are in the same place, as set forth.

Second, I claim combining the maintaining power with an intermediate wheel between the main gear and the central wheel, whereby the ratch of the winding arbor and the ratch of the maintaining power are placed in the same plane, for the purpose set forth.

6.—J. H. Dialogue, of Camden, N. J., for an Improvement in Valve Motion for Steam Engines:

I claim the reciprocating bar, D, its slides, C and C′, connected to the steam valves by any suitable devices, and the catch levers, I and I′, having their upper surfaces parallel with the line in which the said reciprocating bar moves in combination with the vibrating cams, T and T′, or their equivalents, controlled by the governor, the whole being arranged for joint action, substantially as and for the purpose set forth.

7.—Edward Dithridge, of Pittsburg, Pa., for an Improvement in Pots for Glass Making:

I claim the use of the second or false back in retorts or pots used for making glass, as described, and for the purpose set forth.

8.—C. H. Dolbeare, of Boston, Mass., for an Improvement in Lamps:

I claim, in a burner of the kind as specified, the application or arrangement of a filling tube, D, so as to pass down through the cap, a substantially in manner and for the purpose as set forth.

9.—J. H. Durand, of Niles, Mich., for an Improved Clothes-dryer:

I claim a clothes' dryer, A, consisting of a series of slats, B, connected by cross rails, C, in combination with the links, E, and legs, D, all arranged and operating in the manner and for the purpose set forth.

[This clothes dryer is so constructed that it can be expanded or contracted at pleasure, and that it can be used equally well when expanded to its full length or when expanded only partially. Its legs are made so that it will stand firm under all circumstances, and the rests which support the clothes are so arranged that the same do not rise or fall materially when the clothes-dryer is expanded or contracted, and that, when the same is used in the open air and a sudden storm makes it desirable to take in the clothes, this can be done simply by contracting the clothes dryer without danger of soiling the clothes.]

10.—C. Eggelston, of Beloit, Wis., for an Improvement in Seeding Machines:

I claim, first, The combination with the spoked driving wheel, B, and concentric spur gear, E, of a surrounding case, D, and sled shaft pinion, F, the whole arranged and operating as specified, for the purpose set forth.

Second, I claim, in combination with the series of spouts, C, the series of cut-offs, v v′, and the adjustable diamond-slotted bottom, Z, and slide, W, with its hand lever, K, and adjustable stop, L, the whole constructed and operating as described, for the purpose set forth.

Third, I claim, in combination with the semi-cylindrical seed-box bottom, the double seed shaft, G H, with two sets of gears and central bearing partition, t, and separate cut-offs to each seed spout, the whole constructed and operating as specified for the purposes set forth.

Fourth, I claim, in combination with the spouts, C, attached by removable rods, h l, and set in and out as specified, the chains, g, supporting adjustable beam, S, and the main frame with two beams, M and N, one in advance of the other, the whole constructed and operating as described for the purposes set forth.

11.—Nicholas Hackett, of Albany, N. Y., for an Improved Chimney Top:

I claim the employment of the openings, D D D D, near the closed end of the pipe, A, when shielded by the caps, F F, and used in combination with the external conical case, E, and the guard, H, as and for the purpose specified.

12.—Joseph Harris, Jr., of Roxbury, Mass., for an Improvement in Adding Machines:

I claim the spring escapement movement, a, in connection with the pins, n n, and inclined plane, c, working in the manner and for the purpose described.

13.—Alfred Hathaway, of Charlestown, Mass., for an Improvement in Skates:

I claim an improved skate as made not only with its foot rest combined with its runner by means of a hinge, rocker or fulcrum, but with a spring or springs so applied to such runner and foot rest as to present an elastic support to either or both ends of the runner.

I also claim the combination and arrangement of the locking arms, or their equivalents, with the foot rest and the runner having a spring or springs so applied to them as to enable them to operate together, substantially as specified.

14.—H. Hathaway, of Detroit, Mich., and B. Lathrop, of Tolland, Conn., for an Improvement in Apparatus for Evaporating Liquids:

I claim the use of the siphon, in combination with the gratings and arrangement of the pans, substantially as described.

15.—J. G. Henderson, of Mo., for an Improvement in Hand Looms:

I claim, first, So constructing and combining the picker staff, M, and driver, L, that the staff will stand at right angles to the lay and operate as a stop to the lay when the shuttle fails to box, substantially as described.

Second, Operating the take-up and let-off motions by the beating up of the web, by means of the endless belt connecting the cloth and yarn beams, substantially as described.

Third, The combination of the treader, E E, gnides, G G, and shaft, M, Fig. 1, so arranged that the taking down of one treadle by the backward motion of the lay turns said shaft, M, partly around, throwing out another staple, to take down the treadles in the proper manner to make the required shed, substantially as described.

16.—Joseph Hollen, of Fostoria, Pa., for an Improvement in Knitting Machines:

I claim, first, The hook, G, when the same is constructed and arranged to operate in taking up the stitch and carrying it over the end of the needle, V, substantially in the curved manner described.

Second, I claim giving the said hook, G, the sinking and curved returning motions described for carrying down and discharging the stitch by means of the hook carrier, H, operated by the lever arm, N, substantially in the manner described.

Third, I also claim making the lower end of the presser, I, in the forked form described, and causing the said fork to move in a curve along the two sides of the needle. v, as described and for the purpose specified.

17.—W. J. Hotchkiss, of Derby, Conn., for an Improvement in the Link Shackle of Chain Cables:

I claim The construction of the link, A, and the movable side piece, B, with apertures and hook-formed tenons in their extremities, in the manner and for the purposes shown and described.

[The ordinary shackle used to connect cables with anchors, and to connect two pieces of chain, or supply the place of a broken link in cases where it is inconvenient to insert a new link by welding, consists of a stirrup-like bow, with two eyes at its extremities, having a pin inserted through them, making a very cumbrous and awkward attachment. This improved link shackle consists of a link of the form of an ordinary chain link made with a movable sidefitted into its place, with one or more tenons, in such a manner that, when in its place, the complete shackle presents the appearance of an ordinary chain link. The movable side is to be secured in its place by rivets.]

18.—Prosper Humbert, of Boston, Mass., for an Improved Lever Escapement:

I claim the lever, C, having its cylindro-pallets, i j, on a cylinder, D, and its fork, g g′, and staff, d, arranged substantially as described relatively to the staff, b, of the balance and spindle, c, of the escape wheel, to operate as set forth.

[This invention consists in a certain construction of the lever and mode of applying its pallets, and mode of applying the lever relatively to the balance and escape wheel, whereby the fork of the lever is made to act upon the said pin with a more nearly accompanying movement, and thereby to operate with much less friction.]

19.—John C. Kimball, of New Haven, Conn., for an Improvement in Self-adjusting Carriage Seats:

I claim so constructing and connecting the two seats that the curvilinear motions of the back seat will perfectly control the curvilinear motions of all parts of the forward seat, when the two seats are constructed, connected and made to produce the result, substantially as described.

20.—Henry Leibert, of Norristown, Pa., for an Improvement in Lamps:

I claim forming an adjustable cap for lamps of a single flat piece of metal having projections, e, f and b, and recesses of the shape and arrangement described, the said piece of metal being bent as specified, so as to form the body of the cap and so that the two projections, e e, shall form a spring clip for grasping the tube of the lamp in the manner set forth.

21.—T. D. Mathews, of St. Peter's Parish, S. C., for an Improvement in the Composition of Castor Oil Soaps:

I claim the product formed by combining the following named articles in the proportions indicated:—Oil of palma christi, 1 gallon; aqua ammonia, 2 lbs.; refined potash, 6 lbs.

22.—A. G. Mack, of Rochester, N. Y., for an Improved Machine for Setting up Barrels:

I claim the adjustable or rising and falling band, B, in connection with the adjustable and flexible loaded band or rope, D, applied to a frame, A, which is provided with an annular ledge, d, at its base, a, an annular plate, c, at its top, and a winch or windlass, H, all arranged substantially as and for the purpose set forth.

[The object of this invention is to obtain a simple machine that may be economically constructed and manipulated with great facility for setting up the staves of barrels and all kinds of casks preparatory to hooping them, so that the work may be done much more expeditiously than by the usual process.]

23.—John Middleton, of New York City, for an Improved Ice Crusher:

I claim the combination of the receiver, A, jaws, B and D, and sliding bottom, G, operating together substantially in the manner and for the purpose set forth.

24.—G. H. Moore, of Rochester, N. Y., for an Improvement in Plows:

I claim a plow constructed and composed of the several characteristic features described.

25.—Wm. Newbury, of Clarksville, Mo., for an Improvement in Straw Cutters:

I claim, first, the combination of one rake-toothed feed roller, U, a vertical hopper, F, a series of revolving knives, T T, a horizontal gage plate, A, and the gearing, D B E K J G I M N, the whole constructed, arranged and operating in the manner and for the purposes set forth.

Second, The combination of the separate or removable projections, b b, on which the knives rest, set screws, m, knives, T T, and horizontal gage plate, A, in the manner and for the purposes set forth.

26.—August Nettinger, Jr., of Philadelphia, Pa., for an Improved Sausage Stuffer:

I claim, first, The cylinder, J, with its projection, m, in combination with the spring latch, i, the latter being so constructed and so arranged in respect to the said projection that the cylinder is rendered self-locking, as set forth.

Second, The hinged table, L, and its oblong slot, p, when arranged on the frame in respect to the cylinder, J, and its tube, K, as and for the purpose set forth.

27.—J. T. Plummer, of Plainfield, Conn., for an Improvement in Machinery for Drawing and Twisting Wool:

I claim the stationary detached tube, G, applied in combination with the rotating gear box containing the front or lowerdrawing rollers, substantially as and for the purpose specified.

[This invention relates to that description of drawing and twisting machinery in which the front or lower drawing rollers are caused to revolve about a common axis perpendicular to their own axes for the purpose of producing twist and draft of the roving at the same time. It consists in a certain construction and arrangement of the parts, whereby the distance between such revolving drawing rollers and the receiving end of the channel for conducting the sliver or roving to such rollers is very greatly reduced, and the difficulty of introducing the end of the roving between such rollers is obviated; and in the employment of a detached stationary conducting tube, applied in combination with such drawing rollers, whereby the necessity of "piecing" is generally avoided.]

28.—John Reist, of Philadelphia, Pa., for an Improvement in Scissors:

I claim scissors formed by the described combination and arrangement of blades, A, springs, C and D, plates, B, and pivots, b and c, the whole being constructed and operating substantially as described.

29.—G. H. Reynolds, of New York City, for an Improvement in Mounting Lithographic Stones:

I claim mounting each stone permanently in a metallic frame, in the manner and for the purposes substantially as set forth.

30.—Ezra Ripley, of Troy, N. Y., for an Improved Wrench:

I claim the rotating face adjustable jaw, C, having a direct screw adjustment, as described, in combination with the hook or claw gripper, B, hinged to the wrench stock or bar, A, combined substantially and operating in the manner and for the purposes set forth and shown.

31.—Ezra Ripley, of Troy, N. Y., for an Improved Mode of Hanging Covers to Boiled Metallic Hollow Ware:

I claim an improved and more convenient article of tea kettle cover, substantially the same as fully described and shown, and such as may be attached in a line with the spout, to spouted and bailed metallic hollow ware or tea kettles, in the manner substantially as set forth.

32.—Archibald H. Rowand, of Allegheny, Pa., for an Improvement in Coupling for Railroad Cars:

I claim the application and use of the compound metallic springs, supported by the elastic spring pods or cushions, C C CC, and its socket or bed, m m, operating by lateral resistance or pressure against the entrance of the wedge-shaped end of the bar, A, substantially as described in the second claim.

I also claim the application of the ratchet-shaped notches, N N N N N, in the inside of the main or metallic springs, and the corresponding recesses in the wedge-end of the bar, A, in combination, for the purpose set forth substantially as described.

33.—Thomas N. Rooker, of New York City, for an Improvement in Type Cases:

I claim a type case having its boxes, a, provided with movable or adjustable bottoms, b, arranged to operate by any suitable mechanism, substantially as and for the purpose set forth.

34.—Henry Scheuerle, of New York City, for Improved Punches for Making Sides for Hoop Skirts:

I claim combining with the male and female dies, H I K L, for cutting and forming the slides from the strips of metal, the additional set of dies, M M′, for cutting and forming the tips from the portions of the metal strip which heretofore went to waste, as set forth.

35.—John C. Schooley, of Cincinnati, Ohio, for an Improved Refrigerator:

I claim, first, The application and arrangement of the air induction passage, G, extending from the top of the exterior of the ice chamber down its inside underneath the ice meltings, and discharging at a point above them, substantially as and for the purpose set forth.

Second, I claim the construction of the double water escape tube, M, so arranged as to carry off the meltings in the ice chamber and the moisture produced by condensation within the submerged air induction passage with one and the same water cup, substantially as and for the purposes set forth.

36.—Herrmann Shlarbaum, of New York City, for an Improvement in Aquariums:—

I claim the described construction of an aquarium arranged so as to be suspended on a wall in the manner and for the purpose substantially as set forth.

37.—R. R. Taylor, of Reading, Pa., for an Improvement in Steam Hammers:

I claim, first, Combining the vibrating wooden helve, G, with the hammer block moving in vertical guides and with a double-acting steam cylinder when the latter is connected to the wooden helve at a point between the center of the helve's vibration, and the hammer as and for the purpose set forth.

Second, Operating both exhaust and steam valves, by means of the projections, j, on the helve, and the slotted lever, h, with its adjustable set screws, k, and k′, the whole being arranged and operating as set forth for the purpose specified.

38.—John Terrell, of Philadelphia, Pa., for an Improvement in Knitting Machinery:

I claim, first, Operating the thread presser, 5, by means of the reciprocating slide, Q, and its roller, m′, in combination with the lever, S, vertical slide, T, and spring, s, the whole being constructed and arranged substantially as set forth.

Second, Giving the signal for reversing the motion of the machine on turning the heel or toe of the stocking by means of the sliding blocks, W W′, on the edge of the plate, U, in combination with the shaft, 7, its arm, 12, and bar, 13, catch, 9, and ratchet wheel, f, the whole being arranged and operating substantially as set forth.