been, the extremely uncertain one of contracting the openings by which steam is admitted under the ring, or rings, to expand them. The obvious objection to such an arrangement is, that it allows the steam to act on the rings with its full force during slow motion, as when a train is starting, while if effective under any circumstances, it will be so only at comparatively high piston speed. The efficacy of such a remedy, if it possesses any, is in fact inversely as the piston speed.

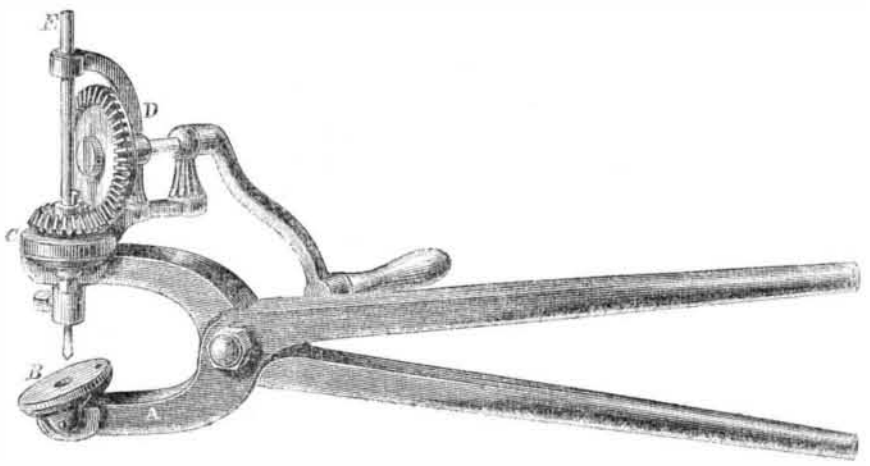
Fig. 1 is a perspective of the piston itself, or the "spider," with its follower and its rings removed, which are shown in Fig. 2. Fig. 3 is a cross section of another form of the piston, to be presently described, but which will serve to explain that shown in Figs. 1 and 2. Next to the core of the spider are two narrow internal rings, A, in Figs. 1 and 3; surrounding these two outer rings, B, the cross section of which is of L-form, as seen in Fig. 3. The lips of these outer rings extend to the whole thickness of the piston. The flange head of the piston, and also the follower, are turned beveling on their edges to admit the steam around the annular space thus formed under the rings, B. These spaces are plainly exhibited at C, in Figs. 2 and 3. Both inner and outer rings are adjusted to the bore of the cylinder by means of the gibs, D, and set screws seen in Fig. 1.

The section, Fig. 3, represents a modification intended for use in vertical cylinders, if considered necessary. The additional center ring, E, is intended to prevent leakage through the cut in the expanded ring and over the face of the unexpanded one, which might occur when the rings and cylinder should become so worn that the rings, when not expanded, should collapse and leave the surface of the cylinder. The rivets, F, shown by the dotted lines, are placed near the cuts in the L-rings, and are intended to hold the outside and inside rings together at that point, and prevent any tendency on the part of the latter to collapse and let steam under that part of the L-rings. Probably, however, if the packing is properly constructed and adjusted in the first instance, these devices will be unnecessary. In horizontal cylinders the weight of the piston, if properly supported on the set screws and gibs, will accomplish these objects, if the cuts in the L-rings are placed near the bottom side of the cylinder. The steam enters the annular space between the beveled edges of the spider flange and follower and the inner periphery of the overhanging part of the L-rings, and acts only on that part.

Patented by Nathan Hunt, Sept. 17, 1867. For further information address the patentee, or Sharps, Davis & Bonsall, Salem, Ohio, who will furnish piston heads to order on receipt of size of cylinder and piston rod.

### Improvement in Hand Drills.

There are frequent occasions in a machine shop where light drilling is required on work it is inconvenient to bring to the lathe. For this the Scotch or ratchet drill, if the job is heavy, is employed, and if light, the breast drill. The placing and working of the former consumes considerable time, and the labor of drilling with the breast drill is excessive and exhausting. It is difficult also to hold the instrument so steady as not to cramp and break the drill. The combination of the drill with tongs and a pivoted bed piece, as seen in the engraving, obviates these objections.




NEVERGOLD & STACKHOUSE'S TONGS DRILL.

To the lower jaw, A, of a pair of tongs is pivoted a platen or bed, B, having a hole through its center, which is continued through the jaw for the passage of the drillings. The upper jaw is formed with a circular flange on which is mounted the circular or disk-like base, C, of the drill frame, D. This, with the frame, is secured on the jaw of the tongs by means of two screw bolts—one seen in the engraving—passing through the jaw and screwing into the base of the drill. These bolts pass through semi-circular or segmental slots, by which the drill frame can be swung around at different angles to the tongs, to adapt itself to the convenience of the workman and the requirements of the work. If desired, the crank by which the drill is driven may be used on the upright spindle, E. It will be seen that the pivoted base or bed, B, will allow the work to adapt itself always to the line of the drill.

In operation, the work being placed between the drill and platen, the left hand presses the handles of the tongs together, while the right turns the crank; the feed is thus graduated wholly by the pressure of the hand. No further description is required for understanding the construction or operation of this tool. Patented by F. Nevergold and George Stackhouse, June 19, 1866. Applications for the whole right, or for territorial rights, should be addressed to the latter at Pittsburgh, Pa.

Commissioner of Agriculture.—The Senate on Friday, the 29th ult., confirmed the nomination of the Hon. Horace Capron as Commissioner of Agriculture to fill the position made vacant by the death of Isaac Newton, the former head of the Department.

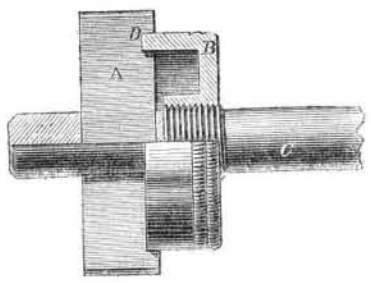
It is estimated that 10,000,000 feet of sawed lumber is frozen up in the docks at Bangor, Maine, three fourths of which is sold and waiting shipment.

## Correspondence.

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

### Improved Method of Securing Cutters on Boring Bars.

Messrs. Editors:—Thinking it may be of use to some of the readers of your invaluable paper, I have taken the liberty of sending you a sketch of a new mode of securing the cutter in a boring bar or pin drill. Where the cutters are secured, as usual, by a key, all mechanics know that it is very difficult to set a cutter twice alike; and the notch, which is filed in the cutter, to prevent it from moving endways, is a great source of weakness, often causing the cutters to crack in hardening, as well as after they are put to work. The inclosed sketch will explain itself:




A is a cutter, and B a collar, screwed upon the cutter bar, C. The edge of this collar fits into a notch on either end of the cutter, as shown at D, thus leaving the cutter as strong as possible at the center, and giving it a solid support at the point where support is needed, and at the same time insuring its always coming alike.

Brooklyn, N. Y. Theodore L. Webster.

[The device seems to be eminently well calculated for the support of the cutter on a boring bar, and is applicable, with but slight modification, to a pin or "teat" drill. Machinists will readily perceive its operation and excellencies.—Eds.

### Tides and Their Causes.

The phenomenon of the daily tides of our seacoasts and tidal rivers is attributed to the attraction of the moon upon the earth—that the moon draws the earth towards it, and that in drawing the earth towards it, it bulges up the water of the ocean on the side presented towards the moon, and drawing the earth and water thus on that side, also draws the earth *away* from the water on the opposite side of it, and thus leaves the water bulged up on *that* side, and in doing all this the effect comes after the cause some three hours, which is termed "the tide lagging behind." Now if we knew, *per se*, what attraction of gravitation was, and that it produced this anomaly of force, there would be nothing to question in the matter. But as we only know by attraction that it means *drawing to*, it is impossible to reconcile the theory of the tides as they run to the attraction of the moon. If the moon is so potent in drawing up, why does it not draw a bulge on the inland seas—our great lakes? I will not discuss the question of the moon's Apogee and Perigee—its different velocities in different pasts of its orbit, as laid down by the law of Kepler, or whether it turns once on its axis in a month, or not, as either theory will answer for its phases, as well as for the face of the "Man in the Moon," but I will endeavor to give a more rational theory for the phenomenon of the daily tides.

The earth revolves on its axis and makes a revolution every twenty-four hours, and this moves its equatorial surface nearly a thousand miles per hour. Now the water on its surface, covering about three-fourths of it, and being more mobile than the solid earth, is, by centrifugal force, made to roll around the earth, the same as the water is made to move around the grindstone when in motion, a thing familiar to every body that uses that instrument. In the Southern Ocean this motion of the water is so well known to mariners who double Cape Horn in sailing from San Francisco to New York, that they now run considerably lower down in order to ride this tide eastward, than they did in former times. Here then we have one fact of water tide more comprehensive, at least, than the tractive theory of the moon. We have also the fact of two great promontories in Capes Horn and Good Hope, where this great tidal wave must strike against, and they produce constant oscillations of the water to and fro, and produce gurgitation and regurgitation in all the gulfs and rivers that line the coasts of the Northern, or more properly, the Land Hemisphere. These gurgitations swell the water highest in the places where the seas become the narrowest, as the more northern latitudes. In addition to these daily oscillations of the water, there are constant eddy currents, denominated "Gulf Streams," all agreeing in their courses and motion to this theory of the ocean tides.

When our present received tide theory of moon attraction was first laid down, the fact of the water of the great Southern ocean rolling round faster than the solid parts of our planets was not known. Smith, in his Physical Geography, says, "The tidal wave flows from east to west, owing to the earth's daily rotation in a contrary direction." Here he is unintentionally correct, because the water striking these promontories of the two great capes, is hurled back, and not, as he assumes, that the great ocean wave is moving from east to west. The United States government sailing charts lay down the fact of this great ocean wave moving from west to east, south of the capes, and the ships coming from the Pacific to the Atlantic ocean take advantage of this, and ride the sea at the rate of over twenty knots per hour, by following the routes laid down in Maury's charts.

The old philosophy of the crystalline spheres was not more at variance with the correct motion of the stars and planets, than the moon theory of the tides. In their dilemma to account for the retrograde motions of the planets, they denominated them wanderers, straggiers, because they would not march with the "music of the spheres." In the moon theory of the tides the lunar satellite is made to pull and push at one and the same time, which is entirely at variance with the philosophy of force.

There is nothing in the heavens, nor in the earth, that proves to us positively that the sun holds the planets, and the planets their satellites, by attraction, as we are taught that the moon attracts the water of our world. We see that all terrestrial bodies tend toward the center of the earth, and we call this gravitation; but we cannot see how a body moves around the earth without falling on it, by this law. We say in dynamic philosophy, that bodies move in the direction of least resistance, and *that* we can positively understand; but what force *per se* is, we do not know. It is always better for us to explain phenomena by positive known laws and motions, than by any that rest merely upon conjecture.

Lancaster, Pa. Jno. Wise.

### The Great Hoosac Tunnel.

Messrs. Editors:—In No. 23, Vol. XVII., of your paper, is an article upon the Hoosac Tunnel, but made up from data nearly a year old, and consequently not correctly representing the tunnel as it is at the present time. Your conclusions of course were based upon the same data; but during the past year, and especially during the past five months, much greater progress has been made than ever before upon the work, and a knowledge of what has been done since the last report was issued will, I think, give you a different impression of the time required for its final completion.

Referring to the profile in that number of the Scientific American, the following are the distances to the various points where the work is being prosecuted:

| | | | |
|---|---|---|---|
| Distance from | east end to central shaft | 12,837.294 | feet. |
| " " | central shaft to west shaft | 9,747.072 | " |
| " " | west shaft to new shaft | 265.000 | " |
| " " | new shaft to well No. 4 | 659.150 | " |
| " " | well No. 4 to pier* | 1,522.825 | " |
| " " | east end to pier* | 25,031.341 | " |

* The instrument pier is 4 feet west of the present west end of the tunnel.

The following are the lengths of the headings at the various points of the work, Dec. 2, 1867:

| | | |
|---|---|---|
| Length of east end heading | 4,608.000 | feet. |
| " " west shaft, east heading | 1,252.000 | " |
| " " " " west heading | 611.000 | " |
| " " west end heading | 617.000 | " |
| Total length of headings | 7,0 8.000 | " |
| Leaving | 17,933.341 | " |

or 3,396 miles of heading yet to be made, of which 1,218.975 feet are between the west end and the west shaft, and 16,714.366 feet between the west shaft and east end of the tunnel.

The central shaft is down 583 feet, and well No. 4 is down 150 feet.

The progress for the month of November, 1867, was as follows:

| | | |
|---|---|---|
| East end heading | 126.00 | feet. |
| West shaft, east heading | 33.00 | " |
| " " west heading | 5.00 | " |
| West end | 20.00 | " |
| Total for the month of November | 184.00 | " |

Thirty feet of brick arch were completed during the month at the west end, making a total of 516 feet of brick arch completed to date.

The progress for the last six months has been as follows:

| | | |
|---|---|---|
| East end | 711.00 | feet. |
| West shaft, east heading | 216.00 | " |
| " " west " | 353.00 | " |
| West end | 150.00 | " |
| Total, from June 1, to Dec. 2 | 1,395.00 | " |
| " for the previous six months | 632.00 | " |
| " " " year ending Dec. 2, 1867 | 2,027.00 | " |

The new shaft has been sunk, and at its foot are the pumps which, together with those at the west shaft, are now throwing out between 900 and 1,000 gallons of water per minute.

During the last month great quantities of water were struck at both headings of the west shaft (70 gallons per minute at the east heading in one day), and the work was stopped in consequence, which accounts for the small progress at this point. A new pump of 1,000 gallons per minute capacity will be at work, in addition to the above, in a few days, and the work can then go forward with increased rapidity.

Well No. 4 is an artesian well, which is now being carried down as a shaft to afford two more faces to work from. Its depth will be, when finished, 215 feet, its dimensions 8 by 8 feet.

At the rate of progress for the past year it will require but eight years and ten months to pierce through the mountain.

and at the rate for the past six months it will require but six years and five months. But when the central shaft and well No. 4 are sunk to grade the number of faces to work from will be doubled, and the time of completion thereby greatly diminished. At present drilling machines are employed only at the east end, but in a few weeks they will be used at the west shaft, and also at the central shaft as soon as the buildings and machinery are again in place, and this again will hasten the completion of the work. At the west shaft buildings are already erected for the manufacture of nitro-glycerin, and the use of this powerful explosive will be adopted during the present month. In fine, every means that will hasten the work will be employed, and ere the present generation passes away, and even within from four to seven years, trains loaded with freights and passengers will pass and repass through the great heart of the Hoosac Mountain as an hourly occurrence.

A. BEARDSLEY, C. E, Asst. Engineer.

North Adams, Mass.

### Horse-hair Snakes--Wonderful Transformation.

MESSRS. EDITORS:—In No. 21, current volume, you referred H. K., of Wis., who had described the horse-hair snake, to page 280, No. 18 current volume, for a reply, which you considered "sufficient." With your kind permission I would like to speak a few words about the "snakes" in question. When I resided in Pennsylvania, I, in company with many other lads, used to tie a bundle of horse hairs into a hard knot and then immerse them in the brook, when the water began to get warm, and in due time we would have just as many animals, with the power of locomotion and appearance of snakes, as there were hairs in the bundle. I have raised them one-eighth of an inch in diameter, with perceptible eyes and mouth on the butt end or root part of the hair. Take such a snake and dip it in an alkaline solution. and the flesh or mucus that formed about the hair will dissolve, and the veritable horse hair is left. They will not generate in limestone water, only in freestone or salt water.

Covington, Ky. T. W. B.

### Man Proposes, but God Disposes.

It may not be generally known that but for one of those accidents which seem to be almost a direct interposition of Providence, Prof. Morse, the originator of the magnetic telegraph, might have been now an artist instead of the inventor of the telegraph, and that agent of civilization be either unknown or just discovered. We publish from Tuckerman's "Book of the Artists" just from the press of G. P. Putnam & Son, the following reminiscence of Prof. Morse:

"A striking evidence of the waywardness of destiny is afforded by the experience of this artist, if we pass at once from this early and hopeful moment to a more recent incident. He then aimed at renown through devotion to the beautiful; but it would seem as if the genius of his country, in spite of himself, led him to this object, by the less flowery path of utility. He desired to identify his name with art, but it has become far more widely associated with science. A series of bitter disappointments obliged him to "coin his mind for bread", for a long period, of exclusive attention to portrait painting, although, at rare intervals, he accomplished something more satisfactory. More than thirty years since, on a voyage from Europe, in a conversation with his fellow passengers, the theme of discourse happened to be the electro-magnet; and one gentleman present related some experiments he had lately witnessed at Paris, which proved the almost incalculable rapidity of movement with which electricity was disseminated. The idea suggested itself to the active mind of the artist, that this wonderful and but partially explored agent might be rendered subservient to that system of intercommunication which had become so important a principle of modern civilization. He brooded over the subject as he walked the deck, or lay wakeful in his berth, and by the time he arrived at New York, had so far matured his invention as to have decided upon a telegraph of signs, which is essentially that now in use. After having sufficiently demonstrated his discovery to the scientific, a long period of toil, anxiety, and suspense intervened before he obtained the requisite facilities for the establishment of the magnetic telegraph. It is now in daily operation in the United States, and its superiority over all similar inventions abroad was confirmed by the testimony of Arago and the appropriation made for its erection by the French Government.

"By one of those coincidences which would be thought appropriate for romance, but which are more common, in fact, than the unobservant are disposed to confess, these two most brilliant events in the painter's life—his first successful work of art and the triumph of his scientific discovery—were brought together, as it were, in a manner singularly fitted to impress the imagination. Six copies of his "Dying Hercules" had been made in London, and the mold was then destroyed. Four of these were distributed by the artist to academies, one he retained, and the last was given to Mr. Bulfinch, the architect of the Capitol—who was engaged at the time upon that building. After the lapse of many years, an accident ruined Morse's own copy, and a similar fate had overtaken the others, at least in America. After vain endeavors to regain one of these trophies of his youthful career, he at length despaired of seeing again what could not fail to be endeared to his memory by the most interesting associations. One day he was superintending the preparations for the first establishment of his telegraph in the room assigned at the Capitol. His perseverence and self-denying labor had at length met its just reward, and he was taking the first active step to obtain a substantial benefit from his invention. It became necessary in locating the wires, to descend into a vault beneath the apartment, which had not been opened for a long period. A man preceded the artist with a lamp. As they passed along the subterranean chamber the latter's attention was excited by something white glimmering through the darkness. In approaching the object, what was his surprise to find himself gazing upon his long-lost Hercules, which he had not seen for twenty years. A little reflection explained the apparent miracle. This was undoubtedly the copy given to his deceased friend, the architect, and temporarily deposited in the vault for safety, and undiscovered after his death.

### Extraordinary Effects of an Earthquake---An American Man-of-War Carried Over the Tops of Warehouses and Stranded.

[OFFICIAL REPORT.]

UNITED STATES STEAMSHIP "MONONGAHELA,"
St. CROIX, Nov. 21, 1867.

SIR:—I have to state, with deep regret, that the United States steamship *Monongahela*, under my command, is now lying on the beach in front of the town of Frederickstadt, St. Croix, where she was thrown by the most fearful earthquake ever known here. The shock occurred at 3 o'clock, P. M., of the 18th inst. Up to that moment the weather was serene, and no indication of a change showed by the barometer, which stood at 30 degrees 15 minutes. The first indication we had of the earthquake was a violent trembling of the ship, resembling the blowing off of steam. This lasted some 30 seconds, and immediately afterward the water was observed to be receding rapidly from the beach. In a moment the current was changed, and bore the ship toward the beach, carrying out the entire cable and drawing the bolts from the kelson, without the slightest effect in checking her terrific speed toward the beach. Another anchor was ordered to be let go, but in a few seconds she was in too shoal water for this to avail. When within a few yards of the beach, the reflux of the water checked her speed for a moment, and a light breeze from the land gave me a momentary hope that the jib and foretopmost staysail might pay her head off shore, so that in the reflux of the wave she might reach waters sufficiently deep to float her, and then be brought up by the other anchor. These sails were immediately set, and she payed off so as to bring her broadside to the beach. When the sea returned, in the form of a wall of water 25 or 30 feet high, it carried us over the warehouses into the first street of the town. This wave in receding took her back toward the beach, and left her nearly perpendicular on the edge of a coral reef, where she has now keeled over to an angle of 15 degrees.

All this was the work of a few moments only, and soon after the waters of the bay subsided into their naturally tranquil state, leaving us high and dry upon the beach. During her progress toward the beach she struck heavily two or three times; the first lurch carried the rifle gun on the forecastle overboard. Had the ship been carried 10 or 15 feet further out she must inevitably have been forced over on her beam ends, resulting, I fear, in her total destruction, and in the loss of many lives. Providentially only four men were lost; these were in the boats at the time the shock commenced. The boats that were down were all swamped except my gig, which was crushed under the keel, killing my coxswain, a most valuable man. During this terrific scene the officers and men behaved with coolness and subordination. It affords me great pleasure to state, that, after a careful examination of the position and condition of the ship, I am enabled to report that she has sustained no irreparable damage to her hull. The sternpost is bent, and some 20 feet of her keel partially gone; propeller and shaft uninjured. The lower pintle of the rudder is gone, but no other damage is sustained by it. No damage is done to her hull more serious than the loss of several sheets of copper, torn from her starboard bilge and from her keel.

She now lies on the edge of a coral reef, which forms a solid foundation, on which ways may be laid. She can thus be launched in 10 feet of water at 100 feet from the beach. Gentlemen looking at the ship from shore declare that the bottom of the bay was visible where there was before, and is now, 40 fathoms of water.

To extricate the ship from her position I respectfully suggest that Mr. I. Hanscom be sent down with suitable material for ways, ready for laying down, and india-rubber camels to buoy her up. I think there is no insuperable obstacle to her being put afloat, providing a gang of ten or twelve good ship carpenters be sent down with the Naval Constructor, as her boilers and engines appear to have sustained no injury. A valuable ship may thus be saved to the navy, with all her stores and equipments.

S. B. BISSELL, Commodore Commanding.

Rear-Admiral J. S. Palmer, commanding H. A. Squadron, St. Thomas.

THE survey of another trans-continental railway route, which shall follow mainly the 35th parallel of latitude, is nearly completed. Its projectors claim this as the most feasible one across the continent and even if the northern and southern roads are constructed, this would still be the favorite popular thoroughfare, and the easiest and cheapest built.

THE CHILIAN GUN now being built at Pittsburgh, is 22¼ feet in length, being two feet longer than the famous Rodman gun at Fort Hamilton, this harbor, but of exactly the same bore, twenty inches. Its greatest diameter is 5 feet 4 inches, its least diameter, 2 feet 9 inches. The gun is designed for garrison or naval service.

FROM lack of economy, in reduction of ores, it is estimated that the aggregate loss on the production of bullion in this country for the present year will reach the sum of $25,000,000.

## Recent American and Foreign Patents.

*Under this heading we shall publish weekly notes of some of the more prominent home and foreign patents.*

WARDROBE.—Nathan Turner, West Lynn, Mass.—This invention consists in a movable or swinging arrangement of the sides and top and bottom, whereby they are folded upon each other, with grooves or strips in or upon the sides to support shelves when used as a closet or book case, and which shelves may be removed when used as a wardrobe.

AXLE BOX.—Henry B. Pitner, La Porte, Ind.—This invention consists of an iron thimble or sleeve provided on each end in the inside with a screw thread, into which are fitted ends of brass or composition, or other metal softer than iron, in such a way that said metallic ends will not turn in the box, and so that the axle bears only upon the softer metal.

SPRING FORMER.—George S. Long, Bridgeport, Conn.—This invention consists of a vibrating anvil or former, upon which the steel to be worked is placed, said former vibrating under a roller, said roller being hollow, and provided with holes or orifices through which water received in the shaft of said roller is distributed upon the heated steel.

DOOR-FASTENER.—Francis C. Levalley, Warrenville, N. Y.—The present invention relates to a fastener for doors more particularly, which, in the construction and arrangement of its parts, is simple, and most effective, and secure, when fastened.

ROOFING.—Orville Manly, Garrettsville, Ohio.—This invention consists of tiles saturated with raw coal tar, made in the same way as ordinary brick, having all the edges bevelled, being thicker at one end, and laid upon the roof with the thicker end towards the eaves, and the spaces between the tiles formed by the bevelled sides of the same filled with a cement made of raw coal and clay.

FOLDING BEDSTEAD OR CRIB.—R. S. Titcomb, Gloversville, N. Y.—This invention consists of the parts being attached to each other by pivots and hinges, whereby the same may be folded in upon the bed and clothing, and upon each other.

CAST METAL CASES FOR SPRING BALANCES.—John Chattillon, New York city.—This invention relates to a new manner of arranging the cast metal cases for spring balances, so that they can be made less expensive and simpler than they are now made, and consists in fitting the iron, to which the upper end of the spring is secured, directly through the upper head of the case, instead of using an additional head in the case for that purpose.

TWEERS.—John B. Himberg, Frederick City, Md.—This invention relates to a new tweers, which is so arranged that the center part or ring can be easily taken out, whenever desired, but not accidentally, by a hook or stirrer, and that it can be easily cleaned and taken apart whenever desired, and that it may conduct a strong blast of air to the fire.

PUNCH.—C. D. Flesche, New York city.—This invention consists in arranging a punch in such a manner that it consists of two parts, which are firmly connected together for cutting the metal, while for bending the same, an inner sliding punch will be moved out of the stationary cutting punch, thus making both operations by one instrument, and avoiding the removal of the article from the cutting to the bending punch, which was heretofore necessary.

RAILROAD CHAIR.—Leander Pollock, Matteawan, N. Y.—This invention consists in making the chair of two pieces, each piece consisting of one cheek and of a portion of the case. When the two pieces are connected, the base of one rests upon the base of the other, the line of division between the two bases being inclined so that as the rail presses upon the upper base, it will tend to force the same downward on the incline, whereby the two cheeks will be brought together.

FIRE LADDER.—Johan Blomgren, Galesburg, Ill.—The main feature in this invention is a telescopic tube, expanded or closed by a coil fitting within it, and worked by a toothed wheel.

HARVESTER.—Francis C. Coppage, Terre Haute, Ind.—The object of my invention is to render more simple and effective the machinery for operating and adjusting the cutter bar and the reel of harvesters.

BOAT-DETACHING APPARATUS.—David L. Cohen, Pensacola, Fla.—The object of this invention is to furnish a device by which a ship's boat can be readily shipped or launched at sea, without danger of capsizing or fouling.

DEVICE FOR HITCHING HORSES.—Samuel Galbraith, New Orleans, La.—This invention is a neat, cheap, and durable device, designed to be attached to halters used in hitching horses, mules, etc., to prevent their being thrown, hung, or injured.

HYDROSTATIC MACHINE.—Dr. J. R. Cole, Kenton Station, Tenn.—The object of this invention is to construct a machine which, by the application of but little power, will raise a stream of water to any desired hight, to furnish motive power for machinery or for other purposes.

FENCE POST.—Robert Ramsay, New Wilmington, Pa.—In this invention the bottom of the post is supported between two parallel sills a short distance from the ground, the post being dovetailed and held by keys passing across the sills, and being adjusted high or low, or at any inclination, by making the keys larger or smaller, or of different sizes.

SELF-LOADING EXCAVATOR.—Benj. Slusser, Sidney, Ohio.—In this invention a pinion, attached to the forward axle is made to elevate the plow, when desired, and at the same instant to ungear and stop the endless apron carrier that conveys the dirt from the plow to the cart. A new method of instantly unloading the cart, and setting it again to receive another load, is shown.

WASHING MACHINE.—J. Q. Leffingwell, Nevada, Iowa.—This invention relates to an improvement in washing machines, and consists of a vibrating semi-cylindrical box operated by a means of a lever handle and gearing.

SCAFFOLD FOR BUILDERS, ETC.—John E. Bliss, Oxford, Ind.—This invention has for its object to furnish an improved scaffold for the use of carpenters, masons, painters, etc., which shall be simple in construction, strong, durable and easily adjusted to any desired hight.

PLOW.—Harvey Briggs, Smithland, Ky.—This invention has for its object to furnish an improved plow for breaking up sod or prairie land, which shall be strong and durable in construction and effective in operation.

CORN PLOW.—John Snyder, Williamsfield, Ohio.—This invention has for its object to furnish an improved plow for plowing and hoeing corn, which shall be simple and strong in construction and will do its work well.

SELF-RAKING ATTACHMENT FOR REAPERS.—James H. Glass and Albert J. Glass, McGregor, Iowa.—This invention has for its object to furnish an improved attachment for reapers of that class in which the rakes act as beaters, in the place of a reel, and are made to descend occasionally to sweep the bundle from the platform, so that the third, fourth, sixth, or any other desired rake may sweep the platform and deliver the bundle.

SKY ROCKET.—John W. Hadfield, Newtown, N. Y.—This invention relates to a modification of an improvement in sky rockets for which letters patent were granted to this inventor bearing date Nov. 28, 1865. The original improvement consisted in a novel application of wings to the body or "carcass" of the rocket, whereby the use of the ordinary guide stick was rendered unnecessary and the rockets rendered capable of being packed for transportation much more compactly than when provided with sticks. The present invention also consists in a novel manner of attaching the wings to the body or "carcass" of the rocket, whereby the same advantage is obtained as hitherto, at a less cost of manufacture.

TAILPIECE FOR VIOLINS.—James Thoms, South Boston, Mass.—This invention relates to a new and improved manner of attaching the E-string to the tail piece of a violin, whereby a comparatively small portion of said string is wasted in case of breakage.

HAME TUG.—James E. Covert, Townsendville, N. Y.—This hame tug, according to the present invention, is made of a strip of malleable iron or other suitable material, perforated or provided with V-shaped holes or slots having a center tongue piece, for the reception of a V-shaped block fixed at one end of the trace, by means of which block the trace is engaged with the hame tug, where through a suitably arranged spring slot that strikes against the end of the tongue to the said V-slots, the block is held firmly in place, and consequently the trace fastened to the hame tug