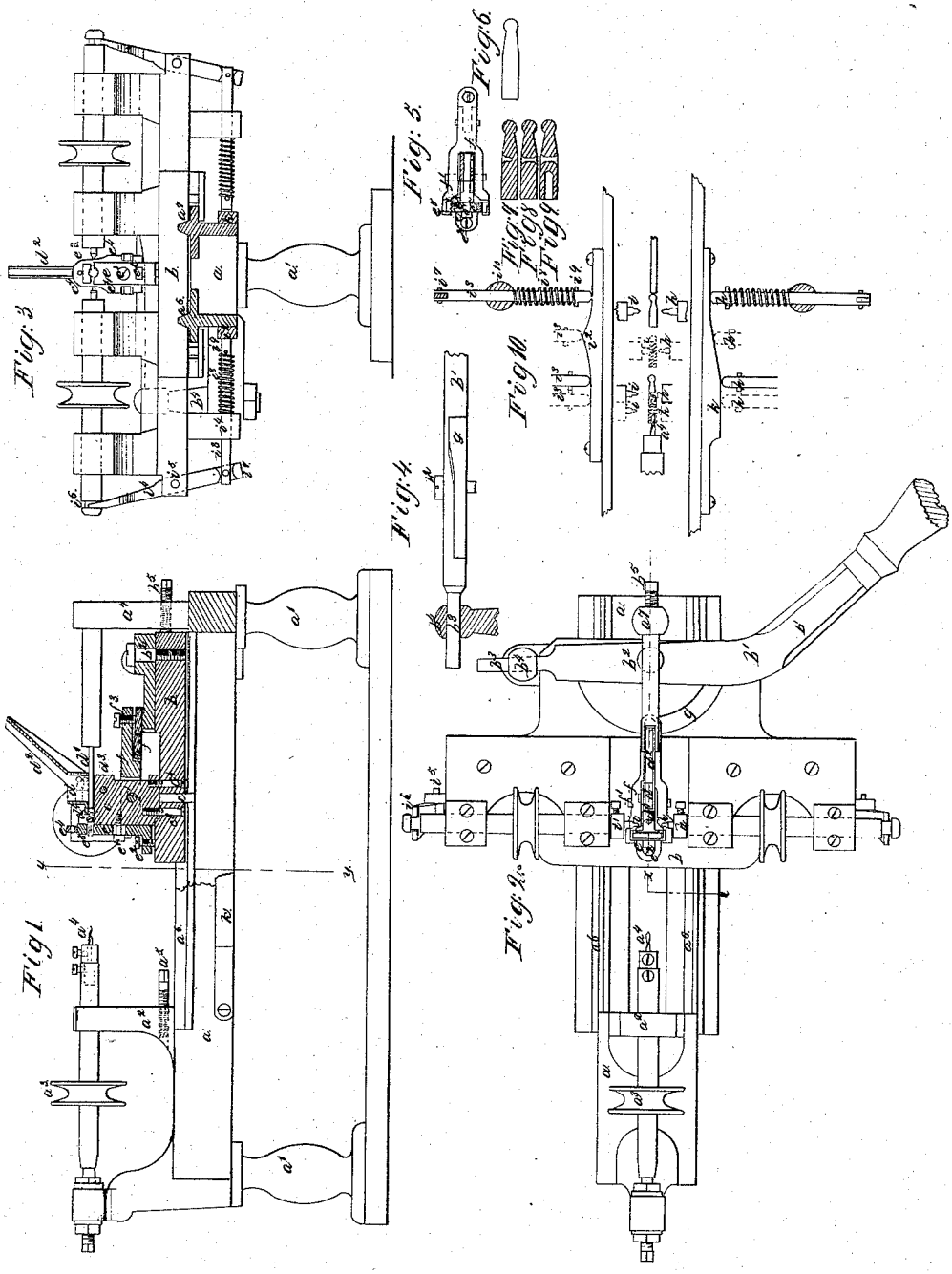
J. W. Lyon.

Making Umbrella Irons.

No. 56,239. Patented Jul. 10, 1866.



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UNITED STATES PATENT OFFICE.

JAMES W. LYON, OF BROOKLYN, NEW YORK.

IMPROVEMENT IN MACHINES FOR DRILLING AND COUNTERSINKING UMBRELLA-TIPS.

Specification forming part of Letters Patent No. **56,239**, dated July 10, 1866.

To all whom it may concern:

Be it known that I, JAMES W. LYON, of the city of Brooklyn, in the county of Kings, in the State of New York, have invented a new and useful Machine for Drilling and Countersinking Tips for Umbrellas and Parasols; and I do hereby declare that the following is a full and correct description thereof, reference being had to the annexed drawings, and to the letters of reference thereon.

Figure 1 of the drawings represents a front elevation of the machine, a part being broken away to show a section of the feeding apparatus, indicated by dotted lines *x x*, Fig. 2. Fig. 2 is a plan view of the machine; Fig. 3, a cross-section through the machine at the place indicated by dotted line *y*, Fig. 1; Fig. 4, detached view of part of the hand-lever *b'*, showing the cam that actuates the lever of the holding mechanism; Fig. 5, detached plan view of the lever of the holding mechanism, showing contiguous parts in section; Fig. 6, a tip-blank; Fig. 7, a tip drilled and countersunk in one side; Fig. 8, a tip drilled and countersunk on both sides; Fig. 9, a tip finished, having a socket-hole drilled for the umbrella-rib, as well as the cross-hole for the attachment of the cloth drilled and countersunk; Fig. 10, a diagram showing the side cams operating the side drills, and the position of the tip and drills at different stages of the operation of the machine.

My said machine is designed more particularly for brass or other metallic tips.

It consists of a feeding mechanism, a holding mechanism, mechanism for drilling and countersinking the cross-hole, whereby the cloth of the umbrella or parasol is attached to the tip, and mechanism for drilling the socket, whereby the tip is attached to the rib of the umbrella, the whole combined and arranged upon a lathe-shears and sliding bed so that (the drills being provided with means of rapid rotation from counter-shafts above, as usual in lathes and drilling-machines) the various devices are brought into successive action upon the blanks supplied to the machine by the simple movement back and forth of a hand-lever grasped by the operator, the power required for this purpose being so little and the machines so small that boys or girls can operate them with ease.

But to more particularly describe the machine, I will refer to the annexed drawings by letters of reference, the same letters referring to the same parts shown in the different figures of the drawings.

The lathe-shears *a* are supported by standards *a' a'*, the feet of which may be secured to a table or work-bench.

The lathe-head a^2 contains an ordinary lathe-spindle provided with a grooved pulley, a^3, and a drill, a^4, of the proper size for drilling the tip-socket.

Below the drill is a projecting set-screw, a^5, which serves as an adjustable stop to limit the forward motion of the sliding bed, thereby determining the depth of the socket.

The lathe-shears are provided with slides a^6, as usual, upon which a sliding bed, *b*, fitted with corresponding grooves, slides back and forth, being moved by a hand-lever, *b'*, pivoted on the sliding bed at b^2, and having a sliding or movable fulcrum, b^3, in a hole in the head of the swiveling-standard b^4. The backward movement of the sliding bed is limited by the adjustable stop b^5, which is a screw placed in the standard a^7, rising from the tail end of the lathe. Upon the sliding bed is firmly secured a block of metal, *c*, by means of a pin, *c'*, projecting down from the block into a hole in the bed, and two screws, c^3 c^4, passing up through the bed and screwing into the block.

The feeding mechanism consists of a hopper, *d*, and a horizontal stationary pusher or plunger, *d'*, attached to a horizontal arm projecting from the upright standard a^7. The hopper is provided with an inclined channel, d^2, which communicates with the hopper, and in which the blanks are placed to slide down into the hopper. The hopper is secured to the block *c* by a screw, d^3. At the bottom of the hopper a groove is formed longitudinally in the top of the block *c*, terminating in front of the hopper in a short tube, d^4, or hole in that part of the metal of the block which extends above the line of the groove in front of the hopper. A hole in the rear of the hopper permits the entrance of the horizontal pusher when the sliding bed is moved back by the hand-lever. The pusher, the groove at the bottom of the hopper, and tube in front, as well as the entrance-hole in the rear, all lie in the axis of the longitudinal drill-spindle and transverse to

the axis of the cross-spindles; and the arrangement of hopper, pusher, groove, and tube relatively to each other and to the other parts of the machine is such that when the sliding bed is moved back against the back stop a tip-blank will be pushed forward from the bottom of the hopper, through the tube in front, into the jaws of the holding mechanism, and when the sliding bed moves forward the hopper moves with it away from the pusher. The pusher being thus withdrawn from the bottom of the hopper gives room for the tip next above in the hopper to drop into the groove, to be in its turn pushed forward.

It will be observed that in feeding the tip is moved farther forward than is necessary to permit the succeeding tip to drop into its place. This excess of motion is given because the rear end of the tip-blank just thrown forward, being rounded, would be apt to tip up the front end of the succeeding tip-blank when it in turn was being pushed forward, and cause it to strike against the front of the hopper, thus stopping it from being pushed forward. By pushing forward the tip-blank far enough to permit the succeeding tip-blank to enter the short tube before coming in contact with the blank preceding it this difficulty is avoided.

It may as well be stated here that the operation of pushing forward the blank discharges the finished tip by pushing it forward out of the holding mechanism, the blank taking its place therein. The hopper, as shown in the drawings, is of a length corresponding to the length of the tip-blanks, and of width only sufficient to admit of the descent of one blank at a time.

The holding mechanism consists of griping-dies adjustable and operated by levers and cams as follows: On the front of the block c, or that part which faces the socket-drill, is a die-plate, e, secured to the block c by a screw, e', there being a slot in the die-plate, through which this screw passes, to permit of its being moved vertically for the purpose of adjustment, the adjustment being determined by the adjusting-screw e^2 in the foot of the die-plate e. In the top of this die-plate is sunk a die or groove corresponding with the tip-blank it is to receive, the groove being a continuation of the feeding groove and tube of the hopper. This forms the lower griping-die of the holding mechanism. The upper die, e^3, is made to fit the blank, and is attached to a yoke, e^4, which slides up and down on slides e^5 at each side of the adjustable die-plate e, so that the upper die, e^3, can be brought down toward the lower die to gripe and hold the blank while being drilled, and then lifted to discharge the finished tip and receive a new blank. The object of providing means of adjustment for the lower die is to center blanks of different diameters properly for the drills. The yoke which holds the upper die is moved up and down to gripe and release the blanks by a forked lever, f, which is pivoted to the block c by a fulcrum-pin, f', on which it turns freely, the pin passing through the block and both members or forks of the forked lever.

The forked lever is lifted when the hand-lever is thrown forward by means of a cam, g, attached to and turning with the hand-lever. The weight of that end of the forked lever which is acted on by the cam is sufficient to react the forked lever when the hand-lever is thrown back; but if desired a spring may be used in addition, and in such case the spring may be fastened at one end to the side of the hopper, and the other may project through the hole shown in the top of the yoke.

The tail of the forked lever, or that part of it acted on by the cam, is provided with means of adjustment, a hinged piece, f^2, and set-screw f^3 being used for that purpose, the operation of the holding mechanism being to gripe the blank when the sliding bed is thrown forward and to release the blank when the sliding bed is being moved back.

The mechanism for drilling and countersinking the cross-hole in the blank remains to be described.

In a line that crosses the line of the axis of the main or socket drill-spindle, just behind the holding-dies, are two opposite drills, h and i, each provided with cutting-surfaces adapted to countersink as well as to drill, it being necessary to countersink the cross-hole on both sides of the tip in order to prevent the cutting of the thread by which the cloth is fastened to the tip when used in the making of umbrellas, parasols, &c.

The drill-spindles h' and i', which carry the drills h and i, respectively, are of similar construction. They each have a grooved pulley, by which rapid motion can be imparted from a band running from a countershaft above. They are each moved toward and from the blank to drill and countersink the cross-hole from opposite sides by means of cams and levers, as follows: The drill i is moved first to drill and countersink the hole on its side of the blank by means of the cam i^2 on the back side of the lathe, which, when the sliding bed moves forward, presses out the sliding bar i^3, and thus communicates a sliding action to the drill-mandrel i' through the lever i^4, which is pivoted upon the sliding frame by a fulcrum-pin, i^5, and is connected with the drill-spindle by fork-and-groove connection i^6, and also with the sliding bar by a joint, i^7. The sliding bar, and consequently the drill, is reacted by a spring, i^8, coiled around the sliding bar, one end being fastened thereto at i^9, and the other pressing against a stud, i^{10}, on the sliding frame, which carries the sliding bar, and through which it slides.

The parts which actuate the opposite drill, h, are the same in construction as those which operate the drill i, as is clearly shown by the drawings, except in the shape and location of the cam k, that governs the action of the drill h. This, as will be seen by the drawings, more especially by the diagram Fig. 1, is so shaped and located that it does not bring into

action the drill h until the cam i^2 has caused the drill i to bore and countersink its side of the cross-hole in the tip-blank, and then, the drill i having been moved back by the action of the spring i^3, owing to the shape of the cam governing the drill i, the drill h is moved forward by the cam k in time to drill and countersink its part of the cross-hole while the socket-hole is being drilled. The object of throwing in the opposite drills successively, instead of simultaneously, is to prevent the drills from interfering with each other, as they would do if thrown in simultaneously.

From the above description, taken in connection with the drawings, it will be seen that at every back motion of the sliding frame a blank is fed and a finished tip discharged, and that at every forward motion of the sliding bed a blank is griped by the holding mechanism, drilled and countersunk by the drills, and a blank suffered to drop into place to be fed in its turn by the back motion of the sliding bed.

I claim as my invention in the above-described machine for finishing umbrella-tips—

1. The stationary pusher and the hopper, with its rear entrance, bottom groove, and short tube in front, in combination with the sliding frame and main frame or shears, substantially as described.

2. The combination of the holding mechanism with the feeding mechanism and the sliding bed of a lathe, the mechanism and combination being such, substantially as herein described, as to gripe and hold the blank during the forward movement of the sliding bed, to release and discharge the finished blank and feed a new blank during the back motion of the sliding bed.

3. In combination with the socket-drill on the main frame or shears, the cross-drills for drilling and countersinking the cross-holes, when combined with the sliding bed and operated by cams on the main frame, substantially in the manner described.

4. In combination with the socket-drill on the main frame, the feeding mechanism and the transverse or cross-drilling mechanism, the whole being arranged and combined, substantially as hereinbefore described, to feed, hold, drill, countersink, and discharge blanks supplied to the machine by the back and forward motions of the sliding bed, substantially as set forth.

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