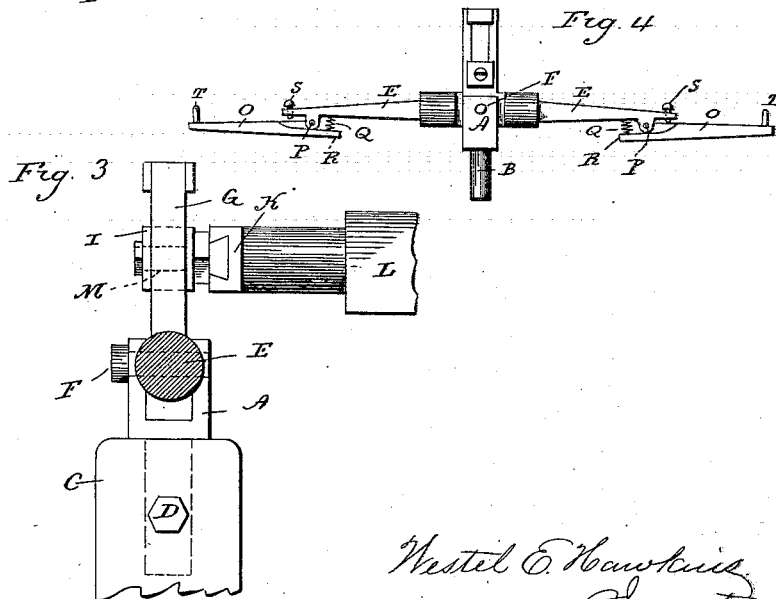
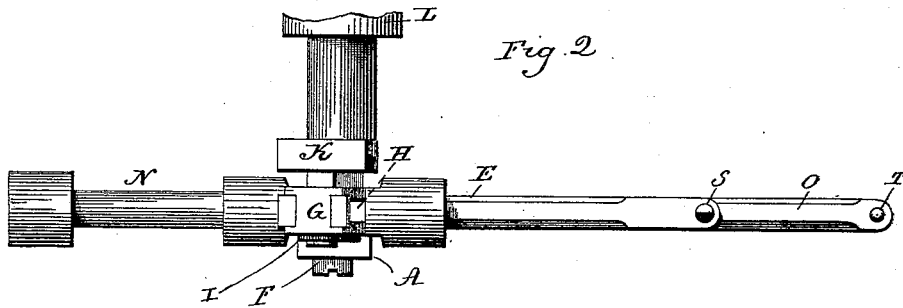
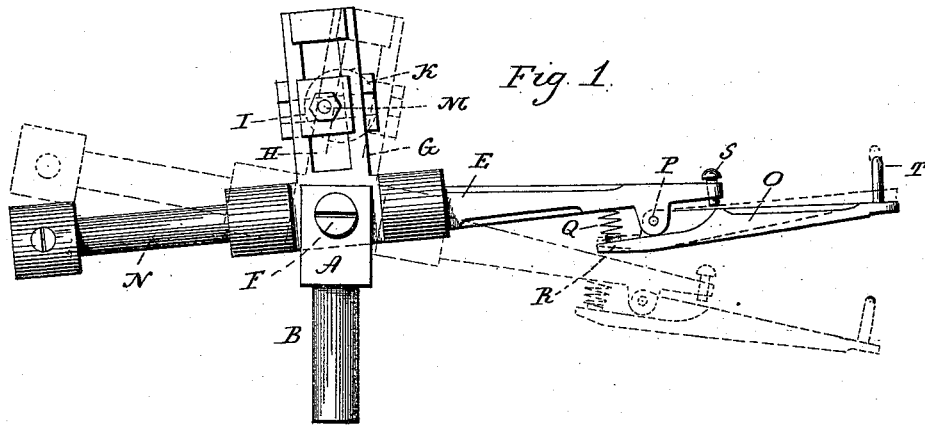


(No Model.)

W. E. HAWKINS.
MACHINE FOR EMBOSsing METAL.

No. 437,432.

Patented Sept. 30, 1890.



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UNITED STATES PATENT OFFICE.

WESTEL E. HAWKINS, OF WALLINGFORD, CONNECTICUT, ASSIGNOR TO THE
SIMPSON, HALL, MILLER & COMPANY, OF SAME PLACE.

MACHINE FOR EMBOSSING METAL.

SPECIFICATION forming part of Letters Patent No. 437,432, dated September 30, 1890.

Application filed March 10, 1890. Serial No. 343,297. (No model.)

To all whom it may concern:

Be it known that I, WESTEL E. HAWKINS, of Wallingford, in the county of New Haven and State of Connecticut, have invented new
5 Improvements in Machines for Embossing Metal; and I do hereby declare the following, when taken in connection with accompanying drawings and the letters of reference marked thereon, to be a full, clear, and exact description
10 of the same, and which said drawings constitute part of this specification, and represent, in—

Figure 1, a side view of the apparatus with the parts standing as about to impart the blow,
15 the blow being represented by the hammer in broken lines, the return-stroke of the bar and hammer also represented in broken lines; Fig. 2, a top or plan view of the same; Fig. 3, a front view, the hammer-arm broken away
20 for convenience of illustration; Fig. 4, the invention arranged as for double operation.

This invention relates to a device for performing the preliminary work of embossing ductile metals—such, for illustration, as hollow
25 ware. The embossing of such metals is generally produced by applying upon the reverse side a soft or yielding material, as a combination of pitch, which, while presenting a support to the metal, will yield to any
30 considerable pressure or force applied to the opposite side of the metal, and the embossing is usually performed by means of an instrument held in one hand, the point of the instrument presented upon the surface to be
35 operated upon, and then struck by a hammer in the other hand, being entirely a hand operation. Much of the raising or depressing of the metal is to a considerable extent produced by degrees, and as it must be the operation is
40 an expensive one.

The object of my invention is the construction of a machine whereby the preliminary embossing may be mechanically produced and
45 with much greater rapidity than when produced by hand; and the invention consists in the arrangement of a rapidly-vibrating hammer adapted to produce a yielding stroke, the hammer presenting a face corresponding substantially to the face of the instrument usually
50 employed by hand, and so that the vibrations of said hammer will produce a rapid

succession of blows upon the surface of the metal to extend or stretch the metal substantially the same as in the hand operation, as more fully hereinafter described. 55

In the best adaptation of the machine I arrange the parts so that it may be set into a common lathe and operated by the usual rotation of the mandrel.

A represents the head of the machine, which
60 is applied to a lathe. It is constructed with a shank B to set into the post C of a lathe-rest, where it may be secured by the usual set-screw D. The head stands vertical, as shown, and in the head a bar E is hung upon
65 an axis F in the head, so as to swing freely up and down, that it may receive a vibratory movement in a vertical plane. Such vibratory movement is produced by the conversion of
70 a rotary movement to such vibratory movement. To accomplish this the bar is constructed with a vertical arm G extending upward and constructed with a vertical slot H, in which slot a slide I is arranged to work
75 freely up and down.

K represents a crank, which is made fast in the revolving mandrel L of the lathe, and so as to revolve with the mandrel in a vertical plane parallel with the arm G. This crank carries a crank-pin M, which extends
80 into the slide I. The throw of the crank is very slight. The revolution of the crank will impart a vibratory movement to the arm G, which will be communicated to the bar E, and so that bar will swing up and down, as indicated by broken lines, Fig. 1, and this vibration of the arm should be very rapid. The arm is counterbalanced by an extension N from the pivot opposite to the bar E. At the
85 end of the bar E the hammer-arm O is hung upon a pivot P, so as to swing in a vertical plane independent of the arm E, yet to partake of the vibratory movement of the bar. A spring Q is arranged at the rear of the pivot P, upon which the tail R of the hammer
90 may rest, and forward of the pivot an adjusting-screw S is arranged, which limits the extent of movement which the hammer-arm may be permitted independent of the bar E—that is to say, the adjustment is such as to
95 allow a limited extent of free play to the hammer-arm. At the outer end of the ham-

mer-arm the hammer-head T is arranged. This is in the form of a stud, presenting a rounded end corresponding substantially to the end of the instrument usually employed
5 by hand for embossing.

As the bar E rises under its vibratory movement, it carries with it the hammer-arm until the extreme upward movement of the bar E is reached, and, as seen in Fig. 1, the tail
10 of the hammer resting against the spring Q in such upward movement; but as the upstroke of the bar is completed the momentum thus imparted to the hammer-arm will cause it to rise until it strikes the adjusting-screw
15 S, and, as represented in broken lines, Fig. 1, thus the hammer receives a slight overmotion, which makes the blow elastic and substantially the same as a blow of the hammer
20 by hand. As the bar E returns to the down position, as in broken lines, Fig. 1, the hammer also returns, and the momentum which is imparted by the descent will cause a similar overmotion to the hammer-arm, which
25 will be met by the spring Q and the spring somewhat compressed, and the reaction of this compression of the spring will be imparted to the hammer-arm with a tendency to raise the hammer. The vibrations being very rapid, this reaction of the spring will be produced on the rise of the hammer to impart its
30 blow. The reaction of the spring therefore gives to the hammer an elastic stroke.

The surface of the metal to be operated upon is placed in a position with relation to
35 the hammer substantially the same as it is usually arranged with relation to the hand instrument, so that the blow of the hammer will be imparted at the required point, the operator moving and adjusting the metal as
40 he moves and adjusts the hand instrument, so that the blows may be produced at the point required and the drawing or embossing gradually produced by successive blows, substantially as produced with a hand instrument.
45 The slide I works in the slot H as the crank revolves in the usual manner for such slides where rotary movement of a crank is required to be converted into vibratory movement. The crank-pin is made adjustable as to throw
50 by being arranged in a longitudinal groove in the crank in the usual manner of adjusting the throw of a crank.

I have described the movement of the hammer as being vertical and the blow as produced in the ascent; but it will be understood that this description is made only with
55 reference to the illustration, and that the position of the parts may be changed so as to make the blow in any desired direction.

60 Instead of providing a counter-balance for the bar, as described, a like hammer may be arranged at both ends of the bar, so that two operators may work at the same machine, as seen in Fig. 4; but it is not to be under-

stood that the counter-balance is essential, 65 but simply that its use is desirable.

I illustrate only a portion of the rest and of the mandrel of the lathe, the construction of the lathe being too well known to require
70 full illustration or description. It will also be understood that the apparatus may be a full organized machine, but that in such organized machine the mechanical parts would correspond to the mandrel of the lathe for
75 imparting the rotary movement to the crank, and the support for the head would correspond to the rest of the lathe.

I claim—

1. In an apparatus for embossing metal, the combination of a vibrating bar, mechanism, 80 substantially such as described, for imparting vibratory movement to said bar, and a hammer-arm pivoted to said vibrating bar and so as to swing in the same plane as the plane of
85 vibration of the bar, the said hammer-arm carrying the hammer-head, the hammer-arm being adapted to partake of the vibration of the bar, but yet adapted to swing upon its own pivot independent of said bar, substantially as described. 90

2. The combination of the head A, the bar E, hung upon a pivot therein and so as to vibrate freely, a crank in connection with said bar, whereby the rotary movement of the
95 crank will be converted into vibratory movement of said bar, and a hammer-arm O, hung to the end of said bar E and so as to swing in the plane of movement of the bar E independent of said bar, the bar carrying a head T at
100 its free end, with an adjusting-screw adapted to limit the extent of such independent movement of the hammer-arm, substantially as described.

3. The combination of the vibrating bar E, the hammer-arm O, hung therein and carrying
105 the hammer-head T, the adjusting-screw S in said bar on one side of a pivot adapted to stop the swinging of said arm in one direction, and a spring arranged to resist the swinging of the said arm in the opposite direction,
110 substantially as described.

4. The combination of the head A, the bar E, hung upon a pivot therein, the said bar constructed with an arm G, projecting therefrom in the plane of movement of the bar, the
115 said arm constructed with a slot, a slide I in the said slot, a crank the pin of which works in said slide, and an arm hung in the said bar and so as to vibrate therewith, but permitting a swinging movement of its own in
120 the plane of movement of the said bar, the said arm carrying a hammer head, substantially as and for the purpose described.

W. E. HAWKINS.

Witnesses:

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