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# UNITED STATES PATENT OFFICE.

JAMES PIPES, OF RIPLEY, WEST VIRGINIA.

## IMPROVEMENT IN FORGING-MACHINES.

Specification forming part of Letters Patent No. **113,922**, dated April 18, 1871.

*To all whom it may concern:*

Be it known that I, JAMES PIPES, of Ripley, in the county of Tyler and State of West Virginia, have invented certain new and useful Improvements in Forging-Machines; and I do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawing, forming part of this specification.

Figure 1 is a side elevation of my improved forging-machine, partly in section to show the construction. Fig. 2 is a front elevation of the same.

Similar letters of reference indicate corresponding parts in the several figures of the drawing.

My invention has for its object to provide an improved machine for forging metals, designed more especially for use in blacksmithing; and to this end it consists, primarily, in the combination of mechanism by which two hammers are caused to deliver alternate blows upon the same point of the metal to be forged, such mechanism being operated by one hand of the workman, leaving the other hand free to handle the metal.

It consists, further, in the means for operating one hammer by the foot while the other hammer is thrown out of operation, as will be hereinafter more fully described.

In the accompanying drawing, A is the frame of the machine, made right-angular in shape, and open at the front to receive the anvil B, and afford the necessary space for the operator in working the hammers and handling the metal to be forged. C is the main shaft of the machine, having its bearings in the uprights D of the frame, and provided upon its inner end with a large gear-wheel, E. F and G are the hammer-shafts, the former placed in front of and parallel to the main shaft, with its bearings in the upright H and cross-bar I of the frame, and the latter placed at right angles to the main shaft, with its bearings in the uprights J of the frame.

The hammer-shafts are operated from the gear-wheel E of the main shaft by means of the pinions K L, mounted respectively upon their inner ends, the former in line with the wheel E, and the latter engaging with the side of such wheel, being beveled for that purpose.

M M are the hammers, attached to the ham-

mer-shafts by means of the clasps N and set-screws O, and occupying such a position upon the shafts with relation to each other that while one is being raised the other descends upon the anvil, the blows of each being delivered upon the anvil at the same point.

P is the operating-lever, attached to the main shaft by means of a socket, Q, as shown. By moving this lever up and down the hammers alternately strike the anvil or the iron being forged, the latter being held in one hand of the operator while the lever is worked by the other hand.

S S are bent springs attached to the parts T of the main frame, and are employed to arrest the momentum of the hammers when the latter are thrown back after completing a stroke. They not only perform this function, but, when they have taken up the momentum of the hammers, their recoil throws the latter forward again, giving the initial movement of the next stroke, so that the operator has only to assist in completing the movement which the springs have begun. By this arrangement the leverage upon the lever P is materially reduced.

In the use of the machine it is sometimes necessary to operate but one hammer. This is accomplished in the following manner: The hammer-shaft F is constructed with extended journals, the inner one, U, passing to the outside of the frame, where it is attached to one end of a pivoted lever, V. The free end of this lever passes to the front of the machine within reach of the operator, and works through a slotted catch-plate, W, attached to the upright J of the frame. By moving the free end of this lever toward the left, the shaft F is moved longitudinally in its bearings to disengage the pinion K from the gear-wheel E, the lever being held in position by the depression formed in the catch-plate. By this arrangement the operation of the hammer mounted upon the shaft F is suspended.

When one hammer only is used under this arrangement it is operated by a foot lever or treadle, X, the hand-lever P being removed. The treadle is hinged to the rear side of the frame, and is connected to the main driving-shaft by means of a hooked rod, Y, entering an eye, Z, attached to the said shaft, as shown. This attachment is necessary when only one

hammer is used, the treadle being disconnected when the hand-lever P is employed to operate both hammers. When so detached the hooked bar is held in an upright position by means of the slotted guide A', as shown in Fig. 1.

B' is a spring coiled around the outer end of the main shaft C, and secured at one end thereto.

C' is a hand-bar hung upon the outer journal of the shaft C, and provided with a lateral projection, d', which, when the hand-bar is turned up in the position shown in Fig. 2, engages with the hook formed upon the free outer end of the coil-spring and prevents such end from moving when the shaft C is oscillated. The hand or catch bar is held in an upright position by the catch e', affixed to the frame, as shown in Fig. 2. By this arrangement the shaft C is operated by the treadle to throw down the hammer against the tension of the coiled spring, and therefore the latter throws up the hammer after a stroke is completed. The coiled spring is disconnected from the catch-bar C' when both hammers are employed, the bar being swung down into the position shown in Fig. 1.

F' is a bent spring, attached to the journal

U of the hammer-shaft F, serving to move said shaft longitudinally for the purpose of engaging the wheels E K for the operation of both hammers when the end of the lever V is thrown out of the notch in the catch-plate. The clasps N and set-screws O permit the adjustment and reversal of the hammers upon their shafts.

Having thus described my invention, what I claim as new, is—

1. The combination of the hammer and its sliding shaft F with the spring F', the lever V, and catch-plate W, substantially as described, for the purpose specified.

2. In combination with the treadle X and shaft C, the single hammer-shaft G, coiled spring B', and the catch-lever C', substantially as described, for the purpose specified.

3. In a forging-machine having two or more hammers that strike alternately upon the same point, the arrangement of the hammer-shafts and their operating devices, substantially as described, whereby one shaft may be thrown out of gear to suspend the operation of one hammer, for the purpose specified.

JAMES PIPES.

Witnesses:

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