No. 711,766. Patented Oct. 21, 1902.

T. HICKS.

FOOT POWER HAMMER.

(Application filed Sept. 9, 1901.)

(No Model.) 2 Sheets—Sheet 1.

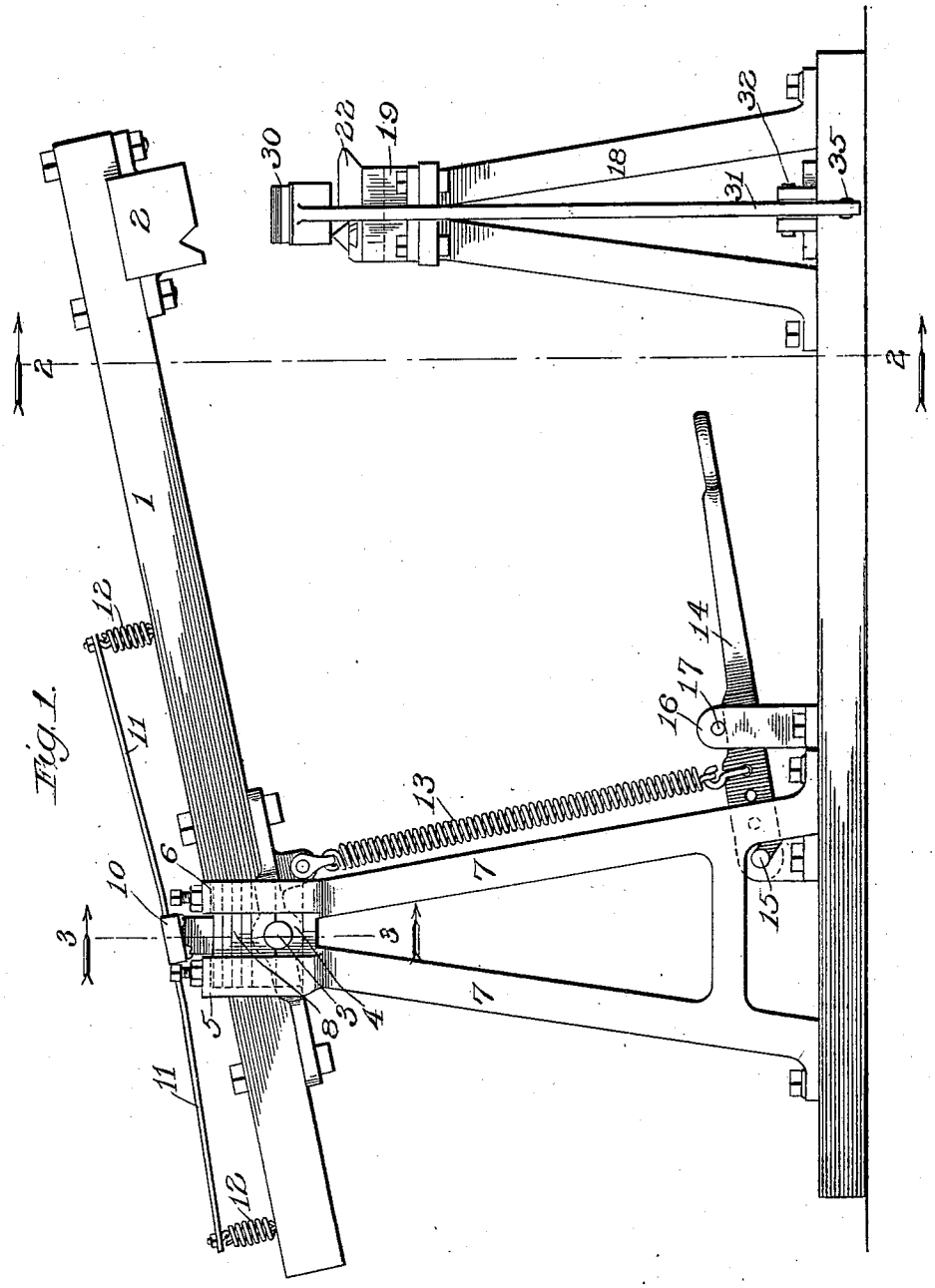


Fig. 1.

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Fig 2

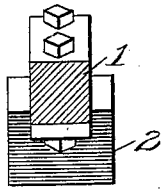
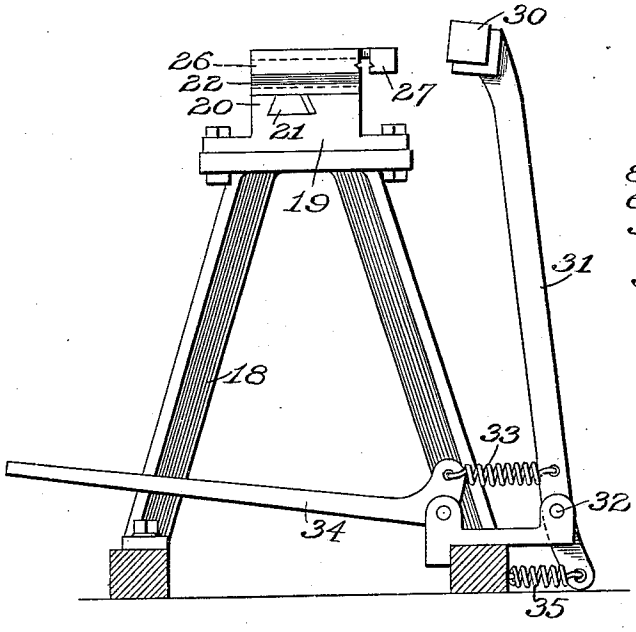


Fig 3



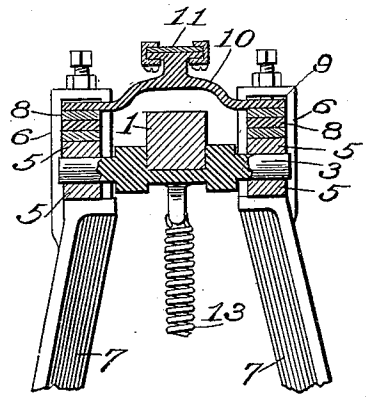


Fig 4.

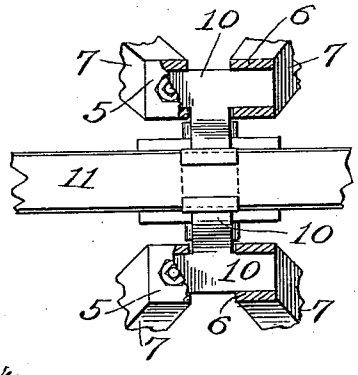
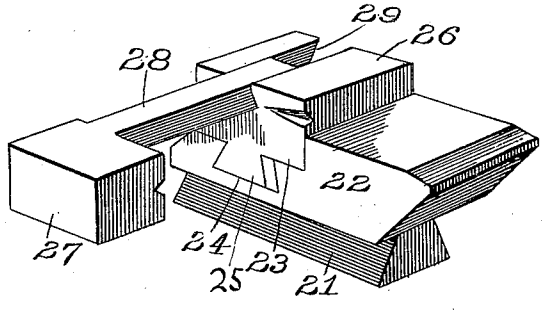


Fig 5.



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UNITED STATES PATENT OFFICE.

THOMAS HICKS, OF CHICAGO, ILLINOIS.

FOOT-POWER HAMMER.

SPECIFICATION forming part of Letters Patent No. 711,766, dated October 21, 1902.

Application filed September 9, 1901. Serial No. 74,809. (No model.)

To all whom it may concern:

Be it known that I, THOMAS HICKS, a citizen of the United States, residing in Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Foot-Power Hammers, of which the following is a specification.

The present invention relates to a foot-power hammer intended more especially for use in blacksmith shops, and particularly adapted, when equipped with appropriate forming-tools, for use in making horseshoes, but which may be used for all purposes for which such hammers are adapted.

The invention relates in part to the means for oscillating the beam which carries the hammer-head; and the object of this part of the invention is to provide improved means whereby the rebounding stroke of the hammer is produced automatically by the action of a spring and whereby the beam is cushioned in all of its movements, so that it may be made to produce either a heavy blow or a light one with either a short stroke or a long one.

The invention relates in part also to a forming-tool; and the object of this part of it is to provide improved means for forcibly closing the two jaws of a forming-tool that are adapted and arranged to pinch or bite between them the piece being formed, the closing action being produced by the blow of the hammer upon one of the jaws.

The invention consists in the features of novelty that are herein described.

In the accompanying drawings, which are made part of this specification, Figure 1 is a side elevation of a foot-power hammer embodying the invention. Fig. 2 is a vertical section thereof on the line 2 2, Fig. 1, located in the direction of the arrow. Fig. 3 is a vertical section of a portion thereof on the line 3 3, Fig. 1, looking in the direction of the arrow. Fig. 4 is a view of some of the parts, partly in plan and partly in section. Fig. 5 is a detailed view showing a forming-tool having a pair of jaws.

The beam 1, carrying the hammer-head 2, is supported by a shaft 3, journaled in boxes 4, that have lateral extensions or wings occupying hollow standards 5 and 6, rising from a main frame 7 and located a sufficient distance apart to admit the shaft 3 between them. The main frame preferably comprises two parts, each of A shape and each surmounted by one of the hollow standards 5 and one of the hollow standards 6. The standards 5 and 6 differ from each other only in that each of the standards 5 is open only at the side adjacent to the shaft, (being closed at its top, bottom, and three remaining horizontal sides,) while the standard 6 is open from side to side, so as to permit spacing blocks or plates 8 to be inserted or removed in a direction which is transverse to the axis of the shaft. The height of the standards (internal measurement) is sufficient to admit the journal-boxes, the spacing blocks or plates, and also the cross-arms 9 of an I-shaped plate, which forms the immediate support for a bracket 10, to which latter is secured, preferably by means of clips, a plate-spring 11, which is disposed above the beam 1 and lengthwise thereof. This spring projects in both directions from the center of oscillation of the beam and is preferably curved upward from its middle to its ends. Its ends are connected to the beam, on opposite sides of the center of oscillation of the latter, by coiled springs 12. The springs 11 and 12 normally hold the beam in position to maintain the hammer-head in elevated position, as shown in Fig. 1. They automatically return the beam to this position upon the removal of the force that moved it therefrom. They cushion the movements of the beam in both directions and allow it to oscillate in both directions from its normal position, and they maintain the beam in such a state of poise that it may be easily moved or oscillated, and by reason of this poised condition it is completely under the control of the operator, so that he may regulate the blows to a nicety.

For the purpose of depressing the hammer-head end of the beam it is connected, by means of a coiled spring 13, with a treadle 14, suitably fulcrumed at 15 and working between guides 16, a stop-pin 17 being provided for limiting its upward movement under the influence of the spring. It will be observed that pressure upon the treadle, transmitted through the spring 13, will tend to draw down

the hammer-head end of the beam in opposition to the resistance of one end of the spring 11. When the blow is complete, the recoil of this same end of the spring 11 lifts the hammer-head, and unless it be restrained by a repetition of the pressure upon the treadle this recoil of the aforesaid end of the spring 11 will carry the beam beyond its normal position. Its excess movement will, however, be resisted by the opposite end of the spring 11 and also by the spring 13. Hence by properly applying pressure to the treadle the beam may be moved through either a long or short stroke and produce either a hard or soft blow.

The anvil is supported in the path of the hammer-head 2 by meams of a suitable frame. In the drawings I have shown a frame 18, surmounted by a base-plate 19, having an undercut groove 20, disposed longitudinally—*i. e.*, in the direction of the length of the beam—and adapted to receive a corresponding dovetail rib 21 on the anvil 22. This anvil may be of any desired character—*i. e.*, it may be flat, or it may be so fashioned as to give the article operated upon any desired form. Preferably it is provided with a seat 23, disposed transversely and having a transverse undercut groove 24 for receiving a dovetail rib 25 on a block 26, the top of which may in like manner be used as an anvil and the end of which forms one of a pair of jaws, the other of which is shown at 27. This jaw has a stem 28 of dovetail shape in cross-section which occupies an undercut groove 29 in the top of the block 26, so that the jaw 27 is capable of moving toward and from the block 26, which, as before stated, serves as a companion jaw. The opposite faces of these jaws may be fashioned to produce any desired results.

The jaw 27 is located in the path of the head 30 of a hammer, the beam 31 of which is fulcrumed at 32 to a suitable part of the frame and is connected upon one side of its fulcrum by means of a coiled spring 33 with a treadle 34, said beam being connected on the other side of its fulcrum by means of a coiled spring 35 with the frame. The arrangement and disposition of the parts is such that the spring 35 will normally hold the hammer-head 30 out of contact with the jaw 27, while at the same time said head may be made to strike the jaw by pressure applied to the treadle 34, said pressure being transmitted to the beam 31 through the coiled spring 33.

It will be observed that the plate-spring 11 and the coiled springs 12 are fixedly supported independently of the beam, so that they partake of the movement of the beam only to the extent of their flexure. They form no part of the mechanism for transmitting movement from the treadle to the beam, their only functions being to automatically lift the hammer and cushion its movements.

The height of the hammer with respect to the anvil may be adjusted by manipulating the spacing blocks or plates, and in like manner the tension of the springs 11 and 12 may be regulated.

What I claim as new, and desire to secure by Letters Patent, is—

1. In an apparatus of the class described, the combination with a beam, a shaft by which it is supported so as to be capable of oscillating, journal-boxes supporting the shaft, hollow standards open at their sides adjacent to the shaft, into which the extended sides of the journal-boxes project, spacing-blocks projecting into said hollow standards and engaging the boxes, and means for holding said spacing-blocks in place, substantially as described.

2. In an apparatus of the class described, the combination of a beam, a shaft supporting the beam, boxes supporting the shaft, a hollow standard open only at the side adjacent to the shaft, a hollow standard open from side to side, spacing-blocks projecting into the hollow standards, and means for holding the spacing-blocks in place, substantially as described.

3. In an apparatus of the class described, the combination of a beam, mounted to oscillate, a plate-spring disposed lengthwise of the beam and extending in both directions from its center of oscillation and adapted to yieldingly restrain the movements of the beam in either direction, a fixed support for said spring, and means independent of the spring for oscillating the beam, substantially as described.

4. In an apparatus of the class described the combination of a suitable frame, a beam, means supporting it so that it can oscillate, a plate-spring disposed lengthwise of the beam and extending in both directions from its center of oscillation, means connecting the opposite ends of the spring with the beam, a bracket fixedly supported by the frame, and means independent of the spring for oscillating the beam substantially as described.

5. In an apparatus of the class described the combination of a beam, means supporting it so that it can oscillate, a plate-spring disposed lengthwise of the beam, means supporting said spring, a coiled spring connecting one end of the plate-spring with the beam, and means for oscillating the beam substantially as described.

6. In an apparatus of the class described, the combination of a beam mounted to oscillate, standards at the sides of the beam, a plate fixedly supported by the standards and passing over the beam, a plate-spring supported by said plate and extending in both directions from the center of oscillation of the beam, means connecting said plate-spring with the beam, and means independent of the spring for oscillating the beam, substantially as described.

7. In an apparatus of the class described the combination of a beam, means supporting it so that it can oscillate, standards at the

sides of the beam, a plate fixedly supported by the standards and passing over the beam, a bracket rising from said plate, a plate-spring secured at an intermediate point to said bracket, means connecting the opposite ends of the plate-spring with the beam, and means independent of the spring for oscillating the beam substantially as described.

8. In an apparatus of the class described the combination of a suitable frame, a beam, a shaft supporting the beam and in turn supported by the frame, a treadle, a spring connecting the treadle with the beam on one side of its center of oscillation, a plate-spring, means supporting the plate-spring and fixedly connecting it with the frame in the vicinity of the center of oscillation of the beam, and means connecting said plate-spring with the beam upon opposite sides of said center of oscillation substantially as described.

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