2 Sheets—Sheet 1.

C. D. ROGERS.

Bolt-Heading Machine.

No. 220,497. Patented Oct. 14, 1879.

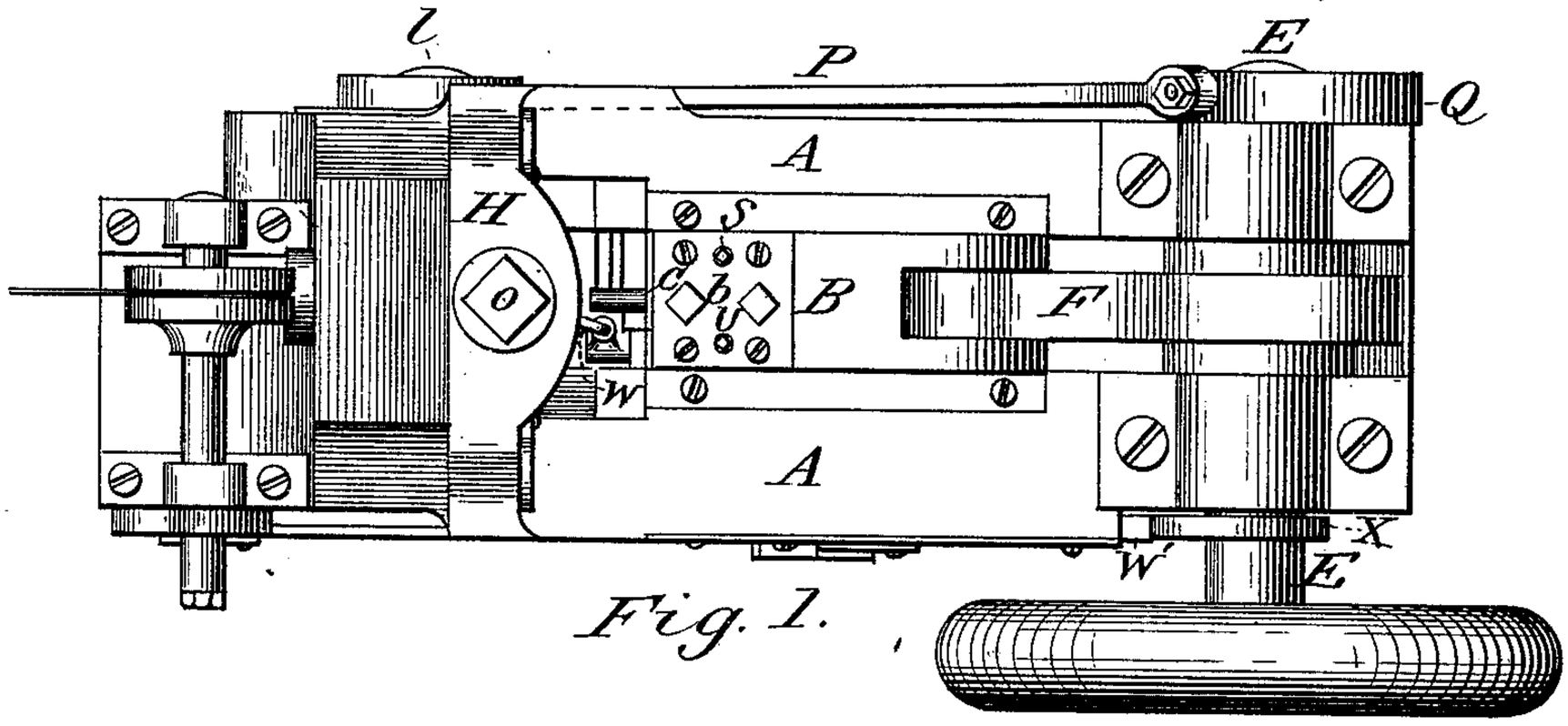

Fig. 1.

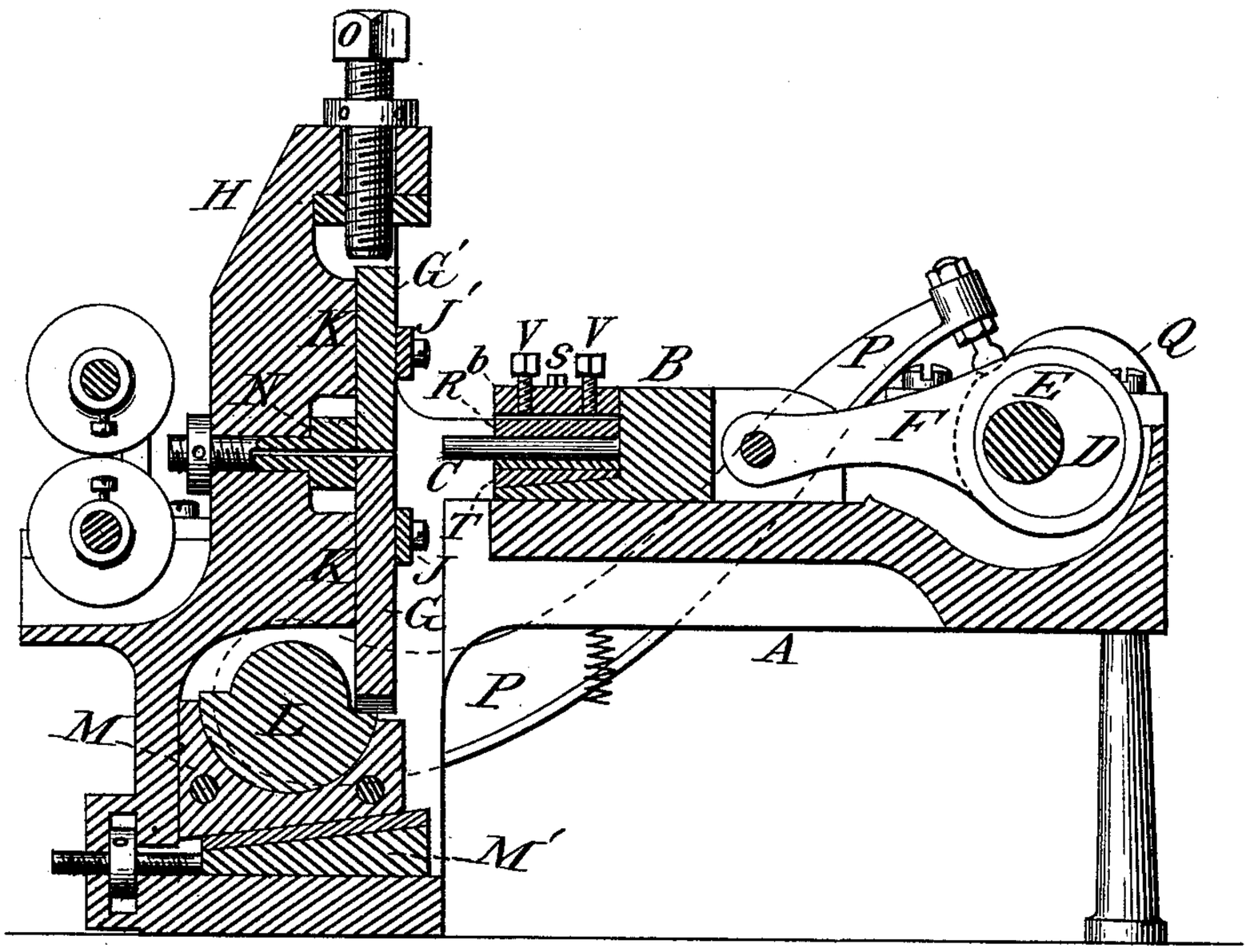

Fig. 2.

Attest:

Thos. J. Groome

W. H. Thurston.

Inventor.

Charles D Rogers

2 Sheets—Sheet 2.

C. D. ROGERS.

Bolt-Heading Machine.

No. 220,497. **Patented Oct. 14, 1879.**

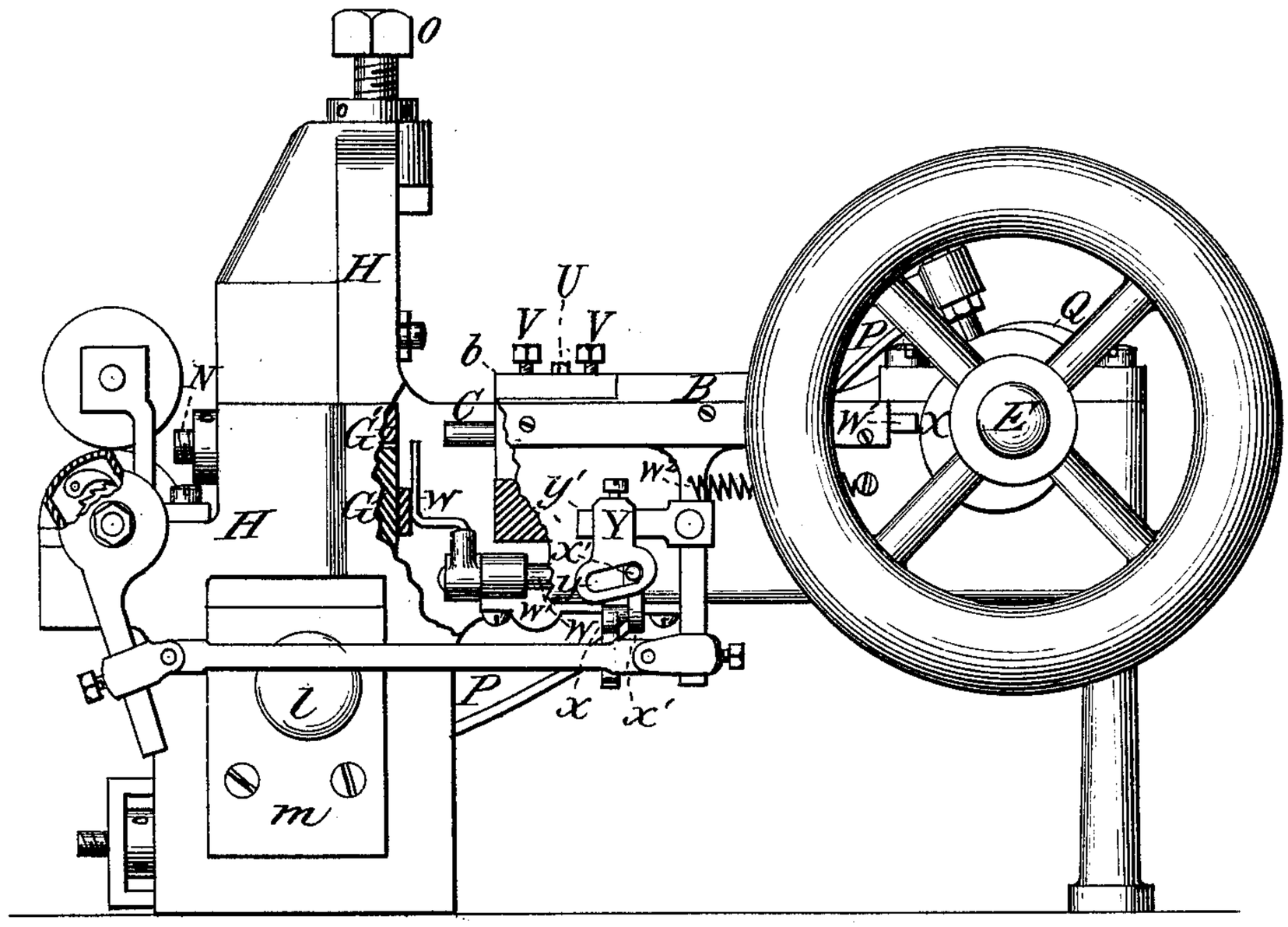

Fig. 3.

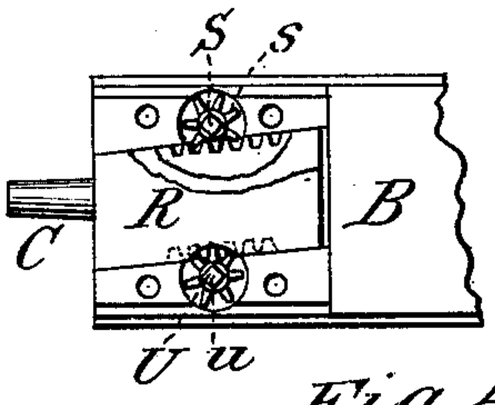

Fig. 4.

Fig. 5.

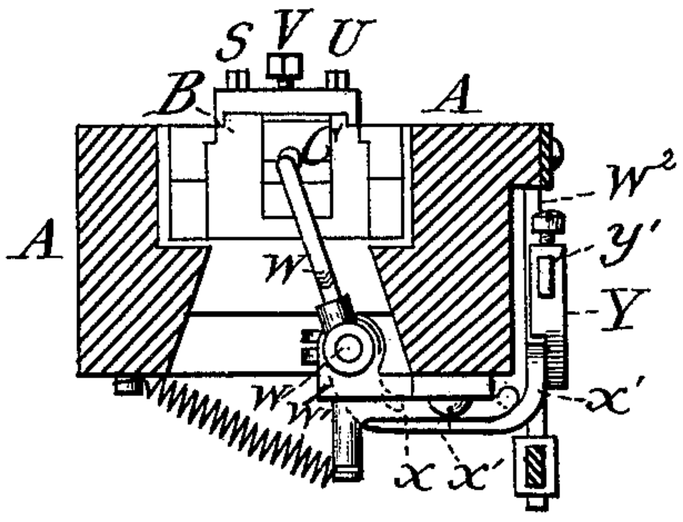

Fig. 6

Attest;

Henry J. Spooner.

W. H. Thurston

Inventor.

Charles D Rogers

UNITED STATES PATENT OFFICE.

CHARLES D. ROGERS, OF PROVIDENCE, RHODE ISLAND, ASSIGNOR TO THE AMERICAN SCREW COMPANY, OF SAME PLACE.

IMPROVEMENT IN BOLT-HEADING MACHINES.

Specification forming part of Letters Patent No. **220,497,** dated October 14, 1879; application filed October 28, 1878.

To all whom it may concern:

Be it known that I, CHARLES D. ROGERS, of the city and county of Providence, and State of Rhode Island, have invented certain new and useful Improvements in Heading-Machines; and I do hereby declare that the following specification, taken in connection with the accompanying drawings, forming part of the same, is a full, clear, and exact description thereof.

The present invention relates to machinery for forming a flanged head upon screw or bolt blanks by the process of upsetting the end of the rod of metal out of which the blanks are formed. Its purpose is to accomplish a greater rapidity of operation than has heretofore been characteristic of this class of machines, by organizing the machine as hereinafter particularly described.

My invention also embraces a means for adjusting the heading-hammer or swaging-tool both vertically and laterally, so as to bring its axis into coincidence with the longitudinal axis of the blank to be operated upon; and a further feature relates to means for operating and timing the movements of the gage, which at stated times must be in proper position to determine the length of the blank, and afterward move out of the way to give room for the heading mechanism to operate.

Referring to the accompanying two sheets of drawings, Figure 1 represents a plan of a heading-machine; Fig. 2, a central longitudinal section of the same. Fig. 3 shows a side view of the machine with portions of the frame cut away. Figs. 4 and 5 represent details of construction; and Fig. 6 shows a vertical transverse section, exhibiting the mechanism operating the gage.

In machines of this class as heretofore constructed, it has been customary to employ toggle-levers for the purpose of working the heading-hammer, or for working the griping-jaws, or both. Now, wherever this mechanical power is used there is of necessity a sacrifice of speed in operation, and consequently a less production. Therefore in my improved machine I have dispensed with the use of such toggles, and secure an increased speed and production by the employment of an eccentric and link to operate the heading-hammer, and a cam and levers to move the griping-jaws.

I am aware that these mechanical powers have been used in similar machines to operate sliding heads and griping-jaws; but they never have been employed in the combination and arrangement in which they appear in my improved heading-machine. It is not simply from the fact that toggle-levers are dispensed with and other orders of levers substituted that an improvement is claimed, but because the whole organization of the machine accomplishes better results, by reason of the combination of these substitutes with other members, as will hereinafter appear.

As shown in the drawings, A represents the bed of the machine, upon which moves the sliding head B, carrying the heading-hammer C. The longitudinal motions of the sliding head are produced by an eccentric, as at D, placed upon the shaft E, and connected to the said head by a link, as at F.

The griping-jaws G G′ are located in the vertical head H of the machine, to which they are confined, as usual, by the locking-arms J J′, between which and the face K of said head they have a vertical motion. The lower jaw, G, is seated on a saddle, as at L, which rocks in a chair, as at M, the said saddle being journaled in the plates *m*, attached to the ends of the chair, which can be vertically adjusted to effect the proper movement of the jaw by means of a block, as at M′, having an inclined face.

The jaw G, during its upward movement, acts, in connection with the tubular block N, through which the wire is fed, as a shear to cut off the blank from the wire, the jaw G′, by its weight, retaining the said blank in place until the jaws have been raised and G′ has come in contact with an adjustable screw, O, and the blank thereby securely clamped for the heading operation. This vertical movement of the jaws G G′ for the purpose of shearing and clamping the blank is produced by the rocking of the saddle L, to the shaft *l* of which a long lever, P, is attached, the said lever being worked by a cam, as at Q, on the shaft E. The slow-moving toggle-levers for operating and clamping the jaws are thus dispensed

with, and equally effective but more rapid results are obtained by the cam, lever, and saddle, the employment of which, under the combination and arrangement described, constitutes a feature of my invention.

The next feature relates to an adjustment of the heading-hammer C, the longitudinal axis of which must necessarily coincide with that of the blank at the time of the heading operation to produce a perfect head.

Heretofore the machine has contained no devices for both laterally and vertically adjusting the said hammer; consequently much time has been lost in properly aligning it. Now, to accomplish this desirable object, I mount the block R, which holds the hammer C, in a socket in the end of the sliding head B, and incline the sides of the said block and socket as shown at Fig. 4, so that by moving the block longitudinally the hammer is adjusted laterally, this movement being performed by the engagement of the pinion *s* on a spindle, S, with a rack on one side of the block. For vertical adjustment the block R is seated on a wedge, T, working on the inclined bottom of the socket, one side of the wedge being a rack, with which engages a pinion, *u*, on a spindle, U, Figs. 4 and 5, so that by moving the wedge longitudinally the block and its hammer are adjusted vertically. The upper ends of the spindles S U are squared to receive a wrench, and they are journaled in the plunger B and cap-plate *b*, the said cap-plate being secured to the sliding head and furnished with clamp-screws V V, to secure the block and its hammer in an adjusted position. By this arrangement the vertical and lateral adjustment of the hammer may be easily accomplished, it only being necessary to turn the spindles S U to effect it.

The next and last feature of my invention relates to means for operating and timing the movements of the gage W, which determines the proper length to be cut off the wire to form the blank, but which must move out of the way of the heading-hammer. This gage derives its movements from the mechanism which is employed to feed the wire. The said feeding mechanism is of the usual kind, and consists of a pair of feeding-rollers, a ratchet and pawl, a connecting-rod, and a sliding rod, W^1, having a depending arm, W^2, to which the said connecting-rod is attached, the said feeding mechanism deriving its motions from a cam, X, upon the shaft E.

The gage W is secured to a shaft, *w*, Figs. 3 and 6, which is journaled in block *w'*, attached to the frame of the machine. This block should be so attached to the frame of the machine as to be longitudinally adjustable thereon, or, what would be the same in effect, the shaft on which the guide is mounted should be longitudinally adjustable in its bearings. Secured to the shaft *w* is an arm, *x*, which is made to take bearing by the force of a spring upon an arm, *x'*, sleeved upon the shaft *w*, the end of said arm *x'* working in an inclined slot, *y*, in a plate, Y, which is placed upon an arm, *y'*, secured to the depending arm W^2 of the sliding rod. Thus, when sliding rod W^1 is moved by the cam X, the gage is moved inward and outward by the rocking of the shaft to which it is attached as the result of the action of the inclined slot *y* in the plate Y upon the arms *x x'*.

The movements of the gage are required to be varied—as, for example, when blanks of larger diameter are being worked in place of one of smaller diameter. It becomes necessary therefore to have a means for adjusting the movements of the gage so that it will get out of the way and come back to place promptly. This is effected by the movement of the plate Y upon the arm *y'*, upon which arm it can be adjusted to any position by a set-screw.

It will be observed that the arm *x*, which is secured to the shaft *w*, has an ear-piece upon its side, which takes bearing upon the arm *x'*, the end of which works in the inclined slot *y* of the adjustable plate Y.

The advantage of this arrangement is that the metal of the blank out of which the bolt is to be made must, for a larger head, project, before the swaging operation is performed, to a greater distance beyond the face of the anvil-jaws G G' than would be required in case a smaller head were to be made. This requires an adjustment of the gage W to correspond to this change of conditions under which the machine is to be worked. This adjustment of the gage is effected by a movement of the block *w'*, in which the gage-shaft *w* is journaled, when said block is adjustably mounted on the frame, as before herein indicated. The times of the movement of the gage, however, may be required to be the same, and by this arrangement of the two arms *x* and *x'* it follows that the distance to which the gage may stand from the face of the jaws G G' may be varied without altering the times of the movement of the gage.

Machines for heading bolts have heretofore embodied feed-rolls, tubular blocks, movable dies for cutting off the rod, and headers, and I make no claim thereto in whole or in part, except in the particular combinations of mechanism hereinafter specified.

The advantages derived by the use of my improvements are a greater speed of production and less shock to the machine than when toggle-levers are used; by the employment of an eccentric and link to move the heading-hammer and a cam, long lever and short levered saddle to move and clamp the griping-jaws, a ready vertical and lateral adjustment of the heading-hammer, that it may properly perform its office, and a quick and accurate adjustment of the gage to determine the movements of the same.

Having described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a machine for heading bolt or screw blanks, the combination and arrangement of

the griping-jaws, a rocking saddle upon which the said jaws are mounted, a lever connected with said saddle, and a cam upon the main shaft, substantially as described, and for the purposes specified.

2. The combination of the griping-jaws, a rocking saddle, upon which the same are mounted, a lever connected with said saddle, a cam upon the main shaft, and the tubular block, through which the wire is fed, substantially as described, and for the purposes specified.

3. The combination, substantially as described, of the block to which the heading-hammer is attached, the socket in the sliding head containing such block, (when such block and socket are constructed with inclined faces, as described,) a wedge or inclined plane, upon which the said block is seated, and rack and pinion gears, combined with the block and wedge, respectively, whereby the said block and the hammer attached thereto can be adjusted both vertically and laterally, as set forth.

4. The combination of the vibrating gage W, the rocking shaft to which such gage is attached, and the adjustable reciprocating slotted plate Y, and its operating-cam, for timing the movements of the gage, substantially as described.

5. The combination and arrangement of the slotted plate Y, adjustable on an arm which is moved by a cam, the arms $x\,x'$, and the rocking shaft to which the gage W is attached, whereby the face of the gage may be adjusted relatively to the faces of the jaws without disarranging the times of the movements of the gage, substantially as described.

CHARLES D. ROGERS.

Witnesses:

HENRY J. SPOONER,

W. H. THURSTON.