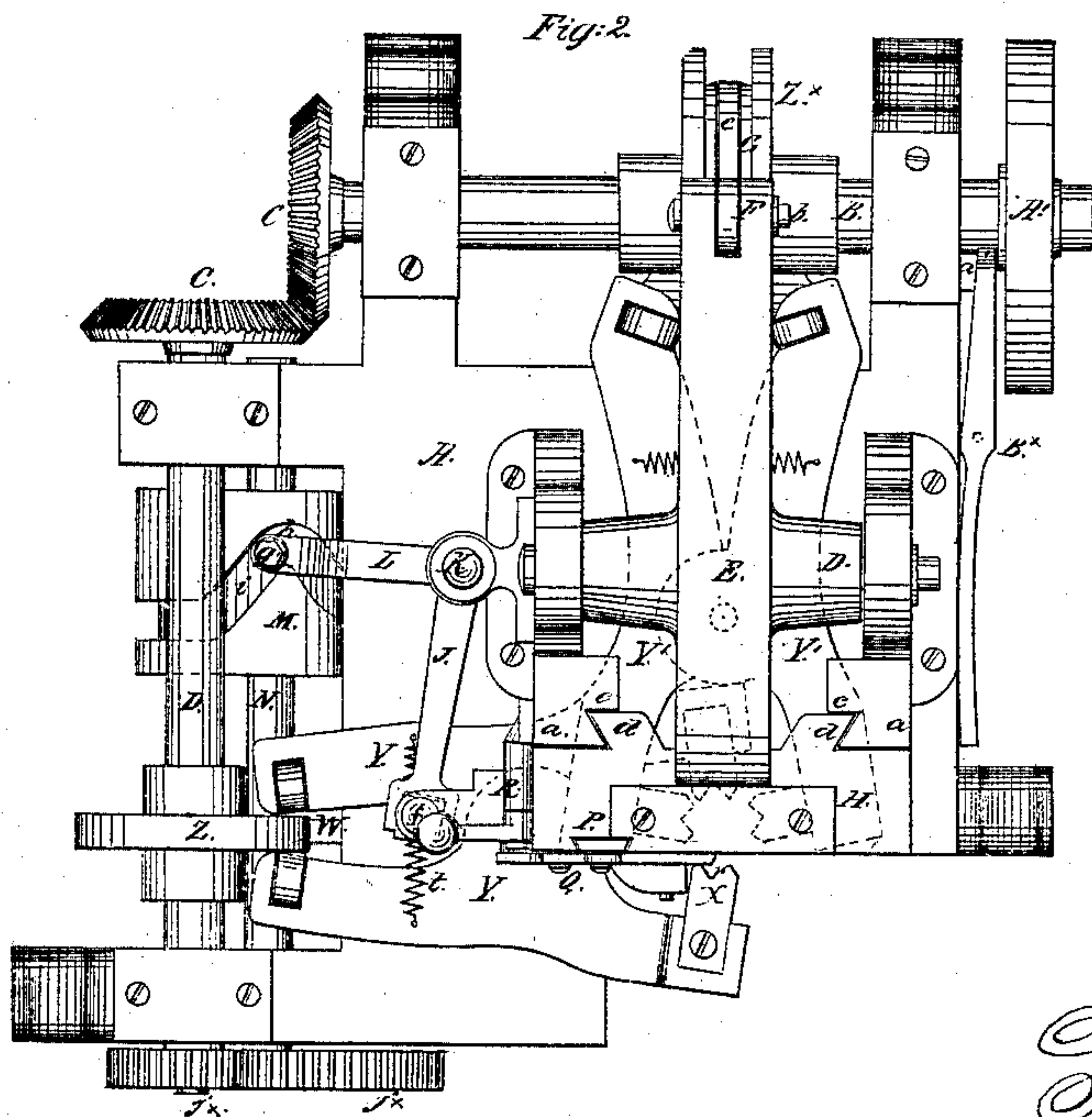
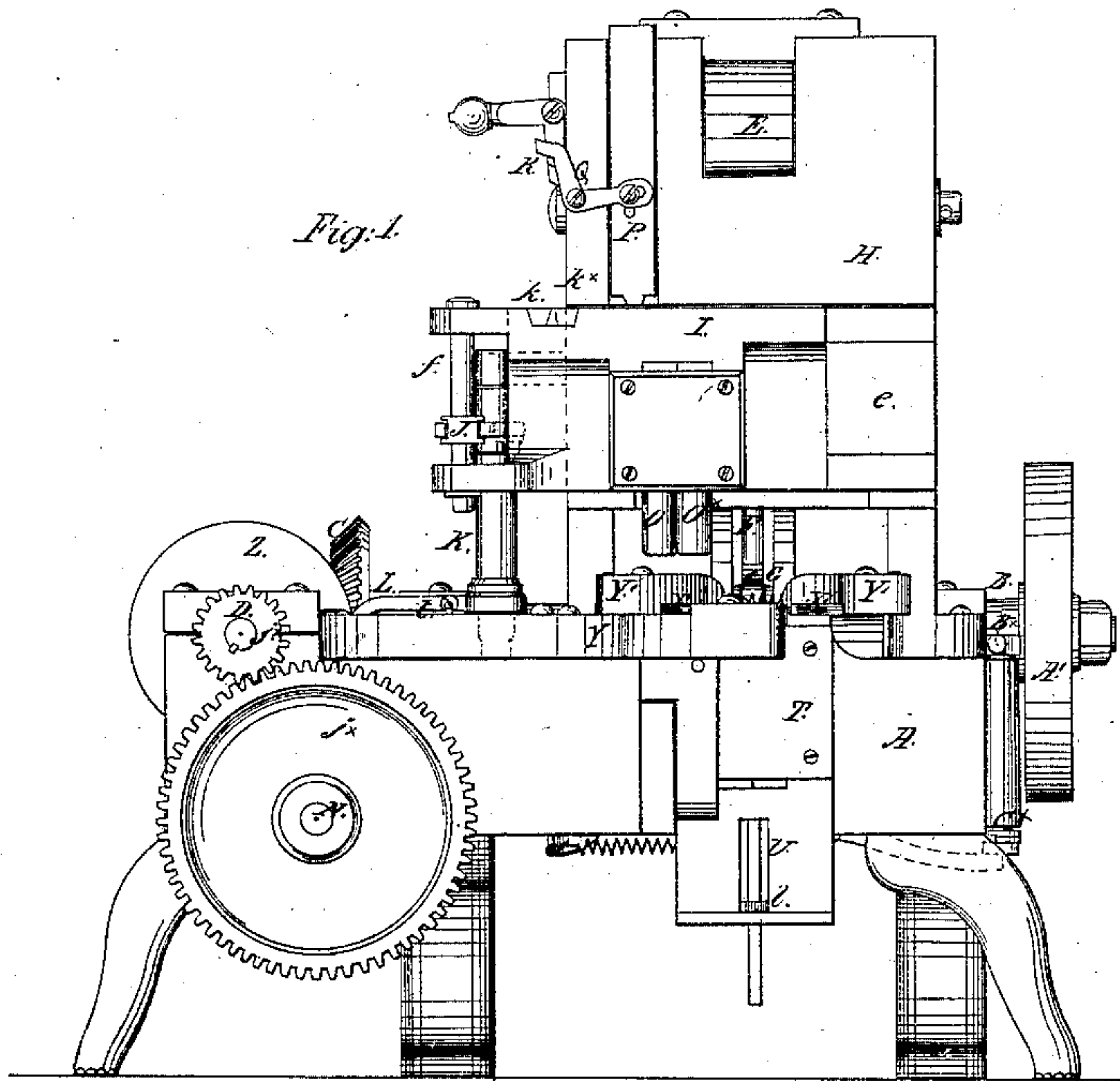


A. B. Glover, Bolt-Heading Machine,

N^o 55,646.

Patented June 19, 1866.



Witnesses:

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Wm. Frewin

Inventor:

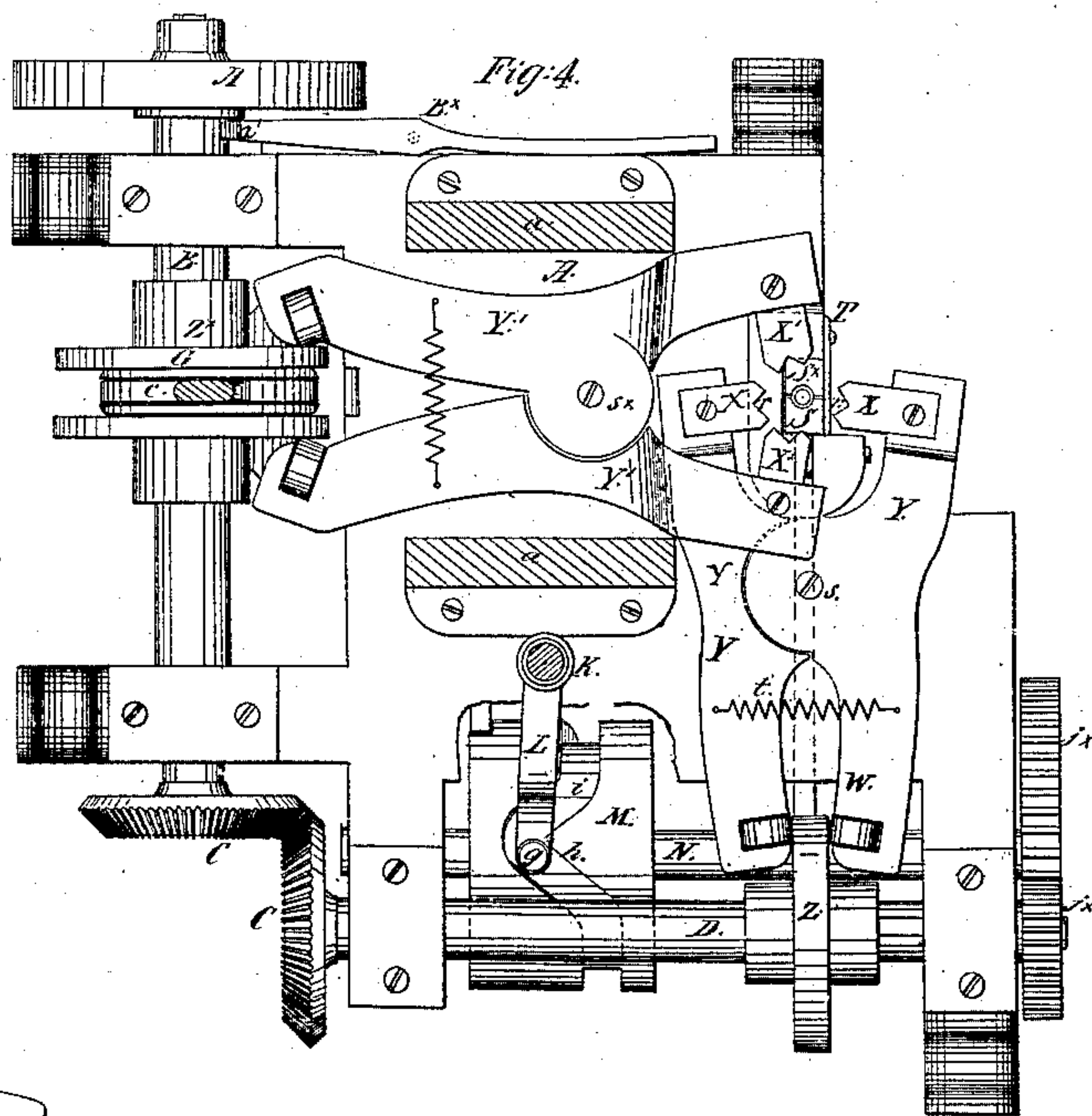
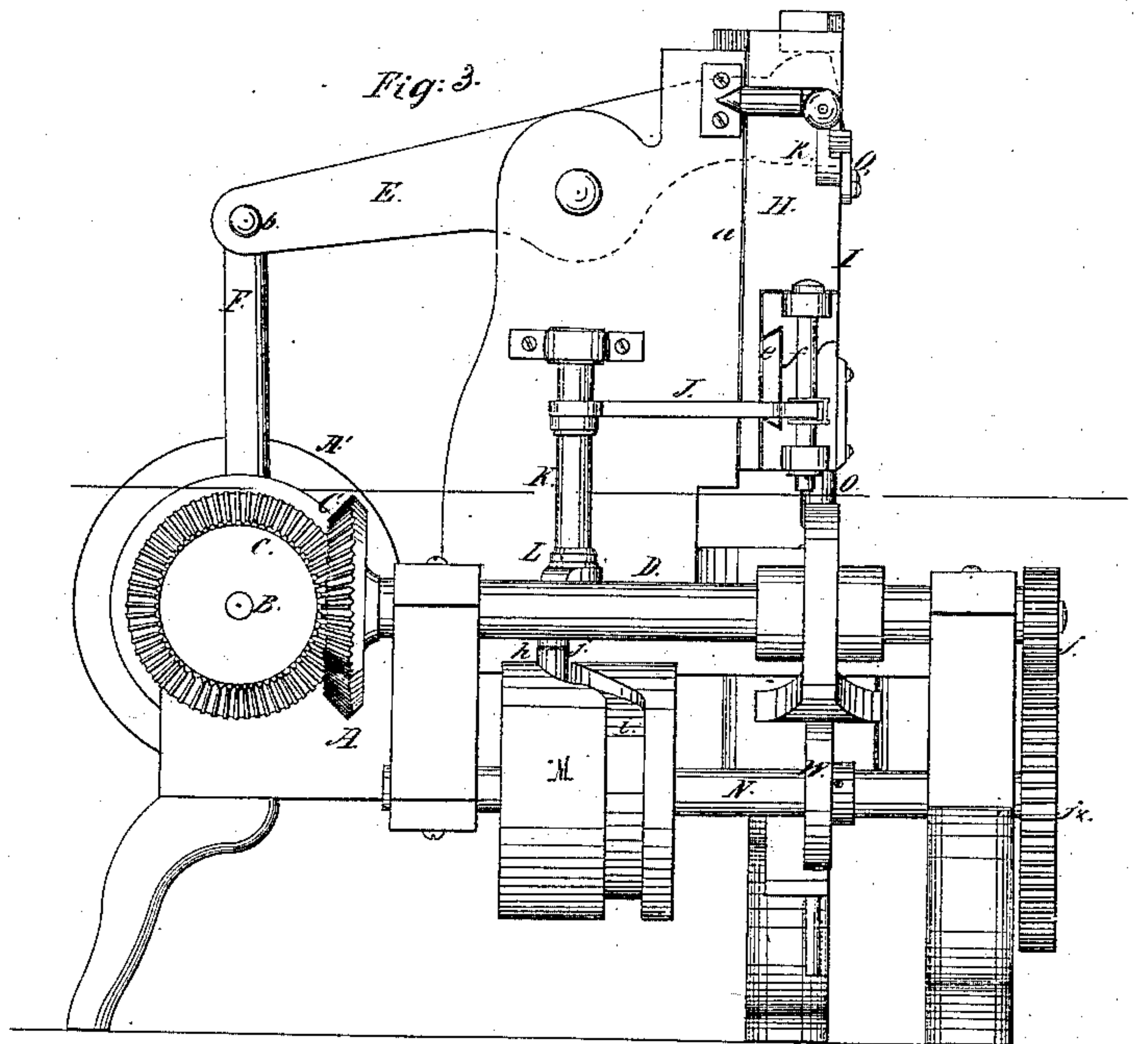
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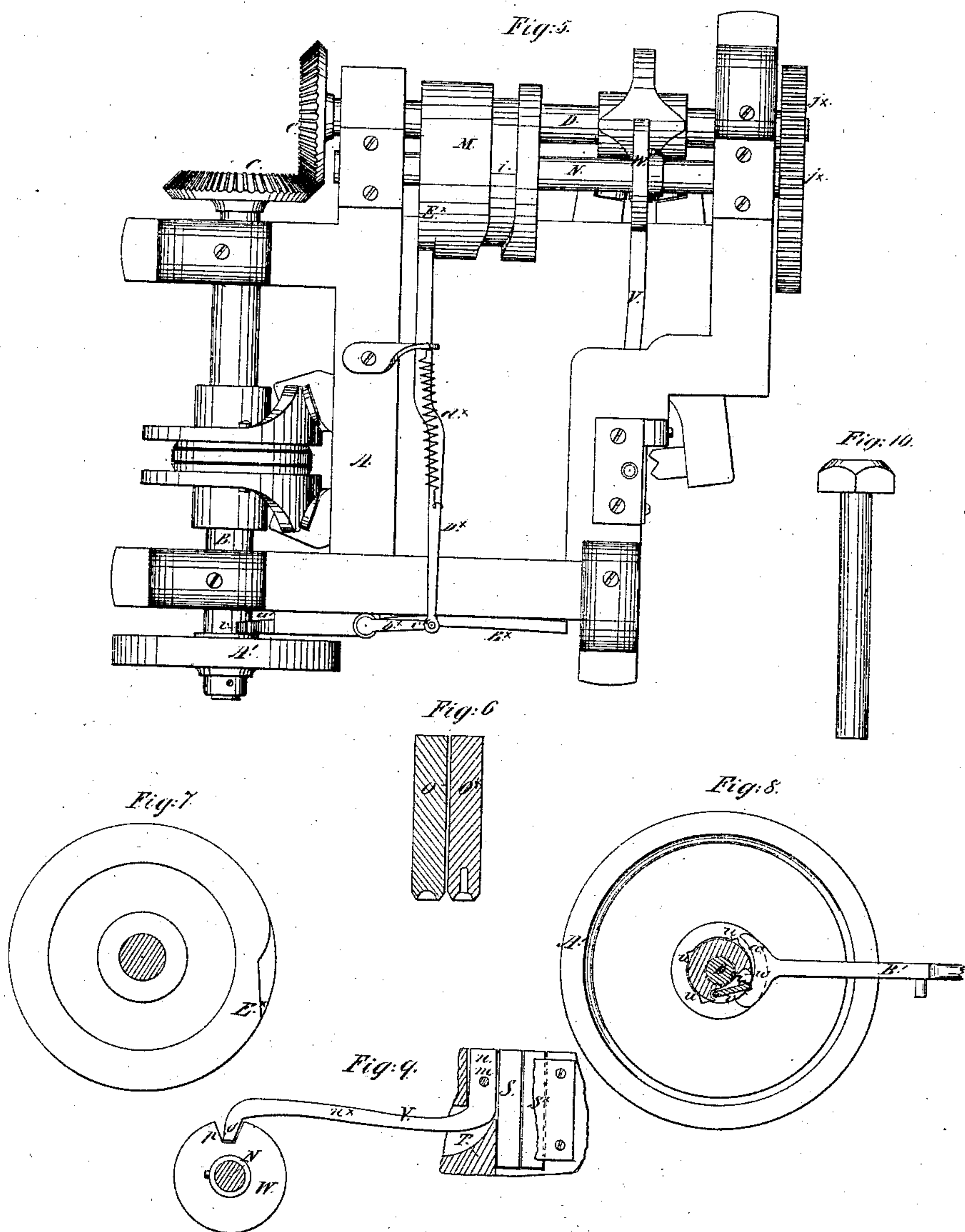
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UNITED STATES PATENT OFFICE.

A. B. GLOVER, OF DERBY, CONNECTICUT.

IMPROVEMENT IN BOLT-HEADING MACHINES.

Specification forming part of Letters Patent No. 55,646, dated June 19, 1866.

To all whom it may concern:

Be it known that I, A. B. GLOVER, of Derby, in the county of New Haven and State of Connecticut, have invented a new and Improved Bolt-Heading-Machine; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable those skilled in the art to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1, Sheet No. 1, is a front elevation of my invention; Fig. 2, a plan or top view of the same; Fig. 3, Sheet No. 2, a side view of the same; Fig. 4, a horizontal section of the same, taken in the line *xx*, Fig. 3; Fig. 5, Sheet No. 3, an inverted plan of the same; Fig. 6, a detached vertical section of the heading-dies pertaining to the same; Figs. 7 and 8, detached views of the mechanism by which the driving-pulley is connected to and disconnected from the driving-shaft; Fig. 9, a detached view of the mechanism for operating the holding-dies, and Fig. 10 an enlarged view of a bolt with a head formed by my improved machine.

Similar letters of reference indicate corresponding parts.

This invention relates to a new and improved machine for forming heads on bolts; and it consists in a novel arrangement of forming-dies in connection with two upsetting or heading dies, as hereinafter fully shown and described, whereby the heads of bolts may be perfectly formed, and by an automatic movement of the several parts throughout the whole operation.

The invention also consists in an arrangement or means employed for operating the heading-dies, whereby the same are brought consecutively over the bolt and operated or forced down consecutively on the bolt, and the finishing heading-die made to operate twice upon the bolt in order to finish the head, as hereinafter described.

The invention also consists in the means employed for actuating the holding-dies so that the bolt and screw may be firmly held during the heading operation and instantly released after such operation is performed.

The invention further consists in a clutch-operating mechanism, whereby the driving-pulley is automatically disconnected from the

driving-shaft as soon as the heading operation is completed.

A represents a framing, which may be constructed in any proper manner to support the working part, and B is a driving-shaft placed on the rear part of said framing, and connected by bevel-gears C to a shaft, D, at right angles with B, and placed at one side of the framing A, as shown clearly in Figs. 2, 4, and 5.

On the framing A there are placed two upright plates, *a a*, having a rock-shaft, D, between their upper parts, on which a lever, E, is secured. The rear end of the lever E has a rod, F, attached to it by a pivot-bolt, *b*, and this rod is connected at its lower end by a strap, *c*, with an eccentric, G, on the driving-shaft B. The front end of the lever E is connected to a slide, H, which is provided with dovetail cleats *d d*, to fit into corresponding grooves *e e* in the inner surfaces of the upright plates *a a*, as shown clearly in Fig. 2. By means of this lever E, eccentric G, and rod F a vertical or reciprocating motion is given the slide H.

I is a slide which is fitted on a horizontal dovetail cleat, *e*, on the lower front side of the slide H. This slide I is allowed to work freely on the cleat *e*, and it is operated and has a reciprocating motion communicated to it as follows: To one end of the slide I an arm, J, is connected by being fitted on a vertical rod, *f*, and the opposite end of said arm is keyed or otherwise secured upon a vertical rock-shaft, K. An arm, L, is secured upon the lower end of said rock-shaft, and projects from it at right angles to the arm J, and has a vertical pin, *g*, passing through its outer end, a friction-roller, *h*, being on said pin, which roller works in a serpentine groove, *i*, of a cam, M, on a shaft, N, which is below the shaft D, and is operated therefrom by gears *j*^x.

The groove *i* of the cam M is of such a shape that the slide I is operated intermittingly, not continuously, in order that the slide may have intervals of rest to admit of the heading-dies, which are attached to it, performing their work. These heading-dies O O^x are placed side by side, and extend vertically down from the slide I, as shown clearly in Fig. 1. The die O may be considered as the upsetting-die and O^x the finishing-die.

In the upper edge of the slide I there are

made two notches, $k k^*$, and P is a vertical slide fitted in the slide H, and is made to engage alternately with the notches $k k'$, and raised therefrom by means of a bent lever, Q, attached to slide H, coming in contact with the lower end of a loaded bent lever, R, attached to one of the upright plates a . This slide P, by fitting in the notches $k k'$, is designed to prevent the casual movement of slide I when the heading-dies O O^{*} are in operation, the slide P being lowered at the proper time to engage with said notches during the dwells of slide I, and thrown up out from said notches just previous to the lateral movement being given the same.

S S^{*} represent two holding-dies, which are fitted vertically in the framing A in a suitable bed-piece, T. These holding-dies receive the bolt to be headed, the bolt resting upon a screw-rod, U, which has a nut, l , upon it, by turning which the rod U may be raised or lowered to suit the length of bolt to be headed, it being, of course, necessary to leave a certain length of the bolt above the dies S S^{*}.

The dies S S^{*} are pressed together to hold the bolt firmly during the heading operation by means of a lever, V, (see Fig. 9,) which has its fulcrum-pin m in the bed-piece T, its shut arm n acting against one of the dies S, and its longer arm n^* being bent at its outer end, as shown at o , and resting on the periphery of a wheel, W, having a notch, p , made in it, said wheel being keyed or otherwise secured on the shaft N. When the bent end o of lever V bears on the periphery of wheel W the shut arm n is pressed against the die S and the bolt held firmly between the two dies S S^{*}, and when the notch p comes under said bent end o the latter will drop into the notch and the die S relieved from the pressure of the shut arm n of lever V.

X X X^{*} X^{*} represent the forming-dies—those which act laterally against the head and give it a square form. These dies are arranged so as to work in pairs, one pair operating at right angles to the other pair. The dies X X are composed of steel plates having V-shaped notches r made in them, corresponding to two adjoining sides of the head of the bolt to be formed, (see Fig. 4,) and said dies are attached to one end of levers Y Y, which are connected by a fulcrum-pin, s , and have a cam, Z, on the shaft D, working between their opposite ends. These two levers Y Y have a spiral spring, t , attached to them, which spring has a tendency to keep the dies X X in contact with cam Z. The other dies, X^{*} X^{*}, are arranged in precisely the same way, being attached to levers Y^{*} Y^{*}, connected by a fulcrum-pin, s^* , and operated by a cam, Z^{*}, on the shaft B.

A' represents a driving-wheel, which is placed loosely on the shaft B, and is provided with a circular recess in a concentric hub or projection at its inner side, the inner side or periphery of said hub or projection being provided with notches u , forming what may be

termed an "internal ratchet." (See Fig. 8.) The driving-shaft B has a pawl, v , fitted in it, against which a spring, w , bears, said spring having a tendency to keep the pawl engaged with the notches u .

B' is a lever secured on the upper end of a vertical shaft, C^{*}, at one side of the framing A, and formed at one end, as shown at a' , to fit over the driving-shaft B. The lower end of the shaft C^{*} has an arm, b^* , projecting horizontally from it, and this arm has a rod, D^{*}, connected to it by a pivot, c^* , which rod is pressed against a cam, E^{*}, formed on the same cylinder as the cam M, by means of a spring, d^* . (See Fig. 1.)

The operation is as follows: At the commencement we will suppose the driving-pulley A' to be loose on the driving-shaft B, the lever B^{*} being over the pawl v , so as to keep the latter free from the notches u in pulley A', the holding-dies S S^{*} being loose or not acted upon by lever V. The rod on which the head is to be formed, properly heated, is placed between the holding-dies S S^{*}, the nut l having been previously turned, so that a suitable length of the rod may extend above the dies S S^{*} to admit of a suitable head being formed upon it. The lever B is then moved or actuated by hand, power being applied to the pulley A', and the pawl v released from the forked end of the lever. said pawl v , in consequence of the spring w , immediately engaging with the notches u and forming a connection between pulley A' and the shaft B, and thereby communicating motion to all of the working parts of the machine. The slide I and lever V are the first parts to move, and the heading-die O^{*} is brought over and in line with the rod between the holding-dies S S^{*}, the rod being firmly clutched by the pressure of the lever V against die S, and the slide I held by the slide P fitting in notch k . The slide H is then forced downward under the action of the lever E, rod F, and eccentric G, and the upper end of the rod is upset by the die O^{*}. The die O^{*} then moves upward, and the two forming-dies X X are moved toward each other under the action of the cam Z, and said dies X X partially square the head. The dies X X are then forced back under the action of spring t , and the other two forming-dies, X' X', are, under the action of the cam Z^{*}, made to act upon the head in a direction at right angles to the dies X. The dies X' then move back, and the slide I is still farther moved, so as to bring the die O over the bolt-rod, the slide being held by the slide P fitting in the notch k . The die O now descends and acts upon the bolt-head, and as said die rises the forming-dies X X' act against the sides of the head, and the die O again descends and acts upon the head, and as it rises the dies X X again act upon or against the sides of the head, the slide I, when the slide H is fully raised, being moved back to its original position, and the cam E admitting of the spring d^* of rod D^{*} actuating the lever B^{*}, so that

the latter will act upon the pawl *v* and free it from the notches *u* in the driving-wheel *A'*, thereby disconnecting the latter from the driving-shaft *B*, and the notch *p* of wheel *W* at the same time coming in line with the bent end *o* of lever *V*, so that the die *S* will be relieved from the pressure of said lever and the finished or headed bolt removed from between the dies *S S*^x.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. The two pairs of levers *Y Y Y' Y'*, with the forming-dies *X X X' X'*, arranged so that one pair will operate at right angles to the other pair, in combination with the two heading-dies *O O*^x, all arranged to operate in the manner substantially as and for the purpose set forth.

2. The attaching of the heading-dies *O O*^x to a transverse or laterally-moving slide, *I*, fitted to the vertically-moving slide *H*, and operated through the medium of the arm *J*, rock-

shaft *K*, arm *L*, and the cam *M*, or their equivalents, for the purpose of bringing the dies *O O*^x over the bolt-rod at the proper time, substantially as shown and described.

3. The holding-dies *S S*^x, in combination with the lever *V*, operated by the notched wheel *W*, for the purpose of holding the bolt-rod during the heading operation and releasing the same after said operation is performed, constructed and arranged substantially as described.

4. The lever *B*^x, in combination with the pawl *v* in the driving-shaft, notches *u* in the driving-pulley *A*², rod *D*^x, spring *d*^x, and cam *E*^x, all arranged, substantially as shown, to automatically stop the machine at the completion of the heading of the bolt, substantially as shown and described.

A. B. GLOVER.

Witnesses:

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JOHN S. PISSENCE.