(No Model.) 3 Sheets—Sheet 1.

J. R. BLAKESLEE.

BOLT BLANK MACHINE.

No. 332,869. Patented Dec. 22, 1885.

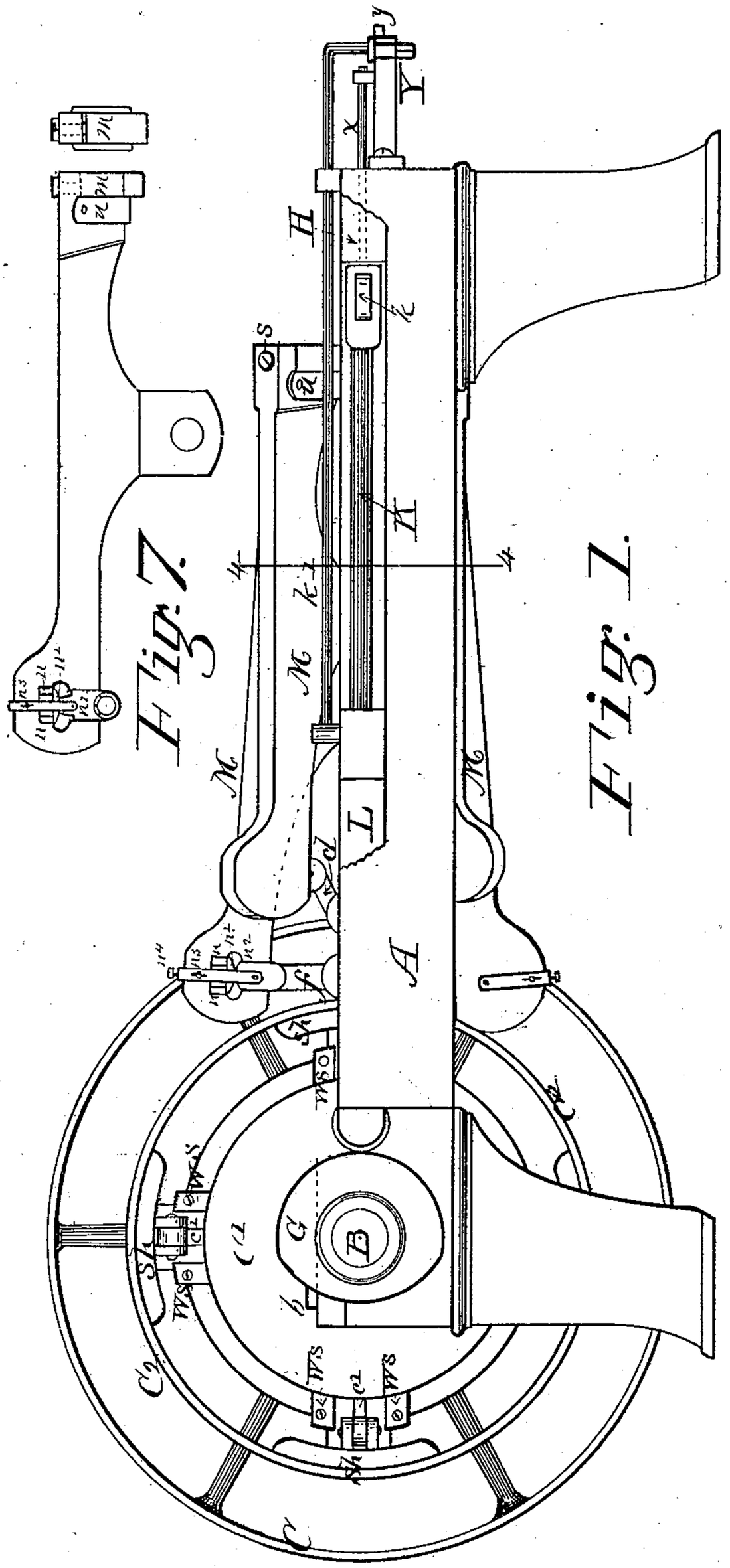

Fig. 7.

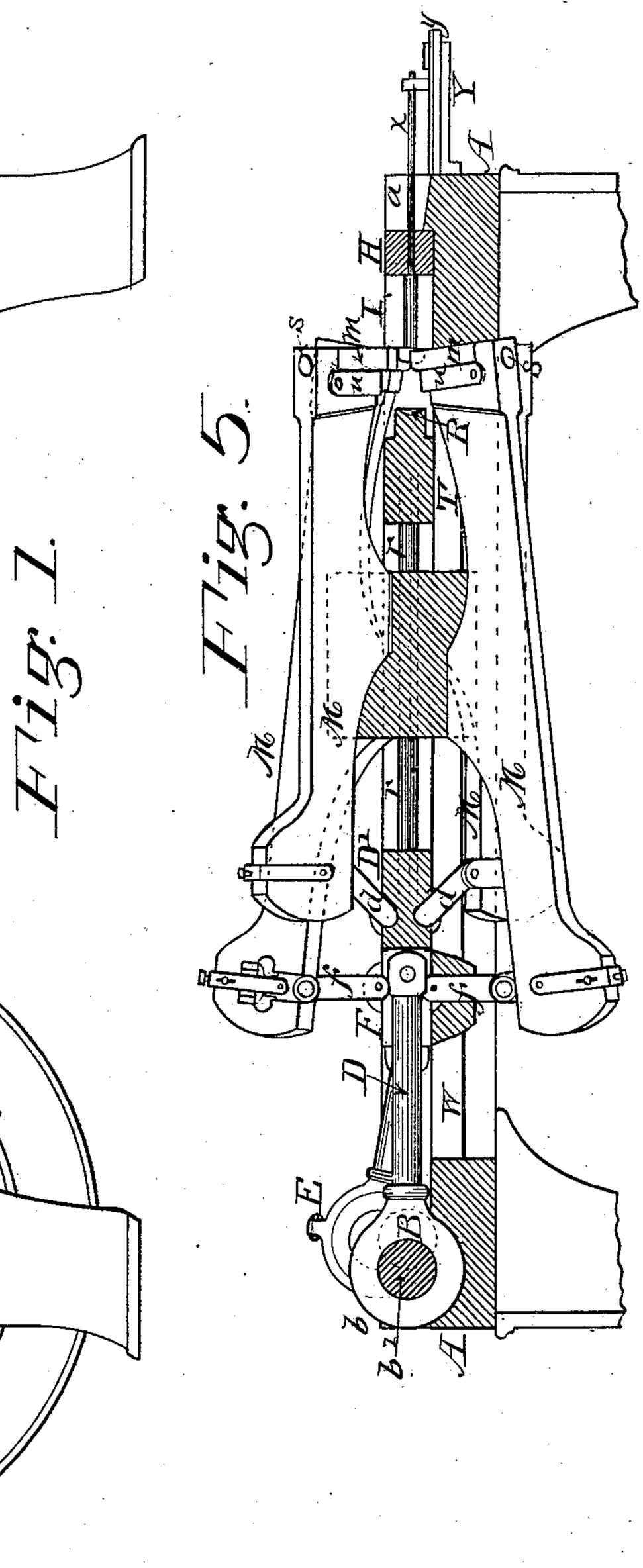

Fig. 1.

Fig. 5.

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(No Model.) 3 Sheets—Sheet 2.

J. R. BLAKESLEE.

BOLT BLANK MACHINE.

No. 332,869. Patented Dec. 22, 1885.

Fig. 2.

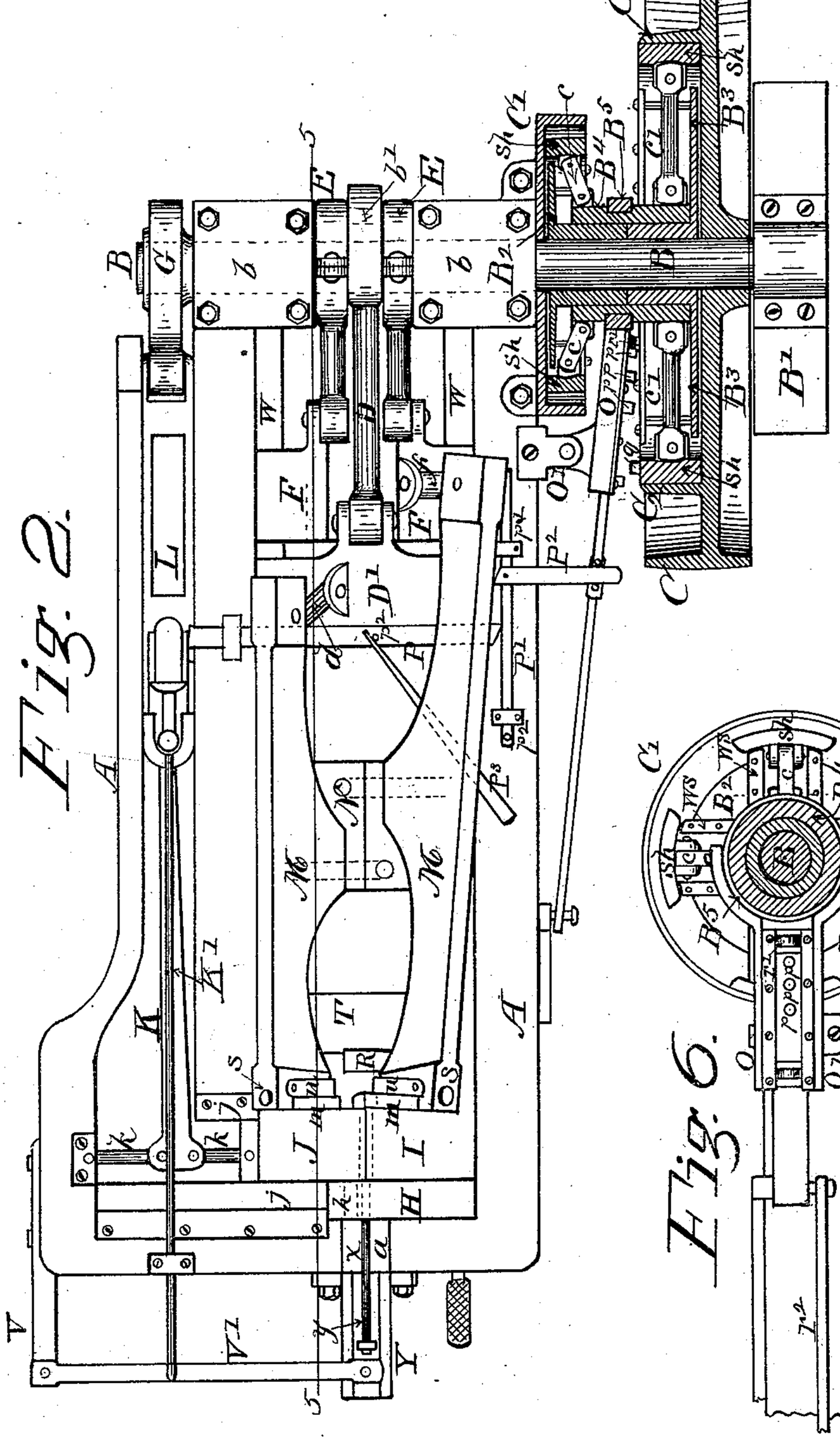

Fig. 6.

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(No Model.) 3 Sheets—Sheet 3.

J. R. BLAKESLEE.

BOLT BLANK MACHINE.

No. 332,869. Patented Dec. 22, 1885.

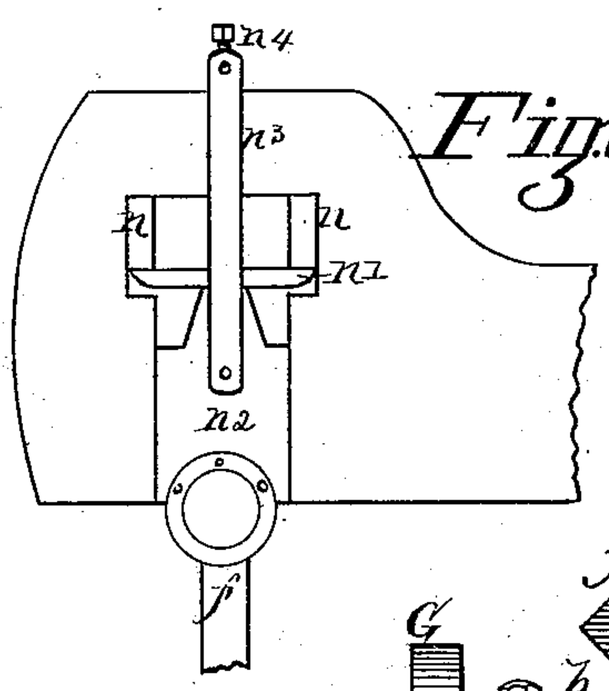

Fig. 8.

Fig. 4.

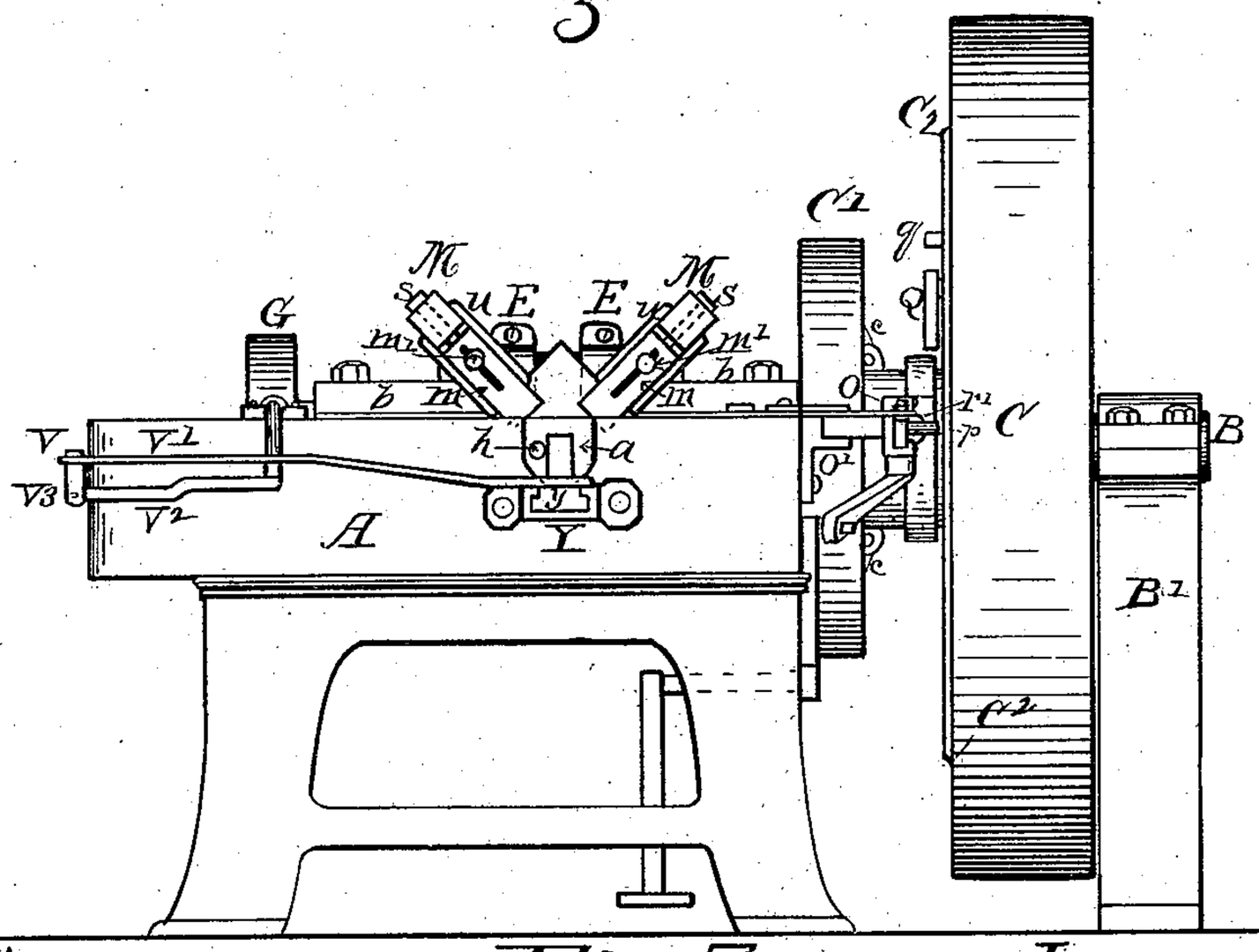

Fig. 3.

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UNITED STATES PATENT OFFICE.

JOHN R. BLAKESLEE, OF CLEVELAND, OHIO.

BOLT-BLANK MACHINE.

SPECIFICATION forming part of Letters Patent No. 332,869, dated December 22, 1885.

Application filed May 7, 1885. Serial No. 164,714. (No model.)

To all whom it may concern:

Be it known that I, JOHN R. BLAKESLEE, of Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Bolt-Machines, of which the following is a specification.

This invention relates to machines for making bolts from round bars; and it consists of a mechanism for cutting off the blank, swaging and hammering the head, and discharging the completed bolt-blank by a continuous operation, said mechanisms being constructed, combined, and operating substantially as hereinafter fully described and claimed.

In the accompanying drawings, Figure 1 is a side elevation of my machine with part of frame broken away. Fig. 2 is a top or plan view. Fig. 3 is a front end view. Fig. 4 is a cross-section in line 4 4 of Fig. 1. Fig. 5 is a longitudinal section in line 5 5 of Fig. 2. Fig. 6 is a detached side elevation of the clutch-shifting device. Fig. 7 is a detached view of one of the hammer-levers. Fig. 8 is an enlarged detached view of head of a lever, showing safety-breaker.

A is a heavy iron frame, which supports all the working parts. Across one end is placed a shaft, B, rotating in heavy boxes *b b*, and deriving its motion from a large band-wheel, C, outside of which is a pillow-block, B′, for supporting the outer end of the shaft B. Between the boxes *b b* the shaft is provided with a crank, *b′*, operating a pitman, D, attached to a sliding block, D′. E E are two eccentrics on said shaft, one on each side of the said crank *b′*, each of said eccentrics having a pitman operating a second sliding block, F. G is a cam on the end of shaft B. From the said crank, eccentrics, and cam are transmitted powerful movements to the subjoined mechanisms. In the front end of the frame are located the cutting and gripping dies for cutting off the blank and gripping and holding said blank while having the head formed upon it. In the head of the frame is made an opening, *a*, through which the heated blank-bar is passed to the dies.

H is a steel block or backing secured to the head of the frame A, through which is made a hole, *h*, for the said blank-bar to pass. Next to said backing H is a fixed gripping-die, I, having a half-round cavity in its gripping-face to receive the blank from which the bolt is to be formed. J is a corresponding moving die having a similar half-round cavity in its gripping face. Said die J is set in slides or ways *j j*, and is operated by a link movement consisting of a pitman, K, having a head to which are pivotally attached two links, *k k*, one of which is connected to the sliding die J and the other connected to the side of the frame A. Said pitman K is attached to and operated by sliding frame L, set in the side of the main frame A. Said sliding frame L is operated by the cam G on shaft B. Die J also serves as a cutting-die for cutting off the blank. The aforesaid hole *h* is just at one side of the center line of the space in the gripping-dies, when closed, so that the movement of the movable die cuts off the blank as the said die moves toward the opposite one.

In the middle portion of the machine are arranged strong power-hammers consisting of four heavy levers, M M, pivotally hung in a heavy cross-piece, N, firmly bolted to the side rails of the frame A. In the ends of said levers, toward the head of the machine, are fixed hammers *m m*, consisting of blocks of steel having slots by which they are adjustably fixed to the ends of the levers by bolts *m′*. They are held at the sides by means of bands *n*, bolted to the sides of the heads of the levers, and there is also a set-screw, *s*, put through the end of each lever bearing on the hammer, for adjusting it. These hammers are arranged in pairs, the two hammers of one pair striking simultaneously, so that one serves as the anvil for the other. Each of said hammers strikes on opposite sides of the blank, the pair forming two sides of the head of the bolt. The other pair of hammers, working alternately with the first, form the two other sides of the bolt-head. There is also a header-die operating in conjunction with the said hammers in forming the bolt-head, which will be described further on. The said levers M M are fulcrumed in slots made in the cross-piece N, and are operated at their farther ends by a mechanism, as follows: In the frame A are placed two sliding blocks, D′ and F, riding on the ways W, made on the inside surfaces of the side rails of said frame. Sliding block D′ is connected with pitman D, and block F is connected with eccentrics E. To the block

D′ are attached links *d d*—one on the upper and one on the lower side—and said links are attached to the short pair of levers M M, and the block F is connected by links *f f* with the long pair of levers M M. Let it be here noticed that the crank *b′* and the eccentrics E are fixed at right angles on the shaft, so that said pairs of levers are thus made to operate alternately, and, further, that said levers are also made to strike two blows to each revolution of the shaft. Instead of links, the under sides of the levers may have inclines by which rollers on the said sliding blocks would raise the ends of said levers to make them strike the blows. In the ends of the levers M M M M, where the power is applied, is provided a safety breaker device, to guard against the contingency of obstructions at the hammer end. The end of the lever is enlarged and has a chamber in one side. In said chamber are made shoulders *n n*, (or two blocks may be placed therein instead,) next to which are placed the ends of a piece of cast-iron, *n′*. A block, n^2, is also placed in the said chamber, having one end narrowed, and its narrow end resting against the middle of the said piece of cast-iron *n′*. A bail, n^3, may be attached for holding or retaining the block n^2 and the piece of cast-iron in place. A set-screw, n^4, in the bail is used for adjusting and setting up the bail. The lower end of block n^2 has a cavity in which the round end of the link *f* fits, and there are rings n^5, secured to the sides of the block n^2, which embrace the sides of the link and hold it up in place. The purpose of this device is this: that in case any obstruction should interpose at the hammer ends of the levers while they are in motion the excessive force would break the piece of cast-iron *n′*, and thus relieve such strain and save breaking the lever or injuring any other part of the machine from such a cause. This breaker device is also applied in the sliding frame L, for a like purpose.

R is a heading-die set in a sliding block, T, riding on the ways W of the frame A, and is connected to the sliding block D′ by strong rods *r r*, passing through and sliding in holes in the cross-piece N. The heading-die works simultaneously with the short hammers.

A device for throwing out the finished bolt-blank consists of a bracket, Y, on the front end of the machine, secured just below the opening *a*, in which is placed a slide-piece, *y*, carrying a rod, *x*, which plays through a hole in the steel piece H, in line with the bolt-space in the dies I and J. At the left-hand corner of the frame A is bolted an arm, V, to which is joined a lever, V′, the other end of which is attached to the sliding piece *y*. Beneath the lever V′ is hung a lever, V^2, hinged to short hanger V^3, and its swinging end is turned upward, and is passed through a hole in the lever V about midway from its ends. K′ is a rod attached to the end of the sliding frame L, which extends out over the end of the machine, having its end bent downward and resting on the lever V′. The end of lever V^2 reaches up through the hole in lever V′, where it is caught by the bent end of rod K′. The rod K′, being attached to the sliding frame L, moves with it as it moves back and forth, and, catching onto the upwardly-protruding end of lever V^2, pulls the lever V′, and thus, moving the slide-piece *y*, carries the push-rod *x* against the bolt, and releases it at the same time that the movable jaw J recedes, thus discharging the finished bolt. This movement takes place at a given time in relation to other movements of the machine, as will be hereinafter seen.

The movements of this machine are controlled by means of an automatic clutching device, in combination with the driving-wheel C, as follows: To the side of the machine is attached a flanged disk, C′, through which the shaft B passes. The wheel C also has an annular flange, C^2. Upon the shaft B are placed two disks, B^2, which is in close proximity with disk C′, and B^3 in close proximity with the spokes of the wheel C. These disks have hubs, by means of which they are keyed to the shaft. The wheel C runs loosely on the shaft. Over the hubs of the said disks B^2 and B^3 is placed a sleeve, B^4, which has a sliding movement longitudinally thereon. To each end of said sleeve are pivoted links *c c* and *c′ c′*, to the outer end of which are attached brake-shoes *sh*, which shoes slide in radial ways WS on the aforesaid disks B^2 and B^3. The said brake-shoes are made to engage alternately with the flanged disk C′ and the annular flange C^2 in starting or stopping the machine. On the sleeve B^4 is placed a loose ring, B^5, set in an annular groove in said sleeve, and is connected with a shifting-lever, O, pivoted to a bracket, O′, bolted to the side of frame A. Said lever O has a sliding bar fixed in its outer face, to which are attached rollers *r′* and three pins, *p p p*, said pins being located on the said bar between said rollers from the middle toward the inner roller.

Q is a leaf attached to disk B^3, which is curved in line of rotation of the disk, having one end nearer the center of rotation, however, to form a cam, the purpose of which is, as the driving-wheel revolves, to strike the pins *p p p* successively in three revolutions, to move the sliding bar to which said pins *p p p* are attached, thereby drawing said bar inward. Then when said bar has been drawn in a projection, *q*, on said disk B^3, strikes the roller *r′* on said sliding bar in lever O. This moves said lever O on its pivot at O′, and thus shifts the clutch over into the fixed disk C′, which stops the machine.

The machine is set in motion by the operator, who stands at the head thereof, by means of a foot-treadle, *t*, pivoted to side of frame, and connected by rod r^2 to the aforesaid sliding bar in lever O, the drawing out of which sliding bar again throws the clutch over into

the wheel C. The machine is thus made to make three complete revolutions of its shaft to perform the work, but by making a change in the curve of cam-leaf and a change in number of pins *p p* the machine may be made to make more or less revolutions, if desired.

P is a bar lying across the machine, for locking the sliding frame L when pushed forward by the cam G for closing the gripping-die J during the three revolutions of the wheel C and shaft B hereinbefore described. This locking-bar is operated by the sliding bar in the lever O. On the top of the frame is placed a sliding bar, P′, sliding in cap-pieces *p′*, and provided with an arm, P^2, extending over the side of the frame and connected with the aforesaid sliding bar in the lever O. A lever, P^3, is placed on the frame A, fulcrumed about its middle by a bolt or pin, and lying in a diagonal line. Its inner end engages with a pin, p^2, on the bar P, for moving said bar back, which is done by the bar P′ striking against the outer end of said bar P^3, said bar P′ being moved by the operations of the driving-wheel on the aforesaid pins *p p*. When the sliding frame L is thus unlocked, it moves back, and, drawing on the pitman K, opens the gripper and releases the bolt.

The locking of the frame L is performed by the movement of the treadle *t*, which carries bar P^2, the inner end of which is beveled, as is the end of bar P, thus pushing said bar P inward, which remains in until the end of bar P′ again pushes end of bar P^3.

Having described my invention, I claim—

1. In a machine for making square and hexagon headed bolt-blanks by a continuous operation, a mechanism constructed and arranged to cut off the blanks, a mechanism constructed and arranged for gripping said blanks, a mechanism constructed and arranged for hammering and swaging the heads on said blanks, a mechanism constructed and arranged for automatically shifting the clutching device for stopping the machine and unlocking the grippers, and a mechanism constructed and arranged for discharging the headed blank, all combined and operating substantially in the manner and for the purpose specified.

2. The combination of the steel backing H, having the hole *h*, through which the heated bar is fed, the stationary die I, and the movable gripping-die J, connected by links *k k* with the pitman K, connected to and operated by the sliding frame L, which is actuated by the cam G on shaft B, by which the blank is severed from the bar and gripped or held for the upsetting and hammering operations.

3. The levers M M, arranged in pairs, and fulcrumed in the cross-piece N, and provided with the adjustable hammers *m m* on one end, the opposite ends connected by links *d d f f* to the sliding blocks D′ and F, which are connected by pitman D and eccentrics E E with crank-shaft B, the movements of said sliding blocks D′ and F operating the levers M for hammering the sides of the bolt-head, all said parts combined substantially as described.

4. The sliding block T, having the heading-die R, and riding on the ways W in the sides of frame A, said block T being connected to and operated by the rods *r r*, sliding through the cross-piece N, and attached to the sliding block D′, which derives its motion by pitman D from driving-shaft B, all combined and arranged to operate as and for the purpose specified.

5. The combination, with the hammer-levers M, of the breaker device consisting of the piece of cast-iron *n′*, arranged in the chamber in the end of the lever, and the block n^2, bearing against said cast-iron *n′* and connected to the link *f* and bail n^3, substantially in the manner shown, and for the purpose specified.

6. The clutch mechanism consisting of the flanged disk C′, permanently attached to the frame A, and wheel C, provided with flange C^2, the disks B^2 B^3, fixed on shaft B, and provided with the ways WS, for carrying the brake-shoes *sh*, which are connected by links *c c* and *c′ c′* to the sliding sleeve B^4, and the ring B^5, attached to the shifting-lever O, hinged to bracket O′ on side of frame A, said lever O having sliding bar provided with pins *p p p* and rollers *r′*, said pins and rollers being struck and moved by the leaf Q and projection *q* on the disk B^3, whereby the said lever O is moved and the clutch shifted for stopping the machine at one or more revolutions of the driving-shaft B, substantially as described.

7. The combination, in a machine for making bolts, of the bracket Y, having slide *y*, carrying push-pin *x*, and the lever V′, pivoted to arm V on frame A, and having catch-lever V^2, which is actuated by rod K′, connected to sliding frame L, which, when it moves, draws on the rod K, that moves the lever V′, thereby pushing the pin *x* inward at the same time the dies are opened, and thus discharging the bolt therefrom, substantially as described.

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Witnesses:
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