(No Model.) 4 Sheets—Sheet 1.

T. A. PERRINS.

MACHINE FOR SETTING LACING STUDS.

No. 542,492. Patented July 9, 1895.

Fig. 1

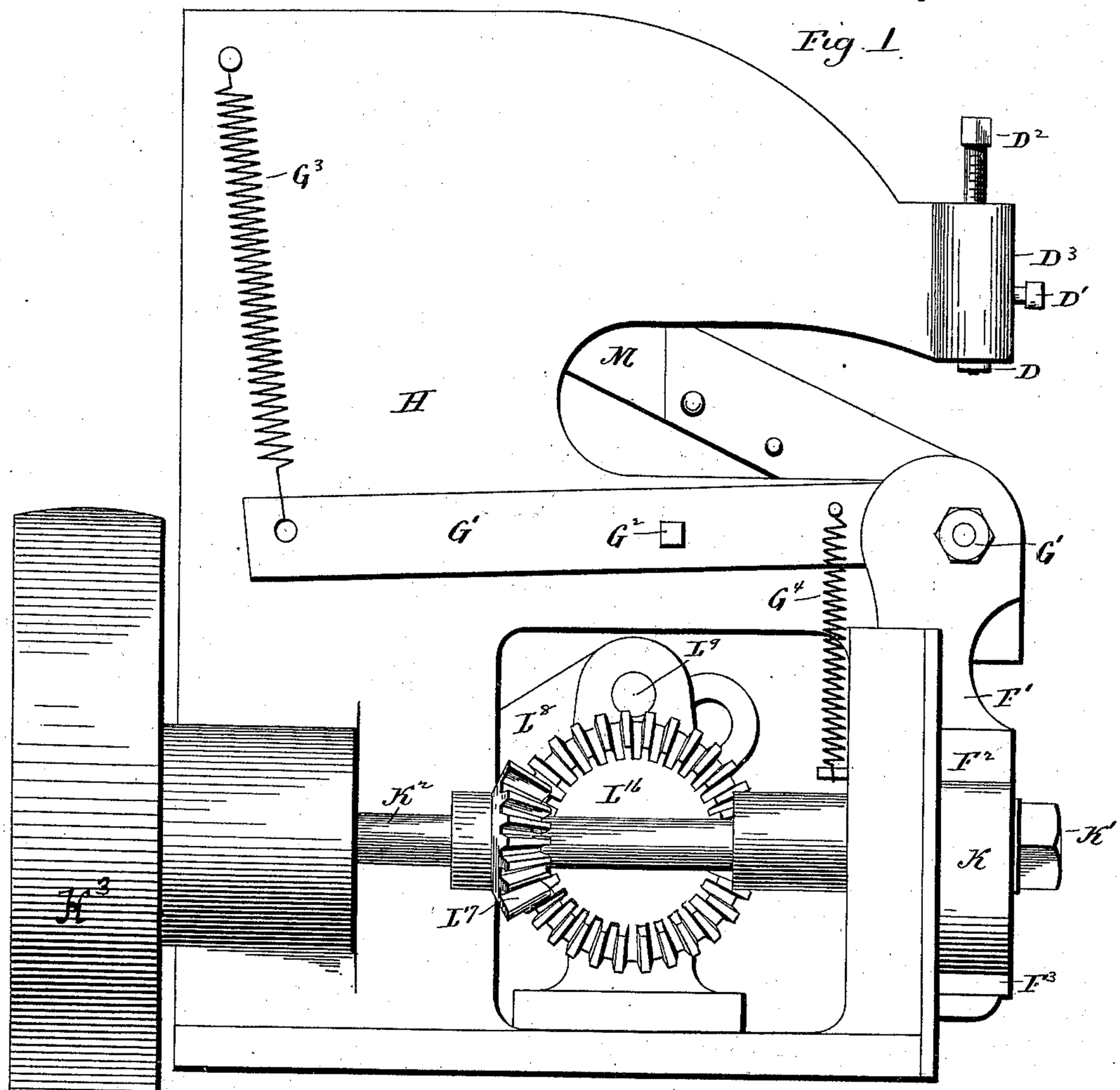
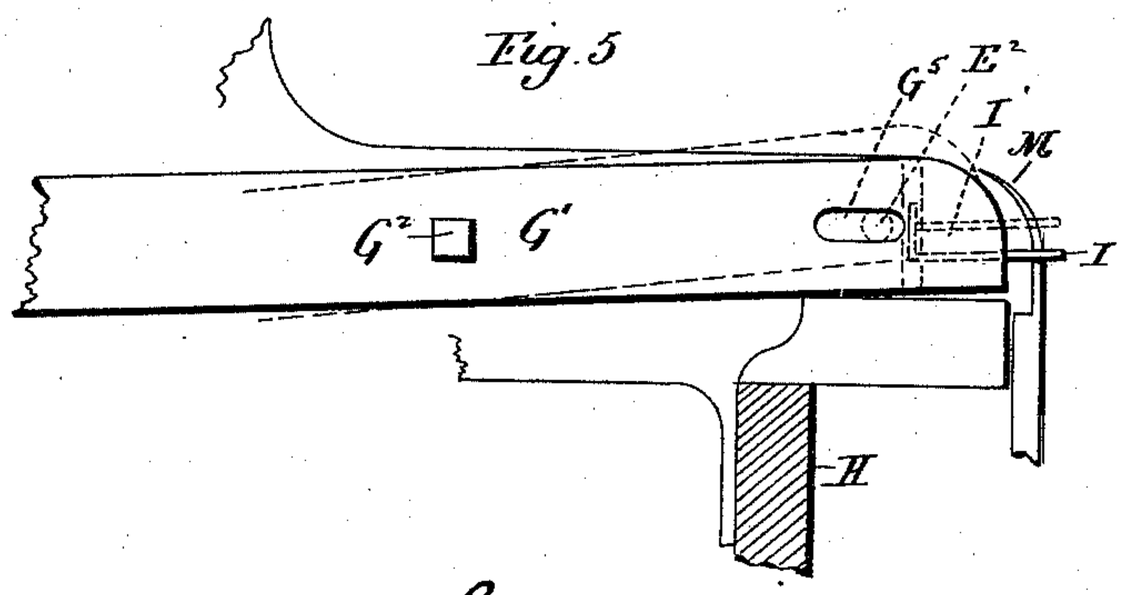


Fig. 5



Witnesses.
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(No Model.) 4 Sheets—Sheet 2.

T. A. PERRINS.

MACHINE FOR SETTING LACING STUDS.

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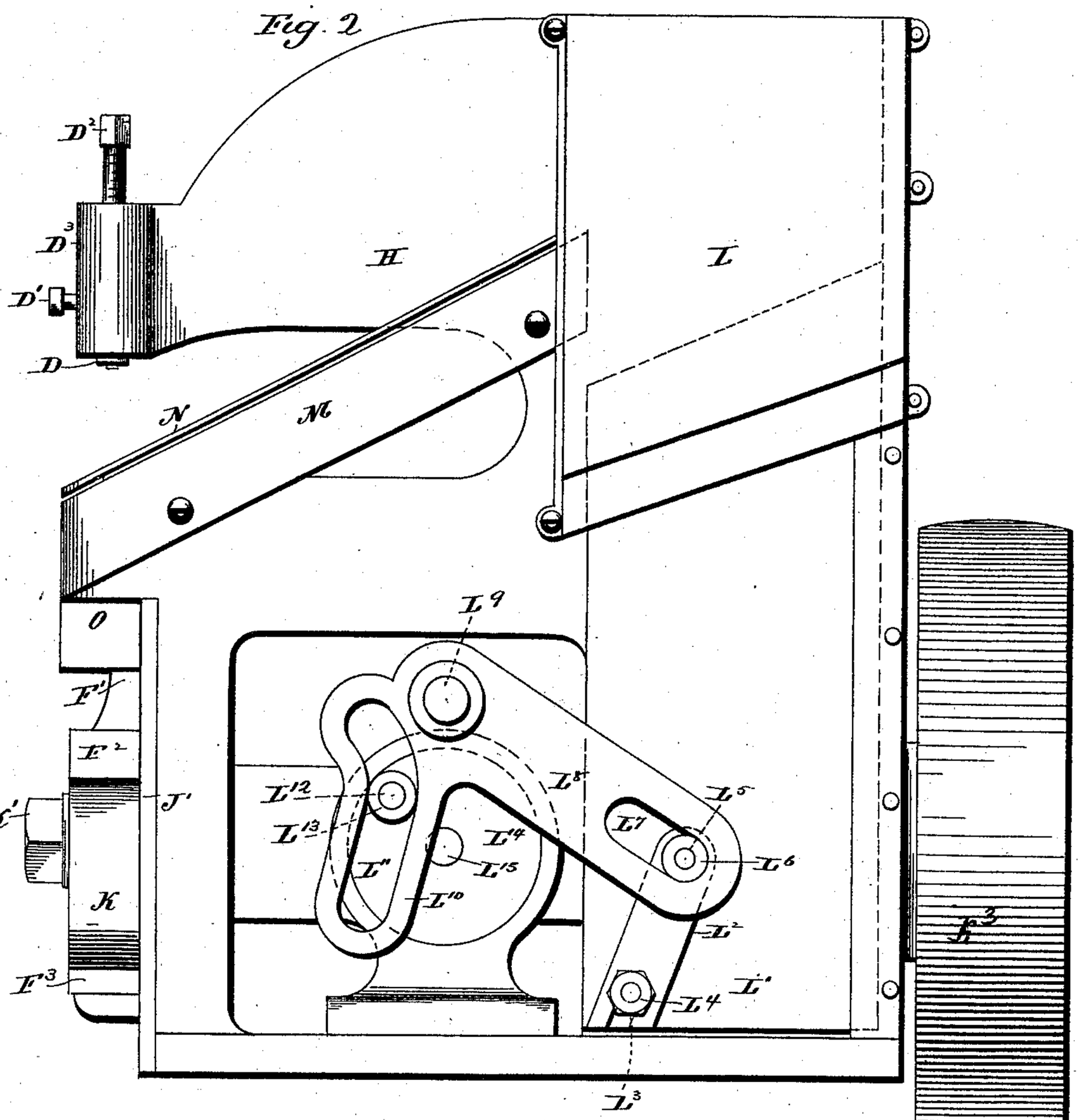
Fig. 2



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(No Model.) 4 Sheets—Sheet 3.

T. A. PERRINS.

MACHINE FOR SETTING LACING STUDS.

No. 542,492. Patented July 9, 1895.

Fig. 3

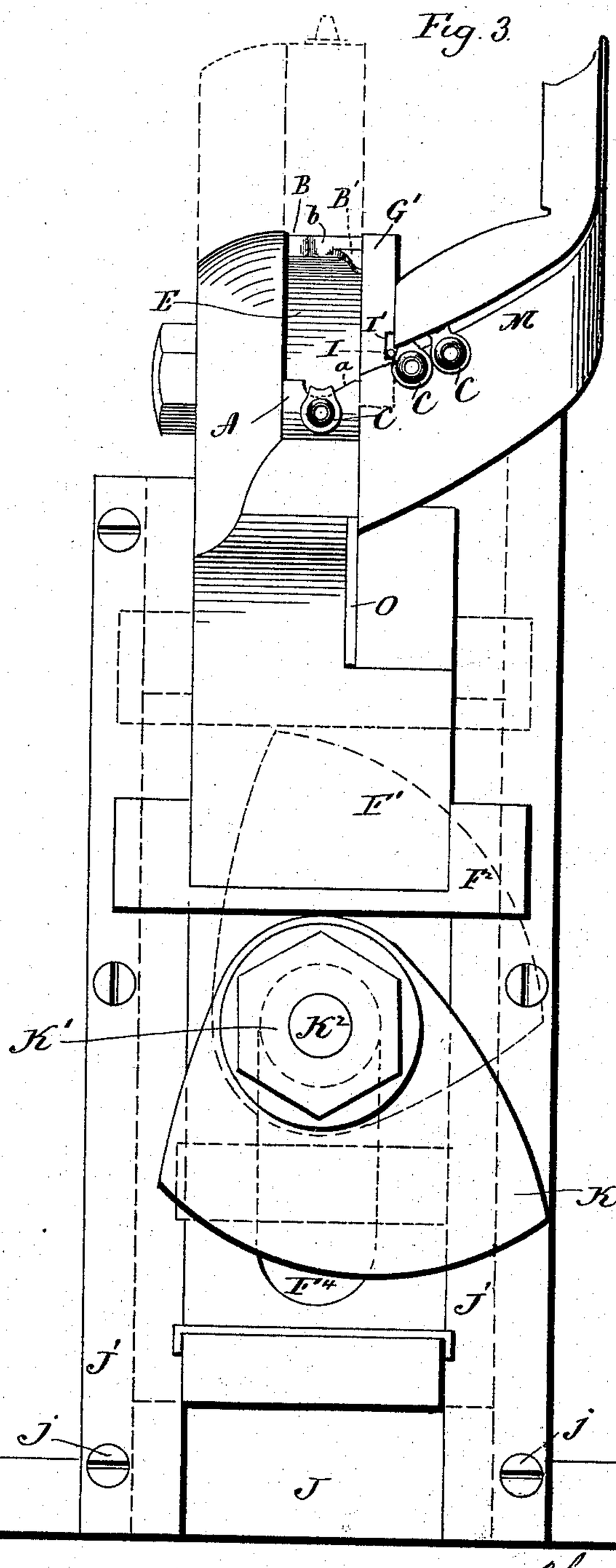
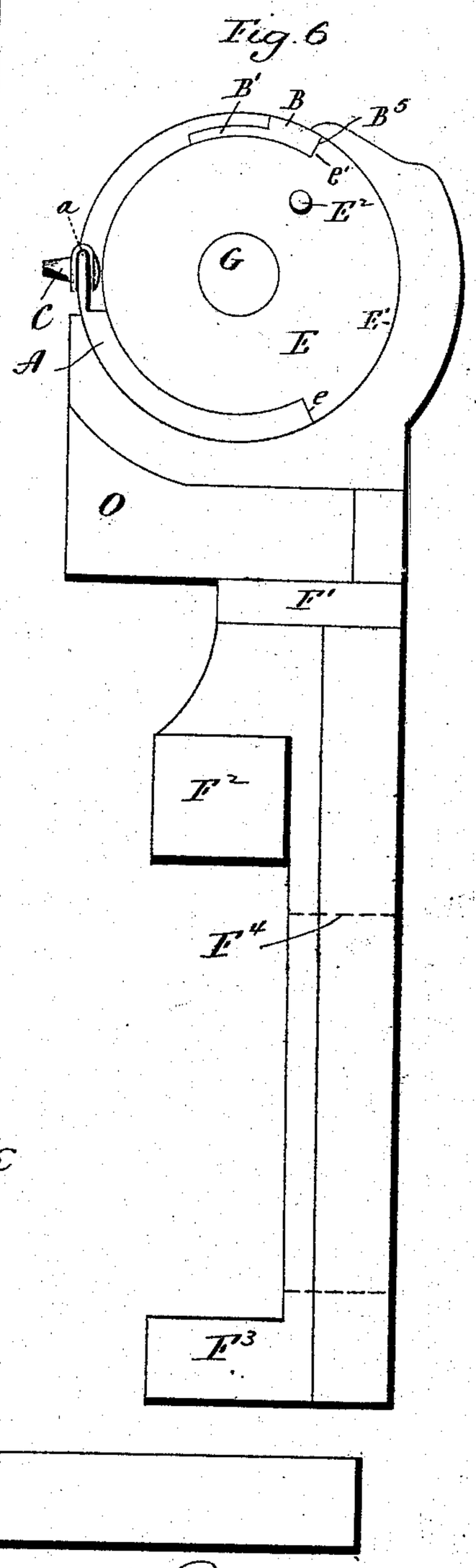


Fig. 6



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(No Model.) 4 Sheets—Sheet 4.

T. A. PERRINS.

MACHINE FOR SETTING LACING STUDS.

No. 542,492. Patented July 9, 1895.

Fig. 4

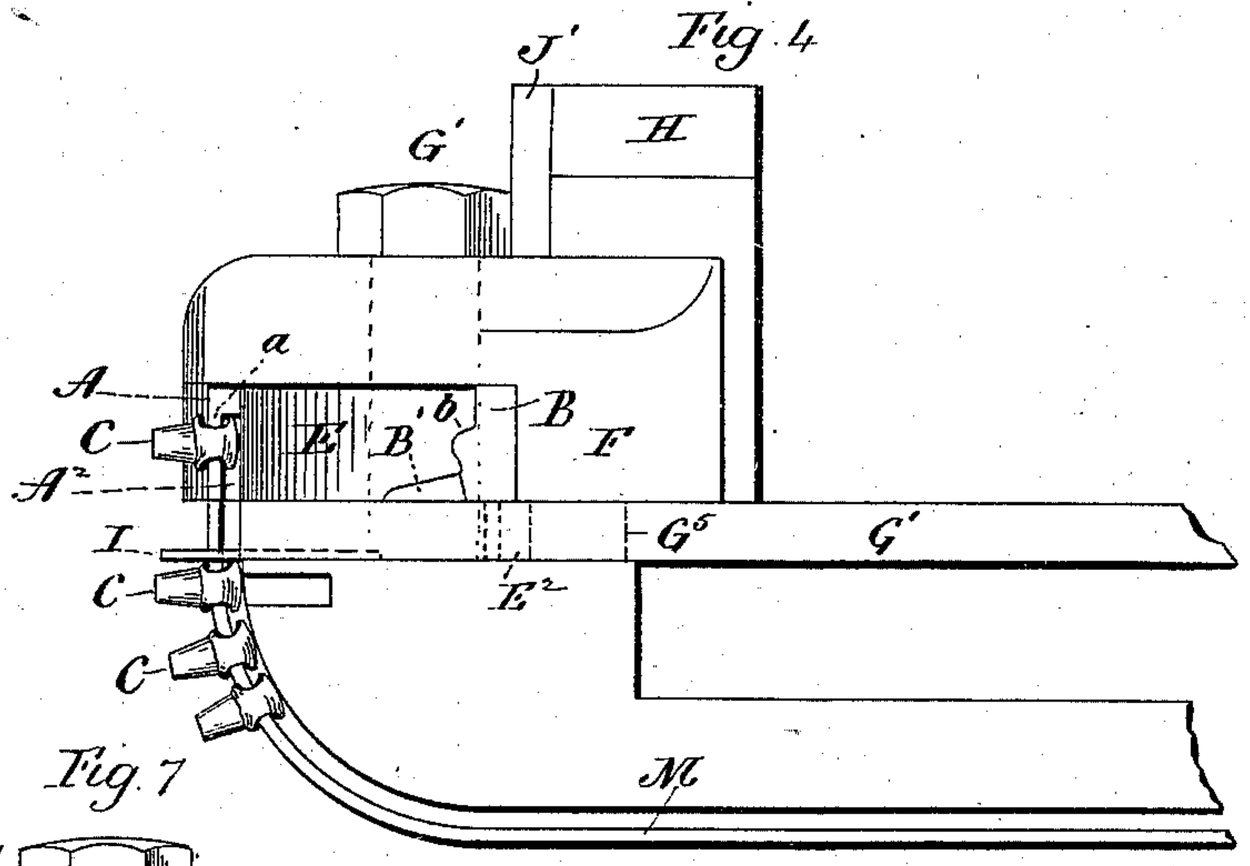

Fig. 7

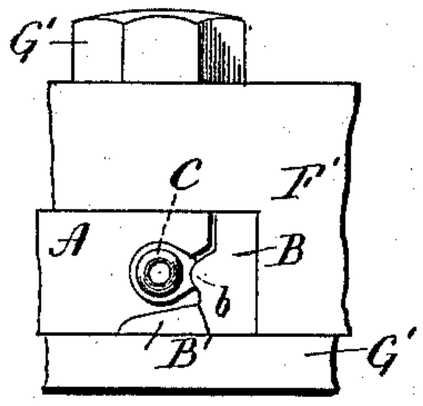

Fig. 13

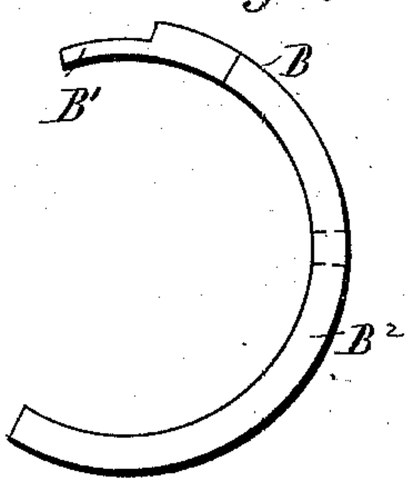

Fig. 8

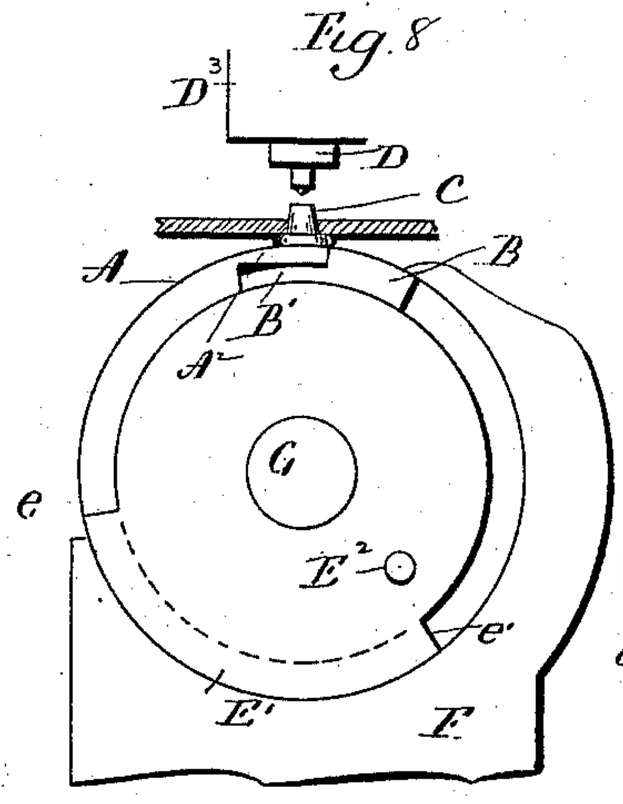

Fig. 14

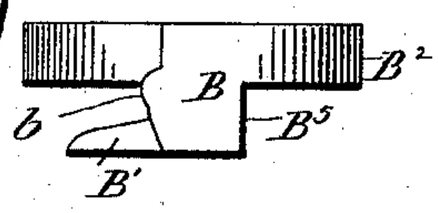

Fig. 9

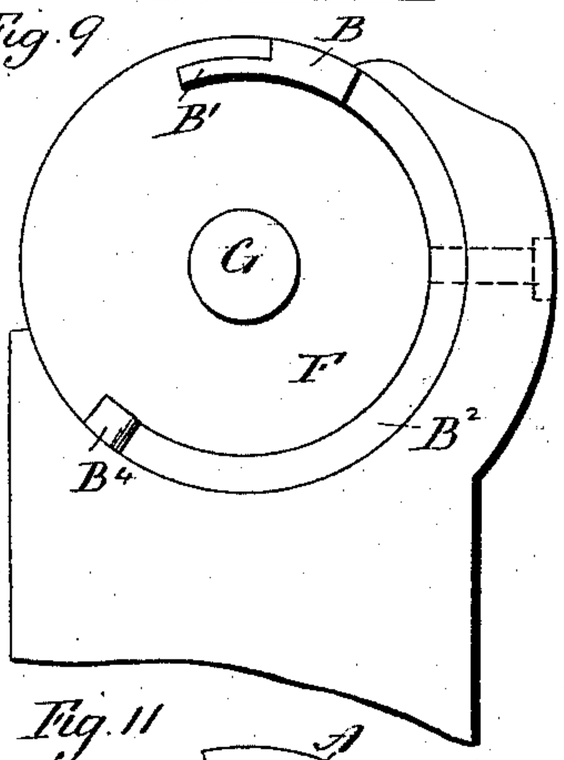

Fig. 11

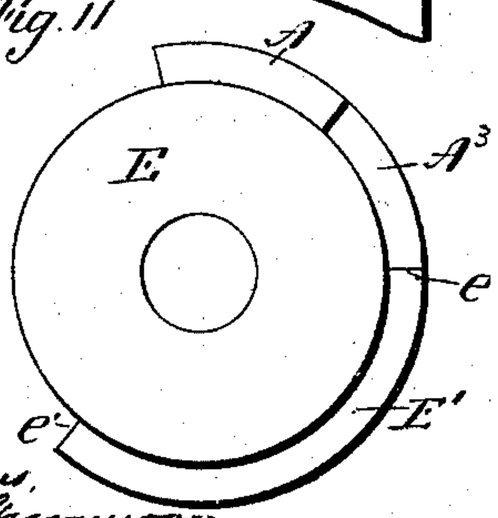

Fig. 10

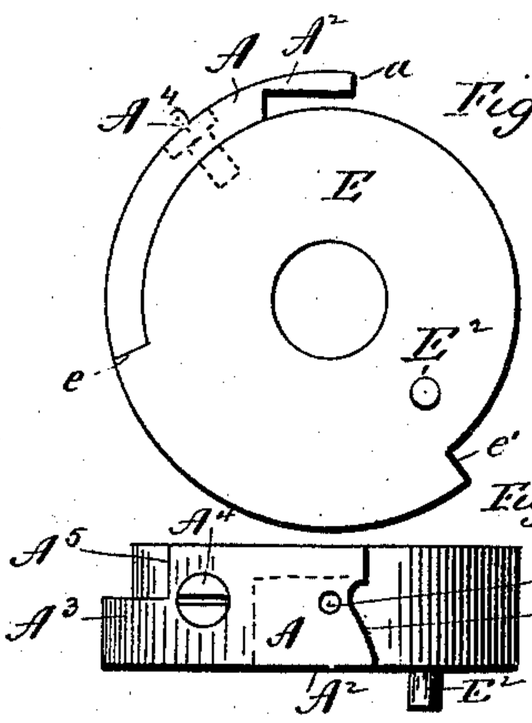

Fig. 12

Witnesses,
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Attys

UNITED STATES PATENT OFFICE.

THOMAS A. PERRINS, OF ANSONIA, CONNECTICUT.

MACHINE FOR SETTING LACING-STUDS.

SPECIFICATION forming part of Letters Patent No. 542,492, dated July 9, 1895.

Application filed February 18, 1895. Serial No. 538,745. (No model.)

To all whom it may concern:

Be it known that I, THOMAS A. PERRINS, of Ansonia, in the county of New Haven and State of Connecticut, have invented a new Improvement in Machines for Setting Lacing-Studs; and I do hereby declare the following, when taken in connection with the accompanying drawings and the letters of reference marked thereon, to be a full, clear, and exact description of the same, and which said drawings constitute part of this specification, and represent, in—

Figure 1, a view in side elevation of a machine constructed in accordance with my invention; Fig. 2, a similar view of the other side of the machine; Fig. 3, a view of the machine in front elevation; Fig. 4, a broken plan view of the machine, showing the lower end of the guide-rail and the holding and feeding jaws; Fig. 5, a detached broken view of the machine, showing in particular the gate-lever and gate-pin; Fig. 6, a detached view in inside elevation of the vertically-movable block or carrier in which the oscillating jaw-head is located and shown; Fig. 7, a detached broken plan view showing the holding and feeding jaws with a lacing-stud gripped between them; Fig. 8, a detached broken view in side elevation, showing the holding and feeding jaws about to force a lacing-stud against the punch; Fig. 9, a broken view in inside elevation of the upper end of the carrier or block, with the jaw-head and feeding-jaw removed; Fig. 10, a detached view of the oscillating jaw-head and feeding-jaw; Fig. 11, a reverse view thereof; Fig. 12, a plan view thereof; Fig. 13, a detached view in side elevation of the holding-jaw; Fig. 14, a plan view thereof.

My invention relates to an improved machine for setting lacing-studs, the object being to produce a simple, compact, and durable machine, composed of few parts, adapted to be operated conveniently, not liable to derangement, and having a large capacity for work.

With these ends in view my invention consists in a machine having certain details of construction and combinations of parts, as will be hereinafter described, and pointed out in the claims.

In carrying out my invention I employ a feeding-jaw A and a holding-jaw B, which are constructed and arranged to receive and grip the studs C and lift and upset the shanks of the same upon the fixed punch D, against which the work is held, while the jaws A and B are moving up and down, whereby my machine avoids the necessity of moving the work up and down also, as demanded by many of the machines now in use.

It will suffice for me to say here that the fixed punch D is of ordinary construction. As shown, it is held in any desired position of adjustment by means of two set-screws D' and D^2, horizontally and vertically mounted in a vertically-arranged sleeve D^3, as clearly shown in Fig. 2.

In addition to the vertical movement of the jaws the feeding-jaw A is adapted to have an oscillating movement, at the outward limit of which it receives the studs and at the inward limit of which it forces and firmly holds the same against the holding-jaw B, which is a fixed jaw, except for vertical movement. The said jaw A has its extreme inner end shaped as at *a* to grip the studs, while the inner end of the jaw B is correspondingly shaped, as at *b*. The said jaw A is also constructed at its inner end with a small clearance-opening A', which receives the punch D and with an undercut pocket A^2, which receives the heads of the studs, as seen, for instance, in Fig. 6. The jaw B is provided at the outer edge of its inner end with a beveled centering-finger B', which is constructed and arranged to enter into the outer edge of the pocket A^2 of the feeding-jaw A and operates to invariably center the studs over the clearance-opening A' aforesaid, whereby the studs are brought into alignment with the punch D. The outer end of the jaw A is constructed with a segmental shank A^3, which is offset to the right, while the jaw B is constructed with a corresponding but longer segmental shank B^2, offset to the left and therefore clearing the shank A^3 of the jaw A. The said jaw A is secured by means of a screw A^4 to a substantially circular jaw-head E, which has formed integral with its outer edge a flange E' corresponding in width and thickness to the shank A^3 of the jaw, one end of the said shank being abutted against one end of the flange, as shown at *e* in Fig. 11, while the op-

posite end of the said flange forms an abutment-shoulder *e'*, as shown in the same figure. The said head is located within a circular recess F, formed in the upper end of a vertically-movable carrier or block F', and mounted for oscillating movement upon the inner end of a large stud G, which projects into the center of the said recess, as shown in Fig. 9, and the outer end of which is threaded for the reception of a nut G', which bears against the outer face of the block and holds the stud firmly in place therein. The jaw B is located in the said recess F in such a manner that its long segmental shank B^2 lies back of the shank A^3 of the jaw A and the flange E' of the oscillating head E, the said shank receiving a screw B^3, which holds the jaw from lateral displacement and from forward endwise movement, while an abutment-pin B^4, located within the recess, is engaged by the extreme outer end of the segmental shank B^2 and prevents the shank and jaw from inward longitudinal movement. The shoulder A^5, formed in the feeding-jaw A, adjacent to the base of the shank A^3 thereof, engages with the opposite face of the abutment-pin and limits the outward oscillating movement of the said jaw and oscillating jaw-head. At the same time the shoulder A^5 just mentioned engages with the abutment-pin the abutment-shoulder *e'* of the flange E' of the head engages with the shoulder B^5, formed upon the jaw B, adjacent to the base of the shank B^2 thereof.

It will be noted that the feeding-jaw A may be readily removed from the jaw-head E, and, furthermore, that the holding-jaw B may be readily removed from the carrier or block F', and I would have it understood that my design is to supply each machine with jaws adapted to be used for setting studs varying in size and form.

For the purpose of oscillating the jaw-head E, and hence the feeding-jaw A, I provide the outer face of the head with an operating-pin E^2, which enters an elongated slot G^5, longitudinally arranged in the forward end of the substantially-horizontal gate-lever G', which is mounted on a stud or pivot G^2 and clearly shown in Figs. 1 and 5. Springs G^3 and G^4, connected with the machine-frame H and with the opposite ends of the lever G', hold the same yieldingly in its normal position, in which a gate-pin I, located in a recess I', formed in the lower edge of the inner face of the outer end of the lever, holds back the column of studs C, which are waiting to be picked up one by one by the oscillating jaw A, as will be described later on. The said gate-pin I is set into the open recess I', and held in place therein by the adjacent portion of the machine-frame H, which the inner face of the lever bears against as the lever is operated and which prevents the pin from falling out of the said recess as the lever moves up and down. The vertically-movable block or carrier F' is located in a large vertical slot J, formed in the machine-frame H, and retained in the said slot by means of two corresponding vertically-arranged plates J' J', secured to the machine-frame by screws *j*. The said block is constructed upon its outer face with two horizontally-arranged shoulders F^2 F^3, located one above the other and receiving between them and coacting with a large cam K, secured by a nut K' upon the outer end of the horizontal driving-shaft K^2, which the machine-frame H affords a bearing for and which projects at its forward end through a vertically-elongated clearance-slot F^4, formed in the lower end of the block. It will be understood that when this cam engages with the shoulder F^2 it positively lifts the block, and when it engages with the shoulder F^3 it positively depresses the same, so that the movement of the block is positive in either direction. The opposite end of the said shaft is furnished with a driving-pulley K^3.

Any approved devices for feeding the studs into the pocket A^2 of the feeding-jaw A may be employed. As herein shown, the machine is provided with a hopper L, into which the studs are introduced in bulk in the usual manner. A feeding-blade L', having its upper edge forwardly inclined, extends at its upper end into the said hopper, in which it plays up and down through the mass of studs, the said blade being furnished at its lower end with an adjustable block L^2, secured to it by means of a stud L^3 and a nut L^4 and carrying a pin L^5, furnished with an antifriction-roll L^6, which plays in an elongated slot L^7, formed in the outer end of the arm L^8 of a bell-crank lever hung upon a stud L^9 and having its other arm L^{10} furnished with a long segmental slot L^{11}, receiving a crank-pin L^{12}, carrying an antifriction-roller L^{13} and mounted in a disk L^{14}, secured to a short shaft L^{15}, the opposite end of which carries a bevel gear-wheel L^{16}, meshing into a pinion L^{17}, mounted on the driving-shaft K^2; but the means just described for operating the feeding-blade may be widely varied without departing from my invention. As the forwardly-inclined upper edge of the blade rises through the mass of studs in the hopper it picks up and lifts some of them into alignment with the elevated rear end of the guide-rail M, which at its said end projects into the hopper, as shown in Fig. 2. When the blade is brought into alignment with the said end of the guide-rail, the studs which have been picked up by the blade slide forward off the same and onto the rail and down the same. At its lower forward end the rail is curved and practically brought to a bearing against the inner face of the block F', as required to bring the studs into range with the pocket A^2 formed in the feeding-jaw A when the same is at the outward limit of its oscillating movement. A plate-fender N, located above the guide-rail, prevents the studs from being derailed on their way to the oscillating feeding-jaw A. The column or line of studs on the guide-rail is held back by means of the gate-pin I, before

mentioned, while the stud fed below the pin is prevented from escaping during the upward movement of the block, and before it has an opportunity of entering the pocket A^2 in the feeding-jaw, by means of a guard O, which is located in a vertical plane and at a right angle to the curved lower end of the guide-rail, which it bears against.

Having fully described the construction of my improved machine, I will proceed to set forth the mode of its operation.

Lacing-studs having been fed in bulk to the hopper, the machine is started in operation, causing the vertical reciprocating feed-blade to move up and down through the mass of studs, of which it will catch a few during its upward movement and deliver them to the upper end of the inclined guide-rail, down which they will gravitate until arrested by the gate-pin I, which we will assume to have been lifted, so as to permit one stud to pass below it, the said stud being prevented from sliding off from the extreme lower end of the rail by means of the vertically-movable block F′ and the guard O. Now, when the said block is, in the operation of the machine, depressed into its lowest position the oscillating jaw-head E will be thrown to the limit of its outward oscillation and so as to bring the pocket A^2 of its feeding-jaw A opposite the lower end of the guide-rail and into position to receive the said stud, which at once glides into it. The block now begins to lift, causing the said oscillating jaw-head to be moved through the medium of the operating-pin E^2 and the gate-lever G′, which at this time is held virtually stationary by the springs G^3 and G^4. Before the jaw-head in its described oscillating movement reaches the limit of its inward movement the beveled centering-finger B′ of the holding-jaw B enters the outer edge of the pocket A^2 and engages with the outer edge of the stud, so as to draw the same into its right position over the small clearance-opening A′ of the feeding-jaw, unless the stud has already taken that position under the action of gravity. The inward oscillation of the jaw-head and the inward movement of the feeding-jaw are stopped, however, before the block has completed its upward movement by the clamping of the stud between the feeding and holding jaws and by the stops provided for the purpose. The block now completes its upward movement, during which the shank of the stud is lifted against the punch D and upset. Also during the completion of the upward movement of the block the forward end of the gate-lever G′ is lifted against the tension of its springs, whereby the gate-pin is lifted above and out of contact with the lower end of the guide-rail long enough to permit another stud to pass below it onto the extreme end of the rail, from which it is prevented from slipping off by the block F′ and guard O thereof. Now, just as soon as the block begins to descend the gate-lever and gate-pin assume their normal positions, the gate-pin being re-engaged with the guide-rail, so as to prevent the column of studs thereupon from feeding, and the gate-lever returning to its normal position, in which it is held with sufficient rigidity to co-operate with the operating-pin to cause the jaw-head to be oscillated, and the feeding-jaw thrown outward into position to bring its pocket into line with the lower end of the guide-rail, from which it receives the stud last fed, and so on.

I would call particular attention to the fact that the fabric to which the studs are applied is held against the punch and is not moved up and down, whereby the machine is very convenient to operate. It will also be observed that the machine is composed of comparatively few parts, none of which are delicate or arranged so as to be liable to derangement.

It is obvious that in carrying out my invention the devices for feeding the studs may be widely varied, as also may the operating connections of the machine. It will be clear also that the details of my improved devices for feeding the studs to the punch may be varied. I would, therefore, have it understood that I do not limit myself to the exact construction shown and described, but hold myself at liberty to make such changes therein as fairly fall within the spirit and scope of my invention. Thus instead of moving the feeding-jaw A and holding-jaw B up and down I might provide for the movement of the punch D toward and away from the said jaws.

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

1. In a machine for setting lacing-studs, the combination with a fixed punch, of a vertically movable block or carrier, a holding jaw secured thereto, an oscillating jaw-head mounted in the said block or carrier, and a feeding-jaw located upon the said oscillating jaw-head and adapted to receive a stud, and carry the same to the holding jaw with which it co-acts to hold the stud when the same is pressed against the punch by the movement of the block or carrier, substantially as described.

2. In a machine for setting lacing-studs, the combination with a fixed punch, of a vertically movable block or carrier, a holding jaw carried thereby, an oscillating jaw-head mounted in the said carrier, and a feeding-jaw located upon the said jaw-head and constructed with a pocket which receives the studs which it carries to the holding jaw, and adapted to coact therewith to hold them while they are forced against the punch by the movement of the block or carrier, substantially as described.

3. In a machine for setting lacing-studs, the combination with a fixed punch, of a movable block or carrier, a holding jaw applied thereto, an oscillating jaw-head located therein, a feeding-jaw carried by the said jaw-

head, and adapted to have the studs fed to it one by one, and a yielding gate-lever arranged to feed the studs one at a time, and connected with the said jaw-head which is oscillated by it and by which it is finally lifted for the feeding of the studs, substantially as described.

4. In a machine for setting lacing-studs, the combination with a fixed punch, of a reciprocating block or carrier moving toward and away from the punch, a holding jaw carried by the said block or carrier, an oscillating jaw-head mounted in the said block or carrier, a feeding jaw located upon the said oscillating jaw-head, and adapted to receive the studs one by one, an operating-pin located in the said oscillating jaw-head, a yielding gate-lever constructed with an elongated slot for the reception of the said pin, and means operated by the said lever for permitting the studs to be fed one by one to the feeding-jaw, substantially as described.

5. In a machine for setting lacing-studs, the combination with a fixed punch, of a reciprocating block or carrier moving toward and away from the same, a fixed jaw removably mounted in the said block or carrier, and having a segmental shank, of an oscillating-jaw-head mounted in the block or carrier, a feeding-jaw removably attached to the said jaw-head, constructed with a pocket to receive the studs one by one, and with a segmental shank arranged out of alignment with the shank of the fixed jaw, and means for operating the said jaw head in oscillation, and for feeding the studs one by one to the pocket of the feeding-jaw, substantially as described.

6. In a machine for setting lacing-studs, the combination with a punch, of a holding jaw, a feeding jaw co-operating with the holding jaw to grip the studs, and a circular jaw-head to which the feeding jaw is secured and by the oscillation of which the said feeding jaw is moved toward and away from the holding-jaw, substantially as described.

7. In a machine for setting lacing-studs, the combination with a punch, of a holding jaw, a segmental feeding jaw constructed at its inner end with a clearance opening to receive the punch, and with an undercut pocket to receive the heads of the studs, and a circular jaw-head to which the segmental feeding-jaw is secured, and by the oscillation of which the said jaw is moved toward and away from the holding-jaw, substantially as set forth.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

THOS. A. PERRINS.

Witnesses:
FRED. M. DREW,
CHAS. E. REMER.