

No. 707,643.

Patented Aug. 26, 1902.

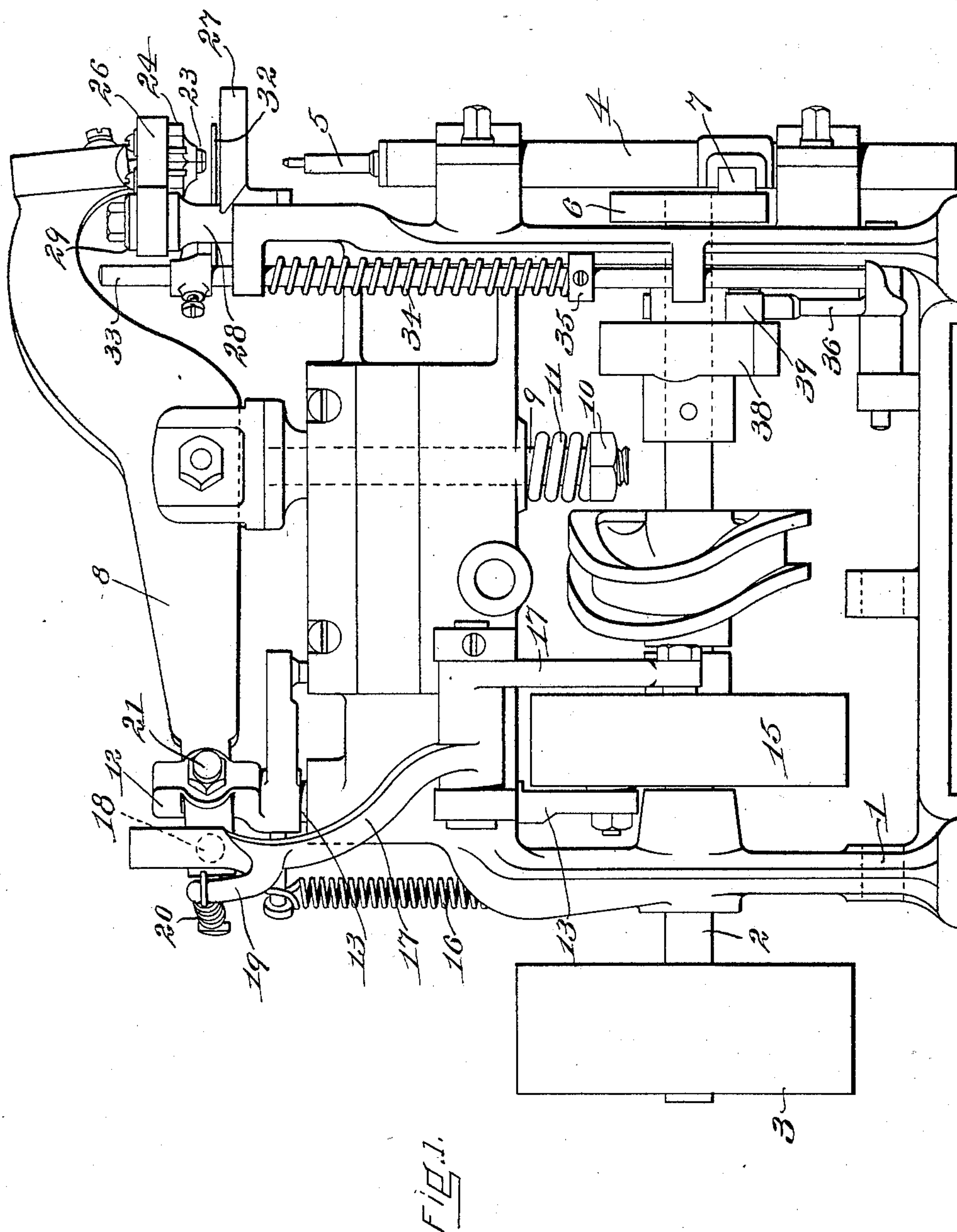
F. A. RUMNEY.

MACHINE FOR SETTING EYELETS.

(Application filed Jan. 22, 1901.)

(No Model.)

3 Sheets—Sheet 1.



WITNESSES

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INVENTOR

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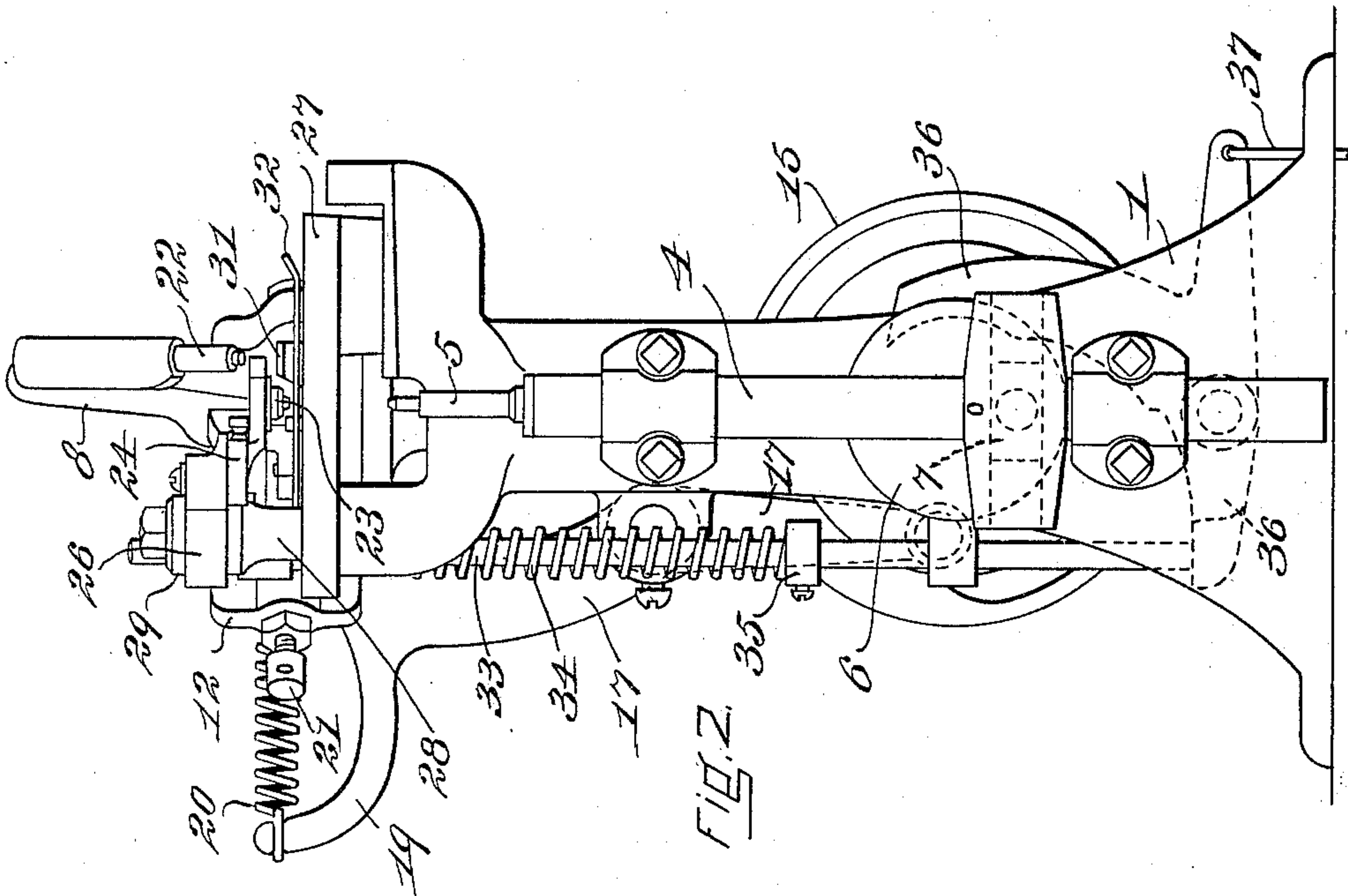
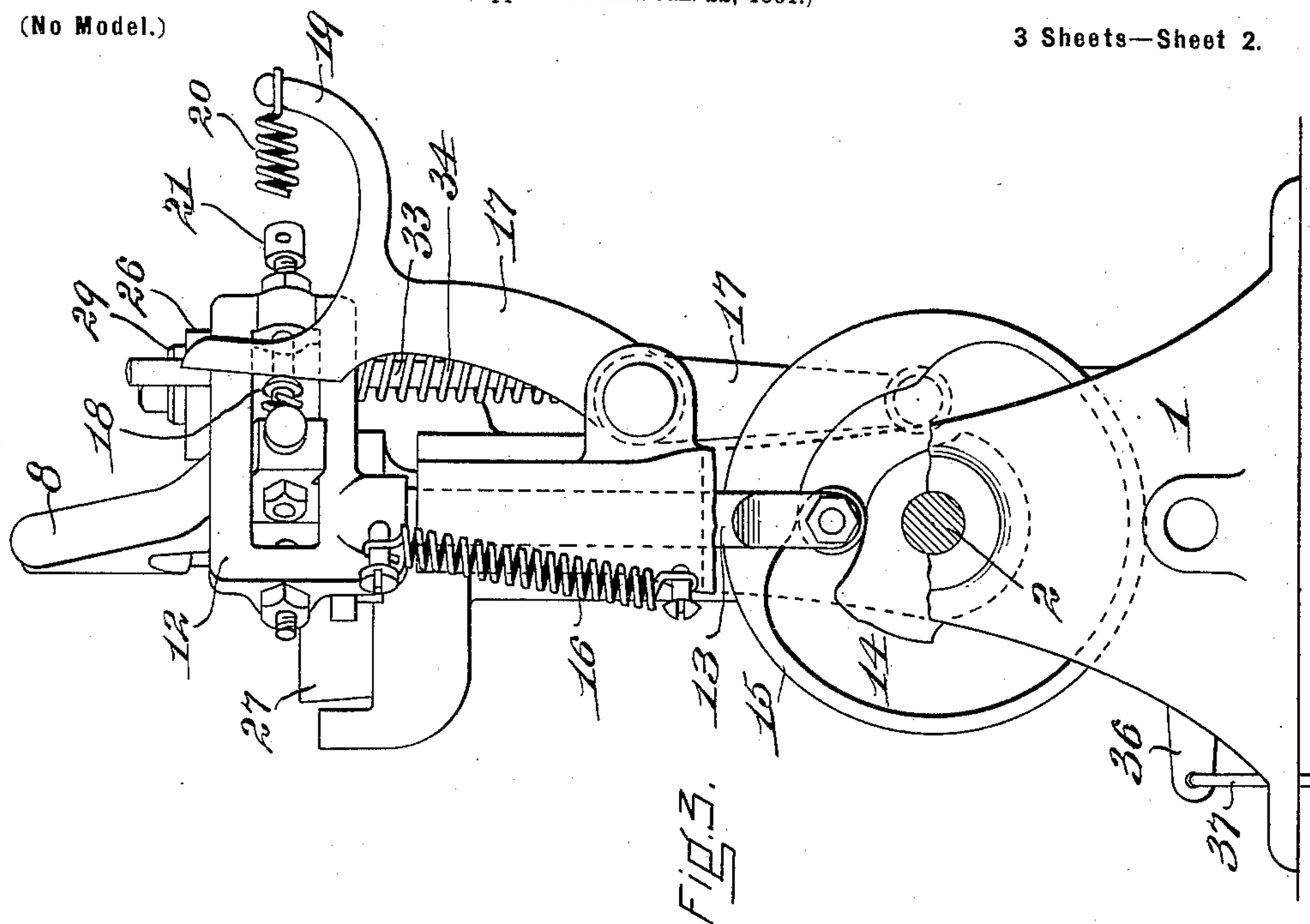
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3 Sheets—Sheet 2.



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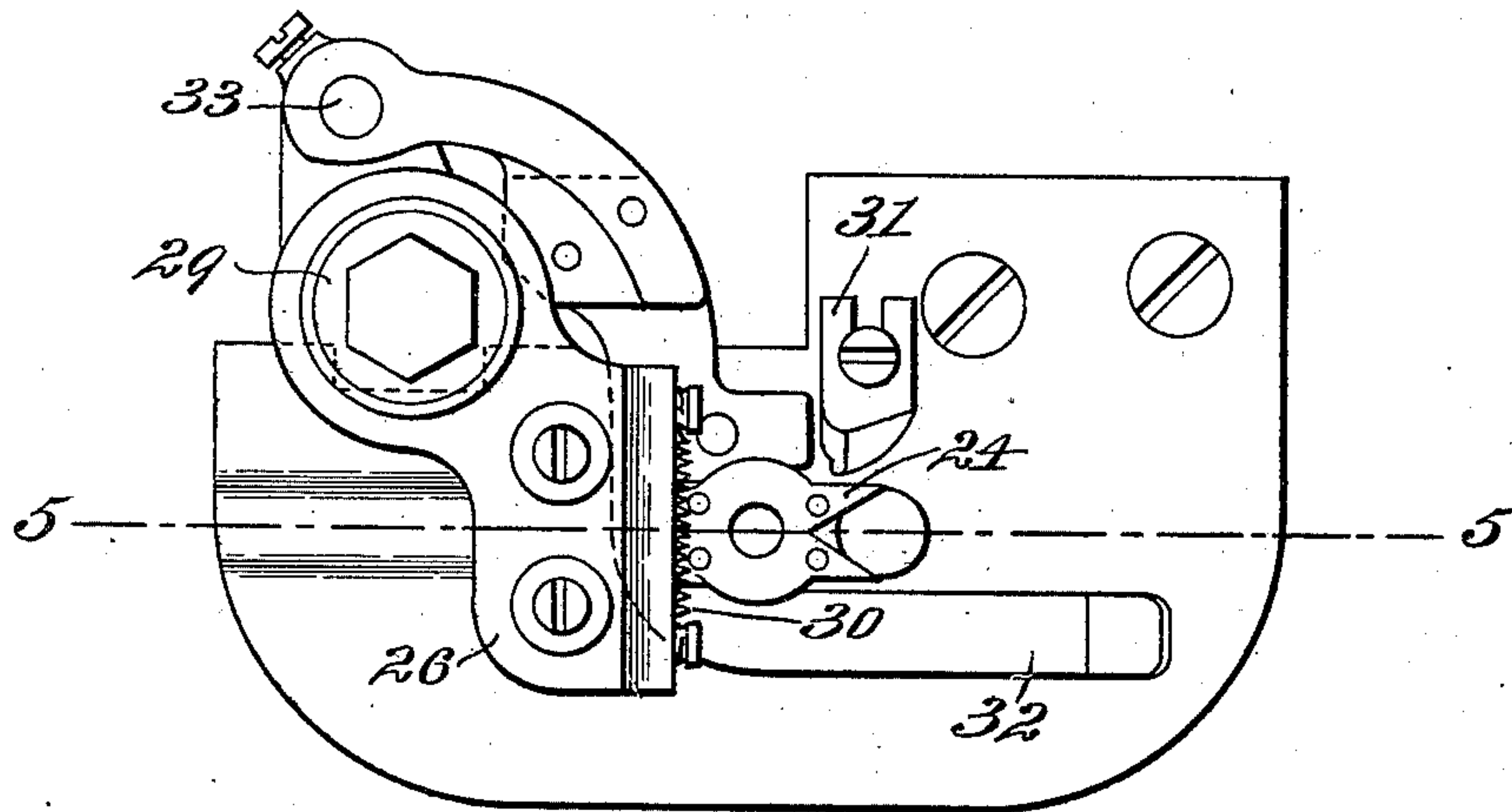


Fig. 4.

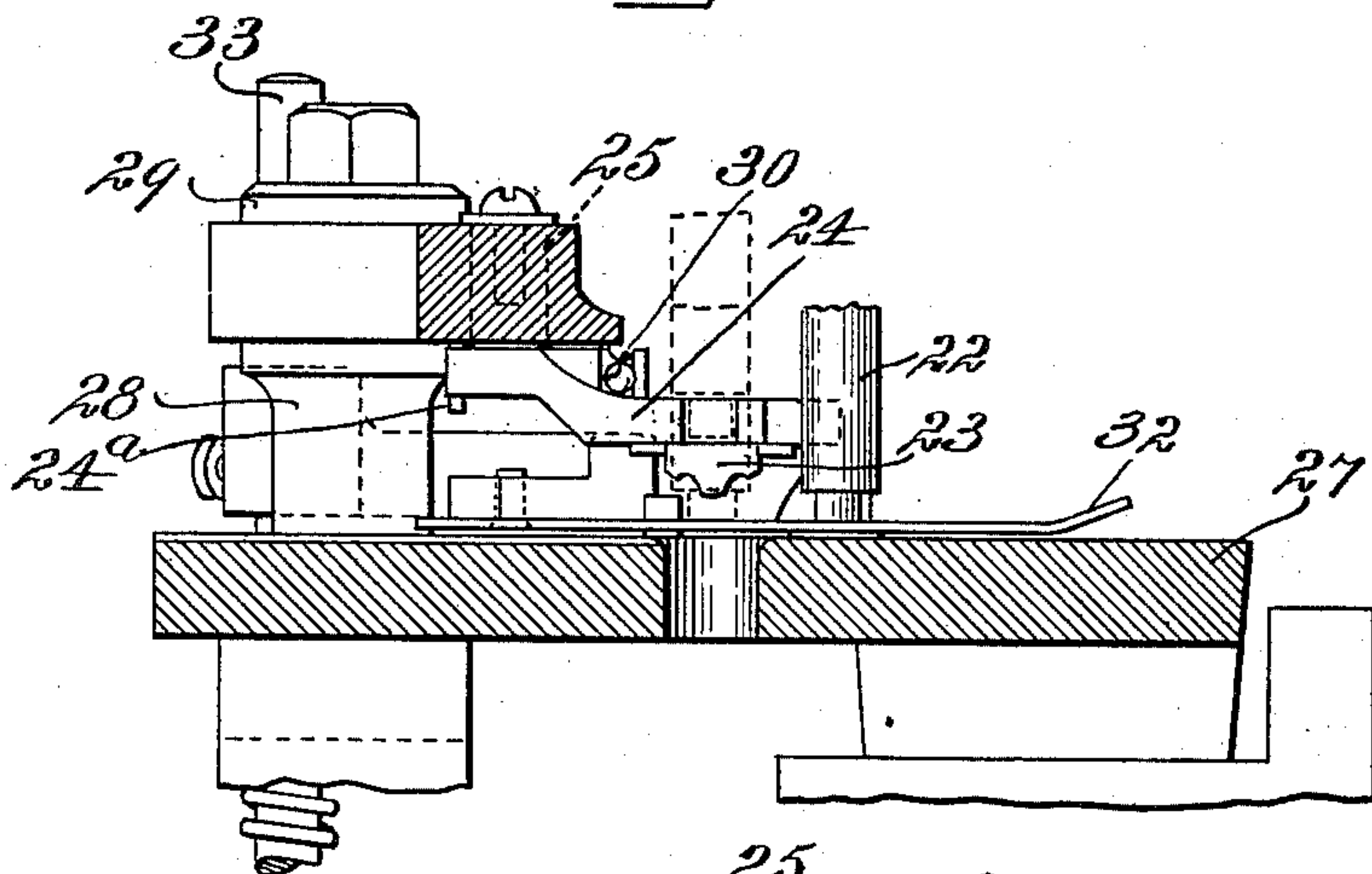


Fig. 5.

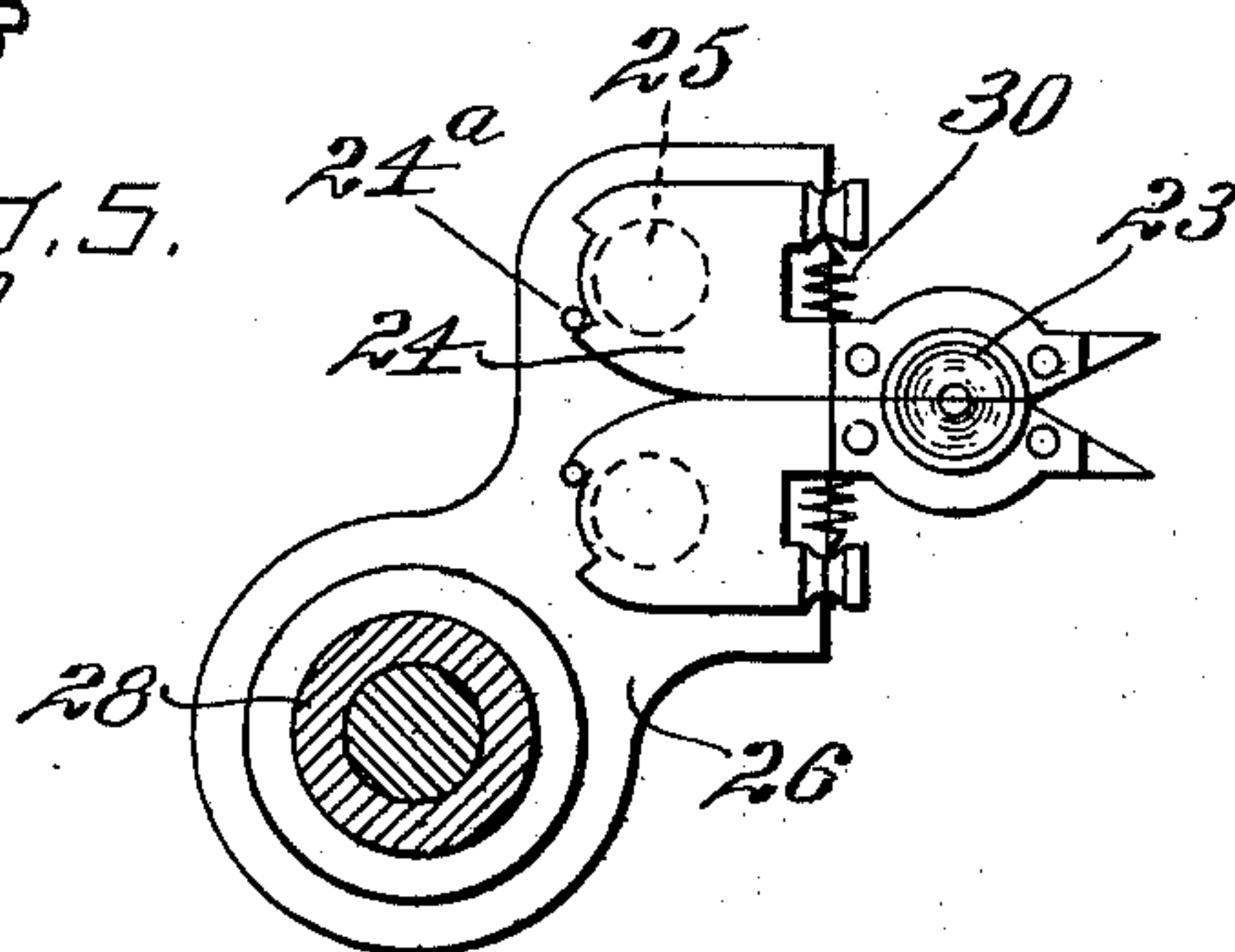


Fig. 6.

WITNESSES

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UNITED STATES PATENT OFFICE.

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MACHINE FOR SETTING EYELETS.

SPECIFICATION forming part of Letters Patent No. 707,643, dated August 26, 1902.

Application filed January 22, 1901. Serial No. 44,256. (No model.)

To all whom it may concern:

Be it known that I, FRED A. RUMNEY, a citizen of the United States, residing at East Somerville, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Eyeletting-Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The present invention relates to machines for setting eyelets, rivets, lacing hooks or studs, and similar articles.

More particularly, the present invention relates to eyeletting or analogous machines in which a punch is employed to form a hole in the work to receive the eyelet or other article to be secured thereto.

The objects of my invention are to provide a machine of the type referred to which shall be efficient in operation, which can be operated at a high rate of speed, and which shall be simple in construction and mode of operation.

To accomplish these results it has been proposed to utilize the shoulder of the punch which forms the hole in the work to receive the eyelet as a clenching-surface or setting-die, thereby eliminating from the machine mechanism for separately actuating one of the dies, with a consequent simplification in the construction and an increase in the speed of operation.

The machine above referred to is of comparatively simple construction and is rapid in operation; but in practical use its efficiency is seriously impaired by certain inherent defects in its underlying principle of organization and mode of operation. Since the shoulder of the punch constitutes one of the setting-dies, in the operation of the machine the eyelets must be forced over the punch, which remains in the hole formed in the work, in order to be clenched or set against the shoulder of the punch. As a result of this construction and mode of operation the cutting edge of the punch is unprotected during the setting of the eyelet, and if the eyelet is slightly out of position or imperfect, as

is frequently the case, it is forced against the cutting edge of the punch, which is thereby dulled or nicked sufficiently to destroy its usefulness. The punch employed is tubular, and it often happens that an eyelet smaller than the average is forced inside instead of outside of the punch, thereby rendering the machine inoperative and breaking the punch. The cutting edge of the punch is also often dulled or nicked by contact therewith of the eyelet-retaining spindle of the cooperating setting-die. Another defect in the operation of the machine above referred to is due to the fact that the hole formed in the material is necessarily smaller than the tubular portion of the eyelet, since the eyelet is forced over the punch during the setting operation. As a result of forming the hole smaller than the tubular portion of the eyelet the work often presents a wrinkled or puckered appearance at the edge of the eyelet after the eyelet is set. In order to overcome these defects and provide a machine of increased efficiency which is simple in construction and rapid in operation, my invention consists in providing an eyeletting or analogous machine with a punch, a setting-die, a cooperating die, and means for moving the setting-die into a position between its cooperating die and the punch. By providing a setting-die separate from the punch and means for moving said die between its cooperating die and the punch the setting-die forms a protection for the cutting edge of the punch during the setting operation and prevents the contact therewith of an eyelet or the eyelet-retaining spindle or other portion of the cooperating die. By this construction the punch may be of any desired size regardless of the size of the eyelet, whereby a hole may be punched in the work larger than the tubular portion of the eyelet to effectually prevent the work from wrinkling or puckering. As a means for supporting the setting-die during the setting operation I prefer to construct the punch so as to form an abutment for the setting-die when in a position between its cooperating die and the punch, and such construction and arrangement of parts constitute a feature of my in-

vention. As in the machine of the prior art above referred to, I prefer to employ the punch to feed the material in order to provide a simple and efficient means for bringing the hole
 5 formed in the material by the punch in alignment with the setting-dies, and in order to dispense with the complicated die-actuating mechanisms of prior constructions, in which the setting-die is separate from the punch, I
 10 prefer to mount the setting-die in the path of movement of the punch, so as to be displaced by the punch during its feeding movement and to return to setting position between its cooperating die and the punch when the punch
 15 rises after having fed the material.

While my invention in its broadest aspects is not limited to the constructions above referred to, I consider such constructions of value as embodying my invention in an efficient and simple machine and in the best form
 20 at present known to me; and certain features of my invention consist in providing a machine, comprising a punch acting to feed the material with the devices and combinations
 25 of devices hereinafter described and claimed, possessing the advantages above set forth and other advantages which will be apparent from the description hereinafter contained.

While a machine embodying the features
 30 of my invention above referred to may be provided with any suitable form of die as affording a simple and compact construction, I prefer to employ a divided setting-die, and this die I consider a feature of my invention.

35 A preferred form of my invention is illustrated in the accompanying drawings, in which—

Figure 1 is a view in side elevation of an eyeleting-machine embodying the same, the
 40 mechanism for feeding the eyelets being omitted, said machine being the same in all essential particulars, except as modified in accordance with my invention, as the well-known Hawkins eyeleting-machine. Fig. 2 is a view
 45 in front elevation of the machine shown in Fig. 1. Fig. 3 is a view in rear elevation, a portion of the machine-frame being broken away to show underlying parts. Fig. 4 is a plan view of the work-supporting table, the
 50 presser-foot, the setting-die, and the means for supporting the die on the frame of the machine. Fig. 5 is a sectional view on the line 5 5 of Fig. 4, and Fig. 6 is an underneath
 55 plan view of the setting-die and the means for yieldingly holding the die in setting position.

Referring to the drawings, 1 indicates the frame of the machine, in the lower portion of which is journaled the driving-shaft 2, provided with the driving-pulley 3. In suitable
 60 bearings in the front portion of the machine-frame is mounted a vertically-reciprocating rod 4, which carries at its upper end a die 5, which cooperates with the setting-die in setting the eyelets, as will be hereinafter described. The rod 4 is reciprocated from the
 65 shaft 2 by means of a disk 6, secured to the

front end of the shaft 2, on which is pivotally mounted a block 7, which is received in a transverse slot in the rod 4.

8 designates a lever pivoted at the upper end of a rod 9, swivelingly mounted in the upper portion of the machine-frame. A nut 10 is screwed on the lower end of the rod 9, and between the nut and the frame a coiled
 75 spring 11 is interposed. The rear end of the lever 8 extends through a slot in a yoke 12, carried at the upper end of a vertically-reciprocating rod 13, which reciprocates in guideways formed in the machine-frame.
 80 The lower end of the rod 13 is provided with a cam-roll which engages a cam-groove 14, cut in the rear face of a cam-disk 15, secured to the shaft 2. As shown in the drawings, the cam-roll does not fit the cam-groove 14
 85 accurately throughout the revolution of the cam-disk, and in order to keep the roll in contact with the inner edge of the cam-groove a coiled spring 16 is provided, which at its upper end is connected to the yoke 12 and at
 90 its lower end to the frame of the machine. By cutting the outer edge of the cam-groove 14 to correspond with the inner edge it will be evident that the spring 16 could be omitted. By means of the cam-groove 14 and the
 95 reciprocating rod 13 vertical oscillating movements are imparted to the lever 8.

A lever 17 is pivoted to the machine-frame, the lower end of which is provided with a cam-roll which engages a cam-groove cut in
 100 the front face of the cam-disk 15 and the upper end of which bears against a screw 18, projecting laterally from the rear end of lever 8. The upper end of the lever 17 is provided with a lateral extension 19, which is con-
 105 nected to the rear end of lever 8 by means of a coiled spring 20. Passing through one end of the yoke 12 is a screw 21, which forms an adjustable stop for limiting the lateral movement of the lever 8 in one direction. By
 110 means of the lever 17 the lever 8 is swung laterally, the rod 9, to the upper end of which the lever 8 is pivoted, turning in its bearings. The spring 20 tends to hold the screw 18 of the lever 8 in contact with the upper end of
 115 the lever 17, but permits the lever to move away from the screw when the lever contacts with the adjustable stop 21. By means of the screws 18 and 21 the lateral throw of the lever 8 can be varied as desired.

The mechanism so far described, with the exception of the shape of the cam-groove 14, is the same as that of the well-known Hawkins eyeleting-machine. In the Hawkins machine the setting-die is carried at the front
 125 end of the lever 8 and is actuated by the lever to enter the hole previously punched in the material by a separate punch and feed the material into a position to bring the hole directly over the lower die 5.

In order to utilize the mechanism above described in carrying out my invention, I mount the punch in the front end of the lever
 130 8, the punch being indicated at 22. The

cam-groove 14 is shaped to impart to the punch 22 a downward movement to punch a hole in the material and thereafter to slightly raise the same to clear the work-supporting table without withdrawing it from the material. The punch is then swung to the left, as viewed in Fig. 2, to feed the material to bring the hole punched therein directly over the lower die 5 and in line with the lower die and the setting-die when the setting-die is in setting position—that is, when the setting-die is in line with the lower die. It is necessary that the setting-die should be in close proximity to the surface of the work when in position to cooperate with the lower die in setting the eyelet. When in this position, however, the die is in the path of movement of the punch, and in order to allow the punch to properly feed the material I mount the setting-die so that it can be displaced by the punch during its feeding movement and be returned to setting position when the punch rises after having fed the material. The construction which I prefer for so mounting the setting-die is clearly shown in Figs. 4, 5, and 6. In these figures, 23 designates the setting-die. This die is annular, as is necessary in this class of machines, in order to set the eyelets and is divided longitudinally or in the direction of its axis into two parts, each of which is secured to or formed integral with a lever 24, pivotally mounted at 25 on a block 26, which is supported at a suitable distance above the work-supporting table 27 by means of a sleeve 28, which rests upon a portion of the machine-frame. The block 26 and the sleeve 28 are held in position by a headed bolt 29, which passes down through the block and sleeve and screws into the machine-frame. The parts of the divided die 23 are yieldingly held in contact in setting position by means of a coiled spring 30, connecting the levers 24, the correct position of the die being insured by suitable stop-pins 24^a, which limit the movements of the levers. The ends of the levers 24, which extend toward the punch 22, are beveled to form a notch into which the punch passes during the feeding movement. The punch first passes into the notch and then separates the levers, thereby displacing the die 23 from its setting position. The lower end of the punch is reduced in diameter, as shown, to form a shoulder. As the punch rises from the lower dotted-line position shown in Fig. 5 to the upper dotted-line position the parts of the divided die 23 are brought into contact by the action of spring 30, the levers 24 being cut away above the die 23 to allow this movement. When the parts of the die have thus been brought into contact, the upper surface of the levers 24 rest against the shoulder of the punch 22, which thus forms an abutment for the levers and securely holds the setting-die from upward displacement during the setting operation. For guiding the work during the feeding opera-

tion an adjustable guide 31 is secured to the upper surface of the table 27, and for holding the work upon the table a presser-foot 32 is provided. This presser-foot is secured to the upper end of a vertical rod 33, mounted to slide in bearings in the machine-frame. The presser-foot is normally pressed against the work by means of a coiled spring 34, surrounding the rod 33 and interposed between the upper bearing for the rod and an adjustable collar 35, secured to the rod. The lower end of the rod 33 rests upon one arm of a three-armed lever 36. One arm of this lever is connected by means of a rod 37 to a foot-treadle, by means of which the presser-foot can be raised by the operator to allow the insertion and removal of work. For raising the pressure-foot automatically during the feeding movement of the punch a block 38 is secured to the shaft 2 and provided with a roll 39, which is arranged to contact with the third arm of the three-armed lever 36.

The operation of the machine above described is as follows: Starting with the parts in the position shown in Fig. 2 the lever 8 is actuated to cause the punch to descend into contact with the work-supporting table or a suitable cutting-block secured thereto and punch a hole in the material. The lever 8 is then actuated to raise the punch slightly and then move the punch to the left as viewed in Fig. 2, to the lower dotted-line position shown in Fig. 5. During this movement the parts of the divided setting-die are separated to allow the punch to bring the hole formed thereby directly over the lower die and in alinement with said die and the setting-die when the setting-die is in setting position. The lever 8 is then actuated to raise the punch to the upper dotted-line position shown in Fig. 5, which allows the parts of the setting-die to return to setting position. The lower die is then raised, carrying the eyelet supported thereon through the hole in the material against the setting-die, which is prevented from upward displacement during the setting operation by the engagement of the upper surface of the levers 24 with the abutment formed by the shoulder of the punch. After the eyelet is set the parts are returned to the position shown in Fig. 2.

It is to be noted that the displacement of the setting-die is effected by the portion of the punch above the shoulder, and as this portion can have the same dimensions in punches of different sizes any desired size of punch can be used in the machine, regardless of the size of the dies.

It will be seen that by my invention I have simplified the construction of eyeletting and analogous machines and have also produced a machine of increased efficiency and certainty of operation.

Without limiting myself to the specific embodiment of my invention illustrated in the drawings, I claim as new and desire to secure by Letters Patent—

1. An eyeletting-machine, having, in combination, a punch acting to feed the material, a setting-die yieldingly mounted in the path of movement of the punch, a cooperating die and means for actuating the punch to feed the material and displace the setting-die, and thereafter allow said die to return to setting position between its cooperating die and the punch substantially as described. 5
2. An eyeletting-machine, having, in combination, a punch acting to feed the material, a setting-die located in the path of movement of the punch and movable from and to setting position, a cooperating die, means for actuating the punch to feed the material and displace the setting-die, and means for returning the die to setting position between its cooperating die and the punch substantially as described. 10 15
3. An eyeletting-machine, having, in combination, a punch acting to feed the material, a setting-die yieldingly mounted in the path of movement of the punch, a cooperating die, and means for actuating the punch to feed the material and displace the setting-die, and thereafter allow said die to return to setting position, the punch being constructed and arranged to form an abutment for said die during the setting operation, substantially as described. 20 25 30
4. An eyeletting-machine, having, in combination, a divided setting-die, means for holding the parts of the die in contact and means for separating said parts, substantially as described. 35
5. An eyeletting-machine, having, in combination, a divided annular setting-die and means for yieldingly holding the parts of the die in contact, substantially as described. 40
6. An eyeletting-machine, having, in combination, a divided annular setting-die, pivoted levers to which the parts of the die are secured and means acting on the levers to yieldingly hold the parts of the die in contact, substantially as described. 45
7. An eyeletting-machine, having, in combination, a punch acting to feed the material, a divided setting-die located in the path of movement of the punch, a cooperating die, means to hold the parts of the setting-die in contact, and means for actuating the punch to feed the material and separate the parts of the setting-die, substantially as described. 50
8. An eyeletting-machine, having, in combination, a punch acting to feed the material, a divided setting-die located in the path of movement of the punch, a cooperating die, means to yieldingly hold the parts of the setting-die in contact, and means for actuating the punch to feed the material and separate the parts of the setting-die, and thereafter allow said parts to come in contact, the punch being constructed and arranged to form an abutment for said die during the setting operation, substantially as described. 55 60 65
9. An eyeletting-machine, having, in combination, a punch, movable toward and from the work, actuating mechanism therefor, a setting-die, a cooperating die, means for moving the setting-die into a position between its cooperating die and the punch when the punch has been moved from the work, and means for relatively actuating the dies to set the eyelet, substantially as described. 70
10. An eyeletting-machine, having, in combination, a punch movable toward and from the work, actuating mechanism therefor, a setting-die, a cooperating die, means for moving the setting-die into a position between its cooperating die and the punch when the punch has been moved from the work, and means for relatively actuating the dies to set the eyelet, the punch being constructed and arranged to form an abutment for the setting-die during the setting operation, substantially as described. 75 80 85
11. An eyeletting-machine, having, in combination, a setting-die, a cooperating die, a punch acting to form a hole in and feed the material, means for actuating the punch to bring the hole formed thereby into alignment with the dies, means for moving the setting-die into a position between its cooperating die and the punch and means for actuating said cooperating die, substantially as described. 90 95
12. An eyeletting-machine, having, in combination, a setting-die, a cooperating die, a punch acting to form a hole in and feed the material, means for actuating the punch to bring the hole formed thereby into alignment with the dies, means for moving the setting-die into a position between its cooperating die and the punch, and means for actuating said cooperating die, the punch being constructed and arranged to form an abutment for the setting-die during the setting operation, substantially as described. 100 105
13. In an eyeletting-machine, a punch and means for producing longitudinal and lateral movements thereof to punch and feed the material; a reciprocating setting device to supply eyelets and to contribute in the setting operation; and a cooperating setting device arranged to be positioned over the punched hole and supported by the punch-rod prior to the return movement thereof after the material has been punched and fed. 110 115
14. In an eyeletting-machine, a punch and means for producing longitudinal and lateral movements thereof to punch and feed the material; a reciprocating setting device to supply eyelets and to contribute in the setting operation; a cooperating setting device normally standing substantially over said first-named setting device but arranged to permit the lateral feed movement of the punch; and an engaging portion of said punch to support said cooperating setting device in the setting operation. 120 125 130
15. In an eyeletting-machine, a punch and means for producing longitudinal and lateral movements thereof to punch and feed the material; a reciprocating setting device to sup-

ply eyelets and to contribute in the setting operation; a cooperating setting device normally standing substantially over said first-named setting device; and a spring to permit
5 a yielding movement of said cooperating setting device when engaged by the punch in the lateral or feed movement thereof and to restore the said device to operative condition when the punch rises from the material.
10 16. The combination with the longitudinally and laterally movable punch; of the lower set, the upper set normally standing substantially in line therewith; a spring nor-

mally holding said upper set, said spring yielding when the said upper set is engaged 15 by the punch and restoring said upper set when the punch rises from the material; and a shoulder carried by the punch and adapted to overlie and engage a portion of the upper set when the latter is in operative position. 20

In testimony whereof I affix my signature in presence of two witnesses.

FRED A. RUMNEY.

Witnesses:

ALFRED H. HILDRETH,
HORACE VAN EVEREN.