

No. 878,236.

PATENTED FEB. 4, 1908.

J. H. REECE.
WIRE DIE-SAFETY APPLIANCE.
APPLICATION FILED JUNE 20, 1907.

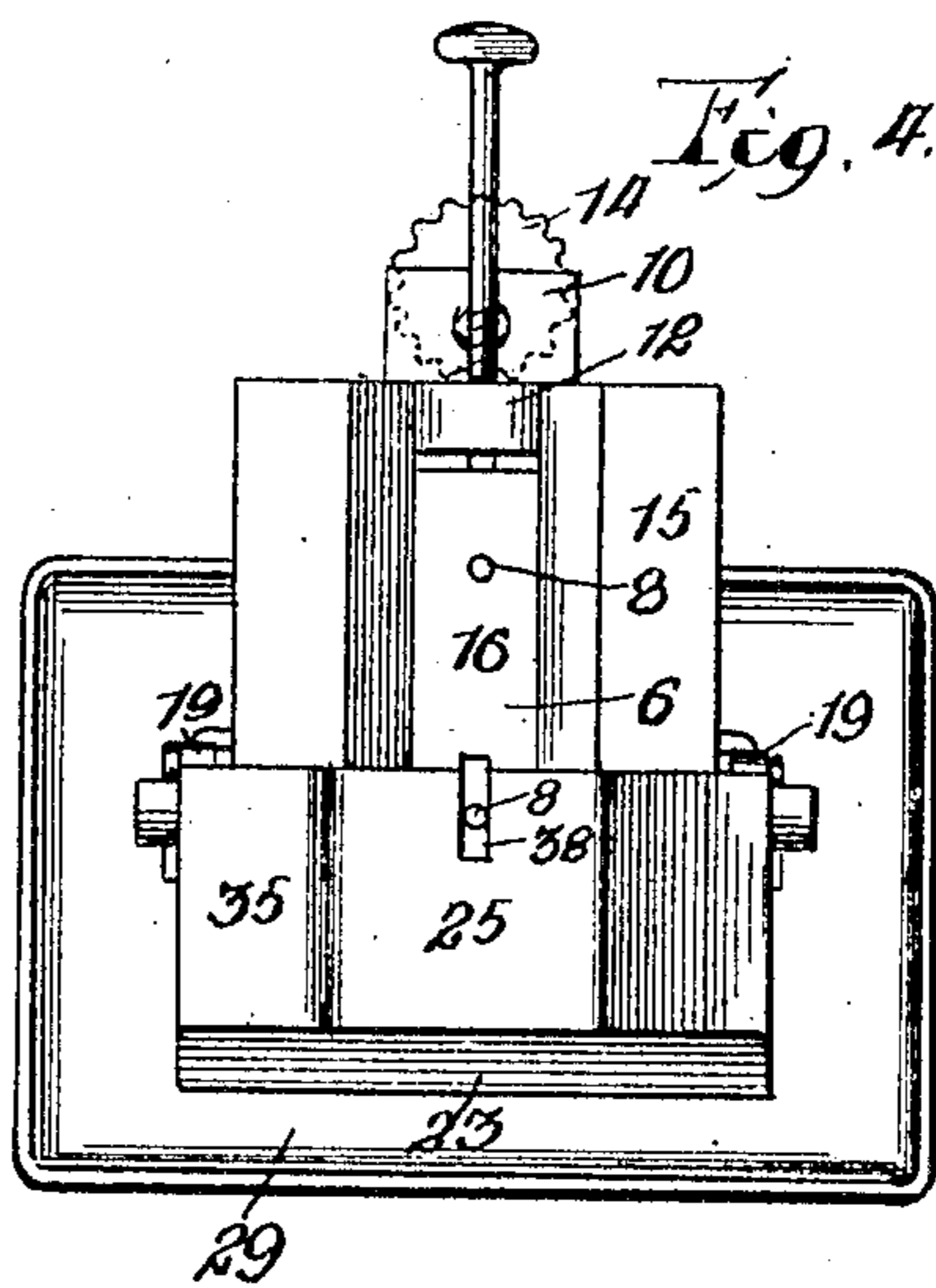
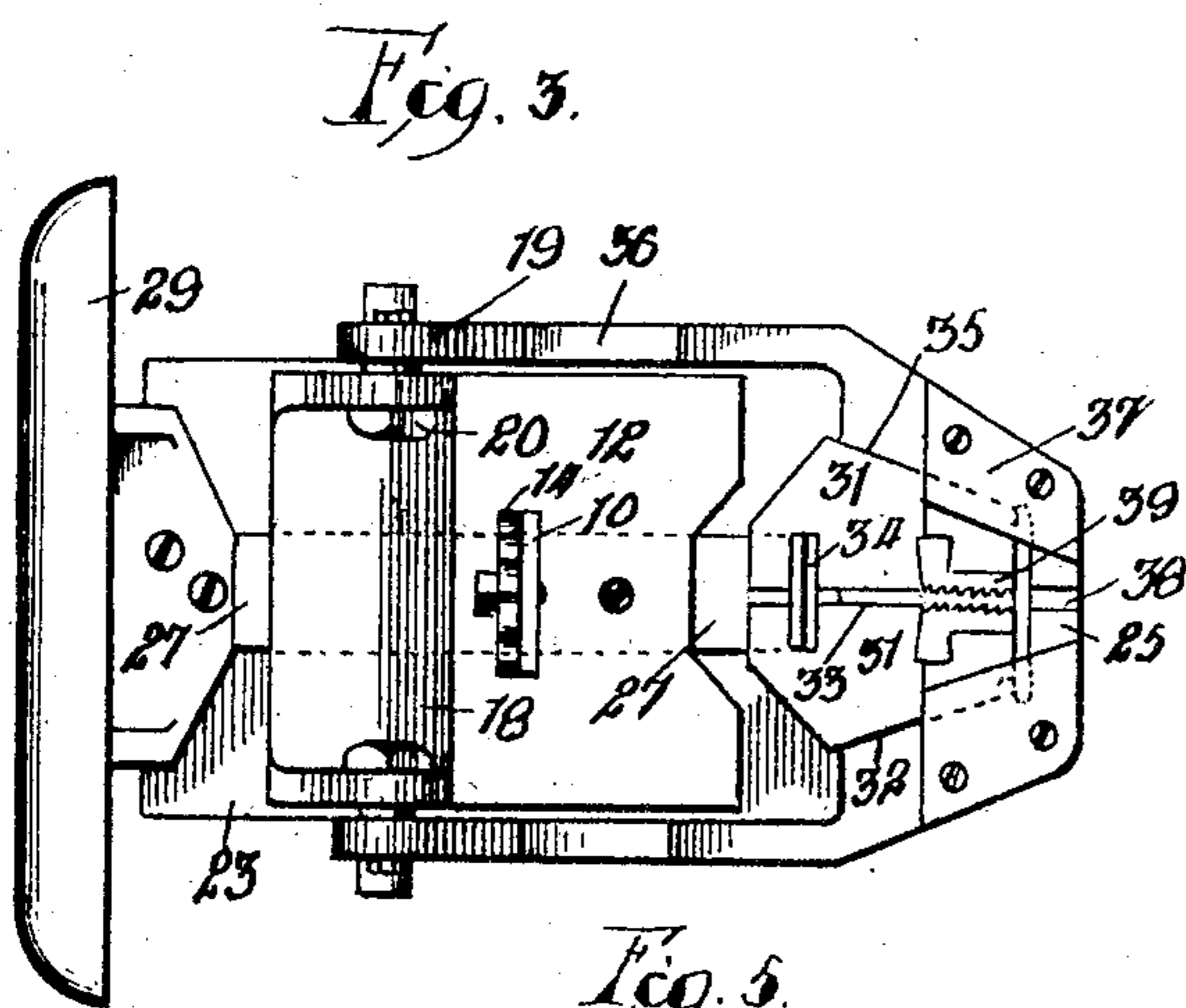
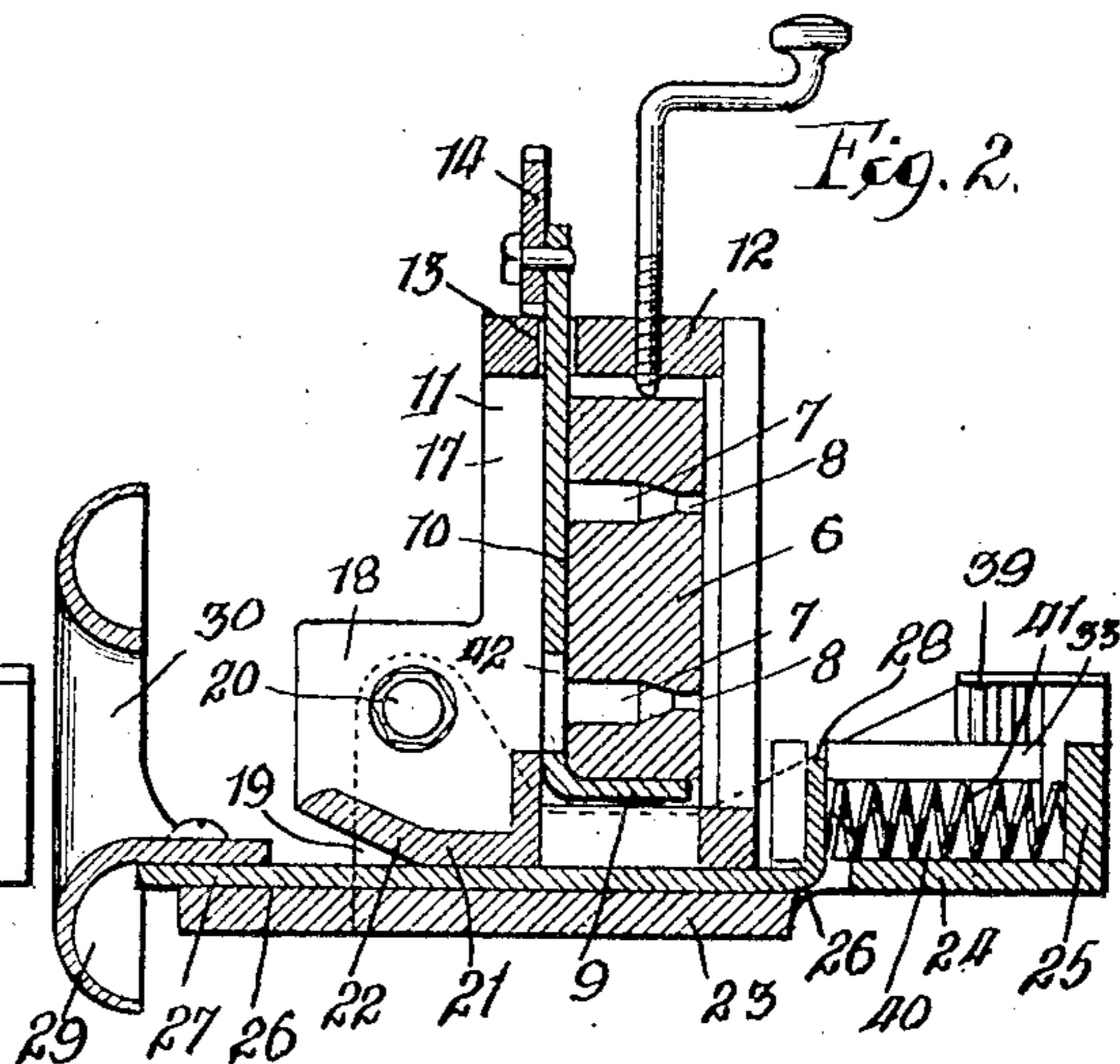
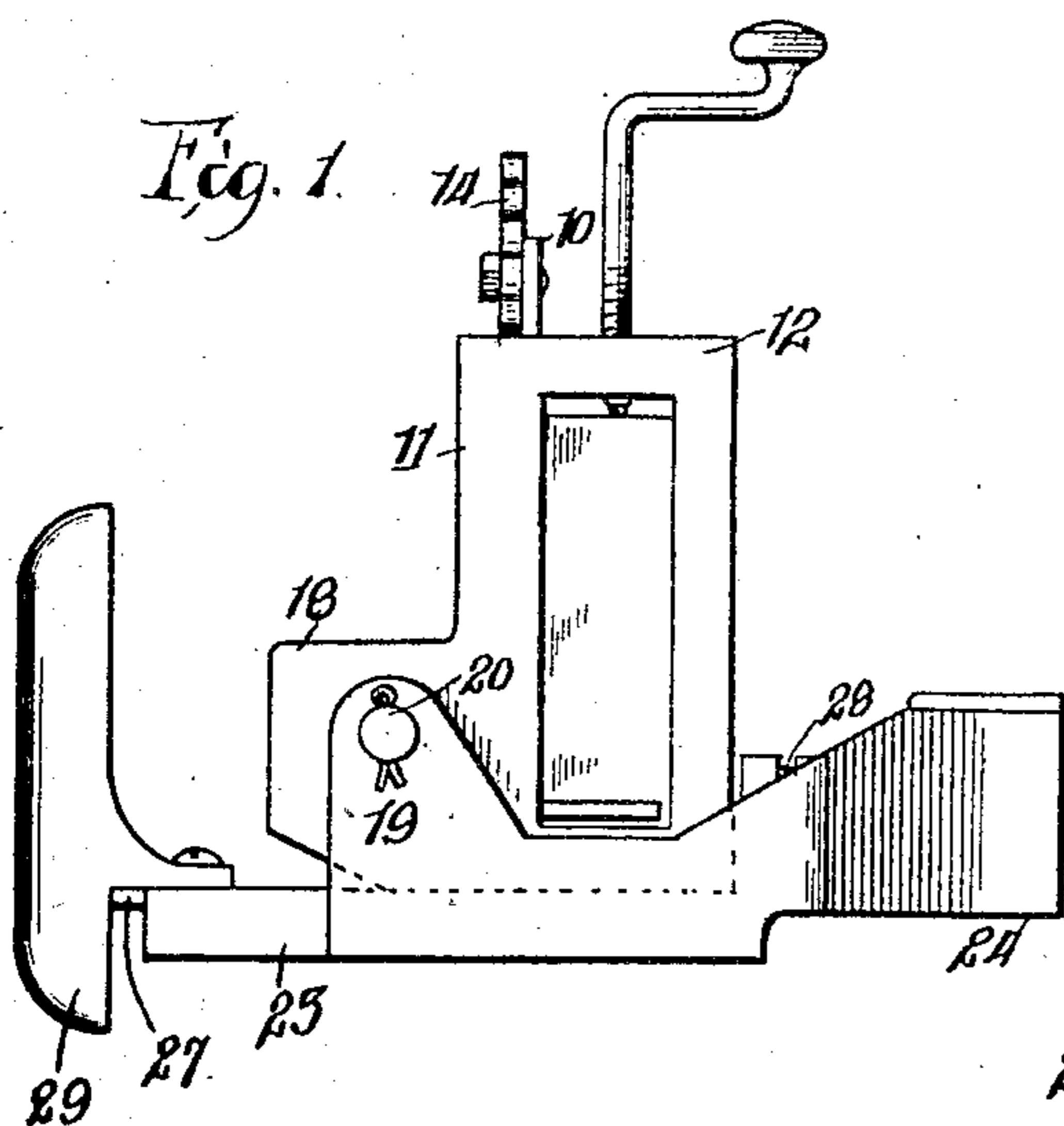
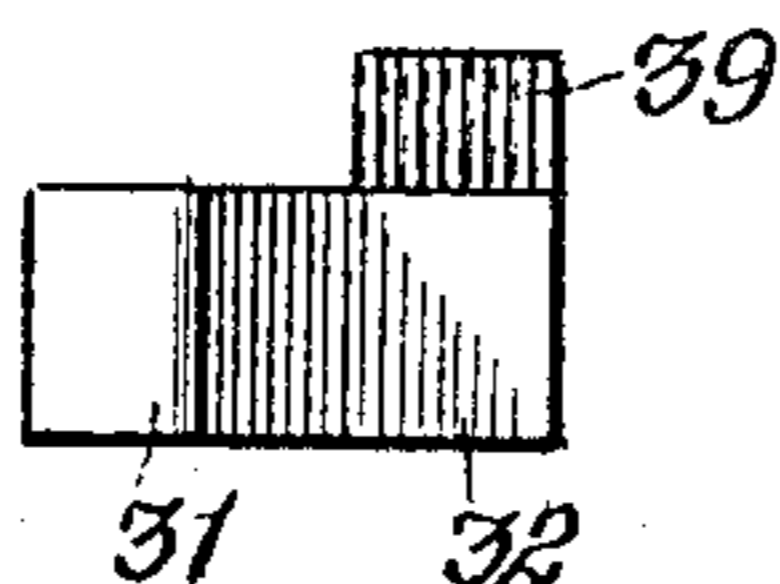


Fig. 5.



Witnesses

P. Bond

Piercen W. Banning.

Inventor:
by *Juan H. Reece*
Banning Banning
Attys

UNITED STATES PATENT OFFICE.

JUAN H. REECE, OF JOLIET, ILLINOIS, ASSIGNOR TO HUMPHREY & SONS, OF JOLIET, ILLINOIS, A COPARTNERSHIP.

WIRE-DIE SAFETY APPLIANCE.

No. 878,236.

Specification of Letters Patent.

Patented Feb. 4, 1908.

Application filed June 20, 1907. Serial No. 379,975.

To all whom it may concern:

Be it known that I, JUAN H. REECE, a citizen of the United States, residing at Joliet, in the county of Will and State of Illinois, have invented certain new and useful Improvements in Wire-Die Safety Appliances, of which the following is a specification:

In the operation of drawing wire, as ordinarily practiced in a wire mill, the wire is fed or drawn through a die block at a very rapid rate of speed by the revolving drawing block. In these circumstances it sometimes happens that accidents occur by reason of the operator being caught by the rapidly traveling wire prior to its passage through the die block, in which case serious accidents and injuries may result in view of the impossibility of stopping the running wire in time to save the operator.

The object of the present invention is to provide a safety appliance which will automatically operate, in case of accident, to instantaneously cut or break the wire in case an abnormal pressure is exerted by the entanglement of the wire around the leg or arm of the operator, thereby obviating the necessity for stopping the wire drawing machinery.

The invention consists in the features of construction and combination of parts hereinafter described and claimed.

In the drawings, Figure 1 is a side elevation of the entire device, showing the die block in position; Fig. 2 a longitudinal sectional view of the same; Fig. 3 a top or plan view of the same; Fig. 4 a rear end elevation; and Fig. 5 a side elevation of the slidable clamping block carrying the wire grippers.

The safety device of the present invention is used in connection with a wire die block 6, of the usual formation, having a plurality of die apertures 7, as shown in Fig. 2, the lower one of which is positioned on the wire line. Each of the die apertures terminates in a reduced aperture 8, which is of the size of the intended wire, the remaining portion of the die aperture being of larger diameter. The wire block is carried by an adjustable shelf 9 which is formed integral with a vertically extending plate 10. The adjustable shelf is slidably mounted within the carrier frame 11, comprising a roof 12 provided with an aperture 13 through which the upper end of the vertically adjustable plate 10 is entered. The upwardly projecting end of the plate has eccentrically pivoted thereto a

notched wheel 14, which bears against the surface of the roof 12 and is movable to different positions to raise and lower the shelf upon which the die block is supported. The carrier frame further comprises inwardly extending front walls 15, which are broken away in the center to provide a recess 16 in vertical alinement with the die holes, through which recess the wire is carried. The carrier frame is further provided with side walls 17 terminating in outwardly extending shoulders 18, which shoulders are pivoted between ears 19 by means of pivot bolts 20. The carrier frame further comprises a floor 21, the edge 22 of which is upwardly sloped or turned to permit the frame to be swung back on its trunnions to accommodate the device to changes in the direction of the wire line, which, at certain points in the operation of wire drawing, will ordinarily be somewhat out of horizontal.

The die block carrier is supported by a bed plate 23, from the side edges of which the ears 19 upwardly project. The bed plate at the wire discharging end is provided with a forwardly extending platform 24, which is elevated and offset with respect to the bed plate and terminates in an upwardly extending flange or abutment 25, which forms in effect the end wall of the structure. The bed plate is provided in its center with a longitudinally extending channel or recess 26, which serves as a guideway for a sliding plate 27, the inner end of which is upturned to provide a finger 28, and the outer end of which has secured thereto an enlarged guard plate 29, which guard plate is provided, in its center, with an opening 30 for the passage of the wire. The guard plate is of outwardly rounded formation, as indicated in Fig. 2, so that it provides a smooth surface against which the arm or leg of the operator may be drawn or carried without injury.

The finger 28 engages a pair of wedge shaped companion clamping blocks 31, the outer edges 32 of which are sloped or beveled, the inner edges 33 being of straight formation and in parallel relation with one another. Each of the inner edges has formed therein a recess 34, the two recesses combining to form a transversely elongated slot for the reception of the upturned finger 28. The clamping blocks are slidably mounted within converging guide walls 35, which are formed integral with the platform 24 and form in

effect the elevated side walls of such platform. The guide walls are of sloping formation, reaching their greatest elevation near the discharge end of the device and terminating at their opposite ends in straight side walls or flanges 36 which upwardly extend from the bed plate and merge into the ears 19 heretofore referred to. The clamping blocks are held against vertical displacement by means of overhanging guide plates 37, which are secured to the guide walls 35 by screws or in any other suitable manner. The end wall or abutment 25 extends above the normal wire line but is provided, in its center, with a slot 38 through which the wire passes, and in line with the slot are a pair of toothed grippers 39, which are carried by and held within the slidable clamping blocks. The companion clamping blocks on their inner under sides are provided with recesses 40 which, in conjunction, form a chamber within which is located a coil spring 41, which is interposed between the upturned finger 28 and the terminal wall or abutment 25, and which normally tends to force back the sliding plate 27 and hold the grippers in distended position for the passage of the wire between them.

In use, the die block is shoved into the carrier frame from the side until one of the die holes is brought into alinement with the vertical discharge slot 38 and a corresponding intake slot 42 in the adjustable plate 10. The end of the wire to be drawn, which of necessity has previously been reduced in diameter for some distance, is then entered through the opening 30 in the guard plate, and through the slot 42, the die hole 8, the distended grippers 39, and the vertical discharge slot 38, after which the reduced end of wire is connected with the drawing block and the wire drawing operation is begun. The initial diameter of the wire is of course greater than the diameter of the die hole, so that as the wire is drawn through the hole its diameter will be correspondingly reduced and its length increased, whereby the greatest speed and the least diameter of the wire will be on the gripper side of the die block. In these circumstances, if an operator's arm or leg or other portion of the body should become entangled in the rapidly moving strand of wire, it will be carried against the guard plate and exert a pressure thereon which serves to thrust forward the beveled companion clamping blocks against the tension of the spring 41, and this movement will instantly cause the grippers to tightly clamp the reduced strand of wire and break it off, without injury to the operator.

It will be observed that the grippers act at the point of greatest efficiency, which is the point where the strength of the wire is lessened by its reduced diameter and the tendency to break increased by the increased

speed of travel of the wire leaving the die. Furthermore, although the carrier frame is tiltable to accommodate the direction of the wire line, nevertheless, after the drawing operation is fully under way, the wire line will be carried down so that the wire will pass between the grippers and will there remain during almost the entire wire drawing operation. The device is highly superior to any mode of stopping the machinery, in that it acts instantaneously and automatically and always serves to eliminate the danger as soon as it becomes imminent. In no case would it be possible for an operator's arm or leg to be dragged to a dangerous point, since the pressure of the wire will be immediately relieved by the breaking of the wire as soon as any abnormal pressure is exerted on the guard plate. In addition to its value as a safeguard against personal injury or death, the device will prevent any inanimate foreign object, which might likewise become entangled in the wire, from injuring the machinery in any manner.

The device as a whole is one which is of great value in wire drawing factories in that it permits the wire drawing operation to be conducted at maximum speed without apprehension of danger to life or property.

What I regard as new and desire to secure by Letters Patent is:

1. In a safety appliance of the character described, the combination of a wire die block, means for engaging a strand of wire, a guard member located in front of the die block and mounted so as to permit of movement when pressure is applied, and connections between the guide member and the wire engaging means constructed and arranged so as to operate the latter when the said guide member is moved in the proper direction.

2. In a safety appliance of the character described, the combination of a wire die block, means located on the discharging side of the die block for engaging a strand of wire after leaving the die block, a guard member located in front of the die block and mounted so as to permit of movement when pressure is applied, and connections between the guide member and the wire engaging means constructed and arranged so as to operate the latter when the said guide member is moved in the proper direction.

3. In a safety appliance of the character described, the combination of a wire die block, normally distended wire engaging mechanism adapted to engage the wire after leaving the die block, a guard member located in front of the die block and mounted so as to permit of movement when pressure is applied, and connections between the guide member and the wire engaging mechanism constructed and arranged so as to contact the latter and bring the same into

contact with the wire when the guide member is moved in the proper direction, substantially as described.

4. In a safety appliance of the character indicated, the combination of a die block, normally distended wire gripping mechanism adapted to grip the wire after leaving the die block, a slidably mounted guard plate through which the wire runs, and a connection between the guard plate and the grippers for closing them on the wire, substantially as described.

5. In a safety appliance of the character described, the combination of a wire die block, a pair of slidably mounted wedge-shaped clamping blocks, grippers carried by the clamping blocks and normally distended to permit the passage of the wire, a guard member located in front of the die block and mounted so as to permit of movement when pressure is applied, and connections between the guide member and the slidably mounted clamping blocks constructed and arranged so as to move the latter into clamping position when said guide member is moved in the proper direction, substantially as described.

6. In a safety appliance of the character indicated, the combination of a die block, a pair of slidably mounted wedge shaped clamping blocks, grippers carried by the clamping blocks and normally distended to permit the passage of the wire, a guard plate slidably mounted in front of the die block through which the wire runs, and a connection between the guard plate and the companion clamping blocks for actuating the latter by the movement of the former, substantially as described.

7. In a safety appliance of the character indicated, the combination of a bed plate, a die block frame mounted thereon, a die block carried by said frame, a bar slidably mounted in the bed plate under the die block frame, a pair of wedge shaped clamping blocks slidably mounted with respect to the bed plate and connected with and op-

erable by the slidable bar, grippers carried by said blocks and normally distended to permit the passage of wire, and a guard plate connected with the slidable bar, through which guard plate the wire travels, substantially as described.

8. In a safety appliance of the character indicated, the combination of a bed plate, a die block frame mounted thereon, a die block carried by said frame, a bar slidably mounted in the bed plate under the tiltable frame, a pair of wedge shaped clamping blocks slidably mounted with respect to the bed plate and connected with and operable by the slidable bar, grippers carried by said blocks and normally distended to permit the passage of wire, a guard plate connected with the slidable bar, through which guard plate the wire travels, and a spring mounted to exert a pressure on the slidable bar for holding the wedge shaped clamping blocks in retracted or normal position, substantially as described.

9. In a safety appliance of the character indicated, the combination of a base or support provided with ears, a tiltable die block frame trunnioned between the ears, a die block carried by the frame, an actuating bar slidably mounted in the base or support below the tiltable frame, and terminating at its inner end in an upturned finger, a guard plate secured to the outer end of the slidable bar, a pair of wedge shaped clamping blocks slidably mounted with respect to the bed plate and engaged and movable by the upturned finger, a spring inserted between a portion of the base or support and the upturned finger for holding it normally retracted, and a pair of grippers carried by the clamping blocks and normally distended to permit the passage of the wire through the die block, substantially as described.

JUAN H. REECE.

Witnesses:

LEWIS W. CONNELL,
HARRY B. HUMPHREY.