

No. 627,935.

Patented June 27, 1899.

C. KUHLEWIND & E. C. EISENGART.

SAFETY DEVICE FOR ROLLS.

(No Model.)

(Application filed Sept. 10, 1897.)

3 Sheets—Sheet 1.

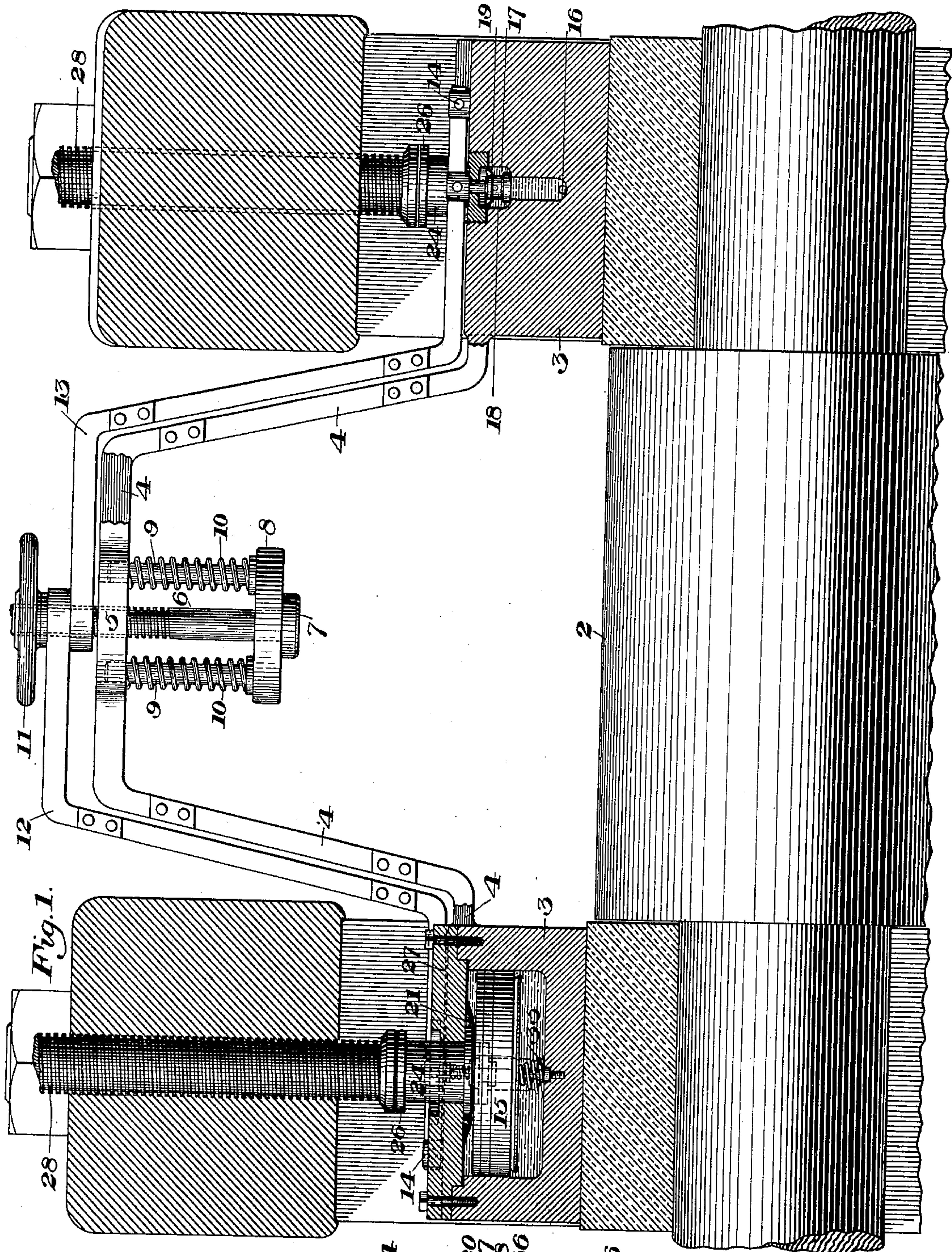


Fig. 1.

WITNESSES

J. J. H. H. H. H.
Warren W. Swarth

Fig. 4.

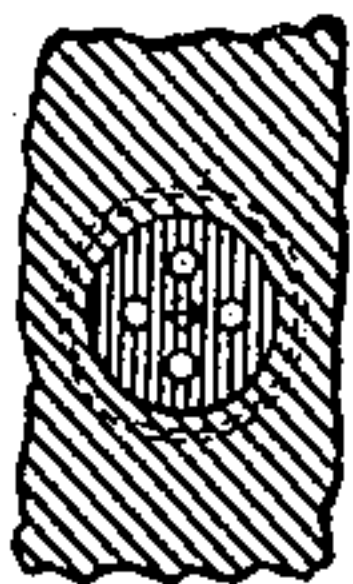
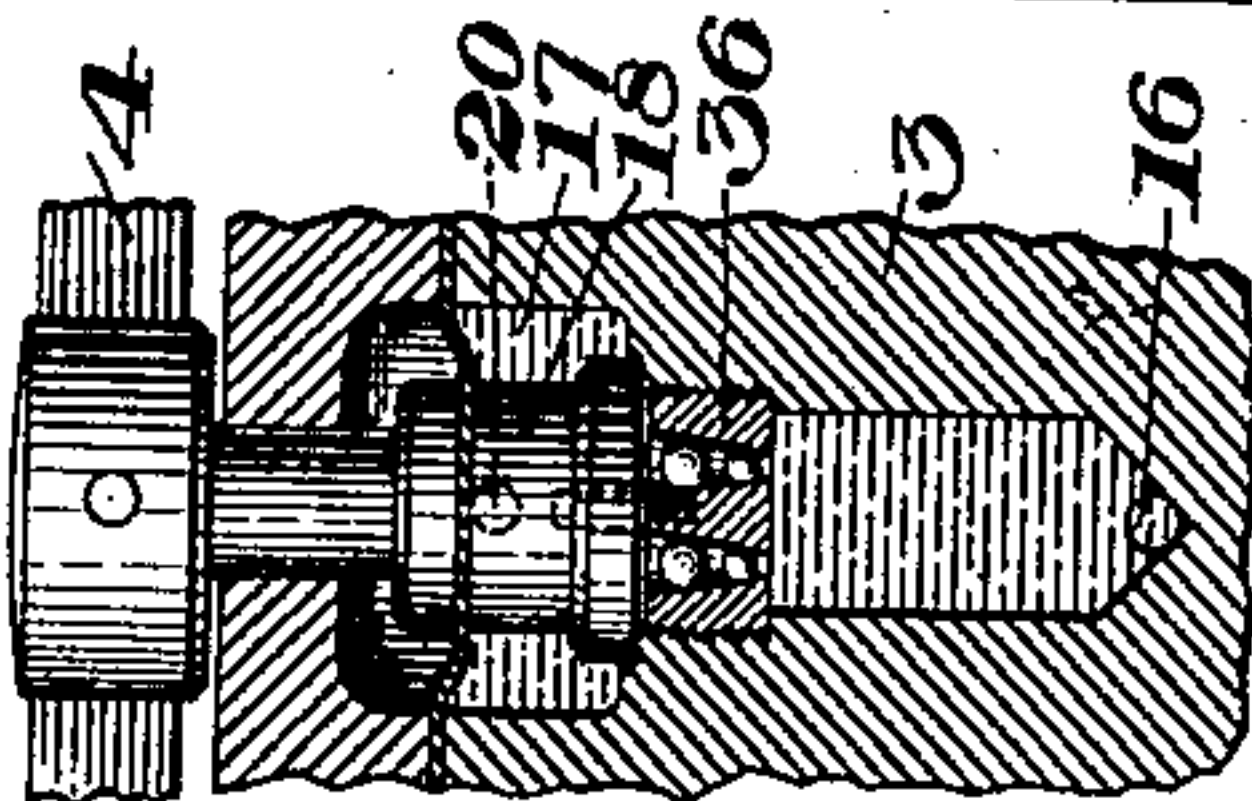


Fig. 5.



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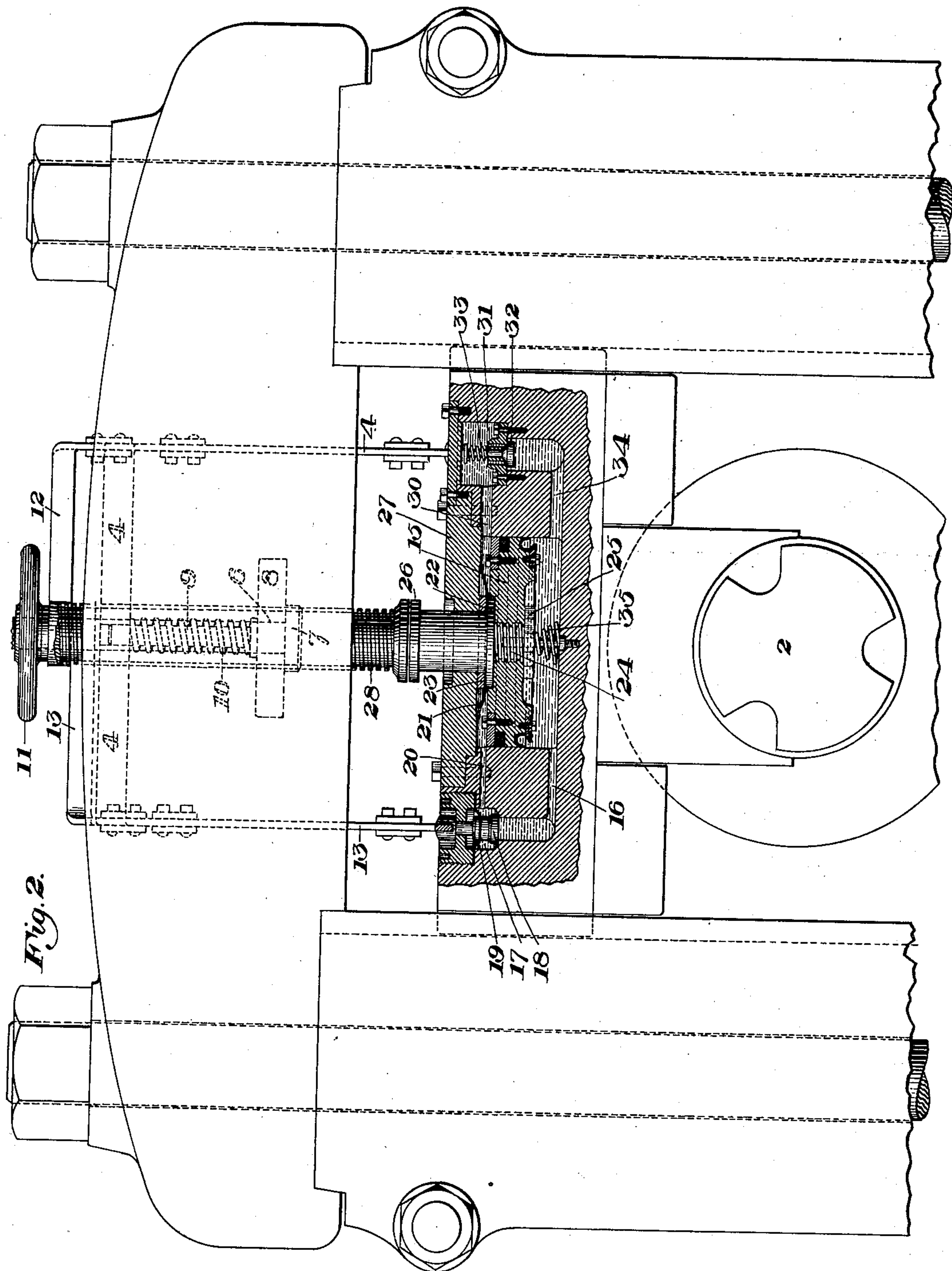
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3 Sheets—Sheet 2.



WITNESSES

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3 Sheets—Sheet 3.

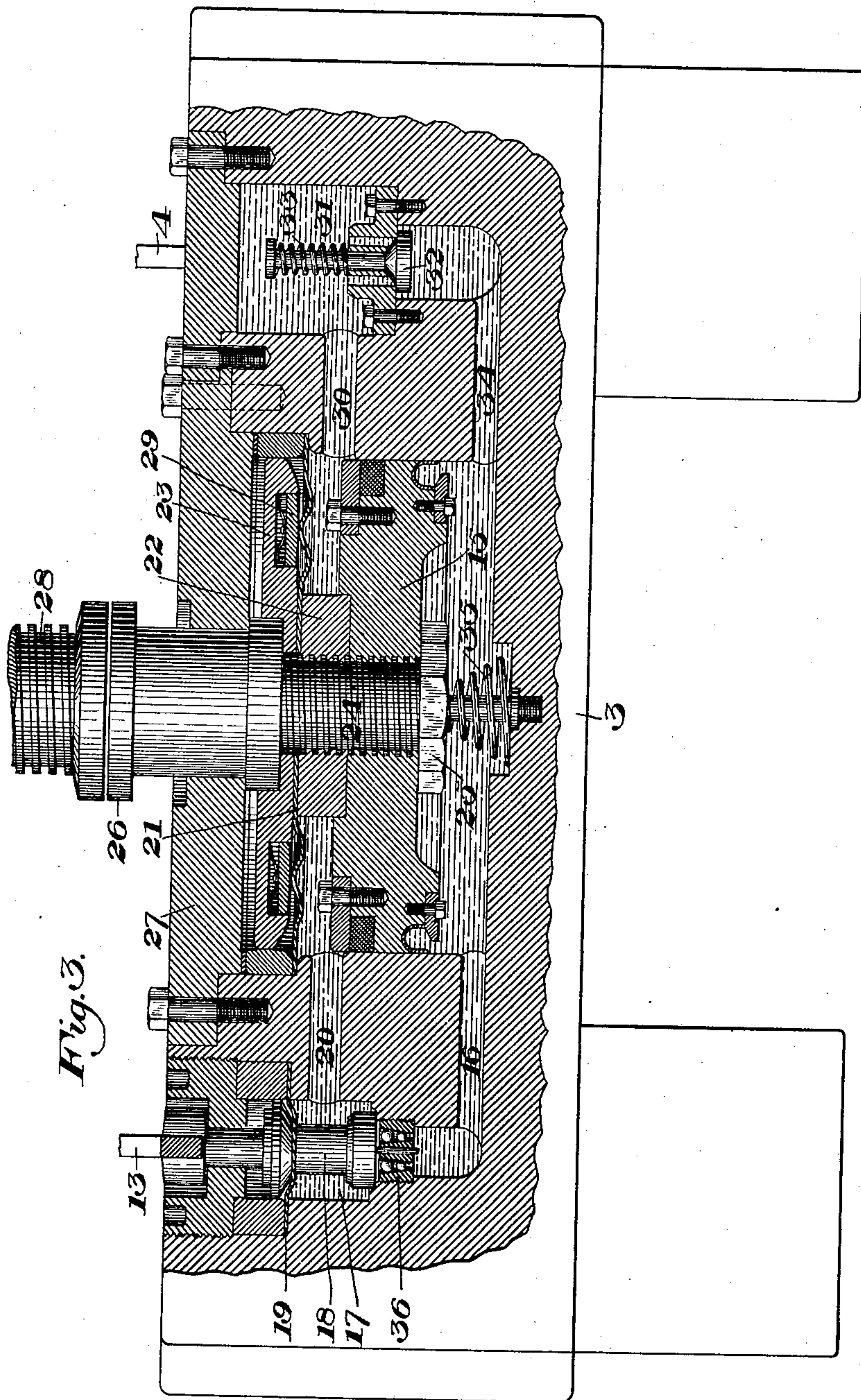


Fig. 3.

WITNESSES

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UNITED STATES PATENT OFFICE.

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LATOR COMPANY, LIMITED, OF PITTSBURG, PENNSYLVANIA.

SAFETY DEVICE FOR ROLLS.

SPECIFICATION forming part of Letters Patent No. 627,935, dated June 27, 1899.

Application filed September 10, 1897. Serial No. 651,259. (No model.)

To all whom it may concern:

Be it known that we, CORNELIUS KUHLEWIND and EDMUND C. EISENGART, of Knoxville borough, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Safety Devices for Rolls, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a sectional front elevation of rolls provided with our invention, the section of one rider being at a different point from that of the other. Fig. 2 is a sectional end elevation. Fig. 3 is a broken longitudinal section of one end of the roll, taken on an enlarged scale; and Figs. 4 and 5 are detail views of the relief-valve.

Our invention relates to the rolls employed for reducing metal, &c., and is designed to provide means whereby one of the rolls may be allowed to move away from the other when the pressure upon the rolls exceeds a certain limit, thus avoiding the breakage and injury to the rolls which has heretofore often happened when the metal sticks in the rolls.

In the drawings, 2 represents the upper of a pair of rolls, and 3 3 the usual end riders for its bearings. Extending upwardly and inwardly from each of these riders are two arms 4, which are united to a central plate or ring 5. Through a central hole in the plate 5 loosely extends a screw-threaded spindle 6, whose lower end terminates in a head 7, which bears against the lower face of a plate 8, having upwardly-extending pins 9, guided within holes in the plate 5. Spiral springs 10 surround the pins 9 and normally tend to press the plate 8 and spindle 6 downwardly. The upper end of the screw-threaded spindle is provided with a hand-wheel 11, and engaging the screw-threaded portion of this spindle are two arms 12 and 13, which are bent in opposite directions, as shown in Fig. 2, and thence extend downwardly and outwardly across the riders at opposite ends, respectively, of the same, their outer ends being fulcrumed thereon, as shown at 14. The central portion of each rider is formed hollow or chambered out to receive a piston 15, each rider forming, in ef-

fect, a cylinder which is movable over this piston.

16 is a port leading from the lower end of the cylinder to a valve-chamber 17, containing an upwardly-movable valve 18, having a diaphragm-packing 19. The upper end of the stem of this valve is slotted to receive the lever-arm 12 or 13, which is pinned therein. From the valve-chamber 17 the port 20 leads into the cylinder above the piston and below the diaphragm-packing 21. This diaphragm 21 is secured between a central plate 22 upon the piston and an upper plate 23 by the screw-threaded rod 24, which passes through the plates and the piston and is provided at the lower end with a nut 25. The rod 24 is provided with an enlarged portion 26 at its upper end, which limits the upward movement of the rider and is provided with a flat upper face, which contacts with the lower end of the ordinary adjusting-screw 28. In the lower face of the plate 23 is provided an annular recess, within which is seated a spring-pressed ring 29, which presses against the diaphragm 21, and which, being forced back when the rider is moved upwardly under excessive pressure, gives a space for the oil to enter, which flows from below the piston through the relief-port into the cylinder above it.

30 is a port leading from the space above the piston into a valve-chamber 31, containing the upwardly-seating valve 32, whose stem is surrounded by a light spring 33, which normally holds the valve closed. From below this valve leads the port 34, which directs the oil back into the space below the piston.

35 is a spring seated in the lower end of the central rider-cavity and pressing upwardly upon the piston therein, this spring being arranged to move the rider downwardly and force the oil from above the piston back through the return-valve 31, bringing the parts to their normal position. We employ the usual hydraulic packing, as shown, upon the piston, and preferably use a valve-cage 36, containing loose balls, as shown, below the chamber 17 and valve 18.

The operation of our device is as follows: The springs 10 being adjusted by the hand-

wheel 11 to the desired point of compression and the adjusting-screws being operated in the usual manner, the pistons will remain stationary within the riders, which riders will thus be adjusted in the usual way. When, however, a piece sticks in the rolls or for any reason an excessive pressure is brought upon the rolls sufficient to overcome the resistance of the lever-arms 12 and 13, the relief-valves will be forced upwardly, and the oil flowing upwardly through the ports will allow the riders to move upwardly over the pistons, thus relieving the roll. The space for the oil within the rider being reduced somewhat during this action by the enlarged stem of the piston entering the cylinder, the necessary space above the cylinder is provided by the spring-pressed ring above the diaphragm, which will be forced in by the pressure of the oil. As soon as the excessive pressure is removed the springs 35 will force the riders downwardly over the pistons and cause the additional amount of oil above the piston to force open the return-valve and flow back into the cylinder below the piston, the parts then assuming their normal position.

The advantages of our invention will be apparent to those skilled in the art, since the danger of injury and breakage of the rolls consequent upon the excessive pressure frequently brought thereon is done away with and the rolls relieved when the pressure exceeds a predetermined limit.

The bearings may of course be connected with the piston or plunger instead of with the cylinder, as shown.

Instead of forcing the liquid from one side of the piston to the chamber upon the other side thereof we may provide a separate chamber in the rider or breaker, into which the liquid is forced when the pressure exceeds the limit, and many other variations may be made in the form and arrangement of the relief-cylinder and the chamber into which the liquid is forced, since we consider ourselves the first to force the fluid from the chamber on one side of the piston to another chamber controlled by a pressure-valve and contained

within the rider and the housing without the use of any external pump or accumulator. 50

We claim—

1. The combination with a roll, of a bearing therefor, having a cylinder and piston, a chamber carried upon and movable with the bearing, said chamber having an inlet-port and an outlet-port, both connected to the cylinder, valves controlling said ports, and mechanism for applying pressure to at least one of said valves; substantially as described. 55

2. The combination with a roll, of hollow riders therefor, pistons within the riders, valve-controlled ports leading from below the pistons to the spaces above them, and means for applying pressure to said valves. 60

3. The combination with a roll, of hollow blocks forming riders therefor, pistons within the blocks, valve-controlled ports leading from below the pistons to the spaces above them, spring-pressed levers bearing upon the valves, and valve-controlled return-passages, leading from above the pistons to the spaces below them. 65

4. The combination with a roll having hollow riders containing pistons, of adjusting-screws arranged to contact with the stems of said pistons, and valve-controlled passages leading from one side of the piston to the other side thereof and arranged to allow passage of fluid whenever the pressure upon the roll exceeds a certain limit. 70

5. The combination with a roll, of a bearing therefor, having a cylinder and piston, a chamber carried upon and movable with the bearing, said chamber having an inlet-port and an outlet-port, both connected to the cylinder, valves controlling said ports, and a projecting lever connected to one of said valves and arranged to apply a regulated pressure thereto; substantially as described. 80

In testimony whereof we have hereunto set our hands. 85

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Witnesses:

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