No. 661,017. Patented Oct. 30, 1900.

C. KUHLEWIND.

ROLLING MILL.

(Application filed Dec. 22, 1899.)

(No Model.) 3 Sheets—Sheet 1.

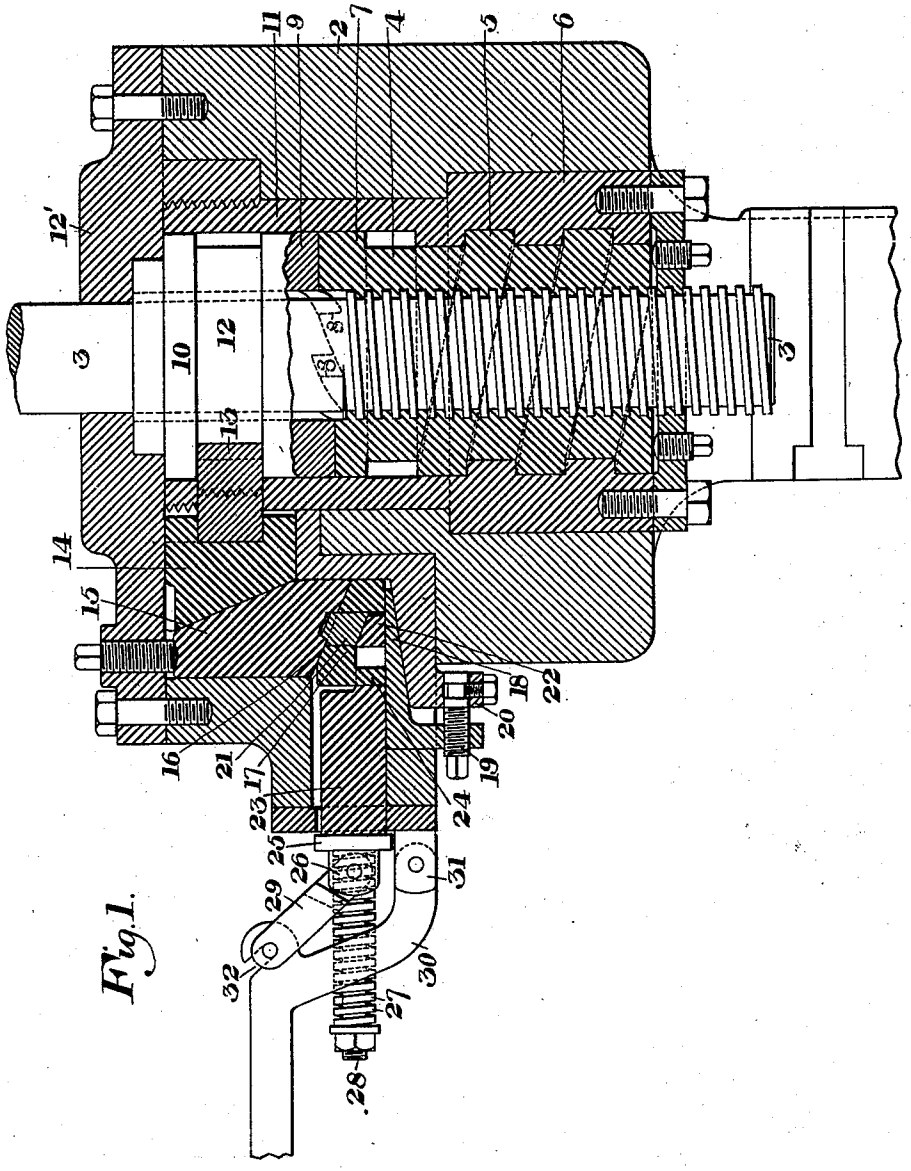


Fig. 1.

WITNESSES

Warren W. Swartz

A. M. Corliss

INVENTOR

C. Kuhlewind.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

No. 661,017. Patented Oct. 30, 1900.

C. KUHLEWIND.

ROLLING MILL.

(Application filed Dec. 22, 1899.)

(No Model.) 3 Sheets—Sheet 2.

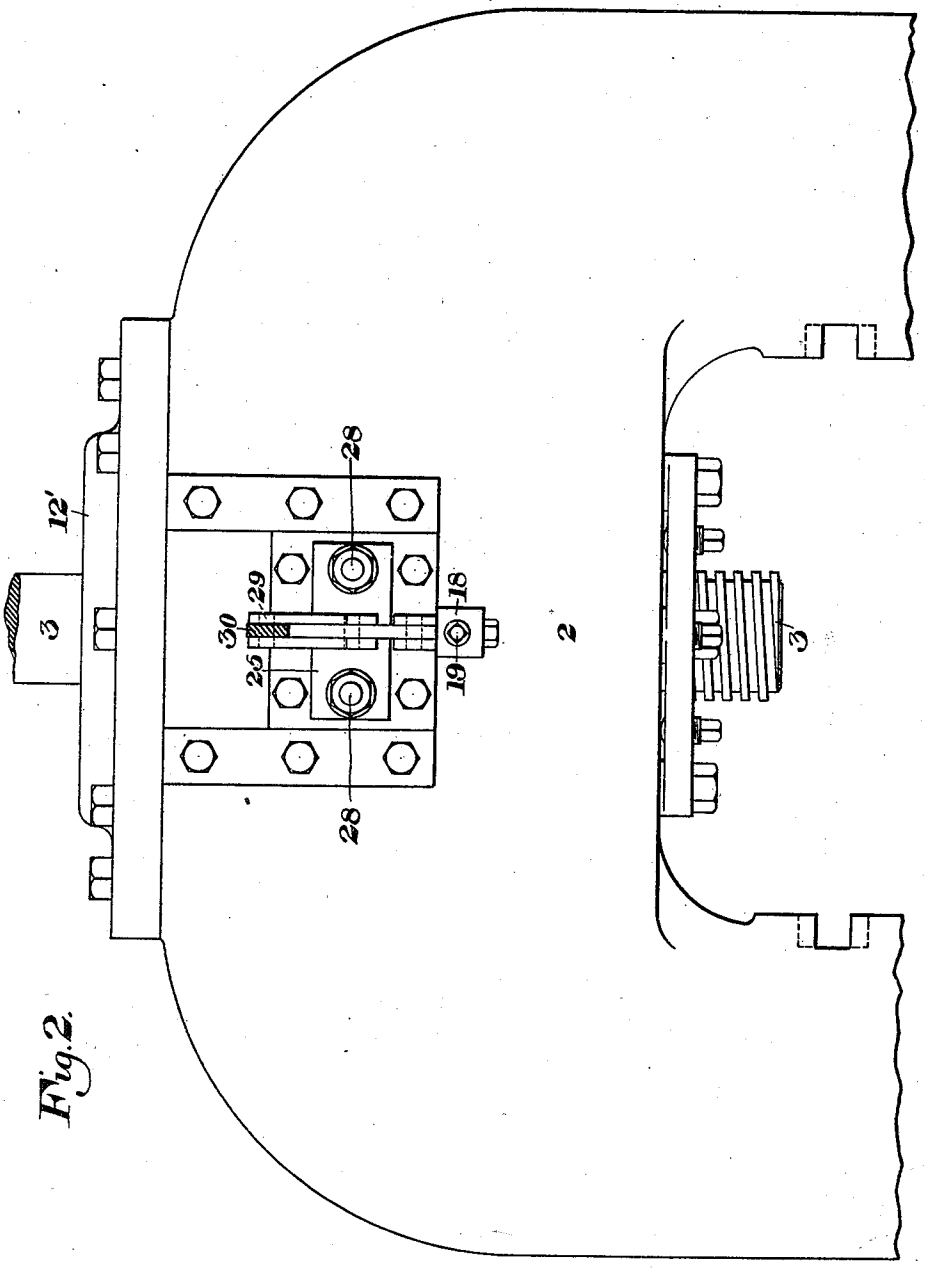


Fig. 2.

WITNESSES

Warren W. Swartz

H. M. Corwin

INVENTOR

C. Kuhlewind.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

No. 661,017. Patented Oct. 30, 1900.

C. KUHLEWIND.

ROLLING MILL.

(Application filed Dec. 22, 1899.)

(No Model.) 3 Sheets—Sheet 3.

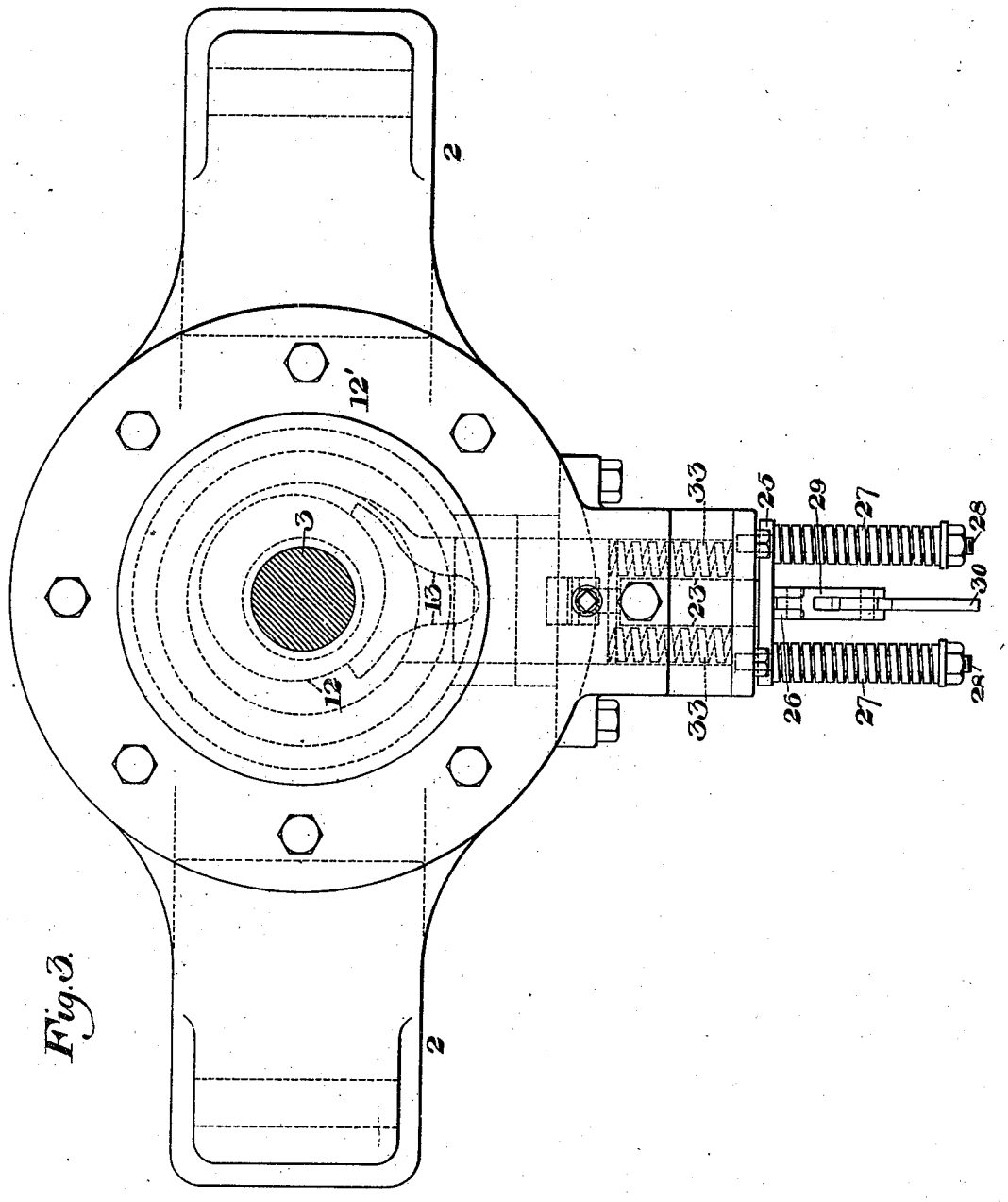


Fig. 3.

WITNESSES

Warren W. Swartz

A. M. Corwin

INVENTOR

C. Kuhlewind.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

CORNELIUS KUHLEWIND, OF KNOXVILLE, PENNSYLVANIA, ASSIGNOR TO THE HYDRAULIC VALVE AND REGULATOR COMPANY, LIMITED, OF PITTSBURG, PENNSYLVANIA.

ROLLING-MILL.

SPECIFICATION forming part of Letters Patent No. 661,017, dated October 30, 1900.

Application filed December 22, 1899. Serial No. 741,210. (No model.)

To all whom it may concern:

Be it known that I, CORNELIUS KUHLEWIND, of Knoxville borough, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Rolling-Mills, 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 side elevation of one of the housings of my improved mill. Fig. 2 is a partial end elevation of the same, and Fig. 3 is a top plan view.

My invention relates to the class of rolling-mills for reducing metal, and is designed to provide a mill in which the adjusting-screws may be used in the ordinary manner and in which when the pressure exceeds a determined limit the bearings of one of the rolls will be automatically relieved, so as to prevent breaking of the rolls. It is further designed to provide a supplemental means for adjustment to take up wear of the brasses in addition to the usual adjusting-screws.

In the drawings, 2 represents the upper portion of a roll-housing, through which extends the usual vertical adjusting-screw 3, the lower end of which bears upon the usual roll-breaker. Around the lower portion of this screw, within the housing, is located a hollow screw 4, the interior of which is screw-threaded to engage the screw 3, while the exterior is provided with square screw-threads 5 of greater pitch and engaging suitable screw-threads in the lower portion of a screw-box 6, secured within the housing. The upper head 7 of this hollow screw is provided with a circumferential series of inclined teeth 8, engaging teeth upon the lower head 9 of a hollow hub 10, which fits within a suitable hollow bushing 11 and is provided with an eccentric portion 12. The stem of the adjusting-screw extends upwardly through this hollow hub, which is held in place by a cap-plate 12′, bolted to the top of the housing. The eccentric portion of this hub engages the inner curved face of a loose push-block 13, (shown in dotted lines in Fig. 3,) and the outer rounded end of this block engages a recess in the inner face of a horizontally-movable wedge-block 14. The outer face of this wedge-block is inclined and engages a similar face upon the vertically-movable wedge-block 15, these blocks being guided within suitable sockets in the housing. The lower face of the wedge-block 15 is beveled or inclined and engages a corresponding face 16 upon a horizontally-movable wedge-block 17, which seats upon an adjustable liner 18. The liner is adjustably secured by a screw 19 engaging a depending flange of the liner and arranged to rotate within a bracket 20.

The horizontal wedge-block 17 is provided with a rectangular hole which contains a locking-block 21, having an upward extension entering a suitable recess in the vertically-movable wedge-block. The lower face of the locking-block is inclined and rests upon the similarly-inclined upper face of the head 22 of a horizontal slide 23, the body of which is contained within a socket in the rear of the wedge-block 17. The head of the slide is vertically slotted and contains a central lug 24, projecting down from the body of the wedge-block, so that after a determined amount of movement of the slide the head of the slide will draw out the wedge-block itself, the locking-block having moved down as the head of the slide is drawn out.

The rear end of the horizontal slide butts against a cross-head 25 and is provided with ears 26, which project through slots in such cross-head. Springs 27, surrounding stems 28, press the cross-head inwardly. The ears 26 are pivotally connected by a link 29 with a curved lever 30, which is fulcrumed to a bracket 31. The upper pivot-pin of the link enters a slot 32 in the lever, so that when the automatic relief action is afforded the hand-lever will not be moved. On pressing down upon this hand-lever, however, the locking-block between the wedges will be lowered and the slide and lower wedge-block drawn outwardly, thus allowing rotation of the hollow hub and the hollow screw and relieving the pressure upon the upper roll.

In the operation of the device the adjusting-screws are used in the usual manner, and

when the piece enters the pass in the rolls the working pressure exerted upon them, being exerted upon the outer hollow screw, will overcome its friction and cause its teeth to turn slightly until they engage the corresponding teeth of the upper hollow hub. The parts remain in this position during the ordinary operation of the mill. When, however, the pressure reaches a determined limit, as by a piece sticking in the roll, the pressure upon the outer hollow screw will cause it to turn the hollow hub. The eccentric upon this hub, through the push-block, will actuate the wedge system, and the vertically-movable wedge being forced down will force the locking-block downwardly within the lower wedge-block, the head of the slide moving outwardly against the pressure of springs 27. The lower wedge-block will also move out under this pressure when the locking-block is released, and the pressure upon the rolls will thus be relieved. As soon as the excess pressure is removed the springs will force the parts back to their normal positions, as shown.

The advantages of my invention result from the automatic relieving of the pressure upon the rolls when it reaches a point where there is danger of breaking them, from the fact that the ordinary adjusting-screws and bearings may be used, and from the compactness of the device, which is inclosed within the housing itself.

Many changes may be made in the form and arrangement of the relief apparatus, as I believe myself to be the first to combine such apparatus with the ordinary adjusting-screw and inclosed within the recess within the housing.

I claim—

1. A rolling-mill having an adjusting-screw, and an automatic relief device comprising a sleeve surrounding the screw, and arranged to be actuated by it, and a yielding pressure device arranged to be actuated by the sleeve when the pressure reaches a determined limit; substantially as described.

2. A rolling-mill having an adjusting-screw, an externally-screw-threaded sleeve having inner screw-threads engaging said screw, a rotatable hub arranged to be turned by the sleeve, and a yielding pressure device arranged to be operated by the hub; substantially as described.

3. A rolling-mill, having a yielding pressure device located in its housing, and at least partially surrounding the adjusting-screw; substantially as described.

4. A rolling-mill having an adjusting-screw, an externally-threaded sleeve arranged to be rotated and moved endwise by the screw, a rotatable head having teeth engaging teeth at the end of the sleeve, said hub having an eccentric, and a spring-pressed wedge system arranged to be operated by the eccentric, substantially as described.

5. A rolling-mill having an adjusting-screw, an externally-threaded sleeve within the housing, and surrounding the screw, said sleeve having inclined end teeth, a rotary hub surrounding the stem of the adjusting-screw, and having teeth engaging those of the sleeve, a push-block actuated by the hub, and a spring-pressed wedge system arranged to be actuated by the push-block; substantially as described.

6. A rolling-mill having an adjusting-screw, a sleeve surrounding the screw and actuated by it, and a yielding pressure device arranged to be actuated by the sleeve; and a liner acting upon the yielding pressure device; substantially as described.

7. A rolling-mill having an adjusting-screw, an externally-threaded sleeve arranged to be rotated and moved endwise by the screw, a rotatable head having teeth engaging teeth at the end of the sleeve, said hub having an eccentric, a spring-pressed wedge system arranged to be operated by the eccentric, and an adjustable liner acting upon the wedge system; substantially as described.

In testimony whereof I have hereunto set my hand.

CORNELIUS KUHLEWIND.

Witnesses:

G. I. HOLDSHIP,

H. M. CORWIN.