

(No Model.)

3 Sheets—Sheet 1.

R. W. HUNT.

# FEEDING ATTACHMENT FOR ROLLING MILLS.

No. 312,640.

Patented Feb. 24, 1885.

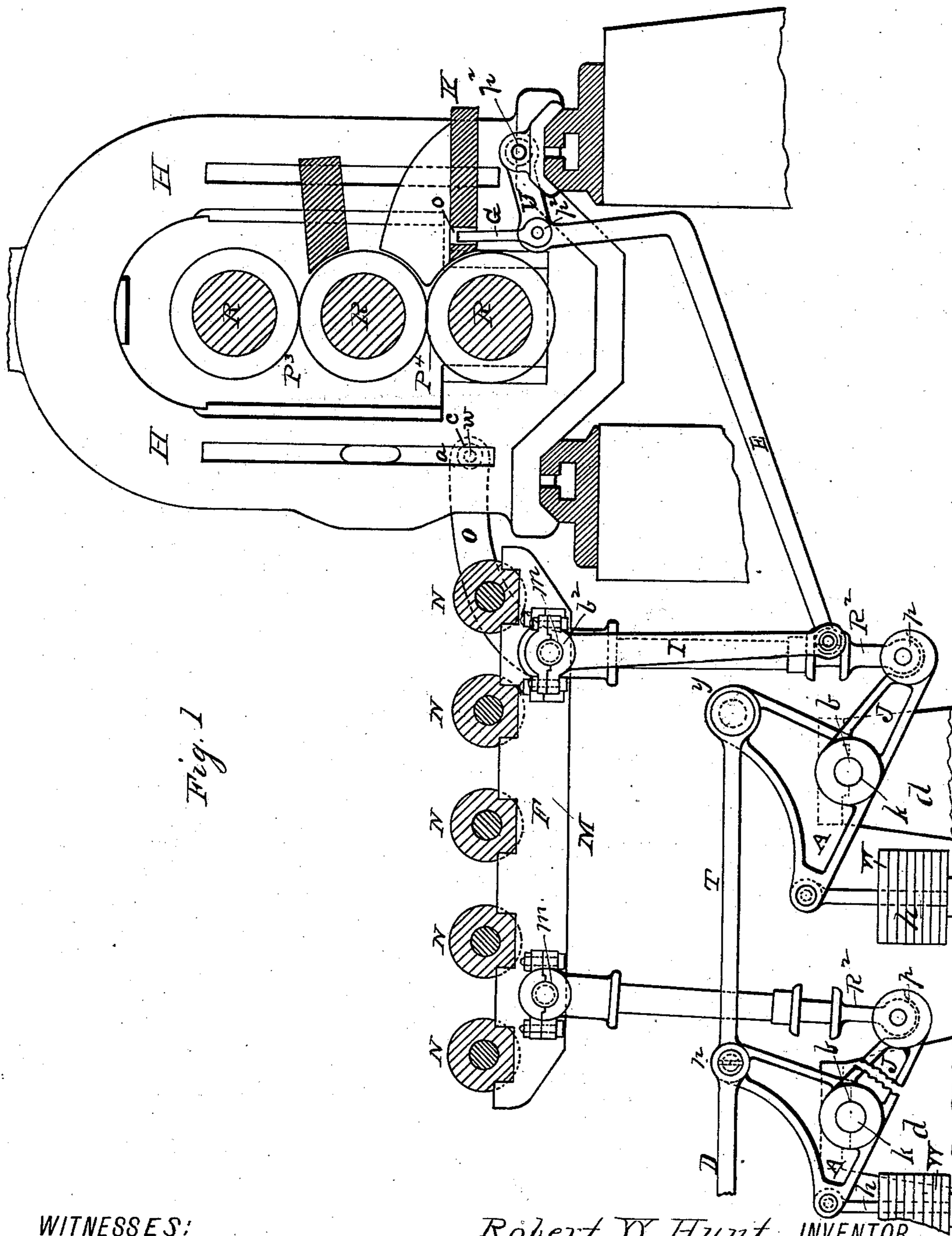


Fig. 1

**WITNESSES:**

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Robert W. Hunt, INVENTOR

BY

BY  
Charles S. Brintnall W E Hagan ATTORNEY

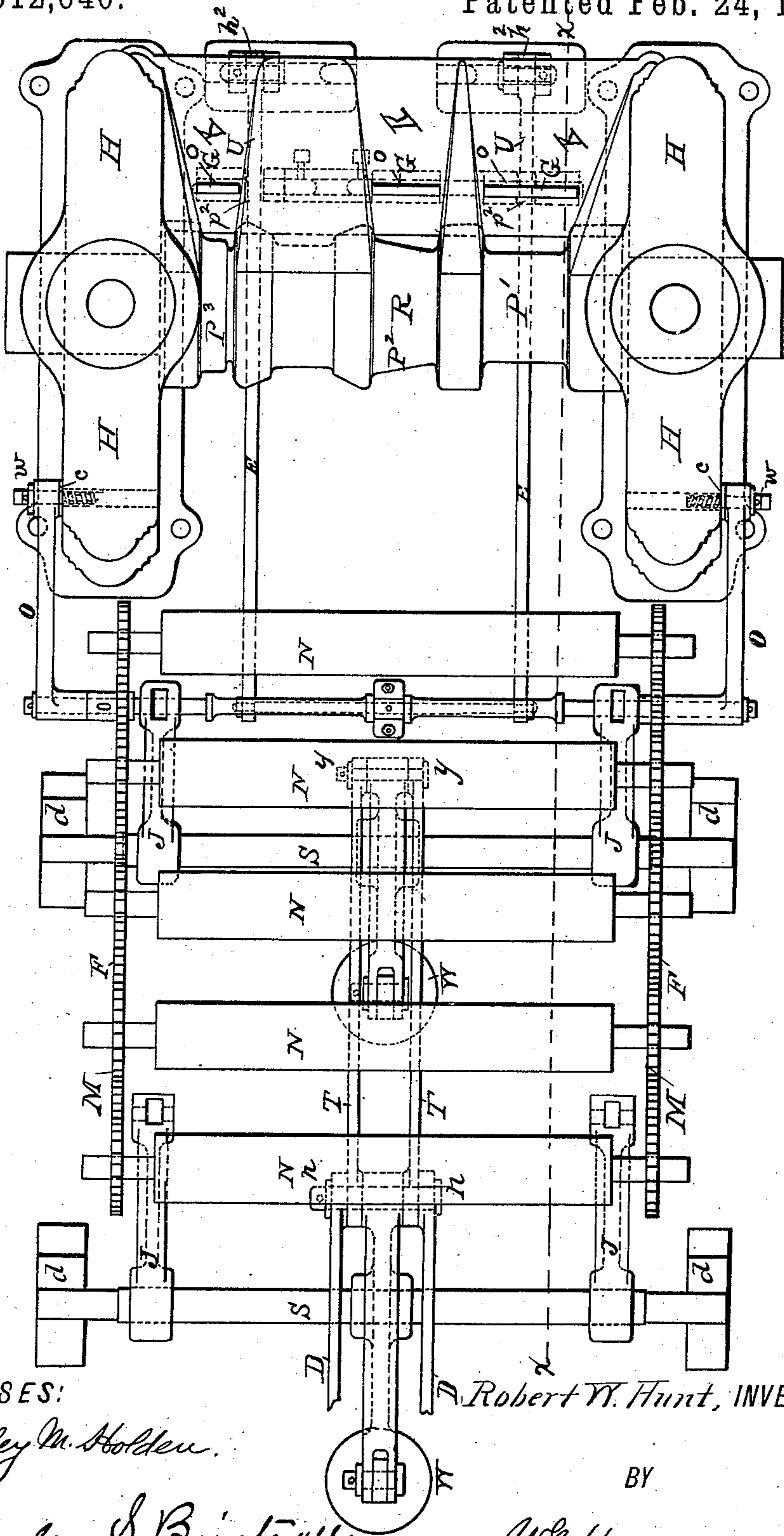
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Fig. 2



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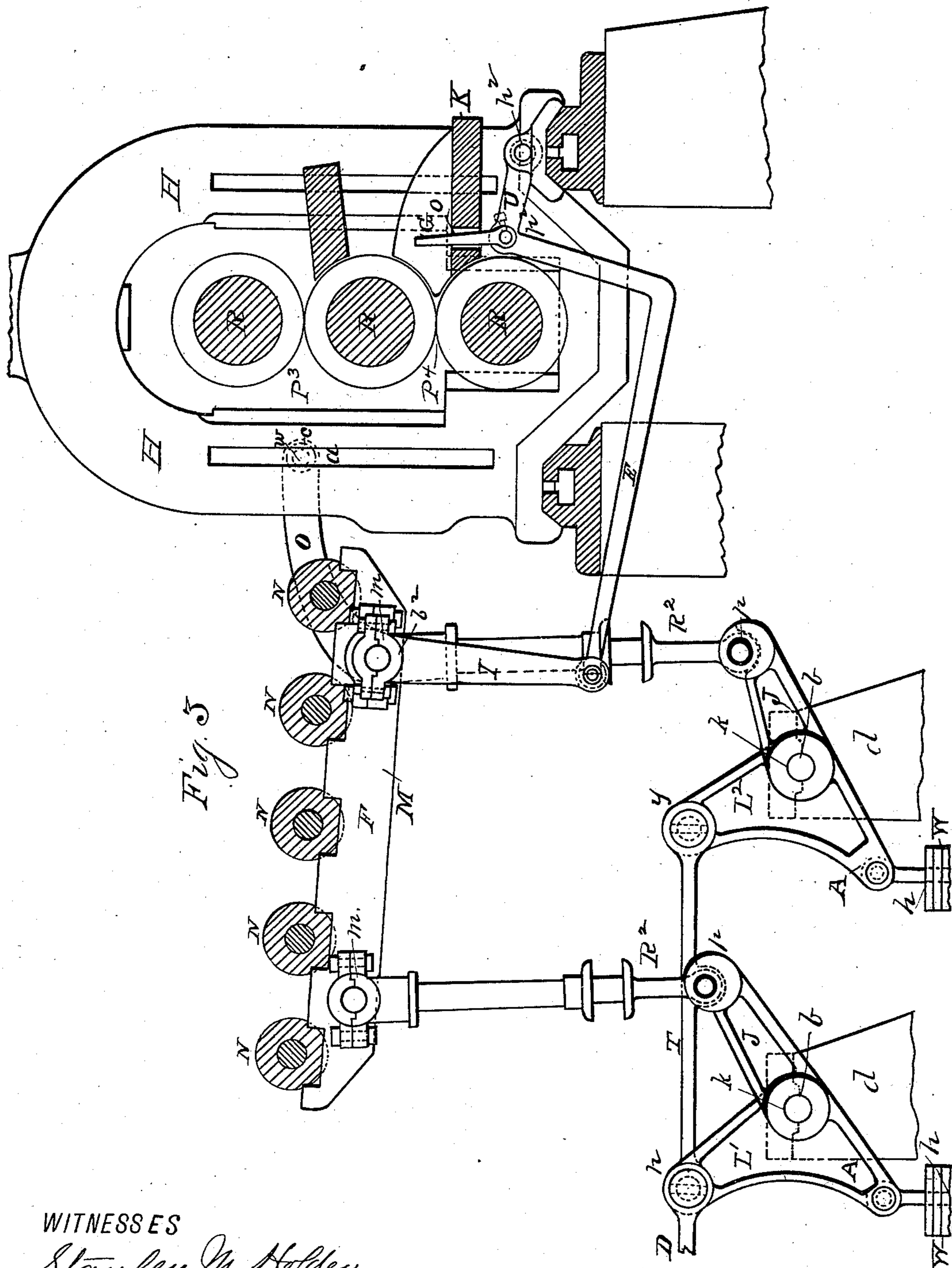
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**WITNESSES**

Stanley M. Holden.

Charles S. Brintnall

Robert W. Hunt, Inventor.

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# UNITED STATES PATENT OFFICE.

ROBERT W. HUNT, OF TROY, NEW YORK.

## FEEDING ATTACHMENT FOR ROLLING-MILLS.

SPECIFICATION forming part of Letters Patent No. 312,640, dated February 24, 1885.

Application filed September 29, 1884. (No model.)

*To all whom it may concern:*

Be it known that I, ROBERT W. HUNT, of the city of Troy, county of Rensselaer, State of New York, have invented a new and useful Improvement in Attachments to Roller-Mills, of which the following is a specification.

My invention relates to mechanical attachments to rolling-mills, it being more particularly adapted to be used in connection with the "roughing-rolls" of a "three-high train;" and the object and purpose of my invention and the mechanism of which it consists is to receive the rail-blooms coming from the lower passes of the roughing-rolls to raise and return them through an upper pass of the train, in combination with automatically-operating stops acting in conjunction with the aforesaid elevating mechanism in such a manner as to detain the rail-blooms from entering the lower passes until the elevating mechanism is in position opposite the lower passes to receive said blooms.

Accompanying this specification, to form a part of it, there are three plates of drawings containing three figures illustrating my invention, with the same designation of its parts by letter reference used in all of them.

Of these illustrations, Figure 1 shows a combined vertical section and side elevation of a set of roughing-rolls and their housings, showing, also, the mechanism containing my invention, with the apparatus that receives the rail-bloom from the lower passes of the rolls and raises it to enter the upper passes shown in this figure as down in a position to receive a rail-bloom from the lower passes, and with the stop-gates in front of the lower passes of the rolls shown as open, all the sectional parts of the mechanism illustrated in this figure being taken on the line *xx* of Fig. 2. Fig. 2 shows a plan view of the roughing-rolls, their housings, and the mechanism containing my invention. Fig. 3 shows a combined vertical section and side elevation of the roughing-rolls and their housings, also the mechanism containing my invention, all the sectional parts of this figure being taken on the line *xx* of Fig. 2, with the gate-stops shown as closed where in front of the entrance side of the lower passes with platform raised.

The several parts of the mechanism thus illustrated are designated by letter reference, and the function of the parts is described as follows:

The letters H indicate the housings of that part of the train in which the roughing-rolls are placed, and which contain the coupler-bearings of the latter.

The letters R designate the rolls,  $P^1$   $P^2$   $P^3$  the upper passes of the latter, and  $P^4$  their lower passes, all of which parts are of the usual and ordinary construction.

The letters N designate a series of rollers having their journal-bearings in a frame, F, and which rollers and frame as thus arranged produce the platform M. This platform is adapted to receive a rail-bloom coming from one of the lower passes of the rolls as it is expelled therefrom, and to be raised so as to bring the said bloom that it carries opposite to where it can enter one of the upper passes of the rolls, and then to descend in sequence to receive another bloom and to repeat the operation, the said platform being so actuated by means of the crank-levers  $L^1$   $L^2$  and the connections made between them and said platform, which connections are the following: The said crank-levers are each located centrally beneath the platform at each end of the latter, and each of said crank-levers at its angular turn center is keyed to, so as to move, one of the two shafts S, the latter having their journal-bearings in the standards *d d*, as designated at *b b*.

The letters A A indicate arms of the crank-levers, to which there are pivoted the counterpoise-holders *h*; and J J designate crank-arms, of which there are two at each end of the platform, one end of each of which crank-arms are at *k* keyed to one of the shafts S, so as to be moved by said shafts. At the other end of said crank-arms each of them is pivoted at *p* to one of the connecting-rods  $R^2$ , of which there are two at each end of said platform, and the said rods  $R^2$  are at their upper ends, as indicated at *m*, journaled onto the sides of the platform near the ends of the latter.

The letter D designates the actuating connecting or piston rod, which is arranged to be operated by any suitable motor, so as to recip-

rocate horizontally, and thus actuate the crank-levers. Where connecting with the crank-lever  $L'$ , said rod  $D$  is forked, so as to pass each side of the lever-arm, to which it connects by a strapped bearing on each of the forked arms and a journal at each side of the crank-lever arms, as indicated at  $n$ .

The letters  $T$   $T$  designate rods that connect the upper arms of the levers  $L'$   $L^2$  by means of strapped bearings on the ends of the rods and journals on each side of the lever-arms, as indicated at  $y$   $y$ , so that said crank-levers when being moved have parallel motion.

Thus made and arranged, when the reciprocating rod  $D$  moves outwardly from the rolls, it raises the platform by the combined action of the connected crank-levers, the shafts, and crank-arms; and when the said rod  $D$  in reciprocating moves inwardly toward the rolls the platform descends by the action of the same combined factors, aided by gravity, the function of the counterpoise  $W$  being to balance the weight of the rail-bloom on the levers and to make more prompt the ascent of the platform.

The letter  $O$  designates a pivotal guide-arm, of which there is one at each side of the platform at its end where nearest the rolls. Each of these guide-arms at one of their ends has a strapped bearing on the journal  $m$  of the platform, the other ends of these guide-arms being pivoted to a slide-pin,  $w$ , which is adapted to move up and down in a slotted guideway produced in the housing-standard, as indicated at  $a$ , the said sliding guide-pin having an inner head or cap,  $c$ , that is greater in diameter than the width of said slot  $a$ , the purpose of which guide-arms and their connections being to prevent the swaying of the platform.

The front crank-arms,  $J$ , are made longer than those at the other end of the platform, and this construction, in connection with the slant given the front connecting-rods,  $R^2$ , as the crank-levers are actuated, causes the front end of the platform to be raised higher than its inner end, which is nearest the rolls, and so that the platform, when raised, inclines from its outward end inwardly and downwardly toward the upper passes of the rolls.

The platform  $M$ , thus described, the crank-levers, shafts, and crank-arms, as connected therewith, are not my invention, considered alone and independently of the means that I combine with them, and by which a platform is actuated to descend so as to receive a rail-bloom from a lower pass of the rolls and actuated to rise to deliver said rail-bloom to an upper pass of the rolls, with said platform, in connection with such operations, also arranged to actuate gate-stops that close the entrance to lower passes of the rolls at such times as the platform is not in a position to receive the rail-bloom, and to open said gate-stops when the platform is in position to receive said rail-bloom.

To carry out the purposes of my invention, and to have a platform that is actuated to raise, descend, and also operate gate-stops in front of the lower passes of the rolls, a downwardly-extended arm,  $I$ , is arranged at each side of the platform, and connected thereto by means of a strapped bearing,  $b^2$ , on each of the upper ends of said arms, and a journal,  $m$ , at each side of the platform. The lower end of these arms  $I$  are hinged or pivoted to a bent lever,  $E$ , of which there is one at each side of the platform, and which pivoted levers are curved so as to pass horizontally beneath the rolls and upwardly toward the front of the latter and upon that side of the rolls which is opposite to the one whereat the platform is arranged. These bent and pivoted levers are hinged at their front ends, as indicated at  $h^2$ , to the top of the train bed-plate; and the letter  $U$  designates a bar arranged horizontally between said pivoted levers  $E$ , with its ends pivoted to the latter at  $p^2$ , a short distance from their hinged fulcrum end, and so as to be moved by them. Upon this bar  $U$  are placed the vertically-arranged gates  $G$   $G$   $G$ , each of which, as constructed thereon, is arranged to come opposite one of the lower passes,  $P^1$ , of the rolls when the said gates are raised.

The letter  $K$  indicates a guide-plate arranged immediately above said bar  $U$ , and said plate is constructed with openings  $o$   $o$   $o$  for the vertical passage of the gate-stops  $G$ .

With the parts connected and constructed as thus described, when the platform is raised by the combined action of the arms  $I$ , pivoted bent levers  $E$ , and bar  $U$ , the gate-stops  $G$  are forced upwardly through the openings  $o$ , so as to be in front of the lower passes,  $P^1$ , of the roll, and as the said platform  $M$  descends to come opposite the said lower passes and to be in a position to receive a rail-bloom therefrom, the said gate-stops are carried down, so as to open a passage to the lower passes of the rolls.

As the operation of supplying the blooms to the roughing-rolls is dependent upon irregular conditions, and as the entrance and expulsion of a bloom from the rolls at a time when the platform is not in position to receive it would injure the latter, it is desirable that the bloom should be held on the feed-rollers until the platform is in a position to receive it, and by having the platform arranged to open the gates when in such a position all these difficulties are avoided and an automatic operation of platform and gate-stops produced.

As the arms  $I$  and pivoted levers  $E$ , as constructed and arranged, act as one device, performing the function of a compound hinged lever, I do not limit my invention to the precise construction of these factors as shown, and any known equivalent means performing the same function may be used.

As the platform  $M$ , when actuated to rise

and descend by any mechanism, would, in connection with the means shown, operate the gate-stops in the same manner; hence I do not limit my invention to its combination with the specific means shown to thus actuate the platform.

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

- 10 1. In an attachment to a rolling-mill, the combination of a platform that is operated to ascend and descend and to alternately stop opposite the upper and lower passes of the rolls, and vertical gates arranged below and opposite the lower passes of the rolls at the front, said gates being connected and constructed to be closed by the ascent of said platform and opened by the descent, substantially in the manner as and for the purposes set forth.
- 15 2. In an attachment to a rolling-mill, the combination of a platform operated to ascend and descend, so as to alternately stop opposite the upper and lower passes of the rolls, vertical gates arranged on a horizontal bar below and in front of the lower passes of the rolls, and an arm and pivoted lever at each side of the platform, connecting said bar with the platform, said parts being constructed and arranged to operate substantially in the manner as and for the purposes set forth.
- 20 3. In an attachment to a rolling-mill, the combination of the vertical gates G G G, arranged on the bar U with reference to the lower passes of the rolls as shown, the curved levers E E, hinged at their fulcrum ends to a support, and at their other ends hinged to an arm on each side of the platform M, with the said gate-bar U, arranged between and at its ends pivoted to said curved levers intermediate to the hinged ends of the latter, the said parts being constructed and arranged to operate substantially in the manner as and for the purposes set forth.
- 25 4. In an attachment to a rolling-mill, the combination of the platform M, constructed to be actuated as shown, the arm I, hinged to each side of the platform, the curved pivoted or hinged levers E E, and the rod U, the said parts being arranged and constructed to operate substantially in the manner as and for the purposes set forth.
- 30 5. Signed at Troy, New York, this 11th day of August, 1884, and in the presence of the two witnesses whose names are hereto written.

ROBERT W. HUNT.

Witnesses:

CHARLES S. BRINTNALL,  
STANLEY M. HOLDEN.