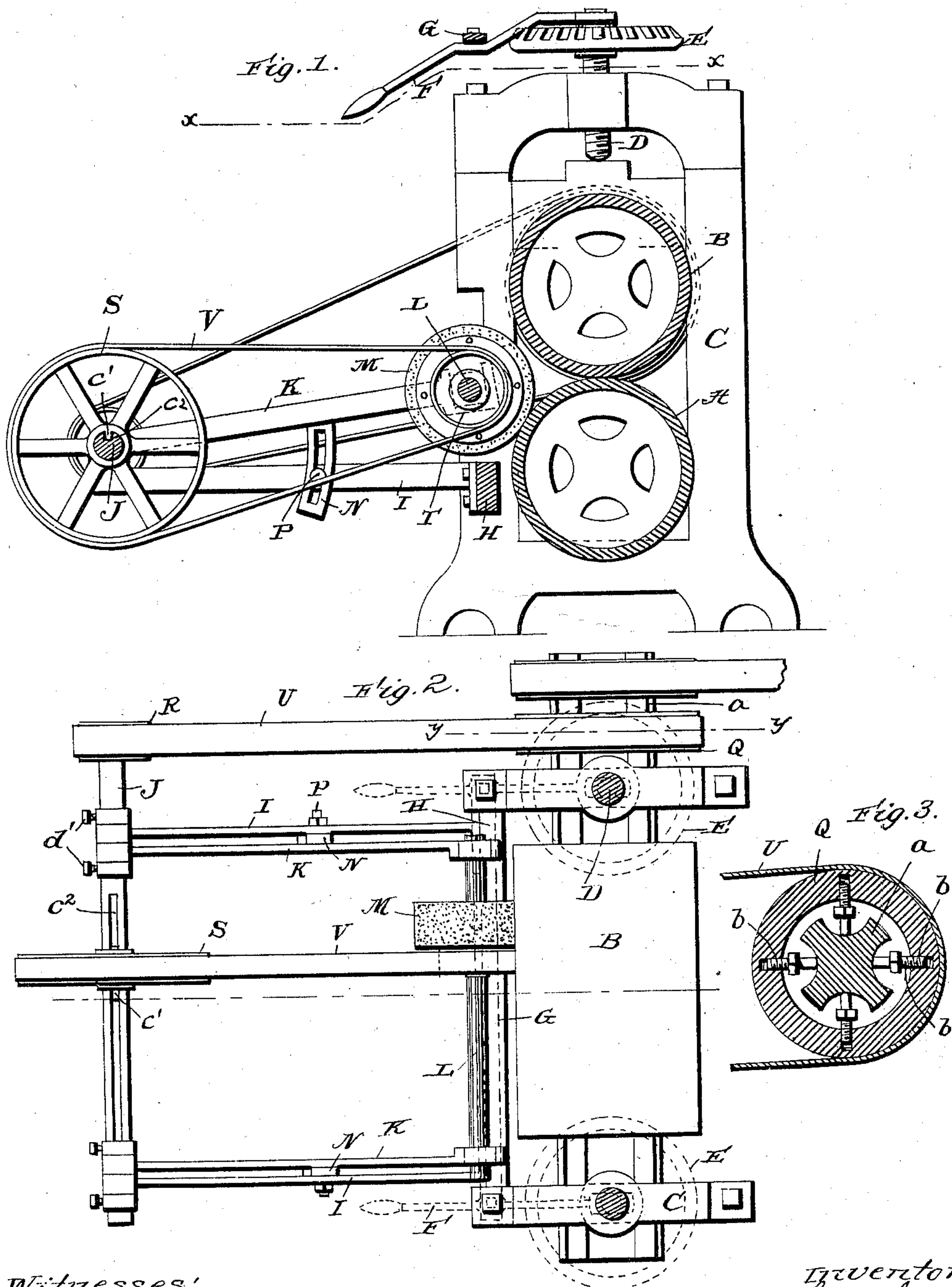


(No Model.)

R. W. HUGHES.
ATTACHMENT FOR TIN PLATE MILLS.

No. 598,784.

Patented Feb. 8, 1898.



Witnesses:

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REESE WILLIAM HUGHES, OF MARTIN'S FERRY, OHIO.

ATTACHMENT FOR TIN-PLATE MILLS.

SPECIFICATION forming part of Letters Patent No. 598,784, dated February 8, 1898.

Application filed August 17, 1897. Serial No. 648,491. (No model.)

To all whom it may concern:

Be it known that I, REESE WILLIAM HUGHES, a citizen of the United States, residing at Martin's Ferry, in the county of Belmont and State of Ohio, have invented certain new and useful Improvements in Attachments for Tin-Plate Mills; and I do 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.

My invention relates to apparatus for polishing and smoothing the rolls of mills for rolling sheet and plate metal while said rolls are hot; and it contemplates the provision of a very cheap and simple apparatus which is adapted to be quickly and easily connected to and detached from an ordinary roller-mill and which is adapted to expeditiously smooth and polish the rolls, so as to prevent the same from getting cold in the time necessary to the placing, operation, and removal of the apparatus.

The invention also contemplates the provision of an apparatus which in addition to smoothing and polishing the rolls is adapted to grind the "bearings"—that is to say, the portion of the rolls at opposite sides of the plates of metal—thus avoiding the necessity of removing the rolls and turning the bearings of the same in a lathe.

With the foregoing ends in view the invention will be fully understood from the following description and claims, when taken in conjunction with the annexed drawings, in which—

Figure 1 is a vertical longitudinal section of a roller-mill equipped with my improvements. Fig. 2 is a horizontal section taken in the plane indicated by the line *xx* of Fig. 1, with the parts above the indicated plane illustrated by dotted lines; and Fig. 3 is a detail section taken in the plane indicated by the dotted line *yy* of Fig. 2.

In the said drawings similar letters designate corresponding parts in all of the several views, referring to which—

A B indicate ordinary two-high sheet-rolls, which are preferably of cast-iron chilled to a depth of about one inch from their peripheries, and are designed in use to be driven the one by suitable power and the other by

friction in order to produce a more even rolling action.

C indicates the housing, and D the screws, by which the upper roll is adjusted upon the lower roll. The said screws D are provided with toothed wheels E, and these wheels, which are keyed or otherwise fixed to the shanks of the screws, are designed to be engaged by arms F, which are loosely mounted on the screw-shanks above the wheels E, and are therefore adapted to be moved vertically to seat them in or remove them from the spaces between the teeth of the wheels E, and are also adapted to be swung horizontally above the wheels independent of the same. These arms F are connected by a cross-bar G, as shown, and in consequence it will be seen that the attendant is enabled to adjust the roll B uniformly throughout its length.

H indicates a cross-bar, which is connected to the housing C, and I indicates bracket-arms, which are connected to said bar by bolts or other suitable means. In these arms I is journaled a transverse shaft J, and on said shaft is loosely mounted an adjustable frame comprising arms K, the shaft J and arms K being detachably secured in position by set-screws *d'* or other suitable means. The said arms K have suitable bearings at their inner ends, in which are journaled the ends of a shaft L, carrying a loose emery or other suitable abrasive wheel M, and in order that the said emery-wheel may be adjusted and adjustably fixed so as to hold it in contact with one or the other of the rolls A B, I provide the arms K with slotted straps N and the arms I with bolts P, which extend through the slotted straps and are provided with nuts, as shown. This is the preferred manner of adjustably fixing the arms K for the purpose stated; but it is obvious that any other suitable means may be employed.

The rolls A B are of the usual length, so that about five inches of their length will be exposed at opposite sides of the sheets or plates being rolled. The emery-wheel is designed to be moved in the direction of the length of the rolls A B throughout the length thereof, and consequently it will be seen that said exposed portions of bearings of the rolls may be ground and polished, as well as the intermediate portions thereof, and when the

intermediate portions are hollowed out by usage the end portions or bearings may be reduced to the diameter of such hollowed-out portions and the diameter of the rolls rendered uniform throughout their length. This is a material and important advantage, for otherwise the rolls would have to be removed from the housing and the diameter of the bearings or end portions be reduced on a lathe.

As before stated, the emery-wheel M is free to turn on the shaft L and is also free to be moved laterally on the same. The emery-wheel is suitably fixed to a pulley T, which is loose on the shaft, so as to permit it to turn and move laterally with the emery-wheel, and the said pulley T is connected by a belt V with a pulley S on the shaft J, the said pulley S being larger than the pulley T, so as to rotate the emery-wheel at a high rate of speed. The pulley S is provided with a key c' , arranged to move in a keyway c^2 of the shaft J, or is otherwise arranged on said shaft so that it will turn therewith and yet is free to move laterally thereon.

When the rolls are to be ground and smoothed, I place on the end portion a of the upper roll a band-pulley Q, the same being connected to said portion a by screws b , which take into threaded sockets b' in the pulley and impinge at their opposite ends against the end portion a , as shown, whereby it will be seen that the pulley may be quickly and easily fixed on the end portion a , and as quickly and easily removed therefrom. I also fix a pulley R on the end of the shaft J and connect it with the pulley Q by a belt U, the said pulley R being much smaller than the pulley Q, so that the shaft J will be rotated at a greater rate of speed than the roll B.

When the rolls A B are to be ground and polished, the frame K is adjusted to carry the emery-wheel into contact with one roll and the mill is set in motion. The pulley S is then moved in the direction of the length of the shaft J by the operator, who, in order to prevent injury to his hand, may, if desired, press against the side of the pulley with a stick. (Not shown.) The emery-wheel, by reason of its pulley T being connected by the belt V with the pulley S, will be moved with said pulley S, when it will be seen that the emery-roller rotated at a high rate of speed will be caused to move the full length of the roll and will quickly smooth and polish the roll. When the smoothing and polishing of one roll are completed, the mill is stopped and the frame K is adjusted and adjustably fixed to hold the emery-wheel in contact with the other roll of the mill and the operation described is then repeated.

When the mill is to be used, all of my improvements except the bracket-arms I are re-

moved, said bracket-arms being left on the housing, because they do not interfere with the ordinary operation of the mill.

It will be appreciated from the foregoing that my improvements are readily attachable to an ordinary mill, that they are highly efficient for the purpose stated, and that they obviate the necessity of cooling the rolls, which occupies a day or more, and the subsequent reheating of said rolls, which can only be done by passing a number of plates or sheets between them, the plates or sheets so formed being necessarily of poor quality. I would also have it understood that when desired my improvements may be used to advantage in conjunction with a cold-roll mill.

Having thus described my invention, what I claim is—

1. The combination with a roller-mill; of a roll smoothing and polishing apparatus comprising a bracket connected with the housing of the mill, a shaft journaled in the bracket, a vertically-movable frame loosely mounted on said shaft and adjustably connected with the bracket, a shaft journaled in the vertically-movable frame, an emery-wheel loosely mounted on the latter shaft so as to enable it to turn and move laterally thereon and having a pulley fixed to it, a pulley arranged on the shaft journaled in the bracket so as to turn therewith and move laterally thereon, a belt connecting this pulley and the pulley fixed on the emery-wheel, and a suitable means for turning the shaft journaled in the bracket, substantially as specified.

2. The combination with a roller-mill; of a roll smoothing and polishing apparatus comprising a bracket connected with the housing, a shaft journaled in the bracket and detachably secured in position, a vertically-movable frame loosely mounted on said shaft, means for adjustably fixing said frame with respect to the bracket, a shaft journaled in the vertically-movable frame, an emery-wheel loosely mounted on the latter shaft so as to enable it to turn and move laterally thereon and having a pulley fixed to it, a pulley arranged on the shaft journaled in the bracket so as to turn therewith and move laterally thereon, a belt connecting said pulley and the pulley fixed on the emery-wheel, a pulley fixed on the end of the shaft journaled in the bracket, a pulley detachably fixed on the end of one of the rolls of the mill, and a belt connecting the said pulleys, substantially as specified.

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

REESE WILLIAM HUGHES.

Witnesses:

HUMPHERY WILLIAMS,
WILLIAM EDWARDS.