Sept. 20, 1938. S. WILLIAMS 2,130,709

ROLL POLISHER FOR ROLLING MILLS

Filed Aug. 21, 1935 2 Sheets-Sheet 1

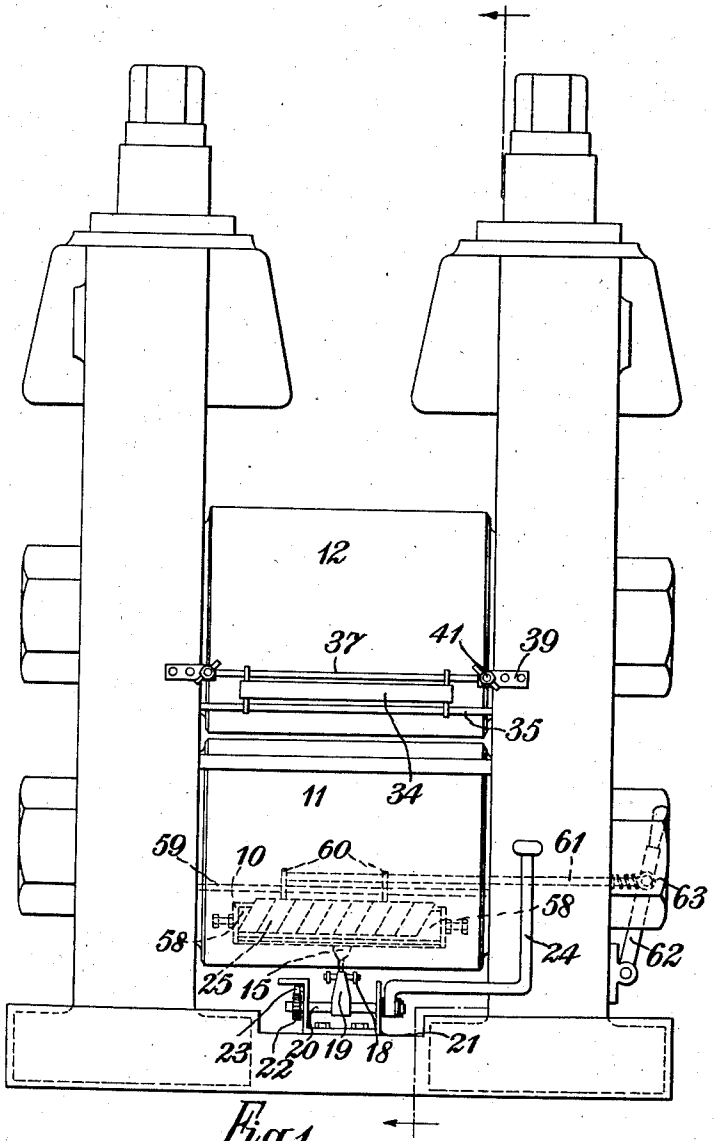


Fig. 1.

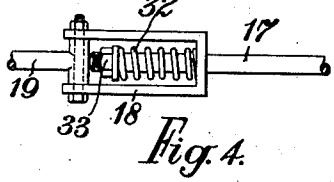


Fig. 4.

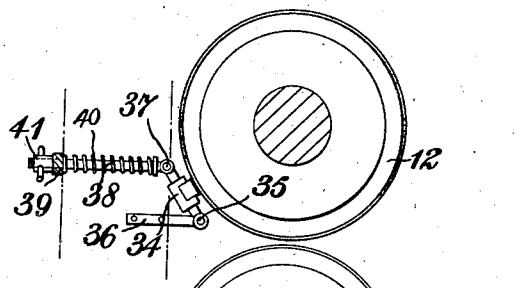
S. Williams
INVENTOR

By: Glascock Downing & Seebold
Attys.

Sept. 20, 1938. S. WILLIAMS 2,130,709

ROLL POLISHER FOR ROLLING MILLS

Filed Aug. 21, 1935 2 Sheets-Sheet 2



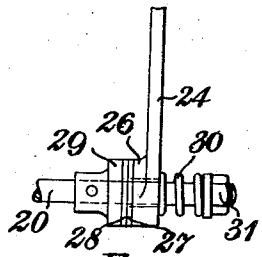


Fig.3.

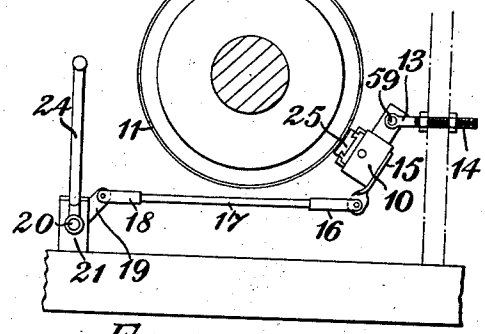


Fig.2.

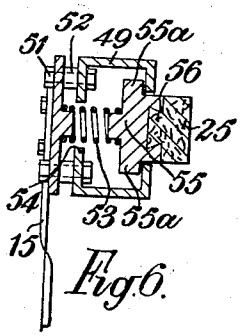


Fig.6.

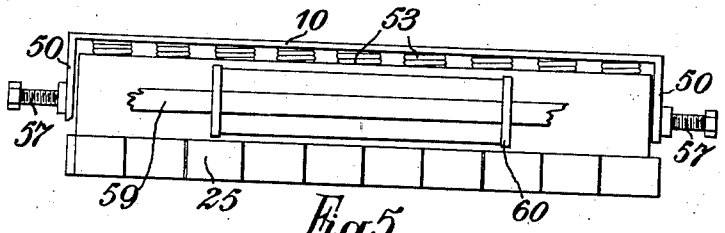


Fig.5.

S. Williams
Inventor

By: Glascock Downing & Seebold
Attys.

Patented Sept. 20, 1938 2,130,709

UNITED STATES PATENT OFFICE

2,130,709

ROLL POLISHER FOR ROLLING MILLS

Samuel Williams, Brynhyfryd, Wales

Application August 21, 1935, Serial No. 37,223
In Great Britain August 29, 1934

3 Claims. (Cl. 51—252)

This invention relates to rolling mills, for example, those employed in the tin plate industry for rolling steel bars in the production of black plates.

The invention has more particular reference to means for cleaning and polishing the rolls, whereby scale or grit and other foreign matter which is liable to become embedded in the rolls during the rolling operation are removed, thus eliminating a considerable amount of spoiling of subsequently rolled bars and plates.

In my British specification No. 299,510 a roll cleaning and polishing device is described, by which a polishing element was pressed into engagement with the roll, through the medium of a pedal device. It is found in practice that the pressure on the pedal may be so great as to break the polishing blocks and also cause them to bite into and damage the operative surface of the rolls.

An object of the present invention is to provide safety means in roll cleaning and polishing apparatus of the character described, whereby damage to the roll by the polisher and to the polishing blocks is prevented.

A further object of the invention is to provide an improved cleaning and polishing apparatus adapted for use with the upper roll, whereby such may be retained in the operative position without interference with the passage of the rolled bars from the "behinder", over the top of the roll to the rollerman or may be readily transferred to an inoperative position during rolling.

The invention comprises means for cleaning and polishing the rolls of rolling mills, comprising a pivotally mounted support carrying abrading means, and adjusting means for moving the abrading means into, and out of, contact with the roll, said adjusting means including a safety device adapted to preclude pressure of the abrading means against the roll, which is higher than a predetermined pressure.

The support may be adjusted by a hand or foot lever shaped or made of a material such that it will distort or bend upon the application of too great a pressure.

Alternatively, the transmission may include a friction device adapted to slip at the predetermined pressure.

The linkage from the operating lever may include a spring device which is arranged to preclude the transmission of too great a pressure.

The invention also consists in a spring pressed cleaning or polishing device adapted to be mounted in association with the upper roll on the behinder's side of the mill.

Such cleaning or polishing device may be permanently located in position or may be mounted upon arms or the like whereby the polisher may be swung upwardly out of the way when the mill is rolling.

The abrading blocks are preferably mounted resiliently in a channel element and each block is carried by a holder formed of metal or an alloy, the blocks and holders having complementary securing means such as a tenon or an undercut groove.

In the accompanying drawings which diagrammatically illustrate the invention:—

Figure 1 is an elevation of a mill looking from the behinder's side.

Figure 2 is a partial sectional view corresponding to Figure 1.

Figures 3 and 4 are details of modified pressure controlling devices.

Figures 5 and 6 are elevation and cross section of the preferred form of polishing device.

In carrying the invention into effect, according to one convenient mode, by way of example, a support or carrier 10 is provided for a polishing element, which extends parallel with the axis of the rolls 11 and 12. The polisher support extends parallel as aforesaid for any desired length equal to or shorter than the length of the roll. The support is located in association with the lower roll 11 of the mill, and on the rollerman's side of the roll below the horizontal plane passing through the axis of the roll. The support may if desired be located in association with the roll in similar fashion on the behinder's side of the roll.

The support 10 is pivotally mounted upon a bar 59, carried by suitable members, for example, a pair of screw eyes 13, which are carried by a part 14 of the housing or by an independent support on the floor. About midway of its length a plate 15 is fastened to the support and extends downwardly to provide an arm. This arm lies within a stirrup element 16 mounted upon one end of a bar or connecting rod 17 extending horizontally below the roll to a position at the behinder's side of the roll.

The bar or connecting rod 17 is provided with another stirrup 18 at its forward end which is pivotally connected to a lever arm 19 mounted upon a horizontal shaft 20 parallel with the axis of the roll and carried in suitable bearings 21 fastened to the floor or to the housing of the mill.

At one end of the shaft a ratchet wheel 22 is

provided co-operating with a pawl **23** by which the shaft may be held in its adjusted position of rotation. At the other end the shaft carries an operating handle or lever **24** which is cranked, so that the portion adapted to be grasped by the operator extends upwardly and is located at the side of the machine out of the way of the roll. As an alternative, the shaft **20** may be extended to the side of the mill and the operating lever mounted on such extension.

The arrangement is such that on exerting a pull on the cranked lever **24**, the polishing block support **10** is pivoted toward the roll so as to bring the polishing blocks **25** which may comprise emery, carborundum, or any known abrasive element into contact with the operating surface and thus remove scale or other matter and clean such surface.

The cranked arrangement of the operating lever **24** is such that in the event of the pressure exerted exceeding a predetermined amount the lever will bend, twist or break, and thus prevent the polishing blocks biting into the roll or the fracturing of the blocks.

A similar effect would be obtained by forming the lever **24** of a relatively soft quality material which would permit a bending of the lever to take place.

According to another arrangement, the lever **24** may be connected to the shaft **20** by means of a soft cotter-pin which would shear in the event of undesirable pressure being applied.

According to a modified arrangement, see Figure 3, a device in the nature of a shock absorber as used on motor cars may be provided between the lever **24** and the shaft **20**.

Thus the lever **24** may be mounted upon or formed with a disc **26** fitting loosely on the shaft **20** and having a friction surface **27** adapted to abut against a friction surface **28** on a disc **29** fixed on the shaft. A spring **30** on the shaft presses the discs **27** and **28** together to create sufficient friction for normal rotation of the shaft by the lever, but such that on excessive pressure being applied slip occurs between the discs. The tension of the spring **30** may be adjusted by a nut **31** threaded on the shaft. With such an arrangement replacement of the lever **24** in case of breakage is avoided and also faults due to faulty material in the lever would be eliminated.

It will be appreciated that when the lever **24** is operated to bring the blocks **25** into cleaning engagement with the roll the pawl **23** will engage an appropriate tooth on the ratchet wheel **22** and hold the parts in their adjusted position.

According to another feature, see Figure 4, the connection between the end of the connecting rod **17** and the stirrup **18** may be by means of a suitable spring. Thus the connecting rod is passed through an aperture in the stirrup and a spring **32** threaded on that portion of the rod **17** located within the stirrup, an adjustable nut **33** on the connecting rod providing a suitable abutment for the other end of the spring.

An advantage of utilizing this spring feature is that the polishing blocks **25** are held resiliently in engagement with the roll and the spring **32** acts as a shock absorber to take up any jerky movements of the roll **11** which occur during the operation of the mill.

According to a further feature of the invention, a cleaning and polishing element is mounted in association with the upper roll **12** on the behinder's side of the machine, being located about midway between the horizontal plane containing the axis of the roll and the bite of the rolls.

The polishing element support **34** is pivotally mounted upon a shaft **35** carried by brackets **36** on the housing of the mill and extends upwardly therefrom.

A spindle **37** passes through eyes in the support **34** and is associated at its ends with screw eyes **38** which are threaded through plates **39** on the sides of the housing of the roll, such screw eyes having springs **40** which force them inwardly toward the roll, whereby the polishing element is pressed into contact therewith. Tension of the springs **40** may be suitably adjusted by nuts **41** on the screw eyes.

According to the preferred form, see Figures 5 and 6, the polishing elements comprise a series of emery, carborundum or like abrading blocks **25** which are mounted in a channel element **49** carried by the support **10**. For this purpose the support comprises a back plate having its ends bent upwardly to form end walls **50** between which the channel member **49** is located.

The channel member **49** is rigidly connected to the back plate by means of bolts **51**, adjustment being provided if necessary by means of washers **52**. A series of compression springs **53** is provided between the back plate and each individual block, such springs passing through apertures **54** in the channel member. The adjacent faces of the blocks are obliquely inclined so that an effective continuous cleaning and polishing surface is provided.

The portion of each block lying within the channel member may be encased in a steel casing suitably shaped to the obliquity of the block surface. Such casing prevents damage to the blocks from relative movement between the block and the channel member and also forms an engaging surface for the spring.

Preferably, however, the polishing blocks are mounted in individual holders **55** (metal or alloy) by forming tenons or tongues **56** on the block and inserting them in undercut grooves in the holders. The blocks may be cemented in position in the holders **55**.

The holders are provided with lateral projection **55a** engaging the channel member **49**. The holders **55** may be formed of metal or an alloy.

The longitudinal positioning of the blocks in the channel member **49** is effected by adjusting bolts **57** engaging end pieces **58**.

It is preferred that the polisher shall be capable of movement parallel to the axis of the roll. For this purpose the hinge element **60** carrying the polishing member is adapted to slide to and fro along the supporting bar **59** hereinbefore referred to. The mill housing is bored to accommodate a coupling rod **61** which extends between the channel member or the back plate of the polisher and an operating lever **62** mounted outside the housing.

The axial movement is effected against the action of a returning spring **63** which may surround the coupling rod and abut against the housing and a collar on the rod.

Alternatively the axial movement may be effected against the return spring **63** which may surround the coupling rod **61** and abut against the housing and the hinge element **60**.

Having now described my invention, what I claim as new and desire to secure by Letters Patent is:—

1. Means for cleaning and polishing the rolls of rolling mills comprising a pivotally mounted

support carrying abrading means, said abrading means extending substantially throughout the length of the roll and comprising a plurality of blocks of abrasive material, adjusting means for pivoting said support to positively move said abrading means into and out of contact with the roll, said adjusting means comprising a rock shaft, linkage between the shaft and said support, an operating lever freely mounted on said shaft and co-operating friction elements on said shaft and lever for transmitting the movements of the operating lever to said shaft but adapted to preclude pressure of the abrading means against the roll which is higher than a predetermined pressure.

2. Means for cleaning and polishing the rolls of rolling mills, comprising a pivotally mounted support carrying abrading means, said abrading means extending substantially throughout the length of the roll and comprising a plurality of blocks of abrasive material, adjusting means for pivoting said support to positively move said abrading means into and out of contact with the roll, said adjusting means incorporating a friction device through which the pressure is applied and adapted to slip when said predetermined pressure is exceeded.

3. Means for cleaning and polishing the rolls of rolling mills, comprising a pivotally mounted support carrying abrading means, said support comprising downwardly depending arms, said abrading means extending substantially throughout the length of the roll and comprising a plurality of blocks of abrasive material, adjusting means for pivoting said support to positively move said abrading means into and out of contact with the roll, said adjusting means incorporating a friction device through which the pressure is applied and adapted to slip when said predetermined pressure is exceeded, said adjusting means also including telescopic elements which may be readily separated to permit the abrading device being swung out of the way when the mill is in operation.

SAMUEL WILLIAMS.