June 9, 1931. J. M. KOCH 1,809,128

AUTOMATIC REPEATER FOR ROLLING MILLS

Filed April 12, 1930 2 Sheets-Sheet 1

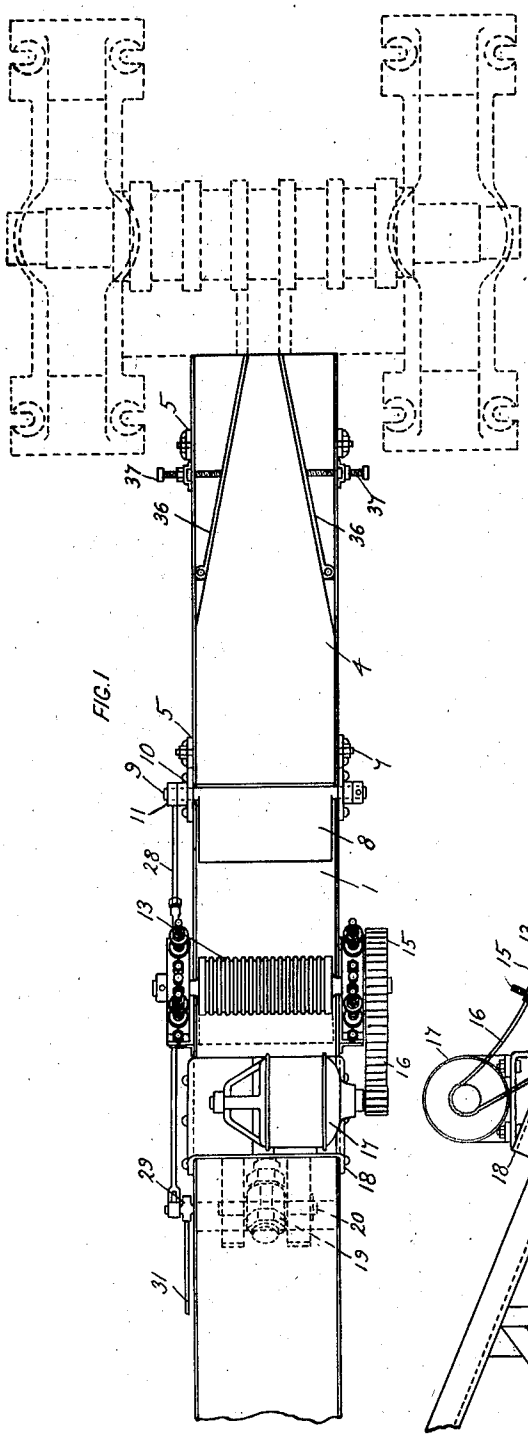


FIG. 1

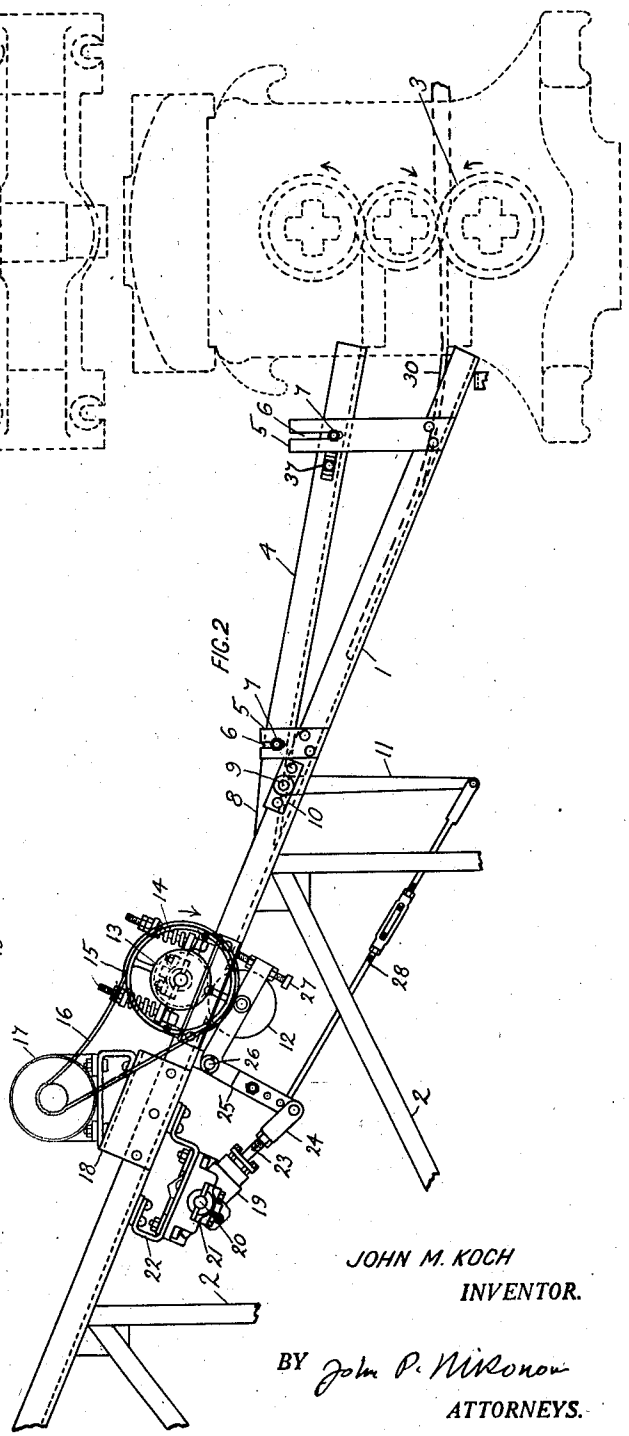


FIG. 2

JOHN M. KOCH
INVENTOR.

BY John P. Nikonow
ATTORNEYS.

June 9, 1931. J. M. KOCH 1,809,128

AUTOMATIC REPEATER FOR ROLLING MILLS

Filed April 12, 1930 2 Sheets-Sheet 2

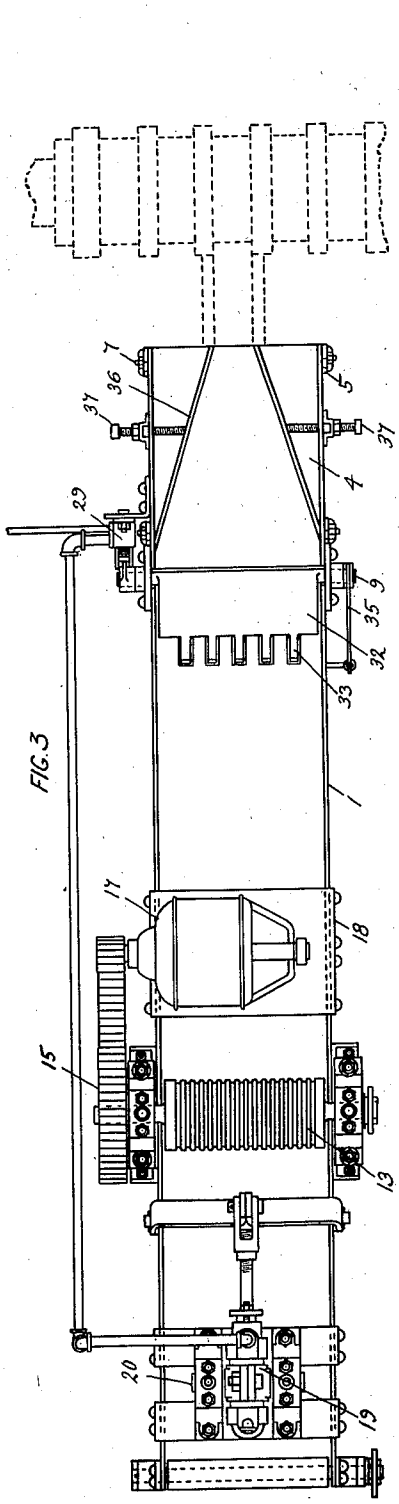


FIG. 3

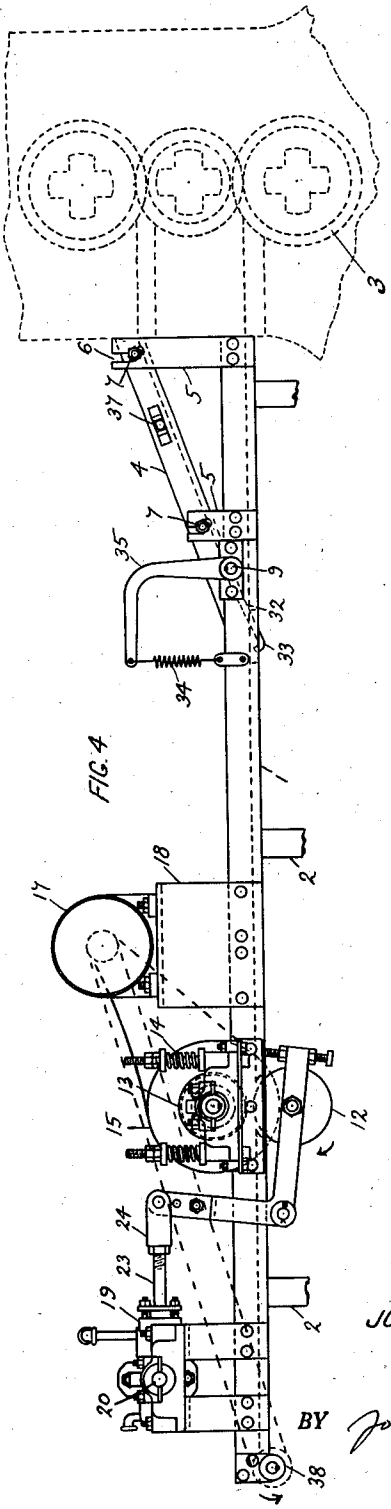


FIG. 4

JOHN M. KOCH
INVENTOR.

BY John P. Nikonow
ATTORNEYS.

Patented June 9, 1931 1,809,128

UNITED STATES PATENT OFFICE

JOHN M. KOCH, OF READING, PENNSYLVANIA

AUTOMATIC REPEATER FOR ROLLING MILLS

Application filed April 12, 1930. Serial No. 443,741.

My invention relates to automatic repeaters for rolling mills and has a particular reference to automatic means for returning the bar which is being rolled, from one pass to the other in the rolling mill.

The object of my invention is to replace manual labor which is usually required for directing a bar into successive passes between the rolls, with an automatic mechanism, using guiding troughs with automatically operated gates or switches.

My invention is more fully described in the accompanying specification and drawings in which—

Fig. 1 is a plan, Fig. 2 is an elevation of my device, Fig. 3 is a plan of a modified device, and Fig. 4 is an elevation of the modified device.

My device consists of a flat trough 1 supported on legs 2 in an inclined position with its lower end directed to the receiving side of rolls 3. A second and shorter trough 4 is supported on bars 5 attached to the first trough. The bars 5 have slots 6 for the bolts 7 so that the position of the second or returning trough can be adjusted in relation to the receiving side of the rolls 3. The upper trough 4 terminates at a sufficient height above the first trough so as to allow the rolled bars to pass under it. It has a light flap 8 mounted on a shaft 9 supported in bearings 10 and provided with a side arm 11. This flap can be easily raised by the movement of a rolled bar and falls back by gravity, so that the bar on its return trip slides over on the upper trough. The lower and the upper troughs are inclined toward the rolls.

A pair of guiding rolls 12 and 13 are supported on the trough 1, the upper roll being pressed against the lower by springs 14 and is provided with a sprocket 15 with a chain 16 driven by an electric motor 17 also supported on the sides of the trough 1 for which purpose a bracket 18 is bolted to the edges of the trough.

An air cylinder 19 is rotatively supported with its trunnions 20 in bearings 21 mounted on a bracket 22 supported at the bottom of the trough 1. A piston with a rod 23 is fitted in the cylinder, the end of the piston rod being connected with the end of an arm or clevis 24 pivotally connected with one end of a lever 25. This lever is pivoted on a pin 26 supported on the trough 1 and its other end carries bearings for the lower guiding roll 12. An adjusting screw 27 regulates the position of the roll when it is in its operating position so as to leave a sufficient clearance from the upper roll 13 and to enable the rolled bar to enter between these rolls.

The arm 11 is pivotally connected with a link 28 the other end of which is connected with an air valve 29 admitting compressed air into the cylinder 19.

The operation of my device is as follows.

A bar 30, coming from the rolls 3, is pushed up the trough 1 and under the upper trough 4. Its end raises the flap 8 thereby moving the arm 11 with its link 28 and opening the valve 29. The air is thereby admitted into the cylinder 19 causing the piston to move out, pushing the end of the lever 25 and pressing the lower roll 12 against the upper roll 13 with a clearance between them regulated by the screw 27. The upper roll 13 is rotated by the motor 17 and is corrugated in order to obtain a better grip on the bar 30. The end of this bar is caught between the rolls and the bar is drawn up by these rolls until its rear end clears the flap 8. The latter drops back thereby moving the arm 11 and closing the air valve from the air supply pipe 31, the same movement opening the exhaust from the cylinder. The weight of the lower roll 12 will cause it to drop down thereby releasing the bar 30 which will then slide back under its gravity. On its return movement its rear end will glide over the flap 8 and will be directed accordingly on the upper trough 4.

This type of repeater is especially adapted for heavy and comparatively short bars which can easily slide down and back into the mill by gravity. For thin and long bars, rods and strips a modified construction is used as shown in Figs. 3 and 4. Here the lower trough 1 is placed horizontally so as to guide the strip coming from the rolls on the low supporting rolls or, even, on the floor. A very light flap 32 is provided rotating on the shaft 9. The end of the flap has

tongues 33 fitting in corresponding slots in the bottom of the trough 1. This arrangement provides a smooth surface for the strip to climb to the inclined trough 4. The air valve 29 is placed next to the shaft 9 in order to reduce the resistance to its movement eliminating the connecting links and levers and using but a short and light connection. A light spring 34 provides the tension for the flap, this spring being connected at one end with the edge of the trough 1 and with a bracket 35—on the other end, the bracket being attached to the end of the shaft 9.

The trough 4 has guiding bars 36 adapted to direct the strip exactly into the space for it in the rolls 3. The opening between the bars can be adjusted by means of screws 37.

The arrangement of the auxiliary or guiding rolls 12 and 13 is similar to the one described above except that the roll 13 is operated in the reverse direction and is used only for feeding the strip back into the mill when the lower roll 12 is pressed against it by the action of the plunger in the air cylinder 19. A small roll 38 is continuously operated in the direction away from the mill and assists the strip to move when the rolls 12 and 13 are disengaged. There being no upper roll, the small roll 38 does not interfere with the movement of the strip toward the mill.

I claim as my invention:

1. In an automatic repeater for rolling mills, the combination with a lower trough adapted to receive a rolled bar from a rolling mill, means to pull said bar away from said mill, controlling device for said means, said controlling device being adapted to be operated by said bar, an upper trough in a cooperative relation with said lower trough, and means to direct said bar into said upper trough, said upper trough being adapted to guide said bar into the return pass of said rolling mill.

2. In an automatic repeater for rolling mills, the combination with a lower trough adapted to receive a rolled bar from a rolling mill, an upper trough arranged at an angle with said lower trough, a flap at the lower end of said upper trough, said flap being adapted to let said bar pass when it is moved away from said mill, and being further adapted to direct said bar on said upper trough when said bar is moved back to said mill, said upper trough being adapted to guide said bar into a return pass in said mill, and means to pull said bar away from said mill, said means being controlled by said flap when said flap is raised, said pulling means being rendered inoperative when said flap is released from said bar and lowered.

3. In an automatic repeater for rolling mills, the combination with a lower trough adapted to receive a rolled bar from a rolling mill, of an upper trough extending from said lower trough to a return pass on said mill, a hinged flap on said upper trough adapted to become deflected by said bar, an auxiliary roller above said lower trough, means to operate said roller, a second roller, and means to press said second roller to said auxiliary roller thereby engaging said bar so as to pull said bar away from said mill, said pressing means being controlled by said flap and rendered operative when said flap is raised by said bar.

4. In an automatic repeater for rolling mills, the combination with a lower trough adapted to receive a rolled material from a rolling mill, of an upper trough extending from said lower trough to a return pass on said mill, an auxiliary roller above said lower trough, means to operate said roller, a second roller, means to press said second roller against said auxiliary roller thereby clamping said material between said rollers, and a controlling device for said pressing means, said controlling device being operated by the movement of said material.

5. In an automatic repeater for rolling mills, the combination with a lower trough adapted to receive a rolled bar from a rolling mill, auxiliary rolls, means to bring said auxiliary rolls in an engagement with said bar for pulling said bar away from said rolling mill, a controlling device for said auxiliary rolls adapted to be operated by said bar, and adapted to render said auxiliary rolls inoperative when said bar is moved away from said controlling device and from said rolls, means to move said bar back into said rolling mill, and means to direct said bar into a return pass of said rolling mill.

In testimony whereof I affix my signature.

JOHN M. KOCH.