Sept. 7, 1926. 1,599,045

R. E. GOOD

AUTOMATIC MEANS FOR DISCONNECTING ROLL TRAINS FROM THE DRIVING MEANS

Filed August 10, 1921 2 Sheets-Sheet 1

FIG. 1.

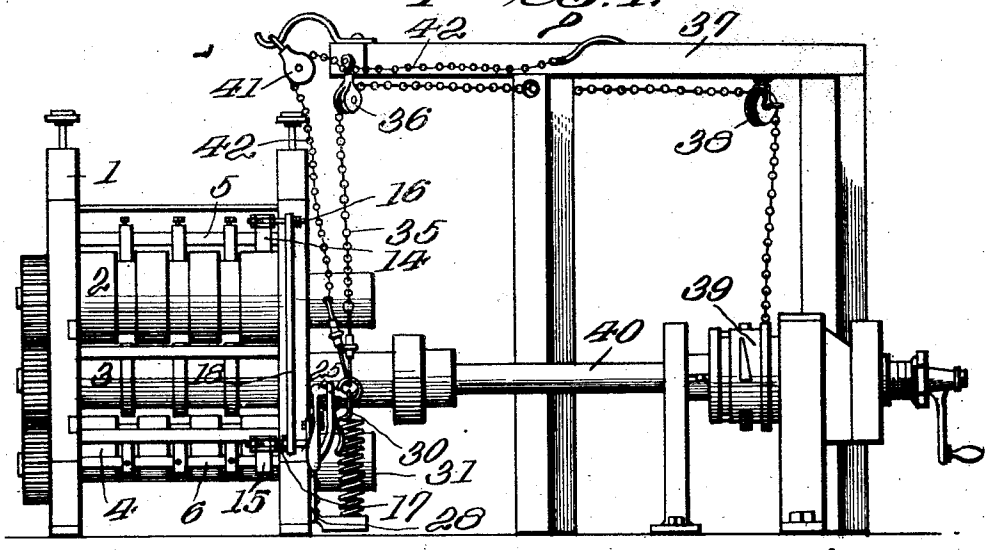


FIG. 2.

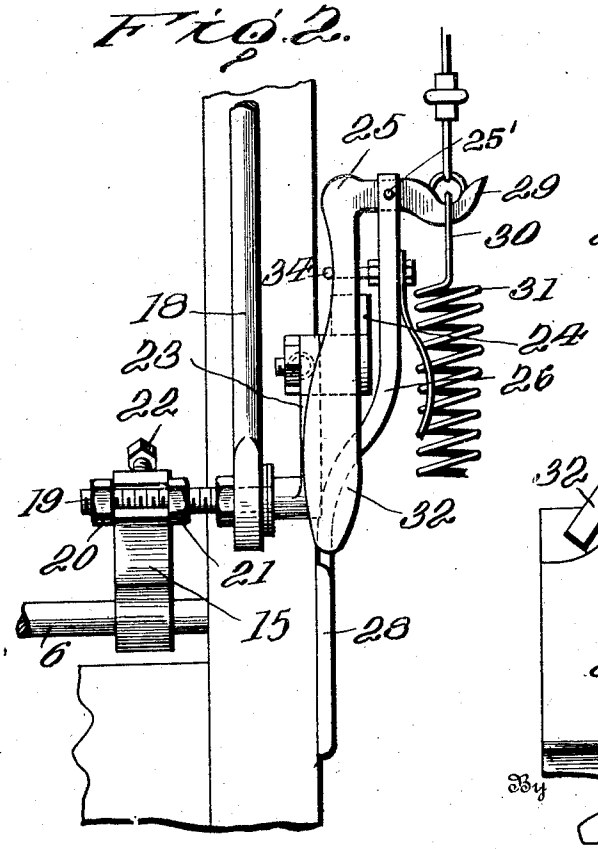
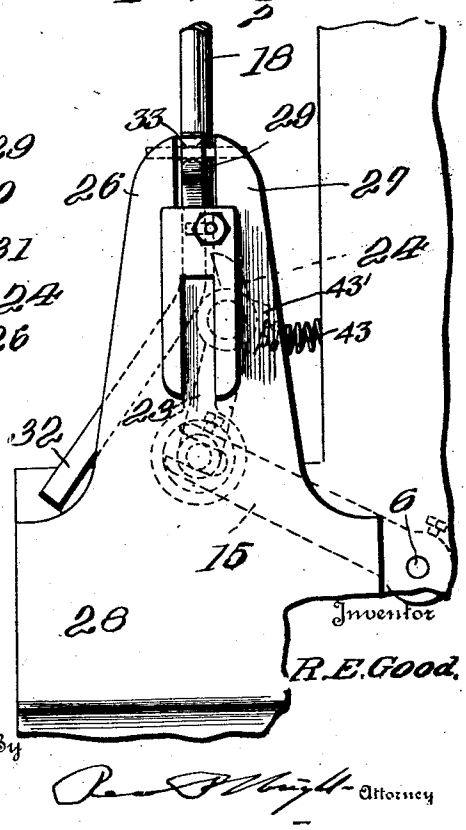


FIG. 3.



Inventor
R. E. Good.
By
Attorney

Sept. 7, 1926. 1,599,045

R. E. GOOD

AUTOMATIC MEANS FOR DISCONNECTING ROLL TRAINS FROM THE DRIVING MEANS

Filed August 10, 1921 2 Sheets-Sheet 2

Fig. 4.

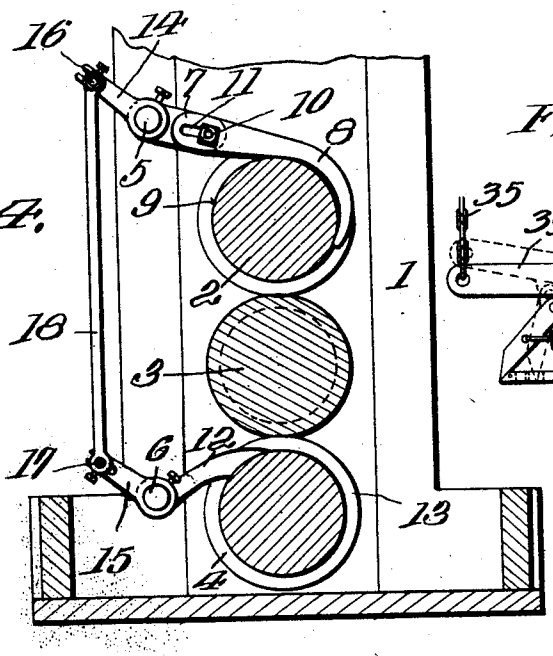


Fig. 7.

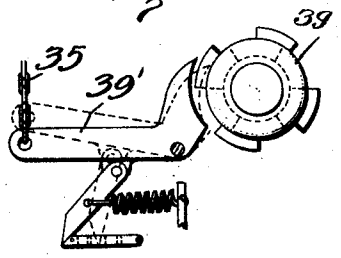


Fig. 5.

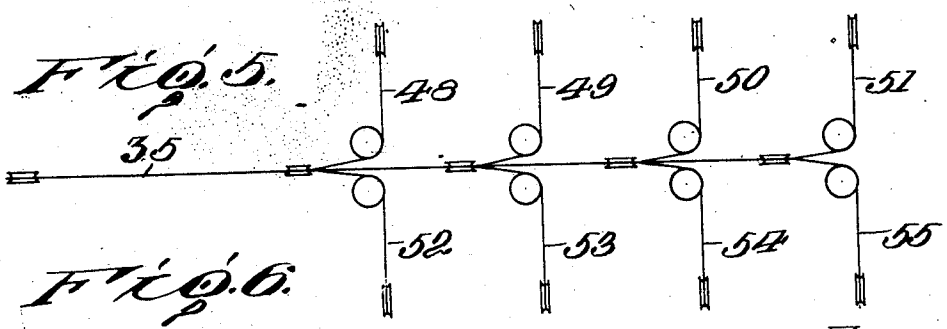
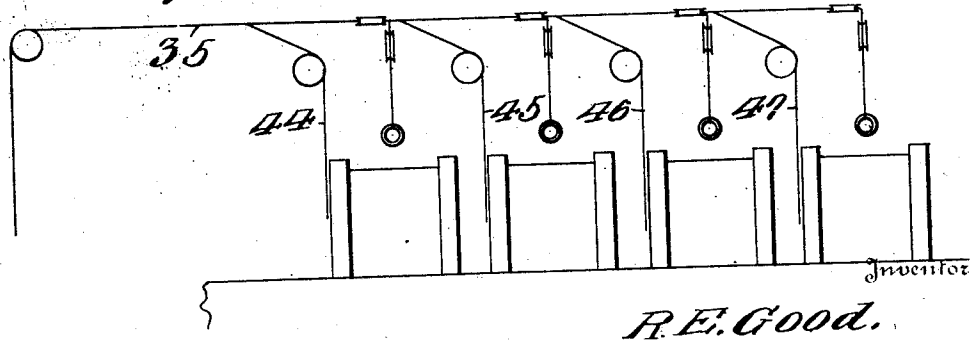


Fig. 6.



Inventor

R. E. Good.

By A. D. Wright

Attorney

Patented Sept. 7, 1926. 1,599,045

UNITED STATES PATENT OFFICE.

ROBERT E. GOOD, OF BERWICK, PENNSYLVANIA.

AUTOMATIC MEANS FOR DISCONNECTING ROLL TRAINS FROM THE DRIVING MEANS.

Application filed August 10, 1921. Serial No. 491,239.

My invention relates to improvements in automatic means for disconnecting a roll train from the driving means.

In roll trains in rolling mills there are always main guides over which iron or steel passes but it often happens the same passes under the guides and in which event collars are formed in the grooves of the rolls. The forming of these collars often result in the breaking of the roll spindle or rolls as the breaker devices usually employed are not adequate to relieve the undue pressure.

The object of my invention is to provide means extending into the grooves of the rolls and operated by any collar formed therein, to operate the connecting means between the driving means and the rolls, so as to disconnect the roll from the driving means and stop the same, so that another bar of iron or steel will pass through the machine.

Another object of my invention is to provide a device of this character which can be readily applied to the ordinary form of roll train without any changes thereof or any changes in the form of disconnecting means ordinarily used and operated by hand.

A still further object of my invention is to provide means whereby a series of roll trains may be driven by a single engine and in which improper passage of the bar of iron or steel therethrough will stop the entire series and at the same time providing means at each side of each roll train, in easy reach of the operator to cause the disconnecting of the engine from the roll trains.

Other and further objects and advantages of the invention will be hereinafter set forth and the novel features thereof defined by the appended claims.

In the accompanying drawings,

Figure 1 is a side elevation of a roll train showing my automatic stopping mechanism applied thereto;

Figure 2 is an enlarged side elevation of the spring releasing mechanism, whereby the spring can disconnect the engine from the roll train;

Figure 3 is an end view of Figure 1;

Figure 4 is a vertical transverse sectional view of Figure 1 showing the guides in the grooves of the rolls and which form the operating means for the spring releasing means;

Figure 5 is a diagrammatical view showing the disconnecting means controlled by any of the series of the roll sets comprising a roll train and also showing the hand operating means opposite each roll set;

Figure 6 is a side diagrammatical view showing the series of roll sets comprising a roll train, and

Figure 7 is an end elevation showing means for holding the operating lever in engagement with the clutch.

Referring now to the drawings, 1 represents the housing of a roll set which as shown consists of the three grooved rollers 2, 3 and 4 and which are rotated in any of the well known manners known to those skilled in the art and needs no further description as this forms no part of my invention.

The rolls as shown are mounted in the housing 1 as shown in Figure 1 and carried by the housing are the two oscillating bars or shafts 5 and 6 which extend entirely across the housing parallel with the rolls. Rigidly carried by the upper shaft 5 are the guides 7 as shown in Figure 4 of the drawings which extend over the upper face of the roll 2 and turn downwardly at 8 and closely fit the bottom of the grooves 9.

As shown in Figure 1 of the drawings, there is a guide for each groove in the roll 2 so that if a collar forms in any groove the roll train is stopped. The guide 7 and the downwardly turned portion 8 are made separate and secured together by the bolts 10 so that they can be adjusted to closely engage the bottom of the grooves. These bolts extend through slots 11 in the portion 8 so that the guides can be moved longitudinally so that they can be adjusted to engage the bottom of the grooves.

Carried by the lower shaft 6 are the rigid guides 12 which enter the groove 13 in the lower roll 4. These guides are rigid and need no adjustment as they can be made to engage the bottom of the grooves 13 in the roll 4 and the upper set of guides then adjusted.

The shafts 5 and 6 at one end are provided with outwardly extending rigid arms 14 and 15 which have their outer ends bifurcated and forming adjustable connections 16 and 17 by means of which they are connected to the rod 18 whereby either guide will operate the rod. These connections as shown in Figure 2 of the drawings are formed by the shafts 19 and nuts 20 and 21 and set screw 22. The lower bolt 19 extends outwardly beyond the rod and carries an upwardly extending arm 23, which carries a

cam 24 adapted to trip the catch 25, which I will now proceed to describe.

The catch 25 is pivotally supported between the arms 26 and 27 of the bracket 28 by the pivot 25', which is carried by the end of the frame 1 as shown in Figure 2 of the drawings. The catch 25 has the hooked end 29 which extends through the looped end 30 of the spring 31 and which holds the spring in its expanded position as shown in Figure 2 of the drawings, and the function of the spring will be later described.

The catch has a downwardly and outwardly extending portion 32 which extends downward in the path of the cam 24 and whereby the catch is rocked on its pivot transverse thereof. This is accomplished by having the arms 26 and 27 spaced some distance from the catch and having the openings through the catch beveled as indicated in dotted lines at 33, Figure 3.

In order to hold the catch against its swinging movement on its pivot, I provide a latch 34 rigidly carried by the bracket 28 and extending around the latch as fully shown in Figure 2 of the drawings.

Connected to the loop 30 of the spring 31 is a cable or chain 35 which extends upwardly over the pulley 36 carried by the frame 37 and which extends rearwardly, over a second pulley 38 carried by the frame and extends downward and is adapted to operate the clutch 39, which disconnects the drive shaft 40 from the engine or motor (not shown).

In operation the formation of a collar in either of the rolls 2 or 4 will cause the guides 7 or 12 of Figure 4 to ride upon the collar rocking the shafts 5 and 6 causing the cam 24 to engage the catch 25 rocking it on its pivot transverse the pivot to move the catch to one side beyond the latch 34. The catch 25 is then free to swing down on its pivot and the tension of the spring draws the catch downward and at the same time pulls the cable or chain 35 downwardly and operates the clutch member 39' of the clutch 39 to disconnect the drive shaft 40 of the roll train from the driving means or engine and thus stops the rolls as shown and described in my application filed September 15, 1921, Serial No. 522,567. After this operation the portion of the collars formed in the groove or grooves of the rolls are removed and the machine again started.

In order to reset this operating means, I provide the frame 37 with a pulley 41 over which passes the chain 42 which extends down and has a connection with the loop 30 of the spring 31 whereby the spring may be expanded or drawn upwardly so that the catch 25 may be passed into the loop 30 and the latch 34 set to hold the spring under compression.

In order to hold the guides 7 and 12 in the grooves in the rolls 2 and 4, I provide a spring 43 which has one end bearing against the housing 1 as shown in Figure 3 of the drawings and its opposite end bearing against the cam 24. The outer end of the spring is provided with a rivet loosely entering the same and upon which may be placed washers 43' for varying or increasing the tension of the spring.

In Figure 1 I have shown my invention as applied to a single roll set but as a rule they are arranged in series and in Figures 5 and 6 I have shown the cable 25 corresponding to 35, Figure 1, having the cables 44, 45, 46 and 47 connected to the guides of the different roll sets and whereby the series of rolls are stopped upon the operation of any of the guides.

In order to stop the rolls by hand I provide chains or cables 48, 49, 50, 51, 52, 53, 54 and 55, which extend over pulley and extend down on each side of the machine in reach of the operator. These cables are connected to the cable 35, Figure 1, and whereby the entire series of rolls can be stopped by the operator of any of the series of rolls from either side.

What I claim is:—

1. The combination with a roll train, guides in the grooves of said rolls, and means operated by said guides when collars are formed in the grooves for stopping the roll train.

2. The combination with a roll train, guides in the grooves of said rolls and means operated by said guides when collars are formed in the grooves for disconnecting the driving means from the train of rolls.

3. The combination with a roll train, means for driving the same, a clutch intermediate the roll train and driving means and guides in the groove of the rolls and adapted to operate the clutch to stop the rolls when collars are formed in the grooves.

4. The combination with a roll train, means for driving the same, means for connecting the driving means to the roll train, and guides in the grooves of the rolls and adapted to operate the connecting means for disconnecting it when collars are formed in the grooves.

5. The combination with a roll train, means for driving the same, spring means for disconnecting the driving means to the roll train, guides in the grooves of the rolls, and means operated by the outward movement of the guide for releasing the spring means for disconnecting the rolls from the driving means.

6. The combination with a roll train, means for driving the same, a connecting means between the roll and driving means, spring means for normally holding the driving means and rolls disconnected, guides in the grooves of the rolls, a catch for holding

the spring tension off of the connecting means and means operated by the guides for releasing the catch and allowing the spring means to disconnect the driving means from the rolls.

7. The combination with a roll train, means for driving the same, a connecting means between the rolls and driving means, spring means for normally holding the driving means and the rolls disconnected, guides in the grooves of the rolls, a catch for holding the spring tension off of the connecting means, and a cam operated by the guides for operating the catch and releasing same to allow the spring means to disconnect the driving means from the rolls.

8. The combination with a roll train, means for driving the same, a connecting means between the rolls and driving means, spring means for normally holding the connecting means disconnected, guides in the grooves of the upper and lower rolls of the train, a connecting rod between said guides, a catch for holding the spring tension off of the connecting means, a cam carried by the connecting rod and operating said catch to release the same to allow the spring means to disconnect the driving means from the rolls.

9. The combination with a roll train, means for driving the same, a connecting means between the rolls and driving means, spring means for normally holding the connecting means disconnected, guides for the grooves of the upper and lower rolls of the train, a connecting rod between said guides, a catch for holding the spring tension off of the connecting means, a latch for holding said catch and a cam carried by the connecting rod and moving said catch away from the latch to release the same to allow the spring means to disconnect the driving means from the rolls.

10. The combination with a roll train, means for driving the same, a clutch connecting the driving means and the rolls, a spring tension device normally holding the clutch disconnected, a latch for holding the tension of the spring device off of the clutch, guides in the grooves of the rolls, means operated by the guides for releasing said latch, and means for resetting said spring tension device on said catch.

11. The combination with a roll train, means for driving the same, a clutch connecting the driving means and the rolls, a spring having a cable connected to the clutch for normally holding the clutch released, a latch for holding the tension of the spring off of the cable, guides in grooves of the rolls, means operated by the guides for releasing said latch whereby the spring draws the cable and releases the clutch and disconnects the rolls from the driving means.

12. The combination with a roll train, means for driving same, a clutch connecting the driving means and the rolls, a spring having a cable connected to the clutch for normally holding the same released, shafts pivoted opposite the upper and lower rolls of the train, adjustable guides carried by the upper shaft and adapted to partly encircle the upper roll within the grooves, rigid guides carried by the lower shaft and entering the grooves in the lower roll, a catch holding the tension of the spring off of the cable, arms carried by the shafts, a rod connected to the arms and means carried by the rod for releasing the catch whereby the spring draws the cable and releases the clutch and disconnects the driving means from the rolls.

13. The combination with a series of roll trains, a single driving means therefor, a clutch between the driving means and the rolls, a cable connected to the clutch, a spring opposite each roll train and connected to the cable, a catch opposite each spring for holding the tension of the spring off of the cable, guides carried by each roll train, means operated by the guides for releasing its respective spring, and hand operated means connected to the cable and extending down on each side of each roll train whereby the operating of any guide of any train will allow the spring to disconnect the clutch or it may be operated by hand from either side of any train.

In testimony whereof I hereunto affix my signature.

ROBERT E. GOOD.