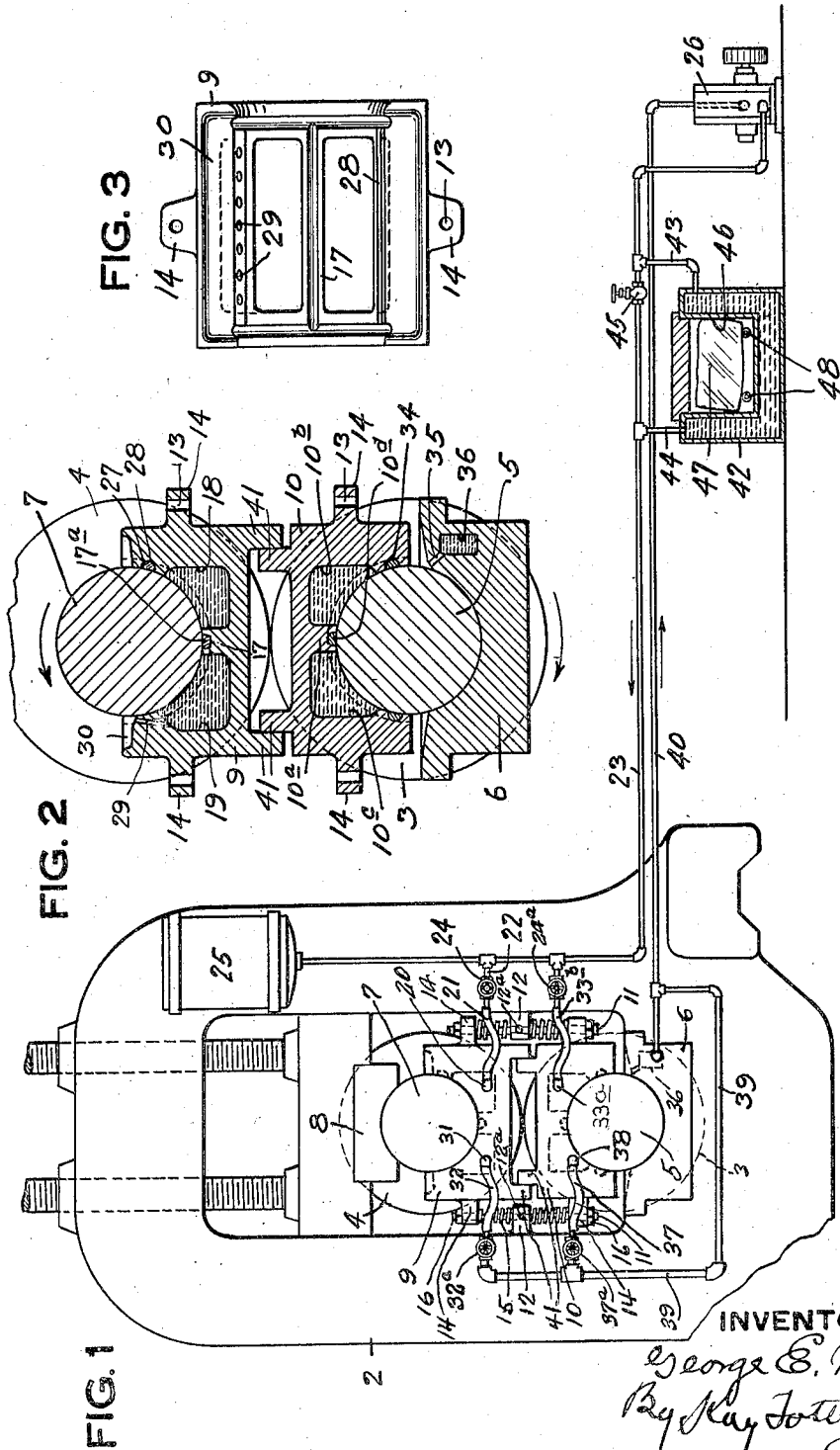


G. E. MELOWN.
LUBRICATING DEVICE FOR ROLLING MILLS.
APPLICATION FILED NOV. 5, 1920.

1,421,805.

Patented July 4, 1922.



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GEORGE E. MELOWN, OF McKEESPORT, PENNSYLVANIA.

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To all whom it may concern:

Be it known that I, GEORGE E. MELOWN, a citizen of the United States, and resident of McKeesport, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Lubricating Devices for Rolling Mills; and I do hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to a lubricating device adapted more especially for the lubricating of the necks of rolls in rolling mills.

The object of my invention is to provide for the thorough and efficient lubricating of the roll-necks without the great waste heretofore present in the methods of lubricating now ordinarily employed.

To these ends my invention comprises the novel features hereinafter set forth and claimed.

Fig. 1 is an end elevation of a housing and rolls, showing my invention applied thereto; Fig. 2 is an enlarged vertical sectional view of the roll-necks and the boxes containing the lubricant; and Fig. 3 is a plan view of the top box.

In the drawing the numeral 2 designates a suitable housing in which the rolls 3 and 4 are mounted. The lower roll 3 has its necks 5 resting in suitable boxes 6, and the necks 7 of the upper roll 4 are engaged by the brasses 8. The upper roll rests on the lower roll.

Lubricating boxes 9 and 10 are employed for the upper and lower roll-necks, respectively. These boxes 9 and 10 are supported by the bolts 11 which are rigidly secured in the lugs 12 on the housings. The bolts 11 pass through openings 13 in the lugs 14 on the boxes 9 and 10, springs 15 being interposed between said lugs 14 and said lugs 12. Nuts 16 engage the upper and lower ends of the bolts 11 and the bolts are held against lengthwise movement in the lugs 12 by means of grooves 12^a. By this construction provision is made for adjusting the boxes 9 and 10, and for independently regulating the pressure with which said boxes bear against the roll-necks.

The upper box 9 is divided by the partition 17 into the chambers 18 and 19. Packing 17^a is located in said partition 17. The chamber 18 has the inlet 20 for the admission of the oil or other lubricant, and said inlet is connected up by the flexible connec-

tion 21 to the branch pipe 22, which in turn is connected to the pipe 23. A valve 24 is located in the branch pipe 22.

The pipe 23 is connected to the tank 25 and at its opposite end to the suitable pump 26.

Suitable packing 27 is inserted in a groove 28 in the box 9 to wipe off the surplus oil carried up by the roll-necks 7 of the upper roll.

The box 9 has the openings 29 which allow the oil collecting in the depression 30 at the top of the box 9 to pass down into the chamber 19. The chamber 19 has the outlet 31 to which the flexible connection 32 is connected.

The lower box 10 has the partition 10^a which divides said box into two compartments 10^b, 10^c. The compartment 10^b has the inlet 33^a which is connected up by the flexible pipe 33^b with the pipe 23. A valve 24^a similar to the valve 24 is located between the pipe 23^b and the pipe 23.

A flexible connection 32, controlled by valve 32^a, connects the compartment 19 with a pipe 39 leading to the suction pipe 40 of the pump 26.

A flexible pipe 37, controlled by valve 37^a, leads from the outlet 38 of the compartment 10^c and pipe 37 is also connected to the pipe 39 which leads to the suction pipe 40 of the pump 26.

Packing 10^d is located in the partition 10^a.

Packing 34 is provided for the lower box 10. The upper faces of the lower journal-boxes 6 are depressed to collect the oil wiped from the lower roll necks, and passages 35 convey the oil into the cavities 36 formed in said lower journal-boxes.

The pipe 40 is connected to the outlet of the cavity 36 and to the suction of the pump 26.

The boxes 9 and 10 have the telescoping flanges 41 to keep said boxes in proper alignment.

A temperature control for the oil is provided in the following way:

A tank 42 is connected by the branch pipes 43 and 44 to the pipe 23. A valve 45 is provided in the pipe 23 to bypass the oil to the tank 42. The tank 42 has the receptacle 46 for a cake of ice 47, or where the oil is to be heated the gas-burners 48 are brought into use.

In operation the rolls 3 and 4 are rotated

in the directions indicated by the arrows, Fig. 2. The valves 24 and 45 are opened and the pump 26 started. The oil is forced into the chambers 18 and 10^b where the roll-neck 7 takes up a certain amount of oil and, rotating in the direction of the arrow, a portion of the oil is wiped off by the packing 34, leaving a film of oil on the roll-neck to lubricate the same. Any excess oil is deposited in the depression 30 and is drawn by the suction of the pump down through the openings 29 into the chamber 19. The oil passes thence by the pipe 32 and the pipe 39 to the suction pipe 40 of the pump 26. The oil passes from the compartment 10^c of the box 10 by the pipe 37 to the pipe 40. Any surplus oil from the necks of the lower roll is sucked into the cavity 36 and thence by the pipe 40 to the pump. In this manner a constant circulation of the oil is maintained.

Oil is forced into the compartment 10^b of the lower box 10 from the pipe 23 by the pump 26, and consequently the oil is at the same temperature as the oil entering the compartment 18 of the box 9, so that the lower roll rotating in the direction of the arrow will take the cool oil from the compartment 10^b and carry it down into the roll boxes 6 to lubricate same.

In case the oil becomes too highly heated a cake of ice 47 is placed in the receptacle 46 and the valve 45 is closed so that the oil has to pass down into the tank 42 to be cooled before it passes back to the boxes 9 and 10. If, on the other hand, the oil gets too cold, as in winter time, the gas burners 48 are brought into use and the oil raised to the proper temperature for flowing properly.

What I claim is:

1. In a lubricating device for rolling mills, the combination with the housings, of rolls mounted therein, floating boxes for containing a lubricant held in proper position with reference to the necks of said rolls, and means for independently adjusting said boxes with respect to said roll necks.

2. In a lubricating device for rolling mills, the combination with the housings, of the rolls mounted therein, and spring actuated boxes for containing the lubricant, the upper box bearing against the lower portion of the upper roll-neck, and the lower box bearing against the upper portion of the lower roll-neck.

3. In a lubricating device for rolling mills, the combination with the housings, of the rolls mounted therein, spring actuated boxes for containing the lubricant, the upper box engaging the lower half of the upper roll-neck, the lower box engaging the upper half of the lower roll-neck, and means for introducing lubricant into the upper box and for withdrawing lubricant therefrom.

4. In a lubricating device for rolling mills,

the combination with the housings, of the rolls mounted therein, spring actuated boxes for containing the lubricant, the upper box engaging the lower portion of the upper roll-neck, the lower box engaging the upper portion of the lower roll-neck, and means for causing a circulation of the lubricant through said boxes.

5. In a lubricating device for rolling mills, the combination with the housings, of the rolls mounted therein, spring actuated boxes for containing the lubricant, the upper box engaging the lower portion of the upper roll-neck, the lower box engaging the upper portion of the lower roll-neck, the upper box being divided into two compartments, means for forcing lubricant into the one compartment, the upper face of said upper box having a depression formed therein, said depression communicating with the second compartment of said box, and means for creating a suction in said second compartment of said first box.

6. In a lubricating device for rolling mills, the combination with the housings, of rolls mounted therein, spring actuated boxes for containing the lubricant, the upper box engaging the lower portion of the upper roll-neck, the lower box engaging the upper portion of the lower roll-neck, the upper box being divided into two compartments, the upper face of said upper box having a depression formed therein communicating with one of said compartments, a reservoir for the lubricant, a pump, and connections whereby the lubricant is forced into the one compartment of the upper box and the oil carried therefrom by the roll neck, is delivered into the second compartment whence it is drawn by the suction action of the pump and back into the pump.

7. In a lubricating device for rolling mills, the combination with the housings, rolls mounted therein, spring actuated boxes for containing the lubricant, the upper box engaging the lower portion of the upper roll-neck, the lower box engaging the upper portion of the lower roll-neck, a supporting journal box for the lower roll-neck, the lower journal-box having a depression formed in its upper face for collecting lubricant withdrawn by the roll-neck from the lower lubricating box, a cavity formed in said lower journal box communicating with said depression, and connections between said cavity and the circulatory system.

8. In a lubricating device for rolling mills, the combination with the housings, rolls mounted therein, spring actuated boxes for containing the lubricant, the upper box engaging the lower portion of the upper roll-neck, the lower box engaging the upper portion of the lower roll-neck, a supply reservoir, a pump, a system of pipes form-

ing a circulatory system for sending the lubricant through the said boxes, and a temperature controlling device in said circulatory system for changing the temperature of the lubricant.

9. In a lubricating device for rolling mills, the combination with the housings, rolls mounted therein, spring actuated boxes for containing the lubricant, the upper box engaging the lower portion of the upper roll-neck, the lower box engaging the upper portion of the lower roll-neck, the upper box being divided into two compartments, the upper face of the upper box having a depression formed therein communicating with one of the said compartments, a packing in said upper box engaged by the roll-neck, whereby the surplus lubricant is wiped from the roll-neck, means for forcing lubricant into one of said compartments, and means for withdrawing it by suction from the other compartment.

10. In a lubricating device for rolling mills, the combination with the housings, rolls mounted therein, spring actuated boxes for containing the lubricant, the upper box engaging the lower portion of the upper roll-

neck, the lower box engaging the upper portion of the lower roll-neck, said boxes being each divided into two compartments, means for delivering the lubricant under pressure to one compartment of each of said boxes, and means for creating a suction for withdrawing the lubricant from said last named compartments.

11. In a lubricating device for rolling mills, the combination with the housings, of rolls mounted therein, boxes for containing the lubricant and means for adjustably and resiliently supporting the said boxes, comprising projections extending from said boxes and from said housings and having registering openings, bolts extending through the said openings at each side of each set of boxes, means for preventing said bolts from moving lengthwise and springs surrounding the said bolts between said projections.

In testimony whereof, I, the said GEORGE E. MELOWN, have hereunto set my hand.

GEORGE E. MELOWN.

Witnesses:

ROBT. D. TOTTEN,
JOHN F. WILL.