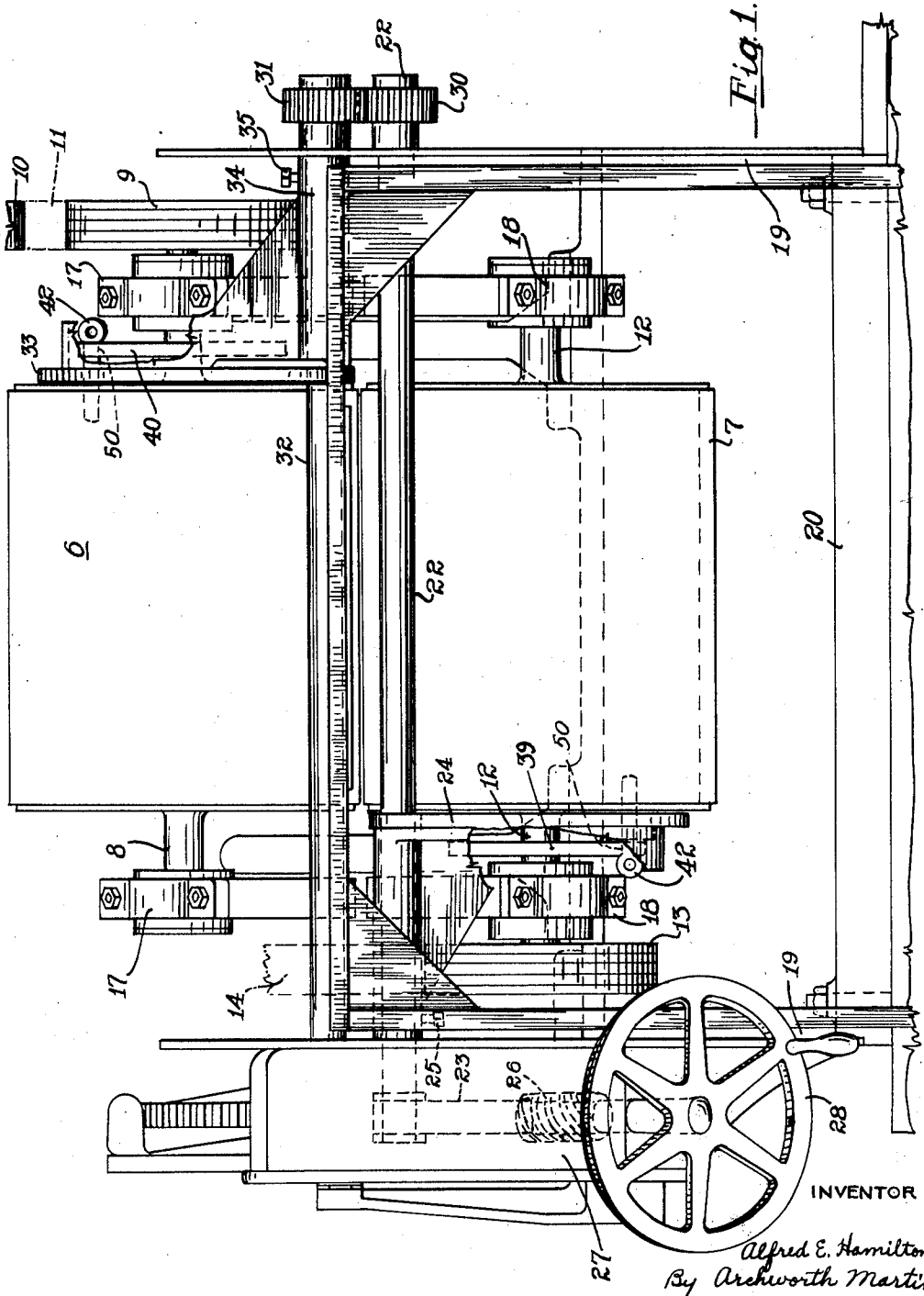
June 9, 1942. A. E. HAMILTON 2,285,966

ROLL HANDLING APPARATUS

Filed April 16, 1941 3 Sheets-Sheet 1

Fig. 1.



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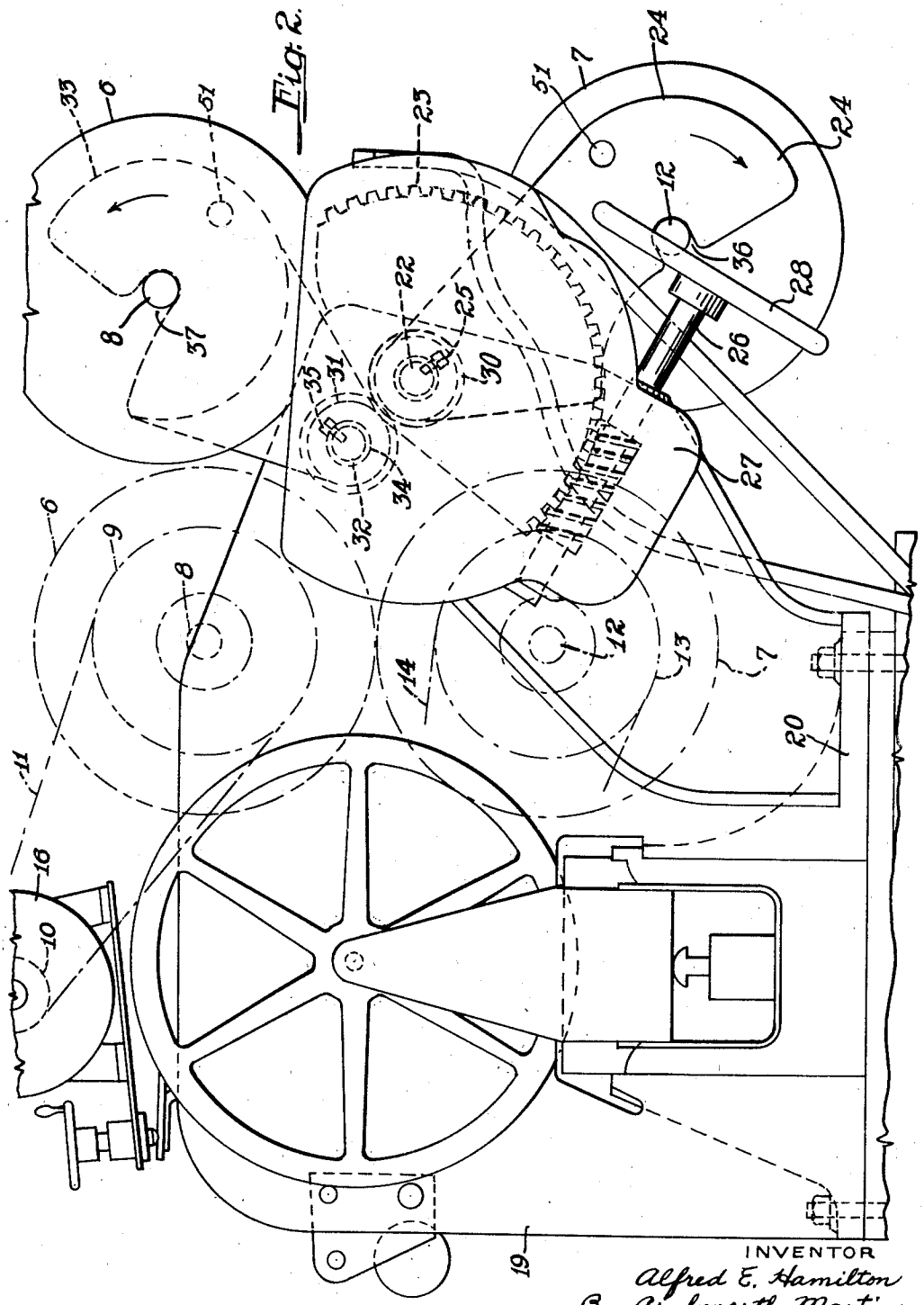
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Fig. 2.



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ROLL HANDLING APPARATUS

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Fig. 3.

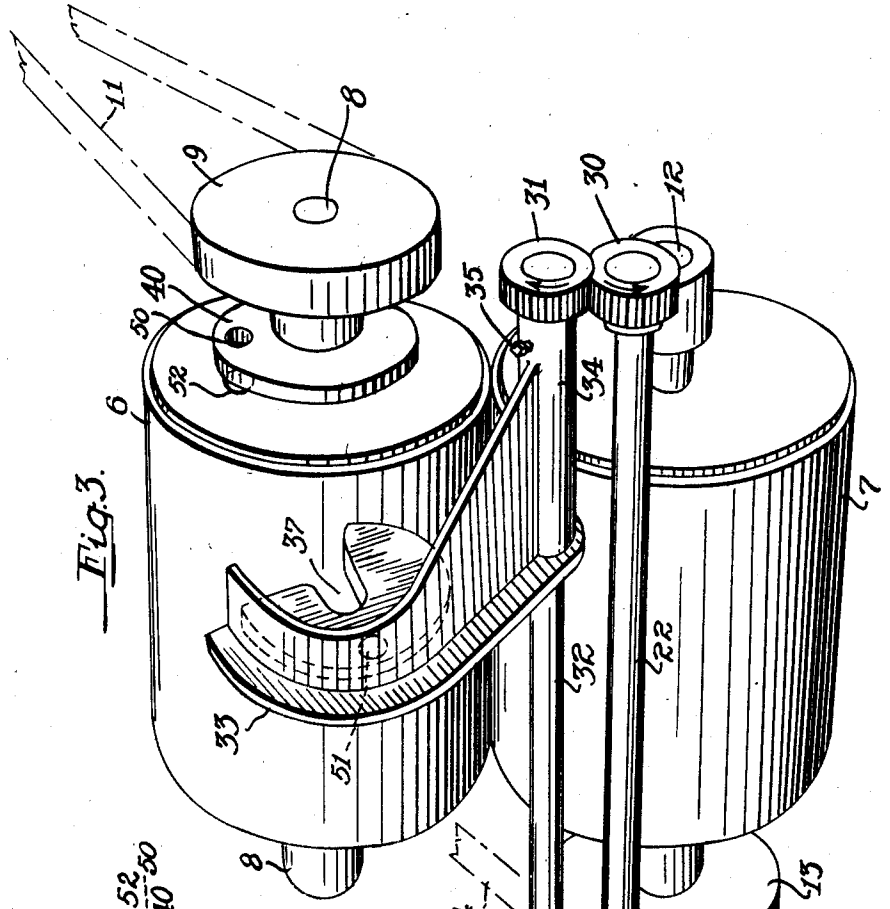
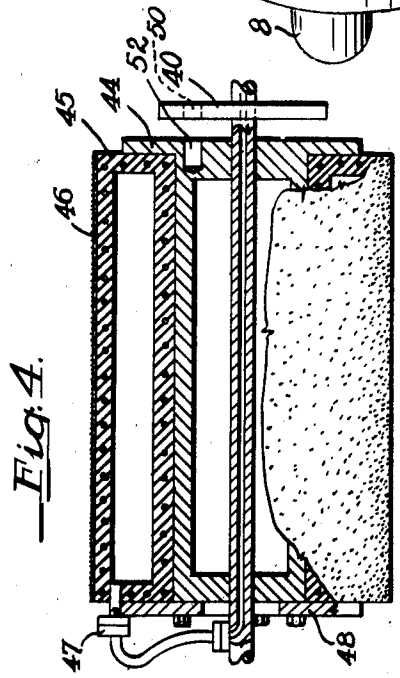
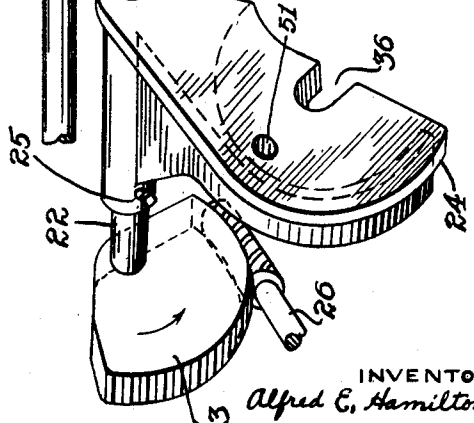


Fig. 4.





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2,285,966

UNITED STATES PATENT OFFICE

2,285,966

ROLL HANDLING APPARATUS

Alfred E. Hamilton, Pittsburgh, Pa.

Application April 16, 1941, Serial No. 388,754

10 Claims. (Cl. 51—262)

My invention relates to roll handling apparatus and is here shown and described as employed in connection with the handling of abrasive or buffing rolls for the surfacing of strip steel and the like, although the invention will be useful in the handling of rolls of other types.

Surfacing rolls commonly have sleeves of abrasive or buffing material that have to be changed frequently as they become worn, and some of these rolls have rubber drums on a metal hub which have to be changed or removed at times.

One object of my invention is to provide means for the convenient lifting and removal of rolls from their bearings, to a point clear of the machine or framework in which they are mounted, from whence they can easily be transported by crane or otherwise, or whereby they may be supported clear of the machine with greater accessibility for inspection and repairs.

Another object of my invention is that in the case of surfacing rolls of the character referred to, such rolls can be swung clear of the machine and supported at one end to permit of removing the abrasive sleeves for substitution of unworn sleeves, or removal of the rubber drums or the like, such changes and removal being effected from the other end of the drum, which is unobstructed by any supporting member.

As shown in the accompanying drawings, Figure 1 is a front view of the machine with certain of the parts broken away; Fig. 2 is a side view thereof in diagrammatic form; Fig. 3 is a perspective view showing certain of the parts of Figs. 1 and 2 independently of various other parts of the machine; and Fig. 4 shows a form of surfacing roll which my invention is adapted to handle.

The surfacing machine shown in the accompanying drawings may be of the same general form as that shown and described in my application Serial No. 295,765, filed Sept. 20, 1939 (Patent 2,269,197), and need not be here described in detail since this application relates more particularly to means for removing the rolls from the machine and supporting them. The surfacing rolls are indicated by the numerals 6 and 7, the roll 6 being mounted on a shaft 8 that has a pulley 9 which is driven from a pulley 10 by a belt 11. The shaft 12 of the roll 7 carries a pulley 13 that is driven by a belt 14. A motor 16 serves to drive the pulley 10, a similar motor being provided for driving the belt 14 and the pulley 13.

The roll shaft 8 is mounted in bearings 17 and the shaft 12 in bearings 18, all of said bearings being supported on suitable framework 19 that is carried by a base 20.

A rock shaft 22 is journaled in the framework 19 and has a gear segment 23 secured to one end thereof. The shaft also carries a lifting arm 24 having a sleeve extension that is keyed or locked to the shaft by a set screw 25. A worm shaft 26 is journaled in a gear box 27 and carries an operating handle 28, so that when the handle is turned, the worm gear segment 23 will be rocked to also rock the lifting arm 24.

At its other end, the shaft 22 carries a gear wheel 30 that meshes with a gear wheel 31 on a rock shaft 32 that is journaled in the framework 19 of the machine, so that when the handle 28 is turned to rotate the shaft 22 in one direction, rotative movement will be imparted to the shaft 32 in the opposite direction. A lifting arm 33 has a sleeve extension 34 that is rigidly connected to the shaft 32 by a screw 35. The arms 24 and 33 have recesses 36 and 37 respectively formed therein, so that when the arms are swung into engagement with the roll shafts 8 and 12, the recesses will partially embrace the shafts.

Thus when it is desired to lift the rolls out of the surfacing machine, the belts 11 and 14 will be disconnected from their pulleys and the handle 28 will be turned in a counterclockwise direction to swing the arms 24 and 33 into engagement with the shafts 8 and 12 respectively, at which time they will be between the adjacent roll ends and flanges 39 and 40 that are formed integrally with or secured to the shafts 8 and 12 respectively. Pins 42 are then inserted through holes 50 provided in the said flanges, holes 51 in the swinging arms and holes 52 in the roll ends, as shown more clearly in Fig. 1. The outer parts of the bearings 17 and 18 are then removed; thereupon, turning of the hand wheel 28 in a clockwise direction will cause the arms 24 and 33 to be swung outwardly so that the rolls 6 and 7 are moved from their dotted line positions in Fig. 2 to their full line positions. It will be understood that if only one roll is to be taken out, the pin 42 at the other roll will not be inserted.

The rolls will be each supported at only one end, leaving the other end clear of any obstruction, to permit the abrasive sleeve to be slid off of the free end and another sleeve to be placed thereon. One form of surfacing roll with which my invention is particularly adapted for use is shown in Fig. 4, wherein the roll shaft is provided with a hub 44 and a pneumatic drum 45 of rubber or other suitable material, an abrasive sleeve 46 being positioned on the drum 45. The

drum 45 will ordinarily have a substantial degree of air pressure therein to afford desired resistance to grinding pressure, and such pressure may be supplied as disclosed in my application Serial No. 380,442, filed February 25, 1941. When a roll of this character is suspended at an outer position, clear of the machine, the air pressure in the drum will be relieved to permit sliding off a worn abrasive sleeve 46 and the placing of a new sleeve thereon. Similarly, the drum itself can be removed for purposes of repair or replacement, by disconnecting the air supply line at 47 and removing the end plate 48.

After replacements have been effected, the handle 28 will be turned to swing the drums back to their operative positions in the machine, the removable bearing parts then replaced at 17 and 18, the pins 42 removed to permit withdrawal of the arms, and the belts 11 and 14 replaced. It will be seen that at the beginning of lifting movement, when taking the rolls from their bearings, the rolls are first given a separating movement, by reason of the arcuate paths of the lifting arms.

I claim as my invention:

1. Roll handling apparatus for a roll having shaft extensions at its ends that are normally supported in bearings, and also having a radially-extending flange on one extension, in spaced relation to the adjacent end of the roll, which comprises a supporting arm movable towards and from the said one extension and having an open-sided recess for receiving the said extension, when the arm is moved into the space, and means for connecting the arm to the roll and the flange when it is in the last-named position.

2. Roll handling apparatus for a roll having shaft extensions at its ends that are normally supported in bearings, and also having a radially-extending flange on one extension, in spaced relation to the adjacent end of the roll, which comprises a supporting arm movable toward and from the said one extension and into and from the said space, and means for connecting the arm to the roll and the said flange.

3. Roll handling apparatus for rolls that are normally supported upon bearings in side-by-side relation, comprising a pair of arms mounted for rocking movement and interconnected so that each will move upon operation of the other, one arm being movable toward and from an end of one roll and the other arm toward and from an end of the other roll, and means for connecting each arm to the adjacent roll end, whereby each roll is suspended at one end, from its associated arm.

4. Roll handling apparatus for rolls that are normally supported upon bearings in side-by-side relation, comprising a pair of arms mounted for rocking movement and interconnected so that each will move upon operation of the other, one arm being movable toward and from an end of one roll and the other arm toward and from the opposite end of the other roll, and means for connecting each arm to the adjacent roll end, whereby each roll is suspended at one end, from its associated arm.

5. Roll handling apparatus for rolls that are normally supported upon bearings in side-by-side relation, comprising a pair of arms mounted for rocking movement and interconnected so that each will move upon operation of the other, one arm being movable toward and from an end of one roll and the other arm toward and from an end of the other roll, and means for connecting each arm to the adjacent roll end, whereby each roll is suspended at one end, from its associated arm, the arms being mounted for oscillation about axes which are parallel to the roll axes and located in planes intermediate the roll axes.

6. Roll handling apparatus for rolls that are normally supported upon bearings, in superposed relation, comprising a pair of arms mounted for rocking movement and interconnected so that each will move upon operation of the other arm, one arm being movable toward and from an end of the upper roll and the other arm toward and from an end of the lower roll, each arm being located at that end of its roll which is remote from the other arm, and means for connecting each arm to the adjacent roll end, whereby each roll is suspended at one end from its associated arm.

7. Roll handling apparatus for rolls that are normally supported upon bearings, in superposed relation, comprising a pair of arms mounted for rocking movement and interconnected so that each will move upon operation of the other arm, one arm being movable toward and from an end of the upper roll and the other arm toward and from an end of the lower roll, each arm being located at that end of its roll which is remote from the other arm, and means for connecting each arm to the adjacent roll end, whereby each roll is suspended at one end from its associated arm, the arms being mounted for oscillation about adjacent axes which are parallel to the roll axes and located in planes intermediate the said roll axes.

8. Roll handling apparatus for rolls that are normally supported upon bearings, in superposed relation, comprising a pair of arms mounted for rocking movement and interconnected so that each will move upon operation of the other arm, one arm being movable toward and from an end of the upper roll and the other arm toward and from an end of the lower roll, and means for connecting each arm to the adjacent roll end, whereby each roll is suspended at one end from its associated arm, the arms being so connected that they move about their respective axes in opposite directions, at any given time.

9. Roll handling apparatus for rolls that are normally supported upon bearings, in superposed relation, comprising a pair of arms mounted for rocking movement and interconnected so that each will move upon operation of the other arm, one arm being movable toward and from an end of the upper roll and the other arm toward and from an end of the lower roll, and means for connecting each arm to the adjacent roll end, whereby each roll is suspended at one end from its associated arm, the arms being so connected that they move about their respective axes in opposite directions, at any given time, the said axes being parallel to the roll axes and located in planes intermediate the roll axes.

10. Roll handling apparatus for rolls that are normally supported upon bearings in side-by-side relation, comprising a pair of rock shafts having geared connection with one another, an arm carried by each rock shaft, one arm being movable into position at an end of one roll and the other arm into position at an end of the other roll, means for connecting the arms to the rolls, a worm gear segment carried by one of the shafts and a worm for operating said segment to effect oscillation of the arms.

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