May 30, 1933. M. H. DAMERELL 1,911,751

CONTINUOUS WIRE CLEANING MACHINE

Filed June 17, 1931 2 Sheets-Sheet 1

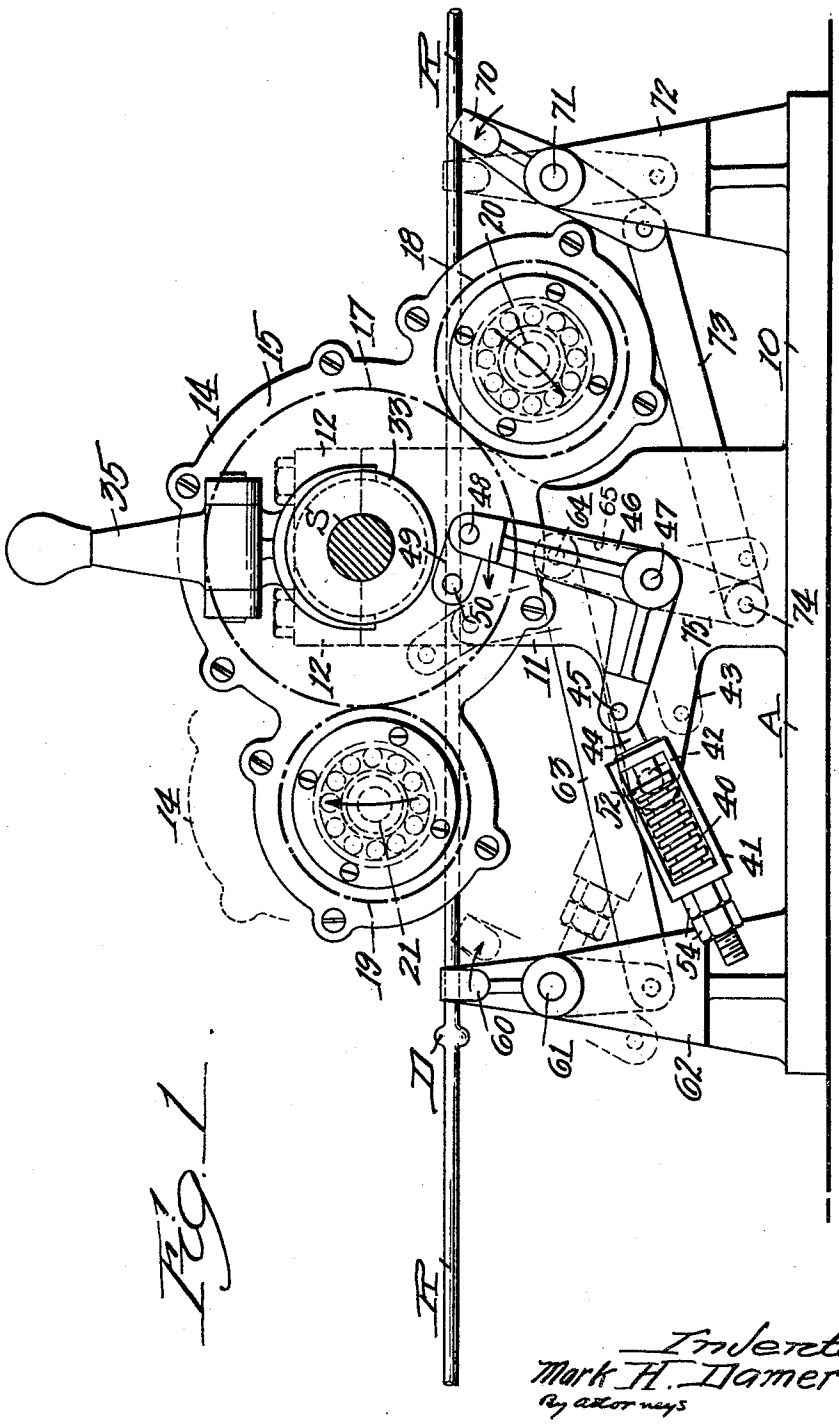


Fig. 1

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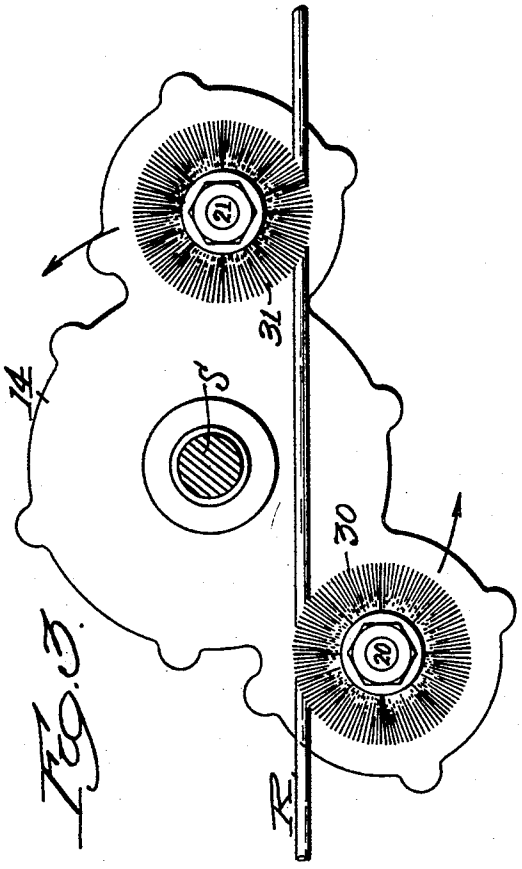


Fig. 3.

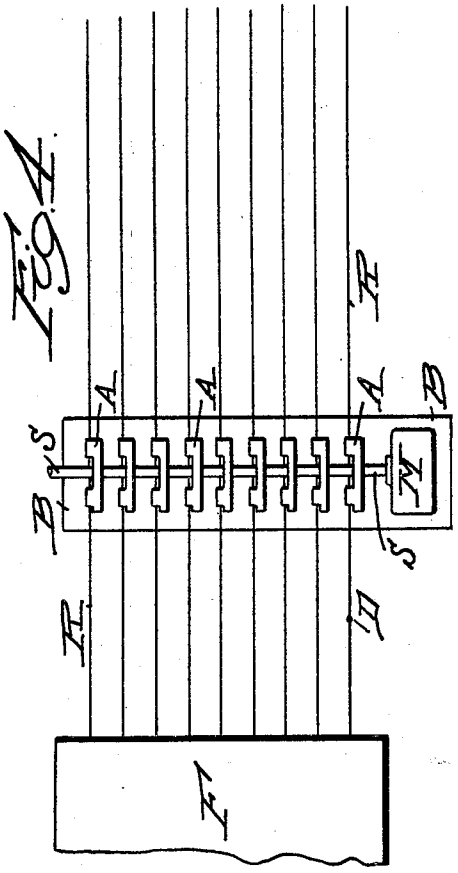


Fig. 4.

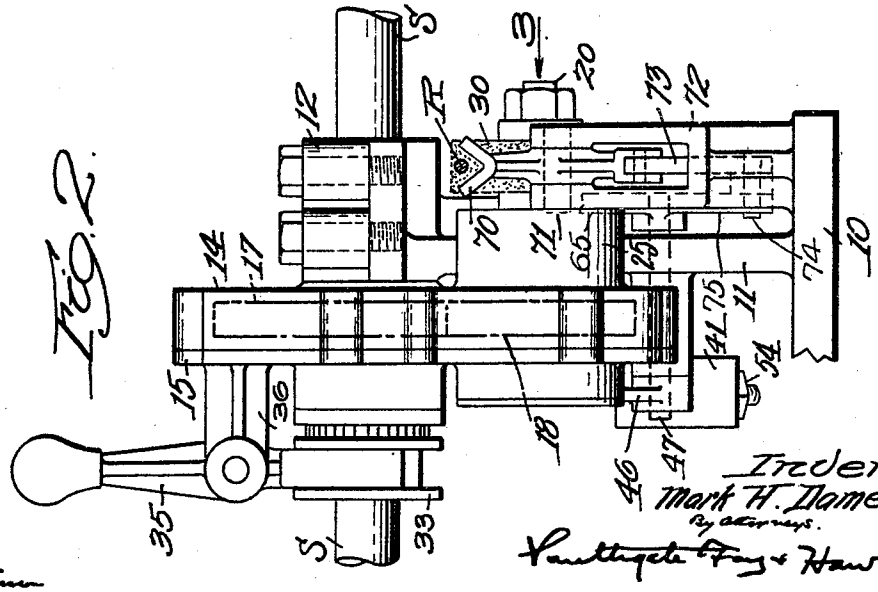


Fig. 2.

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UNITED STATES PATENT OFFICE

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CONTINUOUS WIRE CLEANING MACHINE

Application filed June 17, 1931. Serial No. 545,138.

This invention relates to the cleaning of wire or rods as they are drawn from an annealing or heat-treatment furnace.

It is the general object of my invention to provide improved mechanism for effectively cleaning such wire or rods by a brushing operation as they are delivered direct from the annealing or other furnace and without the necessity for any intermediate handling or for acid treatment.

A further object of the invention is to provide improved mechanism for removing the cleaning brushes from operative position in order to allow a loop or joint of the wire or rod to pass between the brushes and for replacing the brushes in operative position after such passage.

My invention further relates to arrangements and combinations of parts which will be hereinafter described and more particularly pointed out in the appended claims.

A preferred form of the invention is shown in the drawings, in which

Fig. 1 is a side elevation of one unit of my improved brushing machine;

Fig. 2 is an end view thereof, looking in the direction of the arrow 2 in Fig. 1;

Fig. 3 is a rear view of the brushes and rocking casing, looking in the direction of the arrow 3 in Fig. 2; and

Fig. 4 is a diagrammatic plan view, showing the relative position of the machine with respect to an annealing furnace.

Referring to the drawings, my improved wire cleaning machine comprises any desired number of units A (Fig. 4), mounted in parallel series at the delivery end of a furnace F, and spaced apart to correspond to the spacing of the wires or rods R as they are delivered from the furnace.

The several wire cleaning units A are mounted on a suitable base B, and are provided with a common drive shaft S, continuously rotated by a suitable motor M or in any other convenient manner. Provision is made, as will be hereinafter described, for independently starting and stopping any one of the units A and also for independently rendering the brushes of any one of the units temporarily inoperative during the passage of a joint or enlargement D (Fig. 1) on a rod R. The units A are all identical in construction and one of these units is shown in detail in Figs. 1, 2 and 3.

Each unit comprises a stand 10 having an upwardly extending post 11 supporting a bearing 12 for the drive shaft S. A rocking casing 14 is loosely mounted on the shaft S adjacent the bearing 12 and is provided with a removable cover plate 15. A gear 17 is loosely mounted on the shaft S within each casing 14 and engages pinions 18 and 19 fixed on brush shafts 20 and 21.

The shafts 20 and 21 are preferably mounted in antifriction bearings in the outer end portions of the casing 14 and extend rearward through hub portions 25 (Fig. 2) of the casing 14 to support rotary wire brushes 30 and 31, fixed thereon.

A clutch collar 33 (Fig. 2) is keyed to the driving shaft S and may be manually and selectively moved into driving engagement with the gear 17 by a clutch lever 35, it being understood that a separate clutch lever is provided for the driving gear of each separate unit A of the machine. The clutch lever 35 is mounted on a bracket 36 projecting outward from the cover plate 15.

Through the mechanism thus described, the wire brushes 30 and 31 may be continuously rotated and are posititioned to engage the upper and lower sides of the wire or rod R, as indicated in Fig. 3. All parts of the wire or rod are thus effectively cleaned and acid "pickling" is avoided.

The brushes 30 and 31 are yieldingly forced against the rods R by certain mechanism shown in Fig. 1. A heavy coil spring 40 is mounted in a casing 41 which is pivoted at 42 to an offset projection 43 of the post 11. A rod 44 is slidably mounted in the spring 40 and casing 41 and the outer end of the rod 44 is pivoted at 45 to one arm of a bell crank 46. The bell crank 46 is mounted on a shaft 47, and the upwardly extending arm of the bell crank is pivoted at 48 to a link 49, which in turn is pivoted at 50 to the cover plate 15 of the casing 14.

The spring 40 is interposed between the lower end of the casing 41 and a flange or

collar 52 on the rod 44. The spring 40 thus acts normally to turn the casing 14 in an anti-clockwise direction, as viewed in Fig. 1, bringing the brushes 30 and 31 into operative engagement with opposite sides of the rod D. The limit of this movement is determined by check nuts 54 on the lower end of the rod 44, which nuts engage the bottom of the casing 41.

As previously stated, I have made special provision for removing the brushes 30 and 31 from operative position when a loop or joint D of a rod R passes through the machine. Such loops commonly occur when two successive pieces of wire are joined together.

For this purpose I provide a trip lever 60 (Fig. 1) for each unit, pivoted at 61 on a support 62 and having its lower end connected by a link 63 to a pivot stud 64 fixed in an upwardly extending arm 65 on the shaft 47.

The upper end of the trip lever 60 is forked, as clearly shown in Fig. 2, and is positioned to be engaged by a loop or joint D of the rod R as it approaches the machine. On such engagement, the trip lever 60 is moved to the dotted line position indicated in Fig. 1 and acts through the bell crank 46 to swing the casing 14 to its dotted line position, thus removing the brushes from engagement with the wire or rod passing through the cleaning unit.

The rocking of the bell crank 46 by the trip lever 60 also swings the spring casing 41 on its pivot 42 to the position shown in dotted lines in Fig. 1, in which position the action of the spring on the bell crank 46 is reversed, thereby holding the bell crank yieldingly in its dotted line position, with the brushes clear from the rod.

In order to re-set the brushes after the loop or joint D has passed through the cleaning unit, I provide a second trip lever 70, pivoted at 71 on a support 72 and connected by a link 73 to a pivot stud 74 in an arm 75 which is mounted on the shaft 47 to swing with the bell crank 46.

When the brushes 30 and 31 are in operative position, the trip lever 70 is inoperative, but when the brushes are moved to inoperative position, the trip lever 70 assumes its upright or operative position, as shown in dotted lines in Fig. 1.

After the part D has passed both brushes, it engages the trip lever 70, swinging the trip lever to the full line position shown in Fig. 1 and thereby restoring the brushes to their operative position.

I have thus provided a wire cleaning machine which may be made up in any desired number of cleaning units, spaced to correspond with the spacing of the wires or rods delivered from a particular furnace. Each cleaning unit may be started or stopped independently, so that repairs or replacements may be made without interfering with the operation of the rest of the machine.

Furthermore, each unit is provided with trip mechanism by which it is automatically rendered inoperative while a loop or joint of the corresponding wire or rod is passed through the machine. This trip mechanism also operates automatically to restore the cleaning unit to operative condition as soon as the enlarged part has passed the second brush. All parts of the machine are of simple construction and easily manufactured and the machine is particularly effective for the purposes desired.

In the claims, the term "enlarged part" is intended to cover an enlargement caused by a weld or joint in the wire or caused by looping together the ends of successive wires.

Having thus described my invention and the advantages thereof, I do not wish to be limited to the details herein disclosed, otherwise than as set forth in the claims, but what I claim is:—

1. A machine for continuously cleaning a wire rod as it is drawn from a heat-treatment furnace comprising a pair of wire brushes, a rocking support on which said brushes are rotatably mounted, means to rock said support to move said brushes toward and away from operative position, yielding means effective to hold said brushes in both operative and inoperative positions, and means to rotate said brushes in every position thereof.

2. A machine for continuously cleaning a wire rod comprising a pair of wire brushes, a rocking support on which said brushes are rotatably mounted, and means effective to rock said support to move said brushes toward and away from operative position, said latter means having a portion positioned adjacent the path of travel of the associated wire rod and being actuated by engagement of said portions with an enlarged part of said wire rod as it passes through said machine.

3. A machine for continuously cleaning a wire rod comprising a pair of wire brushes, a rocking support on which said brushes are rotatably mounted, a member positioned adjacent the path of the associated wire rod and engaged by an enlarged part of the wire rod as it enters the machine, and connections between said member and said rocking support by which said member is rendered effective to rock said support and move said brushes out of contact with said wire rod when said member is thus engaged by an enlarged part of the wire rod.

4. The combination in a machine for continuously cleaning a wire rod as set forth in claim 3, in which an additional member is provided positioned adjacent the path of the

associated wire rod and engaged by an enlarged part of the wire rod as it leaves the machine, together with connections between said latter member and said rocking support by which said latter member is rendered effective to move said brushes into renewed operative contact with said wire rod when said latter member is thus engaged by an enlarged part of the wire rod.

5. A machine for continuously cleaning a wire rod comprising a pair of wire brushes engaging opposite sides of said wire rod, means to rotatably support said wire brushes, and automatic means to move said brushes out of engagement with said wire rod when an enlarged part of said wire rod passing through the machine engages a part of said automatic means.

6. A machine for continuously cleaning a wire rod comprising a pair of wire brushes engaging opposite sides of said wire rod, means to rotatably support said wire brushes, and automatic means to move said brushes out of engagement with said wire rod when an enlarged part of said wire rod passes through the machine, said latter means comprising a trip lever positioned for engagement by said enlarged part of said wire rod as said part enters the machine, and connections from said trip lever to said brush-supporting means.

7. The combination in a wire-cleaning machine as set forth in claim 6, in which an additional trip lever is positioned for engagement by said enlarged part of said wire rod as it leaves the machine, together with a connection from said additional trip lever to said brush-supporting means.

8. The combination in a wire cleaning machine as set forth in claim 6, in which an additional trip lever is positioned for engagement by said enlarged part of said wire rod as it leaves the machine, together with a connection from said additional trip lever to said brush-supporting means, and in which a single yielding device and operative connections therefrom are effective to hold said brush-supporting means in either operative or inoperative position.

9. The combination in a wire cleaning machine as set forth in claim 6, in which an additional trip lever is positioned for engagement by said enlarged part of said wire rod as it leaves the machine, together with a connection from said additional trip lever to said brush-supporting means, and in which yielding means and operative connections therefrom are provided, effective to hold said brush-supporting means in either operative or inoperative position.

In testimony whereof I have hereunto affixed my signature.

MARK H. DAMERELL.