

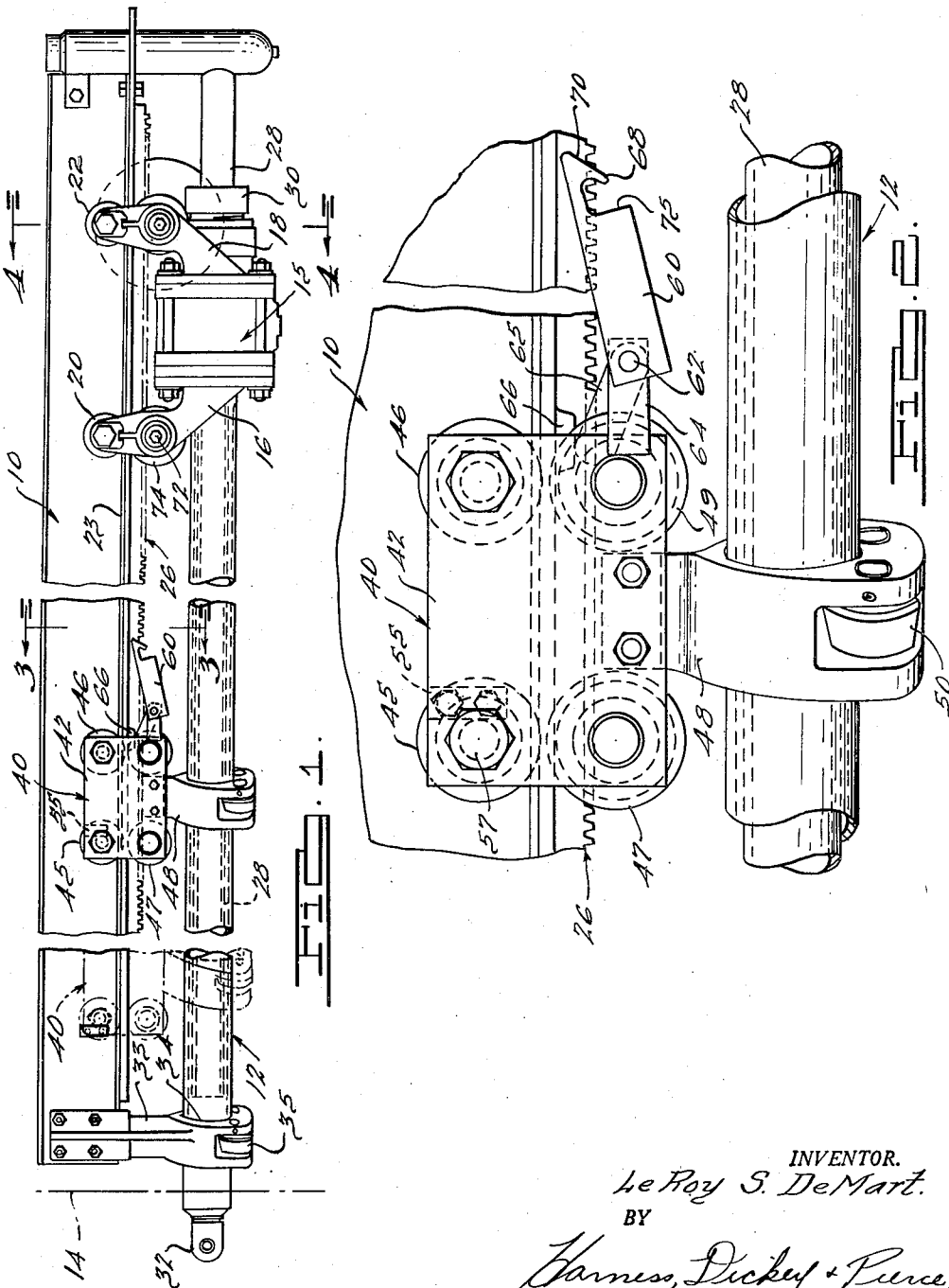
Feb. 16, 1954

LE ROY S. DE MART
RETRACTABLE SOOT BLOWER OF THE LONG-TRAVEL
TROLLEY SUPPORTED TYPE

2,668,978

Filed Feb. 7, 1951

2 Sheets-Sheet 1



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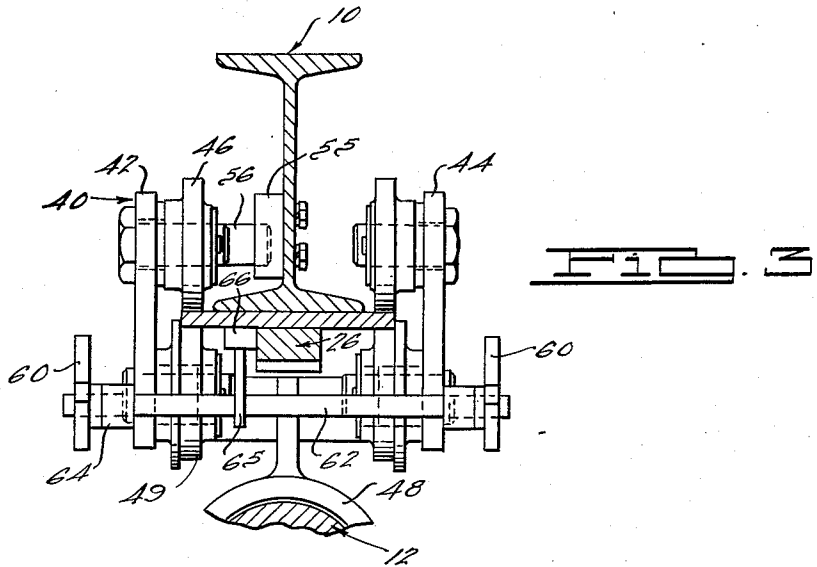
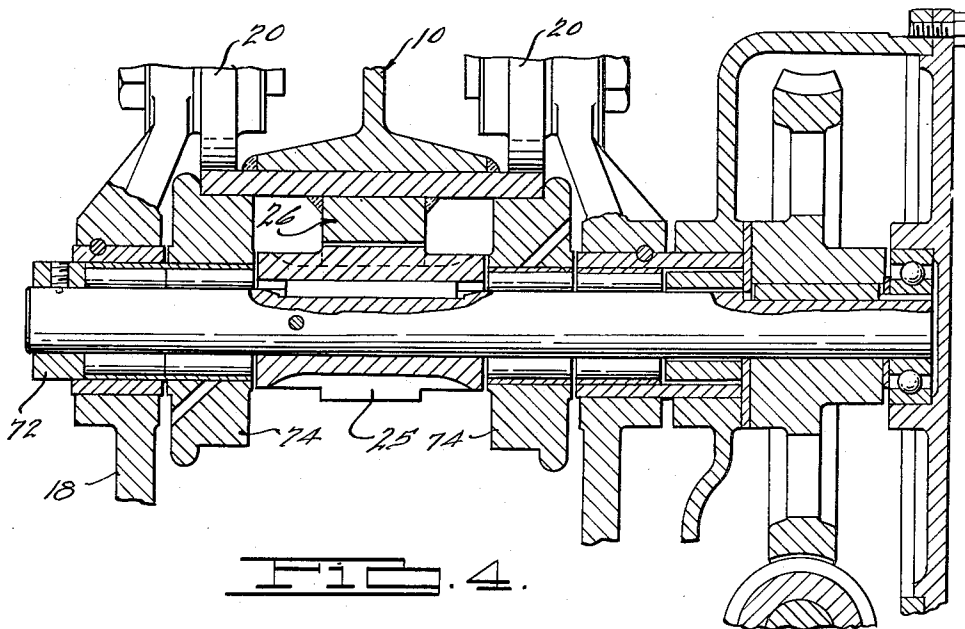
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RETRACTABLE SOOT BLOWER OF THE
LONG-TRAVEL TROLLEY SUPPORTED
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2 Claims. (Cl. 15—317)

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The present invention relates to the construction of cleaning devices of the so-called "soot blower" type, for cleansing the heat exchanging surfaces of boilers and the like by discharging thereagainst a suitable fluid such as steam or air.

An important object of the invention is to provide improved supporting means for such a soot blower of the long-retracting type. Long retracting soot blowers are commonly constructed in the form of a slidable blower lance tube which is projectable through the wall and into the interior of the boiler setting during the performance of its blowing operations, and retractable from the setting, or to a relatively protected position, when not operating, in order to shield the blower element against the deteriorating effects of the high temperatures present in the boiler. It is common to suspend such a blower lance tube from a beam by means of a trolley which serves as an actuating device and supports the rear end of the lance tube, and the beam is ordinarily equipped with a roller type support located at a position close to the boiler setting and through which the lance tube runs during projection and retraction. It has been found that after such constructions have been in use for considerable periods of time there is a tendency for the lance tube to assume a bowed shape due to sagging. The tendency to sag is aggravated by the fact that when the lance tube is retracted after each operation it comes to rest, while still hot, in the same position and supported only at its extreme ends. It has been found that over long periods of time such lance tubes deform and settle so that they become unusable and have to be replaced. The primary object of the present invention is to provide improved means for substantially eliminating the above indicated tendency of the lance tubes of long retracting blowers to sag and bow.

A further object is to provide improved means of very simple, rugged and reliable character which is inexpensive to construct and install and entirely automatic in its operation, for preventing the sagging of blower lance tubes.

A further object is to provide such means which does not substantially reduce the travel of the blower lance tube.

Other objects and advantages will be apparent upon consideration of the present disclosure in its entirety.

In the drawings;

Figure 1 is a side elevational view, partly broken away, of a long retracting blower pro-

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vided with improved supporting means constructed in accordance with the present invention;

Figure 2 is a side elevational view upon a larger scale, showing the principal components of my improved supporting means;

Figures 3 and 4 are cross-sectional views taken substantially on the lines 3—3 and 4—4 respectively of Figure 1 and looking in the direction of the arrows.

Referring now to the drawings, reference character 10 designates generally an I-beam which forms the principal frame and supporting structure, and also serves as a track for guiding the projection and retraction of the lance tube member 12 of a retracting soot blower which will be recognized by those skilled in the art as of a type commonly used. The beam 10 is rigidly carried by suitable supporting structure (not illustrated). When such a soot blower is installed it is ordinarily mounted so that the left end of the beam, as the parts are viewed in Fig. 1, lies close to the outside of the wall of the boiler setting. The position of the wall is indicated by the broken line 14. The beam projects away from the wall, while the lance tube is projectable through a suitable hole and wall box (not shown) in the wall, and movable from the retracted (and protected) position in which it is shown in Fig. 1 to an extended position within the boiler. Ordinarily, blowing fluid is discharged from the tube, and the tube is also rotated, during the projection and retraction thereof, to effect cleaning of the heat exchanging surfaces. During such operation of the blower overheating of the lance tube is prevented by the cooling effect of the blowing medium.

The lance tube is rotated and driven longitudinally by driving mechanism contained within a traveling housing or drive casing generally designated 15 and which is connected to and moves with the rear end of the lance tube. The details of the driving mechanism contained within the casing 15 will not be described herein since they form no part of my present invention and are well understood in the art. The casing 15 is carried by trolley hanger arms as 16, 18 in which trolley wheels as 20, 22 and retaining wheels as 74 are journaled, the trolley wheels overlying the bottom flange 23 of the I-beam 10 to rollably support the drive casing 15 thereupon. The lance tube 12 is rotatable in but held against axial movement with respect to the casing 15 and the casing also contains means for propelling itself, and thereby the lance tube, longitudinally,

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such propelling means including as its final element pinion 25 driven by a motor (not shown) carried by the casing 15 and which when rotated drives the case and lance tube longitudinally along the beam, the pinion meshing with a coaxing rack 26 attached to the underside of the beam.

A fixed feed tube 28 through which the blowing medium is fed to the interior of the lance tube projects into the lance tube through a suitable packing assembly 30 carried by and at the rear end of the drive casing assembly. The feed tube 28 is long enough so that it remains partially telescoped within the lance tube, even when the latter is fully projected, the forward end of the feed tube being open so that the blowing medium is freely discharged into the interior of the lance tube for delivery to and discharge from the blower nozzle 32, as will be understood.

At a position close to the wall of the boiler setting, a forward blower support is provided consisting, in the preferred embodiment illustrated, of a hanger 33 attached at its upper end by suitable bolts to the beam 10 and extending downwardly therefrom and encircling the lance tube. The hanger support 33 is provided with an opening 34 coaxial with and somewhat larger in diameter than the lance tube 12. Journaled in the hanger beneath the lance tube and projecting slightly upwardly into the opening 34 are a pair of rollers 35. The lance tube is rotated in one direction during the projection thereof and is rotated in the opposite direction during its retraction, and the rollers 35 are set at an angle to the axis of the tube corresponding to the pitch of the helix represented by such rotary and longitudinal travel of the lance tube, to minimize sliding contact between the rollers and the tube. The rollers are also of truncated conic form so that they make line contact with the tube despite their angular positioning. The angular arrangement of the rollers is best shown in Fig. 2.

I also provide a traveling support so arranged that when the lance tube is retracted the traveling support occupies a position approximately midway between the forward support 33 and the rear support consisting of the trolley portion 15. The traveling supplemental support also includes a trolley assembly 40 comprising a pair of side plates 42, 43, mounted upon opposite sides of the beam 10 and suspended therefrom by suitable trolley wheels 45, 46 and guide wheels 47, 49. The trolley assembly 40 carries rigidly suspended therefrom a hanger 48 which encircles the lance tube 12. The hanger 48 is also provided with anti-friction rollers 50 corresponding to the rollers 35 of the fixed forward hanger 33. The rollers 50 are similarly disposed upon oblique axes and are of corresponding truncated conic form to reduce sliding friction between the parts.

The traveling support 40 is movable from the retracted position in which it is shown in full lines in Fig. 1 to a forward position, indicated in dotted lines in that view, in which it lies close to the fixed forward support 33. The retracted position is determined by a stop 55 secured to the side of the central web of the I-beam in such position that it is engageable by an abutment carried by the traveling support 40. Such abutment comprises, in the preferred arrangement shown, an inward extension portion 56 of the spindle 51 for one of the trolley rollers 45.

Carried by the frame of the traveling support 40 is a latchpiece 60 pivoted upon a transverse horizontal pin 62 supported in a bracket 64 and

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attached to the side plate 42. An arm 65 which is fast with respect to the latchpiece 60, to pivot therewith, extends angularly forwardly and upwardly from the pivot pin 62 toward the bottom of the beam 10 upon one side of the rack 26, and when the traveling support is fully retracted arm 65 is engageable with a cam lug 66 rigidly secured in suitable position to the underside of the I-beam 10. The latchpiece 60 has a hooked extremity 68 and an inclined nose portion 70 at its rear end serving as a latch actuating camming surface. When the arm 65 is free of the lug 66 the latchpiece 60 moves downwardly, being heavier than the arm 65, and in the down position of the latchpiece 60 the hooked portion 68 is adapted to overengage an axle as 72 of one of the retaining rollers 74 carried by the trolley hanger arm 16. When the latchpiece 60 is raised by engagement of the arm 65 with the lug 66 the hooked portion 68 is lifted clear of the spindle 72 and the traveling support 40 is disengaged from the drive casing 15.

With the parts in the condition shown, when the motor in the drive casing 15 is energized to move the lance tube forwardly to project it, the traveling support 40 may move forwardly due to frictional drag or, depending upon its resistance to movement, may remain at or substantially at the central position in which it is shown in Fig. 1 until the drive casing catches up with and strikes the traveling support and moves it forwardly, during the last half of the projecting movement. Complete projection is attained when the traveling support and the drive casing lie close to one another and close to the fixed forward support 33. It will be observed that a shoulder portion 75 formed upon the latchpiece 60 projects downwardly below the lower extremity of the hook 68, and is always in the path of the spindle 72 so that when the drive casing catches the traveling support the spindle 72 engages the shoulder 75 to move the traveling support forwardly. As soon as the arm 65 moves forwardly free of the lug 66 the latchpiece 60 drops as previously indicated so that the hooked portion overengages the spindle 72. When reverse movement of the lance tube is instituted, therefore, the drive casing pulls the traveling support to the rear during the first half of the retracting movement, and until the arm 65 strikes the lug 66 to lift and release the latchpiece and free the drive casing to continue its rearward movement and pull the lance tube through the remainder of its retracting movement, further rearward movement of the traveling support being prevented by the stop 55, as previously described.

The tendency of the lance tube to sag is completely eliminated by the fact that the traveling support is always in a position to support the central portion of the lance tube when retracted.

While it will be apparent that the preferred embodiment of the invention herein described is well calculated to fulfill the objects and advantages first above stated, it will be apparent that the invention is susceptible to variation, modification and change within the spirit and scope of the appended claims.

I claim:

1. In a long retracting blower assembly, in combination with a lance tube longitudinally movable to projected and retracted positions, two supporting portions, one of which supports the lance tube near one end and the other of which supports the lance tube near the other end when said tube is in the retracted position, means for

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driving the lance tube longitudinally, a traveling intermediate support movable with respect to the lance tube and also with respect to said supporting portions, and which throughout at least a portion of the travel of the lance tube moves from a supporting position at an intermediate point of the length of the lance tube when said tube is retracted to a position near one end of said lance tube when such tube is projected, said two supporting portions comprising a front support and a rear support, the rear support being connected to and moving with the rear end of the lance tube during projection and retraction thereof, track means movably supporting said rear support and also said traveling intermediate support, releasable latch means for separably connecting said rear support and said intermediate support, and means responsive to movement of the intermediate support to and from said intermediate supporting position for releasing and engaging said latch means.

2. In a long retracting blower assembly, in combination with a lance tube longitudinally movable to projected and retracted positions, two supporting portions, one of which supports the lance tube near one end and the other of which supports the lance tube near the other end when said tube is in the retracted position, means for driving the lance tube longitudinally, a traveling intermediate support movable with respect to the lance tube and also with respect to said supporting portions, and which throughout at least a

portion of the travel of the lance tube moves from a supporting position at an intermediate point of the length of the lance tube when said tube is retracted to a position near one end of said lance tube when such tube is projected, said two supporting portions comprising a front support and a rear support, the rear support being connected to and moving with the rear end of the lance tube during projection and retraction thereof, a track frame movably supporting said rear support and also said traveling intermediate support, releasable latch means for separably connecting said rear support and said intermediate support, said lance tube being movable through the intermediate support when the latch means is released, the intermediate support being movable between said intermediate position and a position near the front support, and means responsive to movement of the intermediate support to and from said intermediate supporting position for releasing and engaging said latch means.

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