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C. S. DEAN.

DEVICE FOR TURNING TUBE OR FLUE CLEANERS WHILE MOVING THROUGH THE TUBES OR FLUES.

APPLICATION FILED FEB. 27, 1902. RENEWED MAR. 1, 1904.

NO MODEL.

Fig. 1.

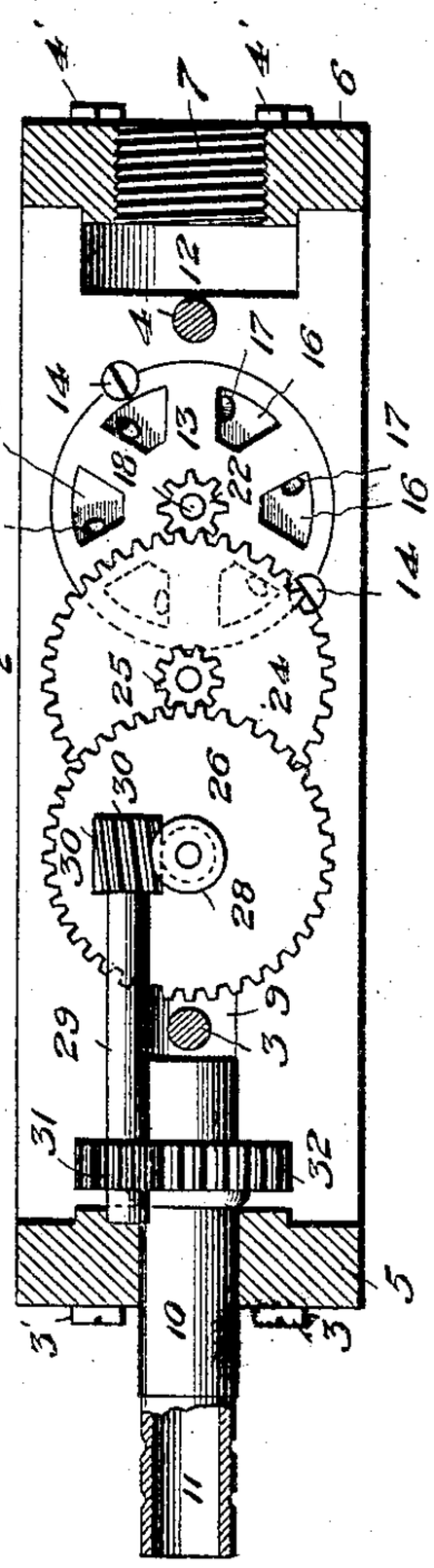


Fig. 4.

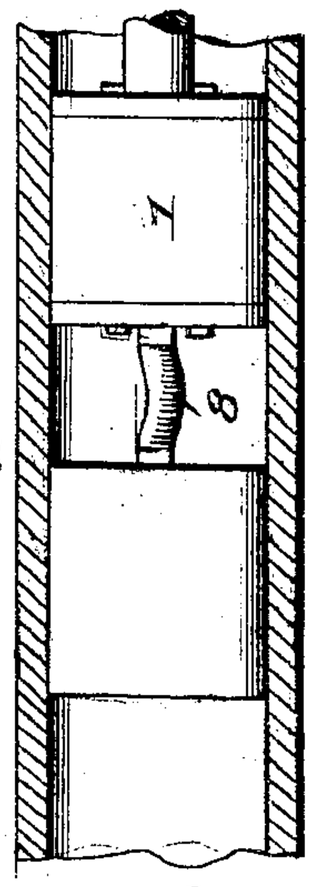


Fig. 5.

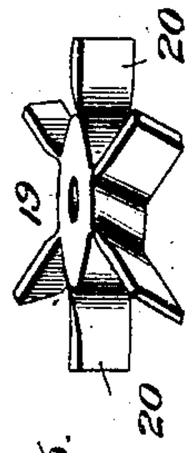
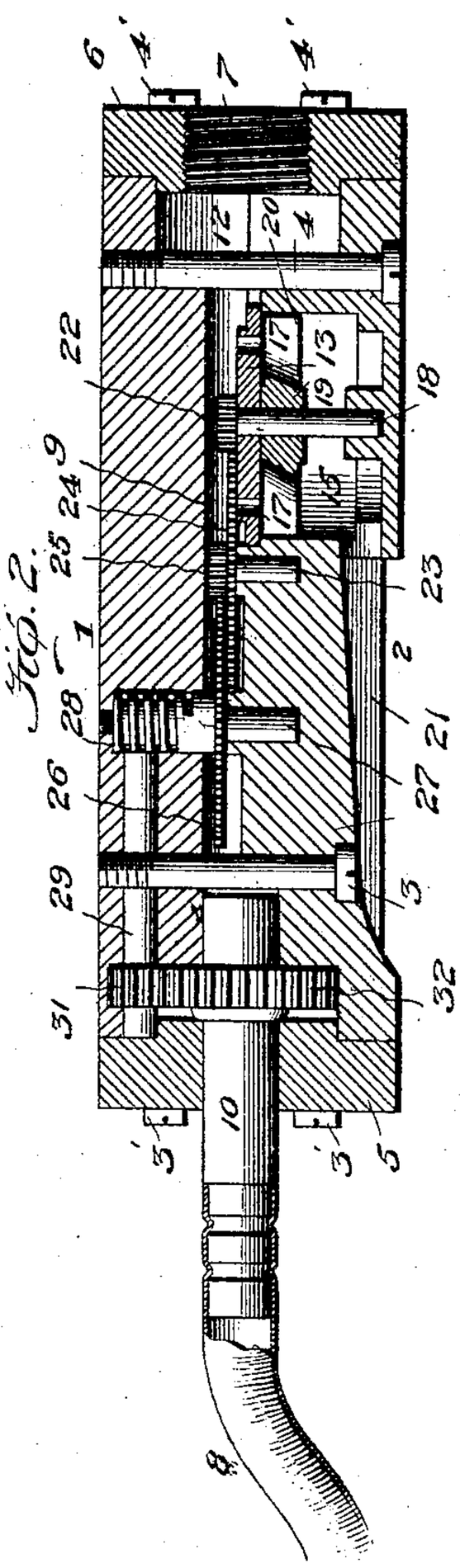


Fig. 2.



Witnesses

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UNITED STATES PATENT OFFICE.

CYRUS S. DEAN, OF FORT ERIE, CANADA, ASSIGNOR OF ONE-HALF TO SHERWOOD MANUFACTURING COMPANY, OF BUFFALO, NEW YORK.

DEVICE FOR TURNING TUBE OR FLUE CLEANERS WHILE MOVING THROUGH THE TUBES OR FLUES.

SPECIFICATION forming part of Letters Patent No. 771,613, dated October 4, 1904.

Application filed February 27, 1902. Renewed March 1, 1904. Serial No. 196,100. (No model.)

To all whom it may concern:

Be it known that I, CYRUS S. DEAN, a subject of the King of England, residing at Fort Erie, county of Welland, Province of Ontario, Canada, have invented certain new and useful Improvements in Devices for Turning Tube or Flue Cleaners While Moving Through the Tubes or Flues, of which the following is a specification.

This invention relates to devices for turning tube or flue cleaners while moving through the tube or flue.

In that type of steam or compressed-air boiler tube or flue cleaner known as a "rapper" or "knocker" unless the device is turned by hand and advanced while going through the tube or flue it will soon seriously damage the tube or flue by repeated knocking or rapping at the same point.

The present invention is designed more particularly for use in connection with steam or compressed-air boiler tube or flue cleaners of the rapper or knocker type, although it is susceptible of use with any type of cleaner and is adapted for automatically turning the cleaner as it is advanced by hand or automatically in the tube or flue, my object being to provide a turning device of this character which will be simple and inexpensive to manufacture, adapted to utilize the same steam or air pressure for its operation employed to operate the cleaner, and one which will turn the cleaner evenly and regularly at a desired rate of rotation.

Having the foregoing objects in view, the invention consists of a turning device for steam or compressed-air boiler tube or flue cleaners comprising certain improved features and novel combinations of parts set forth in detail hereinafter, while the novel features thereof are recited in the appended claims.

In the accompanying drawings, Figure 1 is a view of the device, one-half of the casing having been removed, but with the heads in position and shown in section; Fig. 2, a longitudinal section taken at right angles to Fig. 1; Fig. 3, a detail of the propeller-wheel, and Fig. 4 a sectional view showing the present invention coupled to a cleaner in a boiler-tube.

The numerals 1 and 2 designate the longitudinal halves of the casing, which are held together by suitable bolts 3 and 4 and which have at their ends the heads 5 and 6, the latter being provided with screw-threads 7 for coupling to the hose or pipe supplying the steam to operate the device and afterward to pass on via the short section of hose 8 to the boiler tube or flue cleaner in connection with which the present invention is used, and to permit this passage of the steam or air through the device the casing is provided with the channel 9, extending completely therethrough from end to end, and the driver-spindle 10 is hollow from end to end, as shown at 11, said spindle being journaled in the head 5 and having the short section of hose 8 connected thereto in any preferred manner, such as shown. Located adjacent the steam-receiving chamber 12 is a circular plate 13, which is held by screws 14 above a chamber 15 and is provided with recesses 16 in its upper face, from each of which extends through the plate a port or opening 17.

The numeral 18 designates a shaft or spindle journaled in the plate 13 and in the half 2 of the casing which carries the propeller shown in Fig. 3. As shown in Fig. 2, this propeller 19 is located immediately below the plate 13 in the chamber 15, and its blades 20 are suitably inclined, so that the steam or air passing through the ports 17 will cause a rapid turning of the propeller and the shaft 18 on which it is secured. The exhaust steam or air after rotating the propeller passes out through the exhaust-port 21, made in the face of the half-tube. The shaft 18 carries on its upper end a pinion 22.

The numeral 23 designates a spindle to which is secured a gear 24, meshing with pinion 22, and surmounting and connected to the gear and spindle is a pinion 25, which in turn meshes with a gear 26, secured on the shaft of spindle 27, carrying a worm 28.

The numeral 29 designates a shaft extending longitudinally of the casing and suitably journaled, which carries a pinion 30 in mesh with the worm 28 and at its other end is provided with a pinion 31, meshing with a gear 32, secured on the drive shaft or spindle 10.

The operation of the device is as follows:

Steam or compressed air from the supply hose or pipe is introduced into the chamber 12, from which it passes into the channel 9, and a portion of the steam or air passes through the ports 17 and impinges on the blades 20 of the propeller 19, afterward exhausting through the chamber 15 and the exhaust 21, but meanwhile causing the propeller to turn and through the intermediate reducing-gearing inducing a properly-timed and relatively slow rotation in the drive-spindle 10. The remainder of the steam or air passes through the channel 9 and through the drive-spindle 10 and via the short section of hose 8, which is coupled to the cleaner. In consequence the steam or air pressure is supplied direct to the cleaner, but utilized while *en route* thereto to turn the gearing of the turning device constituting the subject-matter of the present application, and through the medium of the short flexible hose 8 causes the cleaning device to be turned gradually but regularly in the tube or flue. It will be understood that both the cleaner (of which any type may be used) and the present turning device therefor are introduced directly into the tube or flue which is to be cleaned and that the cleaner is operated by the steam or air pressure which is initially supplied to the turning device. If an automatically-advancing cleaner is employed, the entire arrangement will take care of itself; but if the cleaner is not an automatically advancing device the operator will simply have to cause the advancement of the cleaner and the turning device by hand; but in both instances the turning device will keep the cleaning device constantly turning in the tube or flue.

I am aware that various changes of construction and modification of parts could be resorted to in carrying out my invention without interfering with its general mode of operation or depriving it of its spirit and scope, and I do not, therefore, limit myself to the precise construction herein shown and described, but consider myself entitled to all modifications falling within the scope of the invention.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a turning device for steam or compressed-air boiler tube or flue cleaners, the combination with a casing adapted to be introduced in the tube or flue, of a hollow drive-spindle carried by the casing and adapted for coupling to the cleaner, means for supplying steam or compressed air to and through the hollow drive-spindle, and means carried by the casing for turning the hollow drive-spindle.

2. In a turning device for steam or compressed-air boiler tube or flue cleaners, the combination with a casing adapted for introduction into the tube or flue, of a hollow drive-spindle journaled in and carried by the casing and adapted for coupling to the cleaner, said casing having a steam or air passage or channel adapted to supply the steam or air pressure to and through the hollow drive-spindle, and a steam or air actuated motor carried by the casing for turning the hollow drive-spindle.

3. In a turning device for steam or compressed-air boiler tube or flue cleaners, the combination with a casing adapted to be introduced into the tube or flue, and having a steam or air passage or channel extending therethrough, of a hollow drive-spindle adapted for coupling to the cleaner and positioned to receive direct the steam or air pressure coming through the channel and to convey it to the cleaner, a propeller located in a by-pass extending from the steam or air channel to an exhaust-port and adapted to receive and utilize a portion of the main steam or air pressure passing through the channel without return to said channel, and means for turning the drive-spindle by the rotation of the propeller.

4. In a turning device for steam or compressed-air boiler tube or flue cleaners, the combination with a casing having a steam or air passage or channel extending therethrough and a by-pass leading to an exhaust, of a hollow drive-spindle carried by the casing and adapted for coupling to the cleaner and for conveying the steam or air thereto, a plate covering the by-pass and provided with a plurality of steam or air jet holes or ports, a shaft journaled in the plate and in the casing, a propeller-wheel having a plurality of blades which is carried by the shaft and located in the by-pass adjacent the plate and adapted to receive the steam or air jets issuing through the plate, a pinion on said shaft, a gear on the drive-spindle, a shaft carrying pinions, one of which meshes with the gear on the spindle, a worm meshing with the other pinion on said shaft, and reducing-gearing between the worm and the pinion on the propeller-shaft.

In testimony whereof I hereunto affix my signature in presence of two witnesses.

CYRUS S. DEAN.

Witnesses:

SARAH V. LOCKWOOD,

FRANK E. NEWTON.