Nov. 20, 1928. 1,692,028

W. H. ELLIOTT

PIPE CLEANING APPARATUS

Filed July 16, 1926

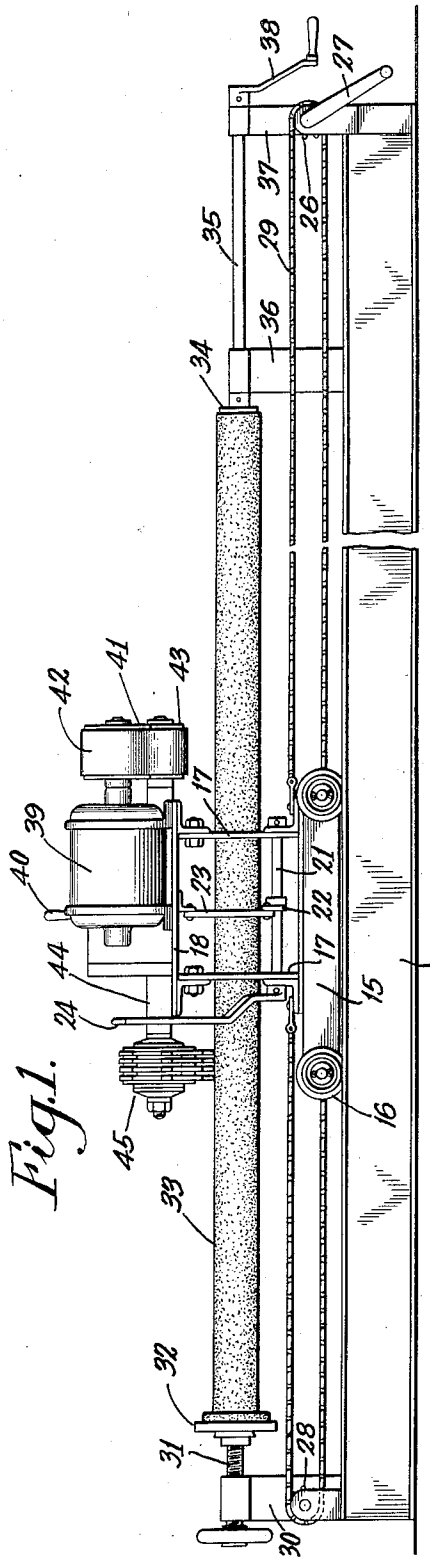


Fig. 1.

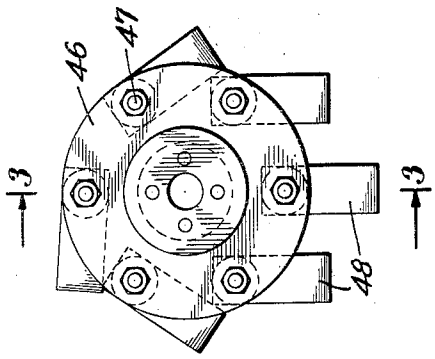


Fig. 4.

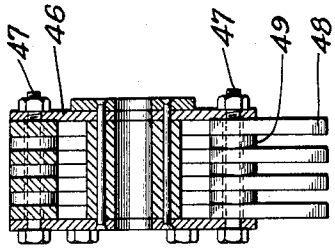


Fig. 3.

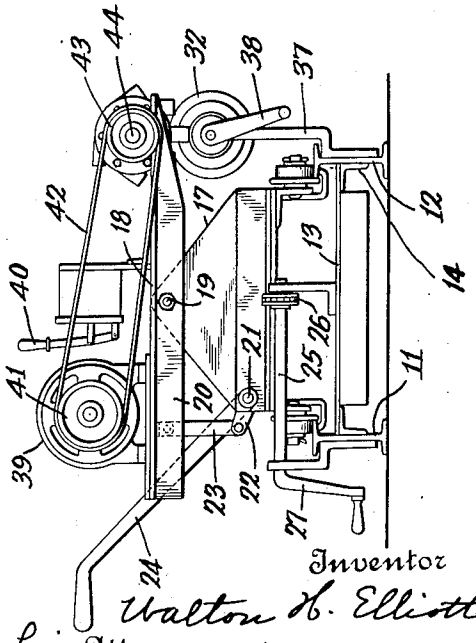


Fig. 2.

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Patented Nov. 20, 1928. 1,692,028

UNITED STATES PATENT OFFICE.

WALTON H. ELLIOTT, OF PORT ARTHUR, TEXAS, ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE TEXAS COMPANY, OF NEW YORK, N. Y., A CORPORATION OF DELAWARE.

PIPE-CLEANING APPARATUS.

Application filed July 16, 1926. Serial No. 122,774.

This invention relates to pipe cleaning apparatus and particularly to apparatus for removing scale, rust and the like from the outside of tubes or pipes, such for example as condenser tubes.

Tubes or pipes which have been used in condensers, pipe lines, etc., gradually accumulate an outer coating of scale and frequently rust, and it is common practice to remove such scale and rust by hand. Hand scraping and cleaning is, however, slow and laborious work.

It is accordingly an object of my invention to greatly improve upon the old method of cleaning tubes and to provide an apparatus or machine which, while of simple construction, will quickly and efficiently remove all scale and rust from the outside of tubes or pipes of different exterior diameters and different lengths.

The more specific objects of the invention which may be particularly noted are to provide means for rotating the pipe during the cleaning operation so that the entire surface may be evenly cleaned, to provide means for accommodating the machine to different lengths of pipe, to provide means for adjusting the machine to permit the cleaning of pipes of different diameters and for the application of various pressures on the pipe, and to provide means for moving the carriage forward and backward along the track upon which it is mounted.

These and other objects, features, and advantages of the invention will appear as the detailed description of the apparatus proceeds.

In the drawing:

Figure 1 is a view in side elevation of a pipe cleaning machine embodying the features of my invention,

Figure 2 is an end view of the same machine,

Figure 3 is an enlarged view of the hammer wheel taken on the line 3—3 of Figure 4; and

Figure 4 is a side view of the same hammer wheel.

Referring to the drawing, 10 represents generally a bed plate which consists of a pair of spaced I-beams 11 and 12 which are maintained in proper spaced relation by means of suitable cross beams 13 and angle irons 14. The spaced I-beams form a track upon which a travelling carriage 15 is mounted, the carriage being provided with flanged wheels 16 adapted to ride on the I-beams.

The carriage 15 is provided with a pair of substantially triangular shaped spaced supporting members 17 positioned with their apexes at the top to form a fulcrum, upon which a platform 18 pivots. Further pivotal connections are provided in the form of bolts 19 which extend through the supports 17 and depending flanges 20 on the underside of the platform 18.

A rotatable shaft 21 is suitably journaled in bearing members on the carriage 15. An arm 22 is secured on the shaft 21, preferably at a point intermediate the ends thereof. Pivotally connected to the free end of the arm 22 is a link 23, the opposite end of which is pivotally connected to the underside of the platform 18 at a point near one of its side edges. A hand lever 24 is also rigidly connected to the end of the shaft 21 and by operating the hand lever the shaft 21 may be rotated to actuate the arm 22 and link 23 so as to rock or tip the platform 18 to any desired degree. At one end of the bed plate there is journaled a rotatable shaft 25 carrying on one end a sprocket wheel 26 and on the opposite end a crank handle 27. At the opposite end of the bed plate a second sprocket wheel 28 is suitably mounted. A driving chain 29 is carried by the sprocket wheels 26 and 28, the free ends of the chain being attached to opposite ends of the carriage 15. By turning the crank handle 27 the sprocket wheel 26 will be rotated with a corresponding movement of the driving chain 29. Thus it is apparent that the carriage 15 can be readily moved in either direction along the track.

At one end of the bed plate there is provided an upright 30 journaled and threaded at its upper end to accommodate an adjusting screw 31 having at one end what may be termed a centering block 32 adapted to fit within one end of the pipe or tubular member 33 to be cleaned. The other end of the pipe 33 is supported on a second centering

block 34 secured on the end of a rotatable rod 35 suitably journaled in uprights 36 and 37 and provided with a crank handle 38 at its opposite end. The centering blocks 32 and 34 are inserted within the opposite ends of the pipe and the adjusting screw 31 is turned up until the pipe is held firmly in position between the blocks. The pipe can then be easily rotated by means of the crank handle 38.

An electric motor 39 is mounted on the platform 18 and is connected in the usual manner to a source of electrical energy. Operation of the motor is controlled by a switch 40. The free end of the rotor shaft of the motor is provided with a pulley 41 carrying one end of a driving belt 42, the opposite end of which is carried by a second pulley 43 mounted on one end of a rotatable shaft 44 which is journaled in suitable supports on the platform 18. One end of the shaft 44 extends beyond the end of the platform and is provided with an element or elements adapted, while rotating, to be brought into tangential contact with the pipe. The element may be a grinding wheel or stone, but preferably it will take the form of a hammer wheel indicated generally at 45, as illustrated.

The hammer wheel 45 comprises a rack formed of spaced discs 46 which are cross connected adjacent their peripheries by bolts 47. Upon each bolt one or more hammer elements 48 are assembled, being spaced from one another by washers 49. The hammer elements are loosely mounted on the bolts so that upon the rotation of the rack the hammer elements will be thrown outwardly by centrifugal force to contact with the outer surface of the pipe. The grinding action in case a grinding stone is used, or the repeated contacting of the hammer elements against the pipe will quickly remove all scale and rust from the pipe and produce a clean outer surface. By rotating the pipe through the agency of the handle 38 all parts of the pipe can be exposed to the action of the hammers as the car is moved backward and forward along the track by the turning of the handle 27.

Certain contact between the hammer elements and the pipe is assured by reason of the adjustability of the platform 18. By operating the hand lever 24 the platform may be readily tipped to bring the hammers within striking distance of the pipe, or to apply greater pressure in the event that a grinding stone or wheel is used in place of the hammer wheel.

Apparatus of preferred form and construction has been illustrated and described for the purpose of showing a way in which this invention may be practiced, but the inventive thought upon which this application is based is broader than this illustrative embodiment. It is therefore understood that the scope of the invention is not to be limited by the present disclosure, reference being had to the appended claims for that purpose.

What I claim is:

1. A pipe cleaning machine comprising means for supporting a pipe, means for rotating said pipe, a rotating hammer adapted to contact with the pipe, and means for moving the rotating hammer along the length of the pipe while in contact therewith.

2. A pipe cleaning machine comprising means for supporting a pipe, means for rotating the pipe, an adjustable platform, means for adjusting the platform, a rotating hammer mounted on the adjustable platform and adapted to contact with the pipe, and means for moving the rotating hammer along the length of the pipe while in contact therewith.

3. A pipe cleaning machine comprising spaced pipe supporting members for supporting a pipe in a horizontal position, a track, a carriage adapted to travel on the track, a rotatable hammer mounted on the carriage so that an edge of the hammer may contact with the pipe, means for rotating said hammer, and manually controllable means for moving the carriage backward or forward on the track during the operation of the rotatable hammer in contact with the pipe.

4. A pipe cleaning machine comprising means for supporting a pipe, a rotatable rack mounted in close proximity and to one side of the pipe, a plurality of hammers pivotally mounted in the rack and adapted to deliver impact blows to the pipe during the rotation of the rack, means for rotating the rack, and means for moving the rack along the length of the pipe during the contacting of the hammers therewith.

5. A pipe cleaning machine comprising means for supporting a pipe in a horizontal position, manually controlled means for rotating said pipe, a power actuated rotatable hammer formed with a plurality of pivotally mounted hammer members disposed in close proximity to the pipe for delivering impact blows thereto, and means for controllably actuating the hammer longitudinally along the pipe whereby the duration of impact on any selected point of the pipe is under full control.

6. A pipe cleaning machine comprising, adjustable and rotatable pipe supporting elements for holding the pipe to be cleaned, means for positively turning one of said supporting elements to turn the pipe, a track disposed parallel to the pipe, a carriage adapted to run on said track, a motor driven rotating hammer adjustably mounted on said carriage and adapted to make a cleaning contact with said pipe, and means for positively moving the carriage in either direction along the track during the rotation of the hammer and the pipe.

7. A pipe cleaning machine comprising, means for supporting a pipe in a horizontal

position, a track disposed longitudinally of the pipe, a carriage adapted to travel on the track, an adjustable platform pivotally supported on the carriage, a power actuated motor mounted on the platform, a rotatable hammer actuated by said motor mounted on the platform and adapted to deliver impact blows to the pipe, manually operated means for regulating the position of the platform to control the force of the impact blows of the hammer on the pipe, and means for controllably actuating the carriage along the track longitudinally of the pipe.

In witness whereof I have hereunto set my hand this 9th day of July, 1926.

WALTON H. ELLIOTT.