Nov. 20, 1951 J. C. JOHNSON 2,575,816

ROTARY SCRAPING DEVICE FOR CLEANING SURFACE PITTED PIPE

Filed June 2, 1947 2 SHEETS—SHEET 1

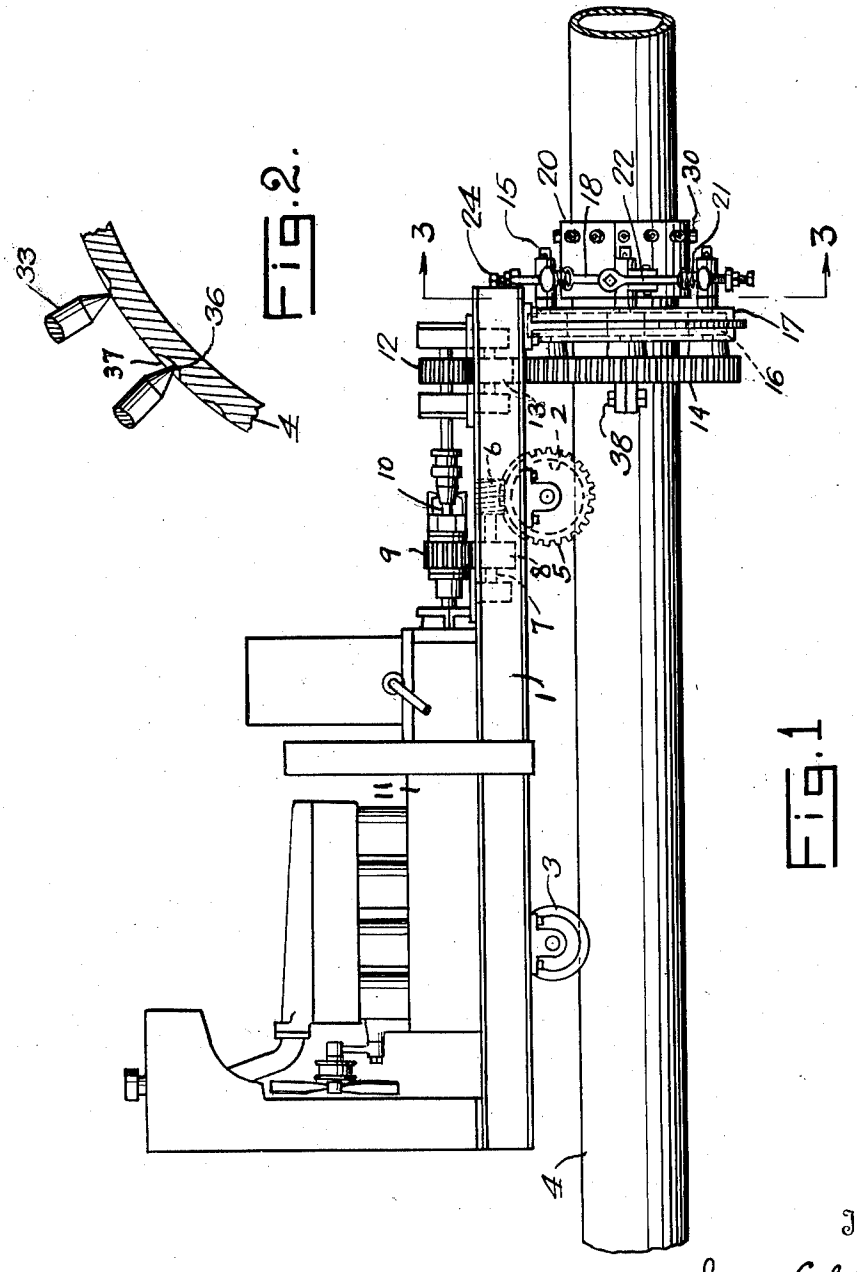


Fig. 1.

Fig. 2.

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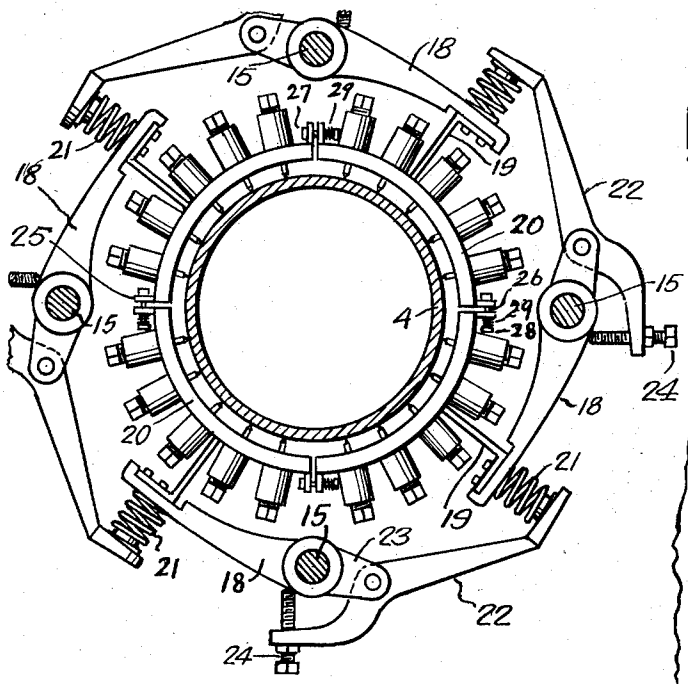


Fig. 3.

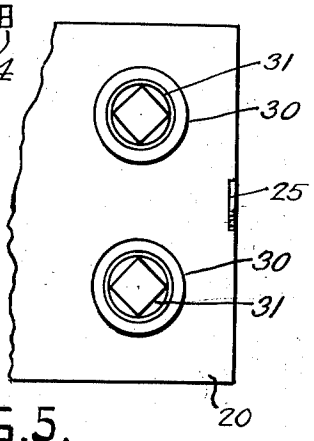


Fig. 5.

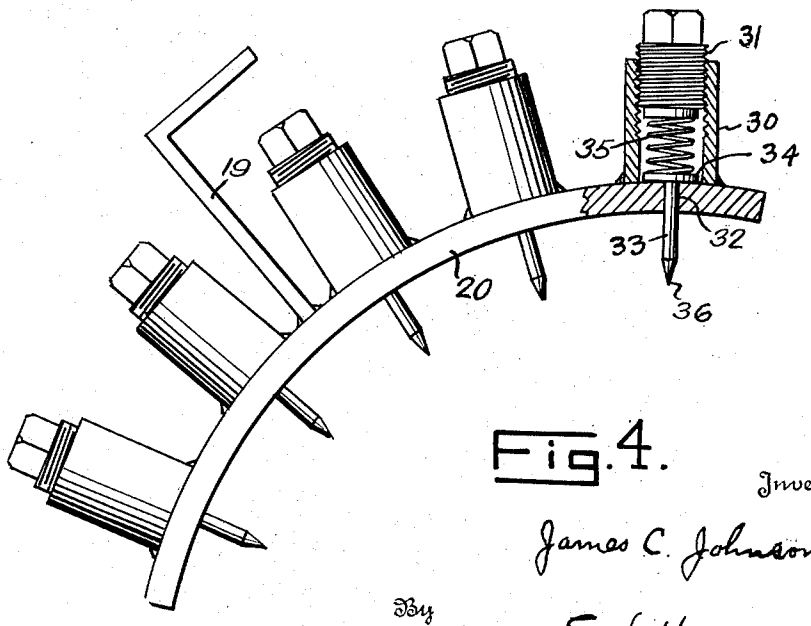


Fig. 4.

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UNITED STATES PATENT OFFICE

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ROTARY SCRAPING DEVICE FOR CLEANING SURFACE PITTED PIPE

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3 Claims. (Cl. 15—104.04)

1

This invention relates to a cleaner for surface pitted pipe.

It is an object of the invention to provide a machine of the character described specially designed to clean the external surface of pipe.

It is another object of the invention to provide a pipe cleaning machine which is specially designed for removing corrosion and other collections that may collect in the surface pits of pipe which has become pitted.

The invention embodies a rotatable head supporting inwardly projecting spikes whose inner ends are pointed and which contact with the pipe surface and enter the pits thereof, to remove foreign matter therefrom, as the head rotates about the pipe.

The invention also includes means for holding the spikes yielding against the surface of the pipe and for adjusting the compression on said yieldable holding means as desired.

The invention is adaptable for use in a stationary machine wherein pipe is moved through the head of the cleaner but is also adaptable for use on a machine which may be mounted to move along the pipe during the cleaning operation.

With the above and other objects in view the invention has particular relation to certain novel features of construction, operation and arrangement of parts, an example of which is given in this specification and illustrated in the accompanying drawings, wherein:

Figure 1 is a side elevation of a traveling type of pipe cleaner, embodying the invention and shown mounted on the pipe to be cleaned.

Figure 2 is a transverse, sectional view of the pipe illustrating the co-operation of the cleaning spikes with the surface thereof.

Figure 3 is a transverse, sectional view taken on the line 3—3 of Figure 1.

Figure 4 is an end view of a section of the head, partly in section, and

Figure 5 is a fragmentary, plan view of a section of the head.

Referring now more particularly to the drawings wherein like numerals of reference designates the same parts in each of the figures, the numeral 1 designates a supporting frame which, in the present illustration, is mounted on the front and rear carrier wheels 2 and 3 which are designed to move along the pipe 4, to be cleaned, as a track.

On the axle of the front wheels 2 there is a gear 5 which is in mesh with, and driven by, a gear 6 which is fixed on the longitudinal shaft 7,

2

which is mounted to rotate on the frame. Also fixed on this shaft 7 there is a spur gear 8 which is in mesh with and driven by a corresponding spur gear 9 which is fixed on the shaft 10 of the driving motor 11 which is mounted on the frame.

Fixed on the shaft 10 there is also a driving gear 12 which is in mesh with and drives an intermediate gear 13 mounted on the frame and this last mentioned gear is in mesh with and drives a ring gear 14 adapted to surround the pipe 4.

Fixed to and extending forwardly from the ring gear 14 there are the spindles 15, four of said spindles being shown in the present illustration.

Rotatably mounted on these spindles 15 are the rollers 16 which run in the inside groove of a channel-shaped circular track 17 which is fixed to the frame.

Each spindle 15 is extended forwardly, and pivotally mounted on the extended end of each spindle 15 there is an arm 18, said arms extending in corresponding directions from the respective spindles and fastened to the free ends of these arms, preferably by means of removable bolts, there are the brackets 19 whose outer ends are overturned to form the required bearing surfaces against the corresponding arms 18.

Secured to the inner ends of the brackets 19, preferably by welding, are the head sections 20 which are of arcuate shape. In the present illustration four sections are shown to completely encircle the pipe 4 and this head may be of any selected length.

Mounted on the free end of each arm 18 opposite the corresponding bracket there is a strong coil spring 21 and there are the tension levers 22 pivoted to the rearwardly extended lugs 23 of the arms 18. One end of each lever 22 rests on a spring 21 and threaded through the other end of said lever 22 there is an adjusting screw 24 whose inner end engages the outer margin of the corresponding arm 18. The compression of the springs 21 may be regulated by the adjustments of the screws 24 so that the sections of the head will be yieldingly mounted in order to provide a more flexibly mounted cleaning head.

The head is, preferably, formed of longitudinal sections having the coinciding outwardly turned ears 25 at the ends of the sections. Bolts 26 extend through adjacent ears 25, said bolts having heads 27 on one end and adjusting nuts 28 on their other ends. Between each nut and the opposing ear and surrounding the corresponding bolt there is a coil spring 29. The head is thus

expansible and its diameter may be regulated by adjusting nuts 28.

Mounted externally on each section 20 of the head, preferably by welding, there are the cylinders 30 whose outer ends are internally threaded to receive the adjusting plugs 31. Any number of series of cylinders 30 may be provided depending upon the length of the head, two series being shown in the present illustration.

Aligned with the cylinders 30 and extending through the head sections are the radial bearings, as 32, and the spikes 33 which extend through said bearings and are provided, at their outer ends, with enlarged heads 34 which limit their inward movement.

Strong coil springs 35 are located in said cylinders between the heads 34 and the adjusting plugs 31.

The inner ends of the spikes 33 are formed with sharp points 36.

When the machine is mounted on the pipe the inner ends of the spikes 33 will come into contact with the surface of said pipe and the sections of the head should be so adjusted that the spike heads 34 will be held a distance outwardly from the head section 20 so that the said spikes will have sufficient range of movement to enter surface pits, as 37, in the pipe.

The head is rotated about the pipe through the driving mechanism above described and at the same time the machine moves forwardly along the pipe and the points 36 of the spikes will enter the surface pits as the head rotates and the machine moves along so as to clean out the surface pits and remove all corrosion and other foreign matter therefrom preparatory to treating the surface of the pipe after the surface has been thoroughly cleansed.

The resistance of the points of the spikes against the pipe surface may be regulated by adjusting the plugs 31 and the nuts 28.

Should any portion of the head become worn or damaged, requiring replacement or repair, the disabled section may be easily unbolted from its corresponding arm 18 and a new one readily substituted for it.

The pipe cleaning head, as shown, is mounted on a travelling type of pipe cleaning machine but it may be incorporated into a stationary type of machine as well; and for convenience in assembly the ring gear 14 may be formed of sections secured together in any preferred manner as by the bolts 38.

The drawings and description are illustrative merely while the broad principle of the invention will be defined by the appended claims.

What I claim is:

1. In a pipe cleaning machine, a substantially cylindrical rotatably supported head shaped to surround a pipe to be cleaned and formed of peripheral sections, means for yieldingly connecting said sections together to allow the circumference of the head to vary so as to accommodate pipe of varying diameters and spikes yieldingly mounted on the sections and extended inwardly to engage the surface of the pipe.

2. In a pipe cleaning machine, a rotatable cylindrical head formed of sections yieldingly connected together and shaped to surround a pipe to be cleaned, spikes yieldingly mounted on the head and extended inwardly to engage the surface of the pipe and whose inner ends are pointed, and means for rotating the head.

3. In a pipe cleaning machine, a supporting frame, a circular track fixed to, and depending from, the frame, a ring gear adapted to surround the pipe and spaced from the frame, spindles extending from the gear ring in parallel relation, anti-friction means on the spindles which run in said track, an arm pivotally mounted on each spindle, said arms extending in corresponding directions from the respective spindles, inwardly extended brackets fastened to the free ends of said arms, arcuate head sections secured to the inner ends of the brackets which complement each other and completely encircle the pipe to be cleaned, resilient means acting radially inwardly against the free ends of the arms, means yieldingly connecting the adjacent ends of said sections, cylinders extending radially outwardly and secured to each section, said sections having radial bearings aligned with the corresponding cylinders, spikes extending inwardly through said bearings and whose inner ends are pointed, means limiting the inward movement of said spikes and yieldable means in the cylinders acting against the spikes to permit the spikes to yield outwardly.

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