

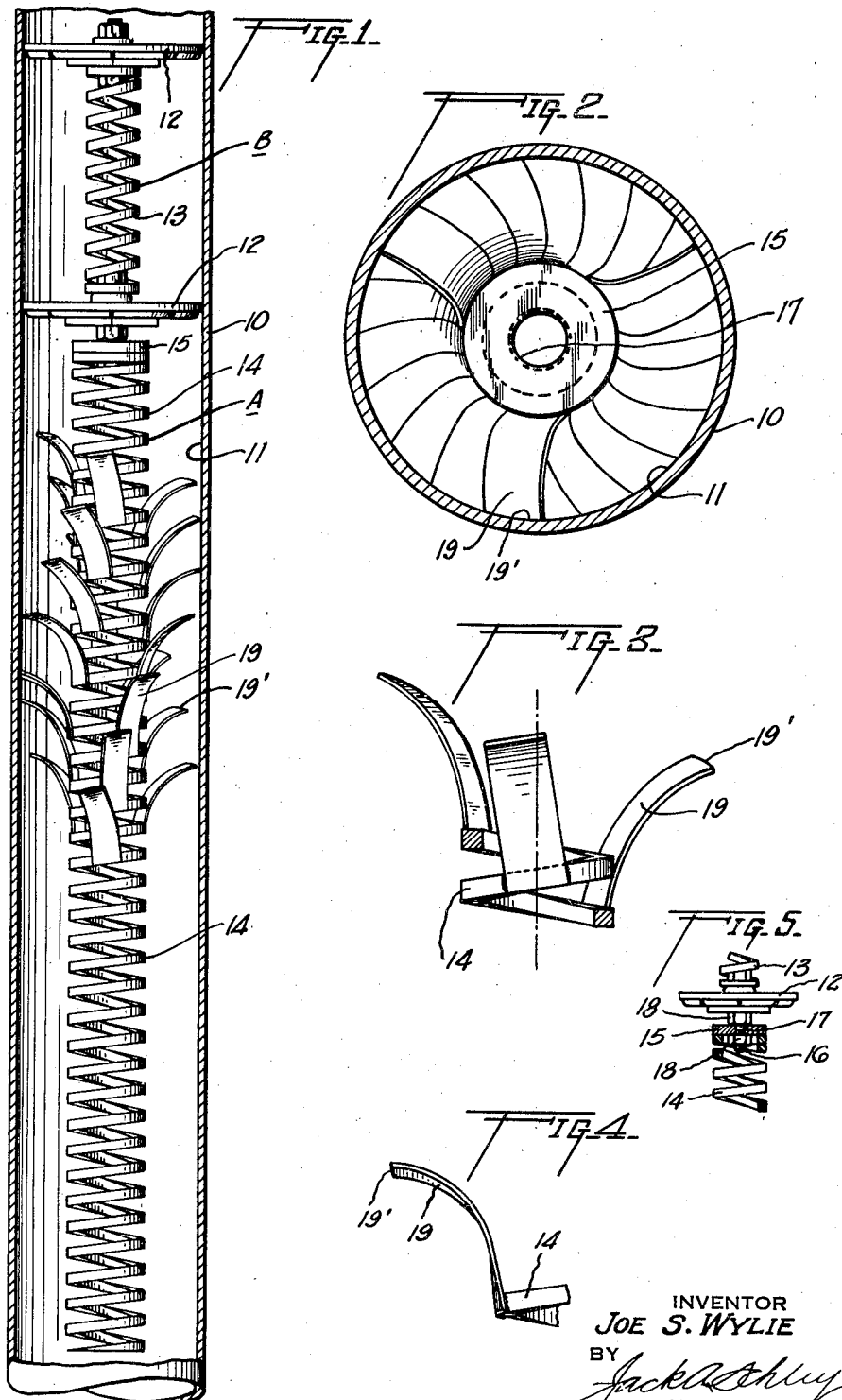
Sept. 17, 1940.

J. S. WYLIE

2,214,982

PIPE CLEANER

Filed June 16, 1938



INVENTOR  
JOE S. WYLIE

BY *Jack A. Kelly*  
ATTORNEY

## UNITED STATES PATENT OFFICE

2,214,982

## PIPE CLEANER

Joe S. Wylie, Oklahoma City, Okla.

Application June 16, 1938, Serial No. 213,980

2 Claims. (Cl. 15—104.06)

This invention relates to new and useful improvements in pipe cleaners.

One object of the invention is to provide an improved device for cleaning or scraping the bore of a pipe, or other tubular element, which is simple and economical to manufacture and efficient in operation.

An important object of the invention is to provide an improved cleaner for a tubular member having a plurality of scraper blades which are arranged to spiral through the bore of the member and which co-act with the wall of said bore to produce a shearing or shaving action, whereby removal of accumulation on the wall of said bore is assured.

Another object of the invention is to provide an improved pipe cleaning device which is capable of a flexing movement longitudinally thereof, whereby the cleaning may pass sharp bends and curves in the pipe while maintaining scraping contact with the wall of the pipe bore; the construction also permitting the cleaner to pass large obstructions or projections on the wall of the bore so as to obviate the danger of the device becoming lodged in the pipe at an inaccessible point therein.

A further object of the invention is to provide an improved pipe cleaning device having an axial support with a plurality of scraper blades mounted on the support, said blades being disposed at various elevations on the support and also at different radial positions therearound, whereby the blades co-act to form a circumferential scraping member; each blade being so mounted that its scraping edge contacts the wall of the bore of the pipe at an angle, whereby the device spirals through the pipe bore to produce a shearing action.

A construction designed to carry out the invention will be hereinafter described, together with other features of the invention.

The invention will be more readily understood from a reading of the following specification and by reference to the accompanying drawing, in which an example of the invention is shown, and wherein:

Figure 1 is an elevation of a pipe cleaning device, constructed in accordance with the invention and located within a pipe which is shown in section,

Figure 2 is a plan view of the device,

Figure 3 is an enlarged view showing the mounting of the scraper blades,

Figure 4 is a side elevation of one of the blades, and

Figure 5 is a transverse, vertical, sectional view of the upper portion of the device and showing the connection with the piston.

In the drawings, the numeral 10 designates a pipe, or other tubular member, having a bore 11. As is well known, the wall of the bore may have a coating of foreign matter which accumulates thereon and for removing this coating, a pipe cleaning device A is provided. The device is connected to a piston B which includes two piston elements 12 which are connected to each other by a coiled spring 13. The piston having the cleaner A attached thereto is inserted within the bore 11 of the pipe and when a fluid pressure is applied to the piston, said piston and cleaner are moved through the pipe. The piston B forms no part of the present invention and is, therefore, subject to variation.

The invention resides in the pipe cleaner A which includes an elongate, helical, coiled spring 14 having a flat plate 15 welded, or otherwise secured to one end thereof. The spring forms the core of the cleaner and its coils have a diameter substantially less than that of the pipe bore 11, whereby said core may move freely through the bore. For fastening the spring 14 to the piston B, a headed bolt 16 extends through the lower piston element 12 and has its extremity passing through an opening 17 in the plate 15 and nuts 18 are threaded on the bolt and abut opposite sides of the plate, whereby, the plate is confined between said nuts and is thereby fastened to the bolt and piston. It is noted that although this method of securing the spring and the piston together has been found satisfactory, other means may be employed.

The spring 14 which forms the core of the cleaner is constructed of a single length of material, which is angular in cross section, whereby the outer surface of each spring coil is flat as clearly shown in Figure 3. A plurality of curved, scraper blades 19 have their lower ends welded, or otherwise secured, to the flat outer surfaces of the coils of the spring 14. The upper ends of the blades are curved outwardly and arranged to contact the wall of the pipe bore 11. The blades are flat being preferably constructed of spring steel, and may be heat treated with the spring after being attached to said spring, whereby each blade is flexible within certain limits. The inherent resiliency of each blade holds its upper scraping edge 19' in contact with the wall of the bore.

The mounting of the blade is an important feature of the invention and as shown in Figure

3, each blade has its lower end secured to the outer surface of the spring coil in such manner that its lower edge is parallel to the underside of the turn of the coil to which it is attached.  
5 This causes the longitudinal center of the blade to be disposed at substantially a right angle to the turn of said coil and locates the upwardly extending blade at an angle with relation to the axis of the spring 14, whereby the upper scraping edge 19' of the blade is inclined with relation to a horizontal plane. Although it is preferable that each blade extend at substantially a right angle to the turn of the coil to which it is attached, this angle may vary and it would be possible to dispose the blade parallel to the vertical axis of the spring 14, although in the latter case, a less efficient scraping action would be had.

The blades 19 have been shown as mounted only on the upper portion of the spring 14 but in actual practice, sufficient blades are provided to extend throughout the length of the spring. The blades at the lower portion of the spring have been omitted to more clearly illustrate the spring. As explained, the blades are secured to the outer surface of the spring and follow the turns of said spring, which disposes each blade at a different elevation. The blades are spaced sufficiently close to each other so that, in plan, the longitudinal edge portions of adjacent blades overlap each other. The spacing between the blades is controlled by the width of said blades and will vary as blades of different widths are employed. By spacing the blades at different radial positions around the spring or core 14 in overlapping relation, it is obvious that said blades co-act with each other to form a circumferential scraper, (Figure 2) whereby as the device moves through the bore 11, the entire surface of the bore is contacted by said blades.

The operation of the device is obvious. As a

fluid pressure is applied to the piston B, the spring core 14 is moved axially through the pipe bore and the inclined scraping edges 19' of the blades 19 contact the wall of the bore 11. Due to their inclination the scraping edges tend to spiral through the coating or accumulation on the wall of the bore, whereby a shearing action is produced, which efficiently removes said coating. Since the blades are flexible, it is manifest that they will readily pass any obstructions or projections on the wall of the bore. The core or spring 14 is capable of longitudinal flexing, which permits the device to readily pass through bends or turns in the pipe. When passing through a bend or turn, it is manifest that the blades on one side of the core will be placed under tension, while the blades diametrically opposite will spring outwardly so as to remain in contact with the wall, whereby the scraping action is continued throughout the movement of the device through the bend or turn. Although the cleaner has been described as cleaning a vertically extending pipe, it is manifest that it may be used in horizontal pipes, as well as in pipes disposed at an inclination.

What I claim and desire to secure by Letters Patent is:

1. A cleaning device for a tubular member including, an elongate coiled spring having a transverse diameter less than the diameter of the bore of the member, and a plurality of curved scraping blades mounted on the coils of the spring and adapted to engage the wall of the bore.

2. A cleaning device for a tubular member including, an elongate helical spring, and a plurality of scraping blades secured to the spring and disposed at various radial positions therearound, the blades being axially spaced along the turns of the spring whereby each blade is in a different plane on said spring.

JOE S. WYLIE.