May 19, 1931.

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APPARATUS FOR CLEANING TUBES

Filed July 19, 1928

INVENTOR

[Signature]
This invention relates generally to an apparatus for cleaning the inside of tubes and more particularly to an apparatus for cleaning mud, silt, soft scale and the like from the inside of tubes of surface condensers.

In the use of such apparatus as surface condensers water circulates through the inside of the tubes and this water after a time deposits soft scale and mud within the tubes so that it is necessary from time to time to remove such deposits. I have found that these deposits may be removed by inserting a plug into one end of the tube and forcing the plug through the tube under the influence of a fluid under pressure. The plugs which I prefer to employ are of a resilient nature and may advantageously be made of rubber. I prefer to employ air under pressure as the fluid for forcing the plugs through the tubes which are to be cleaned.

The single figure of the drawing is a longitudinal sectional view of a device employed in the carrying out of my invention.

Referring to the drawing the device comprises a casing designated generally by the numeral 2 and consisting of an upper portion 3 and a lower portion 4. The upper portion 3 of the casing provides a space in which a plunger 5 is slidably arranged. The plunger is connected at its forward or right hand end to a nozzle 6 by means of a screw coupling 7. At the opposite or left hand end of the plunger 5 the space within the plunger casing 3 is provided with a spring 8 which contacts at its right hand end with a collar 8a screwed onto the plunger to hold the removable liner 8b in place and at its left hand end against a screw plug 9 which forms a closure for the space in which the plunger 5 is slidably mounted. The plunger is further provided with ports 10 which are adapted to cooperate with and a line with a conduit 11 provided in the lower portion 4 of the plunger casing 2 when the plunger is forced to its left hand position. The conduit 11 is connected by means of a screw coupling 12 and tube 13 to a source of fluid pressure (not shown). This casing and plunger construction constitutes a parallel sleeve type valve.

A tube 14, the inside of which it is desired to clean, is mounted on a tube plate 15. A ferrule 16 is mounted in the tube plate and provides a tight connection between the nozzle 6 and the tube 14 because of packing 17 inserted in an opening in the tube plate between the tube and the ferrule.

In cleaning the insides of tubes in accordance with my invention, a number of plugs which preferably are of a resilient nature, such as rubber plugs 18, are inserted into one end of the tubes 14. The nozzle 6 of the device is inserted into the ferrule 16 and pressure is exerted against the device in the direction of the nozzle.

This pressure forces the plunger 5 to the left as shown in the drawing, thus compressing the spring 8 and aligning the ports 10 of the plunger with the conduit 11 connected to a source of fluid pressure. The fluid pressure is thus admitted through the conduit 11, port 10, plunger 5 and nozzle 6 into the tube 14 and forces the plug 17 through the tube, thus expelling the deposits from the inside of the tube. Upon the release of pressure against the device or the withdrawal of the nozzle from the ferrule the spring 8 which has been compressed forces the plunger 5 to the right as shown in the drawing, thus closing the ports 10 from the conduit 11. This the spring readily accomplishes, since the valve is obviously of such construction that it is balanced with respect to pressure.

It will be seen that my invention provides an apparatus for cleaning soft deposits from the inside of tubes in the practice of which, after inserting plugs into the ends of a number of tubes it is only necessary to insert the nozzle of the device into the tube and exert pressure on the device in the direction of the nozzle. When the nozzle is withdrawn from one tube the fluid under pressure is immediately cut off and is not used until the nozzle is inserted into another tube and until pressure is exerted on the device.

While I have described in detail a pre-
ferred embodiment of my invention, it is to be understood that the invention is not so limited but may be otherwise embodied within the scope of the following claim.

I claim:

A device for driving slugs through tubes, comprising a hollow casing having a port communicating with a fluid pressure supply pipe, a hollow plunger slidably mounted in said casing carrying a nozzle at its forward end, said plunger normally closing the port in said casing, resilient means to hold said plunger in normal position, said plunger having a port adapted to communicate with the port in said casing when said casing is forced forward on said plunger against said resilient means.

In testimony whereof I have hereunto set my hand.

NEIL THOMPSON.