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J. C. BAREISS

TUBE AND PIPE TESTING MACHINE

Filed June 24, 1924

Fig. 1.

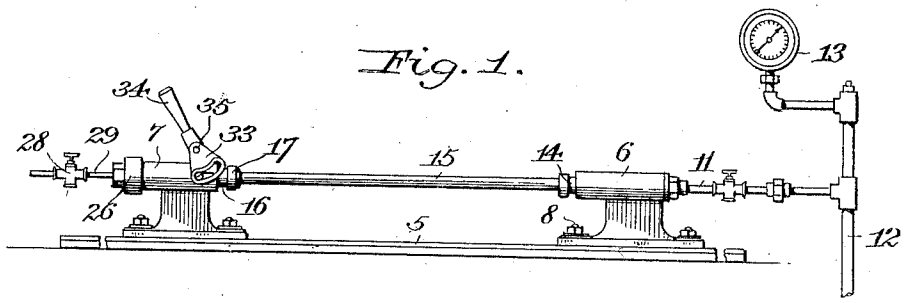


Fig. 4.

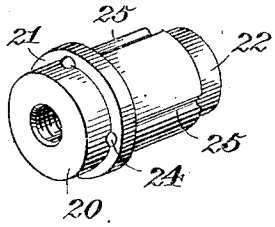


Fig. 2.

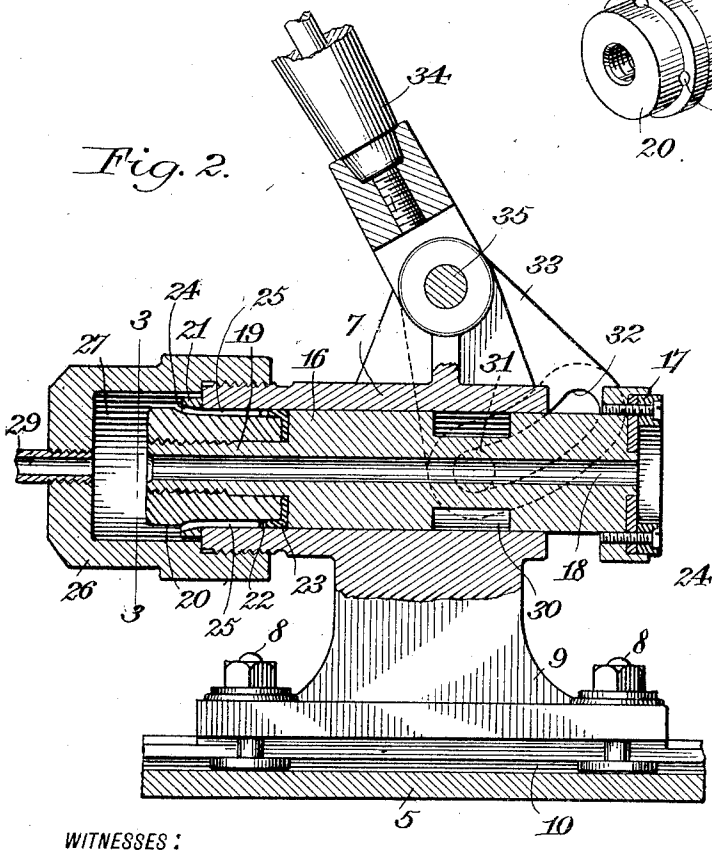
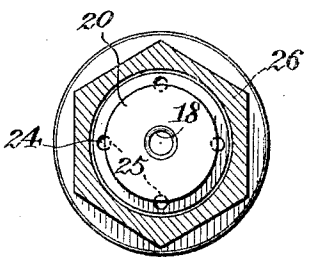


Fig. 3.



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UNITED STATES PATENT OFFICE.

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TUBE AND PIPE TESTING MACHINE.

Application filed June 24, 1924. Serial No. 722,151.

This invention relates to improvements in pipe and tube testing machines, and has particular reference to such machines as disclosed in my Patent No. 1,422,522, issued July 11, 1922.

In said patent, the operation of clamping a tube or pipe in position for a test is utilized to simultaneously effect the admission of a fluid under predetermined pressure into the tube to be tested. When clamping the tube in position a balanced cranking device is employed including a weighted crank arm associated with one of the tube holders and functioning to move said holder longitudinally to retain the tube in position between said holders and actuate the latter holder to control the admission of the fluid under pressure into the tube.

According to the present invention the retention of the tube in position between the holders, while a test is being made, is accomplished by the utilization of the fluid pressure which is admitted to the tube.

The inventive idea involved is capable of receiving a variety of mechanical expressions one of which, for the purpose of illustrating the invention, is shown in the accompanying drawings; but it is to be expressly understood that said drawing is utilized merely for the purpose of facilitating the description of the invention as a whole and not to define the limits thereof, reference being had to the appended claims for this purpose.

In the drawing—

Figure 1 is a fragmentary side elevation of the machine constructed in accordance with the invention;

Figure 2 is a vertical longitudinal section through one of the tube holders and its associated parts;

Figure 3 is a transverse section on the line 3—3 of Figure 2; and

Figure 4 is a detail perspective view of a bushing employed in connection with the holder shown in Figure 2.

The invention is shown in its preferred form as consisting of a base 5 of any suitable length above which are supported the casings 6 and 7 adjustable longitudinally of the base to vary the distance between said casings so as to accommodate tubes of different lengths. Any suitable means may be provided for accomplishing the adjustments of the casings 6 and 7 and in the drawing this means is shown as consisting of a plurality of bolts 8 extending through the supports 9 of the casings and having their heads engaged in the groove 10 formed in the base 5.

Each of the casings 6 and 7 contains different instrumentalities by means of which a tube to be tested is mounted in testing position and retained in such position during the test. The construction within the casing 6 is precisely the same as that disclosed in the right hand casing illustrated in the above-mentioned patent, and reference is made to said patent for a detailed understanding of this construction. Briefly, the outer end of the casing has connected thereto a valve-controlled inlet pipe 11 for admitting fluid under pressure into the casing from the main feed line 12. The fluid employed is preferably water, but may be air, steam, or other fluid, and in order to indicate the pressure of the fluid entering the casing a gauge 13 of any suitable construction may be connected to the line 12. At the inner end of the casing 6 the same has mounted therein a tube or pipe holder 14 providing a mounting for tubes of different forms, such as disclosed in said patent. The holder 14 is movable longitudinally in the casing 6 for the purpose of controlling the admission of fluid under pressure into the tube 15 to be tested, as fully disclosed in said patent.

The casing 7 is arranged on the base in direct axial alignment with the casing 6 and receives therein the tube holder 16, one end of which has secured thereto a recessed head 17 for receiving the adjacent end of the tube 15 to be tested. The holder 16 is provided centrally thereof with a longitudinally extending passage 18 preferably arranged in direct alignment with the tube 15 to be tested so that the fluid under pressure will pass through the tube and into said passage. The end of the holder 16 remote from the head 17 is reduced to provide a screw threaded extension 19 upon which is mounted a bushing 20 substantially cylindrical in formation and provided adjacent one end with an annular flange 21 adapted to engage the adjacent end of the casing 7, as shown in Figure 2 to limit the movement of the holder 16 in the direction of the casing 6. The inner end 22 of the bushing is reduced and is utilized to retain in position a gasket or packing ring 23 interposed between the bushing and the adjacent enlarged portion of the

holder 16 so as to prevent the escape of the fluid around the holder. The flange 21 is provided at intervals with openings 24 therethrough which communicate with longitudinal grooves 25 formed in the outer periphery of the bushing so as to permit of the flow of fluid under pressure around the bushing and against the gasket 23, so as to force the packing firmly against the casing and at the same time exerting a pressure on the holder 16 which will aid in forcing the same in the direction of the casing 6 to retain the tube 15 in testing position after the same has been mounted between the holders 14 and 16. In order to confine the fluid so that the pressure thereof against the holder 16 will be maintained the end of the casing 7 adjacent the bushing 20 is externally screw threaded to receive thereon a member in the form of a nut 26, the closed end of which is spaced from the bushing to provide a pressure chamber 27 in which the fluid passing through the passage 18 accumulates after the valve 28 of the outlet pipe 29 communicating with said chamber is closed.

Means are provided for moving the holder 16 longitudinally in the casing 7 when mounting and demounting the tube 15. This means is substantially the same as that disclosed in the above-mentioned patent and briefly consists in providing the holder 16 intermediate its ends with an annular groove 30. As in the above patent suitable bearings 31 are formed on opposite sides of the holder 16 and extend into arcuate slots 32 in the lower bifurcated ends 33 of the crank arm 34. This crank arm is pivoted to the casing 7 at 35 and may be rocked back and forth about said pivot to produce longitudinal movements of the holder 16 in the casing 7.

In operation, the ends of the tube to be tested are first mounted in the adjacent ends of the holders 14 and 16 and the crank arm 34 is then swung to the position shown in the drawing to force the holder 16 in the direction of the casing 6. The pressure exerted against the adjacent end of the tube 15 is transmitted to the holder 14 and this latter holder being also movable longitudinally in its casing will operate to effect the admission of fluid under pressure from the main line 12 into the casing 6 and from thence through the tube 15 and into the chamber 27 through the passage 18, it being understood that at this time the outlet valve 28 has been closed. After the desired pressure has been attained an inspection of the tube may be made and in doing so the holders 14 and 16 may be rotated, as described in said patent, to enable the entire surface of the tube to be examined. As previously described the accumulation of the fluid in the chamber 27 creates a pressure which acts against the adjacent end of the holder 16 and the packing to force the same against the end of the tube 15 mounted in said holder and thereby effectively retains the tube 15 in its testing position. After the tube has been tested the valve 28 is opened to relieve the pressure in the chamber 27, whereupon the crank 34 may be moved about its pivot to a reverse position from that disclosed in the drawing to accomplish the withdrawal of the holder 16 from the adjacent end of the tube 15 whereupon said tube may be removed from the machine. Upon relieving the pressure of the tube 15 against the holder 14 in the casing 6 the mechanism in said casing is automatically controlled, as described in said patent, to shut off the fluid entering the casing 6 through the pipe 11.

What is claimed is:

1. In a tube testing machine, a casing having a chamber at one end, a longitudinally movable tube holder in the casing and having a longitudinal passage and a reduced end, a bushing on the reduced end of the holder and provided with peripheral passages and with a stop for engaging one end of the casing to limit the movement of the holder in the casing, and a packing between the bushing, holder and casing, means for holding the bushing on the movable tube holder.

2. In a tube testing machine, a casing having a cap on one end forming therewith a chamber, a longitudinally movable tube holder in the casing and having a longitudinal passage and reduced end, a bushing on the reduced end of the holder, and provided with a flange adapted to engage the end of the casing to limit the movement of the holder, means for holding the bushing on the movable tube holder, the bushing also provided with longitudinal passages and its flange with openings registering with said passages, and a packing between the bushing, holder and casing.

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