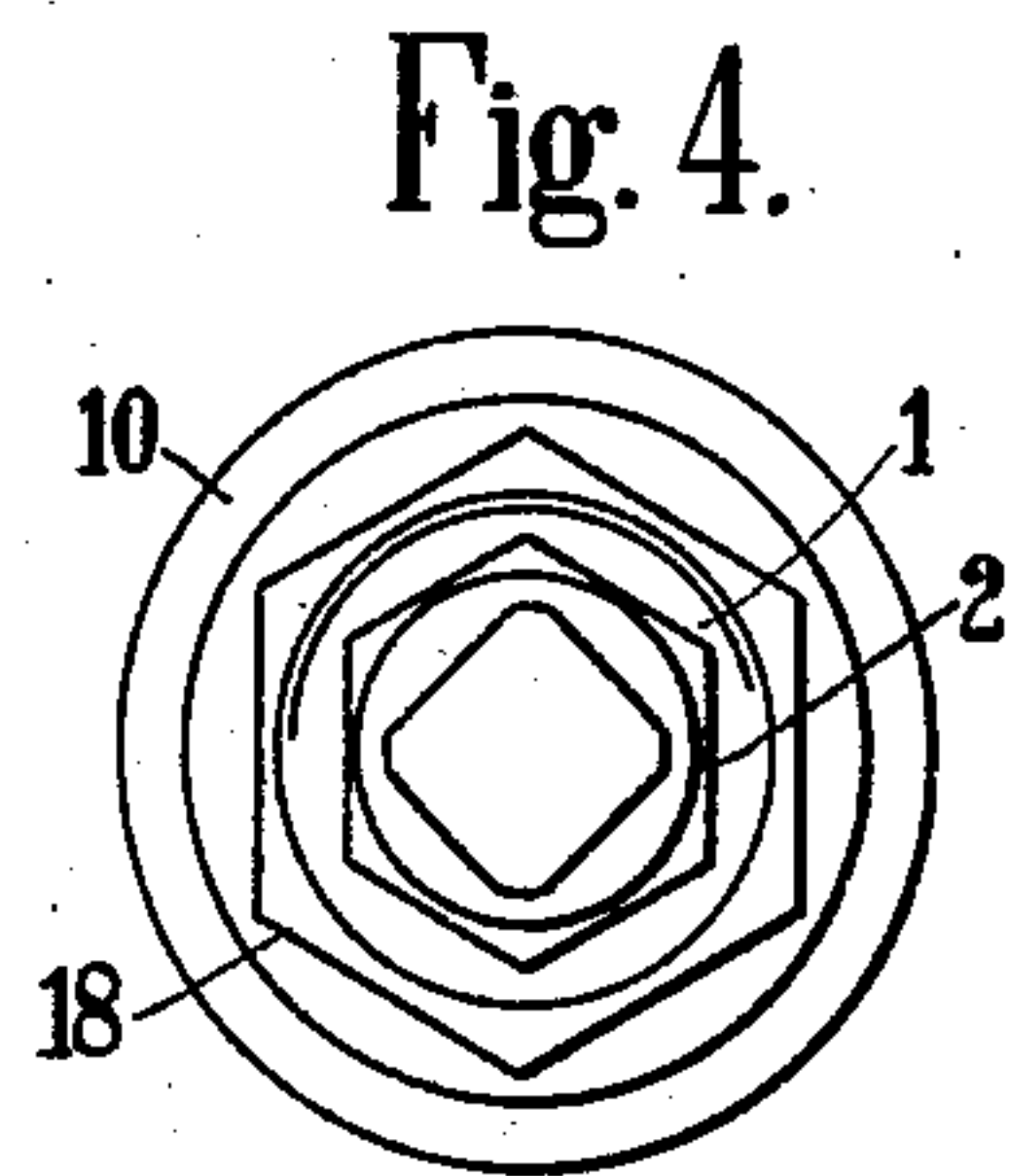
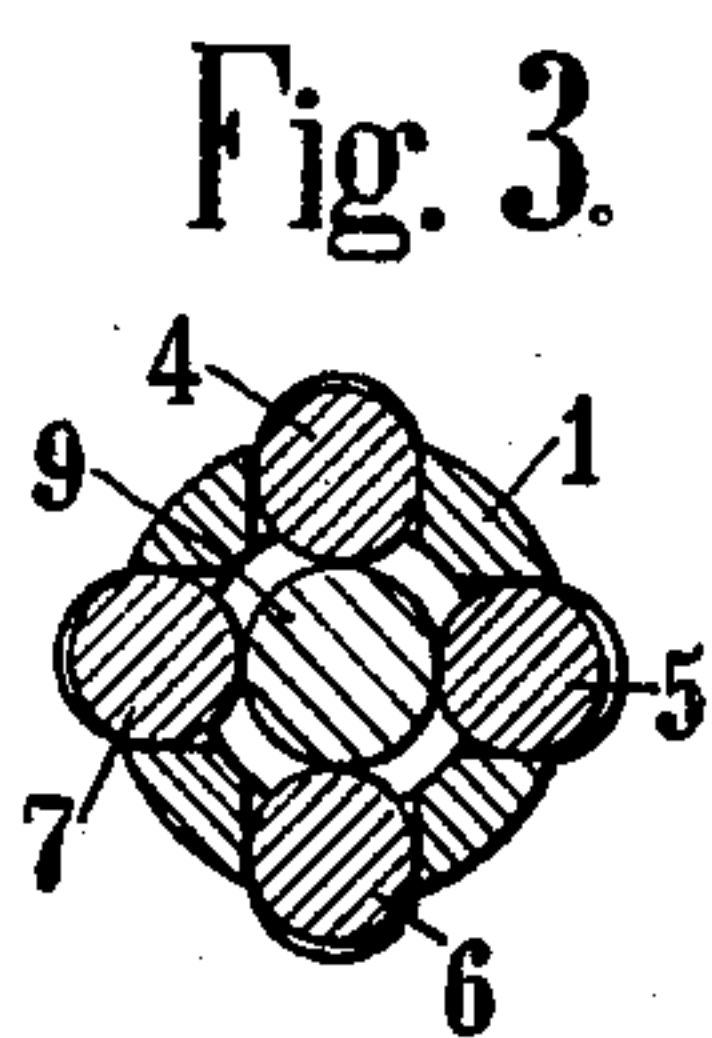
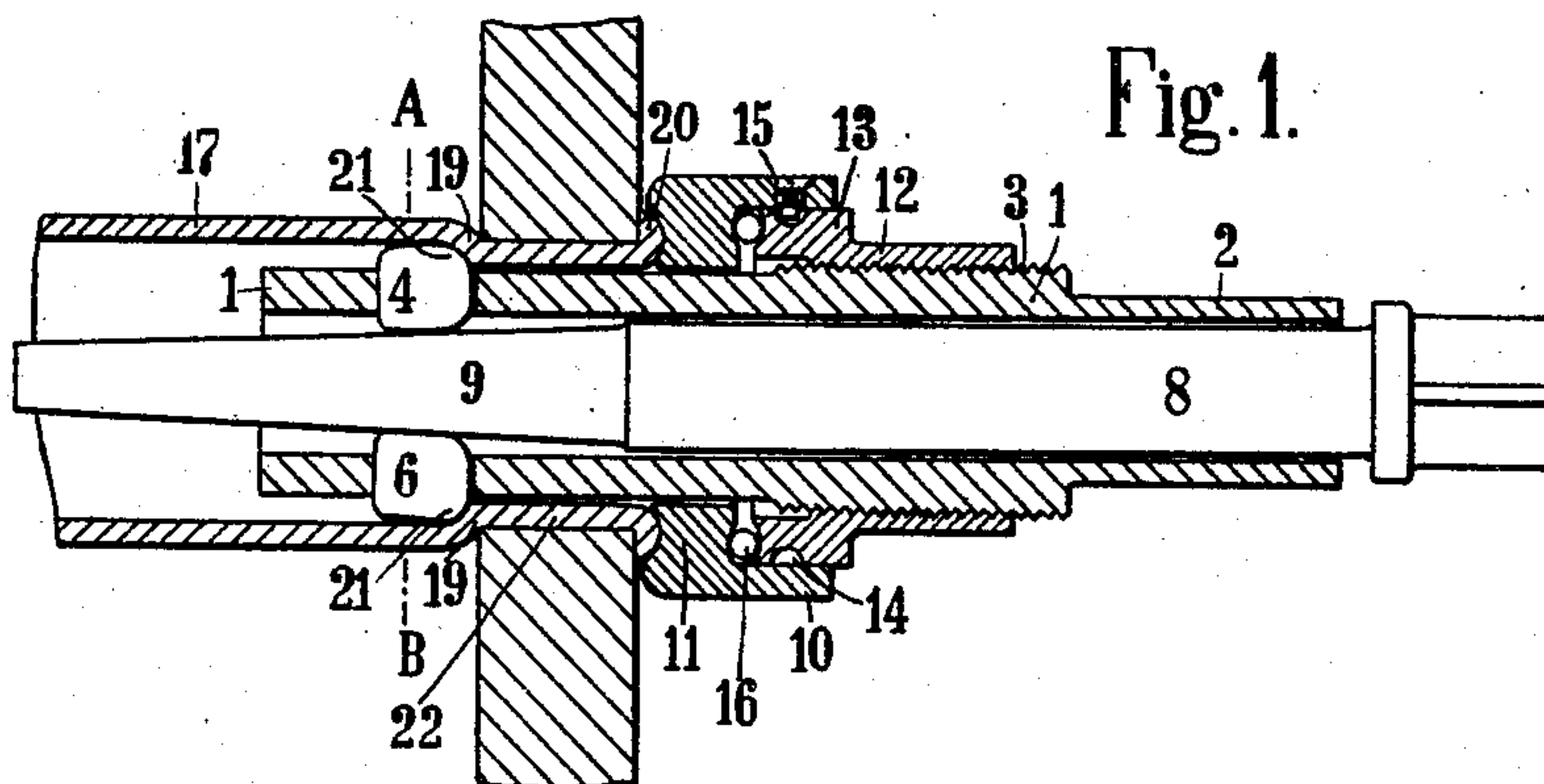
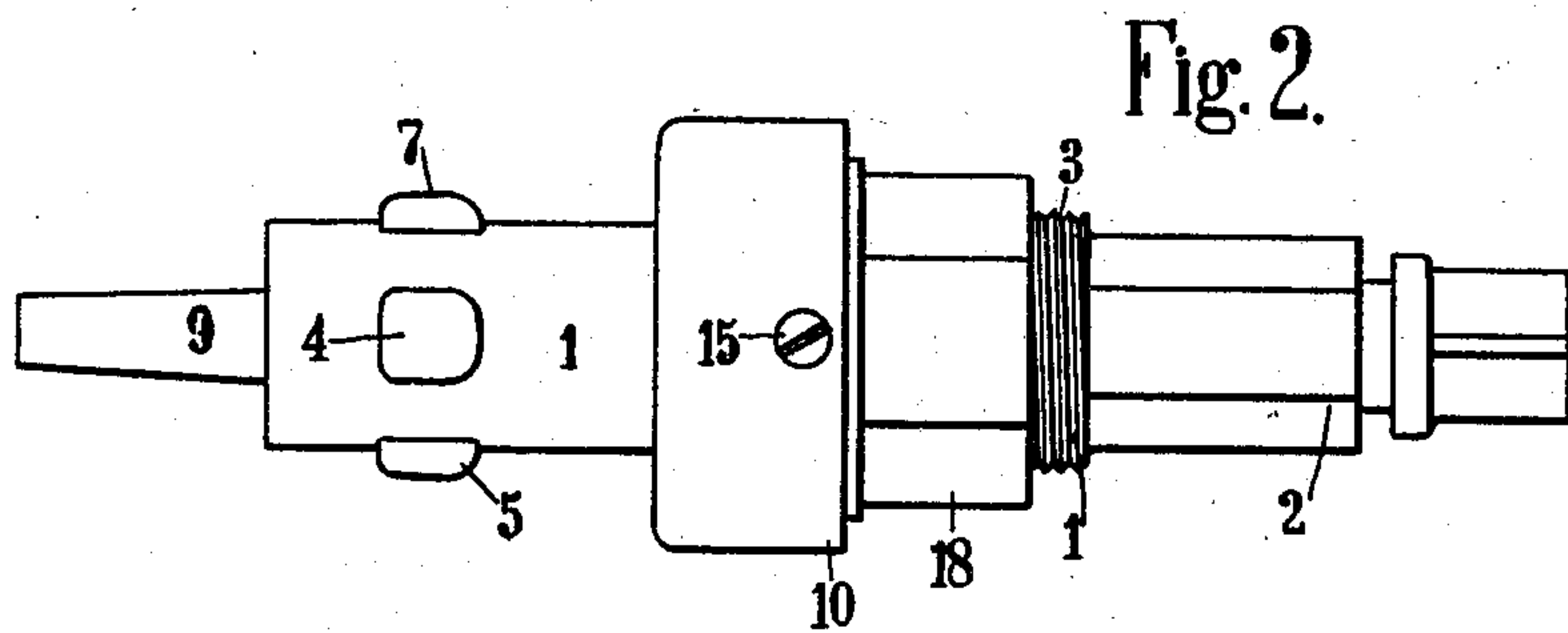


No. 889,242.

PATENTED JUNE 2, 1908.

H. KUNTZE.
DEVICE FOR CALKING BOILER TUBES.
APPLICATION FILED NOV. 7, 1907.



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UNITED STATES PATENT OFFICE.

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DEVICE FOR CALKING BOILER-TUBES.

No. 889,242.

Specification of Letters Patent.

Patented June 2, 1908

Application filed November 7, 1907. Serial No. 401,121.

To all whom it may concern:

Be it known that I, HERMANN KUNTZE, a subject of the German Emperor, and residing at Gleiwitz, in the Kingdom of Prussia and the Empire of Germany, have invented certain new and useful Improvements in Devices for Calking Boiler-Tubes, of which the following is a specification.

The subject-matter of the present application is a device for calking boiler-tubes in the boiler plates. This device is not applied until after the boiler-tubes have been drawn into the boiler and calked in both boiler tube-plates by means of the well-known calking machines and not until after they have been trimmed. By means of the new device the boiler-tubes are further calked in the boiler plates, this calking consisting in slightly expanding the boiler-tube behind the tube-plate and in effectively compressing it longitudinally. For this purpose the new device is so contrived that the pressure-rollers provided on a shell or casing can be pressed not only normally to the axis of the shell but also parallel to the axis of the tube against the wall of the tube and the tube-plate in which the tubes are fitted.

The invention is illustrated in the accompanying drawing, in which:—

Figure 1 is a longitudinal section, Fig. 2 a side elevation, Fig. 3 a cross-section on the line A—B of Fig. 1, and Fig. 4 an end elevation.

As is evident from the drawing the device according to the present invention consists of a steel shell 1. The same is provided at one end with the hexagon 2 and the screw-thread 3 and at the other end with openings for the passage therethrough of the four pressure-rollers 4, 5, 6, 7 (Fig. 3). The latter are of the shape of a cylinder provided on its inner end, that is, on its working-surface with the rounded-off portion 21. A cylindrical mandrel 8 is introduced into the shell 1, said mandrel terminating in a conical portion 9. The conical portion 9 is situated between the four pressure-rollers 4, 5, 6, 7. By means of the conical portion 9 the pressure-rollers are forced outwards through the openings in the shell 1 so that they are displaced normally to the axis of the shell 1.

The shell 1 is surrounded by a socket 10 which terminates in a pressure-plate 11. The socket 12 provided with the hexagon 18 is revolvably supported in the socket 10. Said socket 12 possesses the internal thread

for the thread 3 on the shell 1. The thickened portion 13 of the socket 12 is provided with a groove 14 into which the screw 15 projects. The latter prevents the removal of the socket 12 from the socket 10. In order to reduce as much as possible the friction which exists when the socket 12 is turned in the socket 10, balls 16 are provided between the parts 11, 13.

The manner in which the new device is manipulated is as follows:—After the boiler-tubes have been drawn into the boiler and calked in the two tube-plates by means of the usual calking machines and after they have been trimmed clean, the new device, as Fig. 1 shows, is introduced into a boiler-tube and set according to the thickness of the boiler-plate in which the tube is secured. After this the conical mandrel 9 is driven with moderate force between the pressure-rollers 4, 5, 6, 7 so that the pressure-rollers are displaced normally to the axis of the shell 1, that is, are applied against the internal surface of the boiler-tube 17. The socket 12 is then turned by means of a spanner. The result of this is that the shell together with the pressure-rollers 4, 5, 6, 7 is displaced parallel to axis of the tube 17 against the portion 19 of the tube, that is, the pressure-rollers are pressed against said portion. If now the shell 1 is turned by means of a spanner applied to the hexagon 2, the pressure-rollers 4, 5, 6, 7 will roll in contact with the internal surface of the tube to be calked so that a fairly pronounced roll is formed in the tube close behind the tube-plate. If now the socket 12 and then the shell 1 are again turned, the part 22 of the tube will be correspondingly upset. By alternately turning the socket 12 and thereby forcing the pressure-rollers 4, 5, 6, 7 against the part 19 of the tube, that is, by actuating the tightening device, and then rotating the shell 1, the above-mentioned roll is still further increased. During the rotation of the shell 1 and the socket 12 the socket 10 with the pressure-plate 11 does not participate in the rotation because the friction is for the most part done away with by means of the balls 16. Consequently the edge 20 of the tube remains protected from injury.

By turning the socket 12 in the opposite direction the shell 1 together with the pressure-rollers is moved into the boiler-tube 17, that is, the pressure-rollers are removed from the part 19 of the tube. Thus the pressure-rollers with the shell 1 are shifted towards the

end 9 of the mandrel 8, the consequence of which is that the pressure-rollers are able to approach the axis of the shell 1 so that nothing stands in the way of withdrawing the whole device from the boiler-tube.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

10 A calking device for boiler tubes comprising in combination, a rotatable sleeve provided with an external threaded portion and an exterior polygonal portion and a plurality of radial disposed openings, calking rollers 15 disposed in said openings, a mandrel loosely mounted in said sleeve and provided with an outer polygonal end and an inner conical end adapted to engage said rollers, a bearing member loosely mounted on said sleeve and 20 provided on one side with an annular tube engaging recess, said member being provided

on its opposite side with a recess forming vertical and horizontal portions, said vertical portion having an annular ball race, a retaining screw projecting through said horizontal 25 portion into said recess, a tightener sleeve having an external polygonal portion and internal threads engaging the external threads of said first mentioned sleeve, said tightener sleeve having a flange provided 30 with an annular peripheral groove receiving said retaining screw and having an annular ball race opposite the race formed in said bearing member, and antifriction balls disposed in said race. 35

In testimony whereof I affix my signature in presence of two witnesses.

HERMANN KUNTZE.

Witnesses:

ERNST KATZ,
ERNST BLEISCH.