

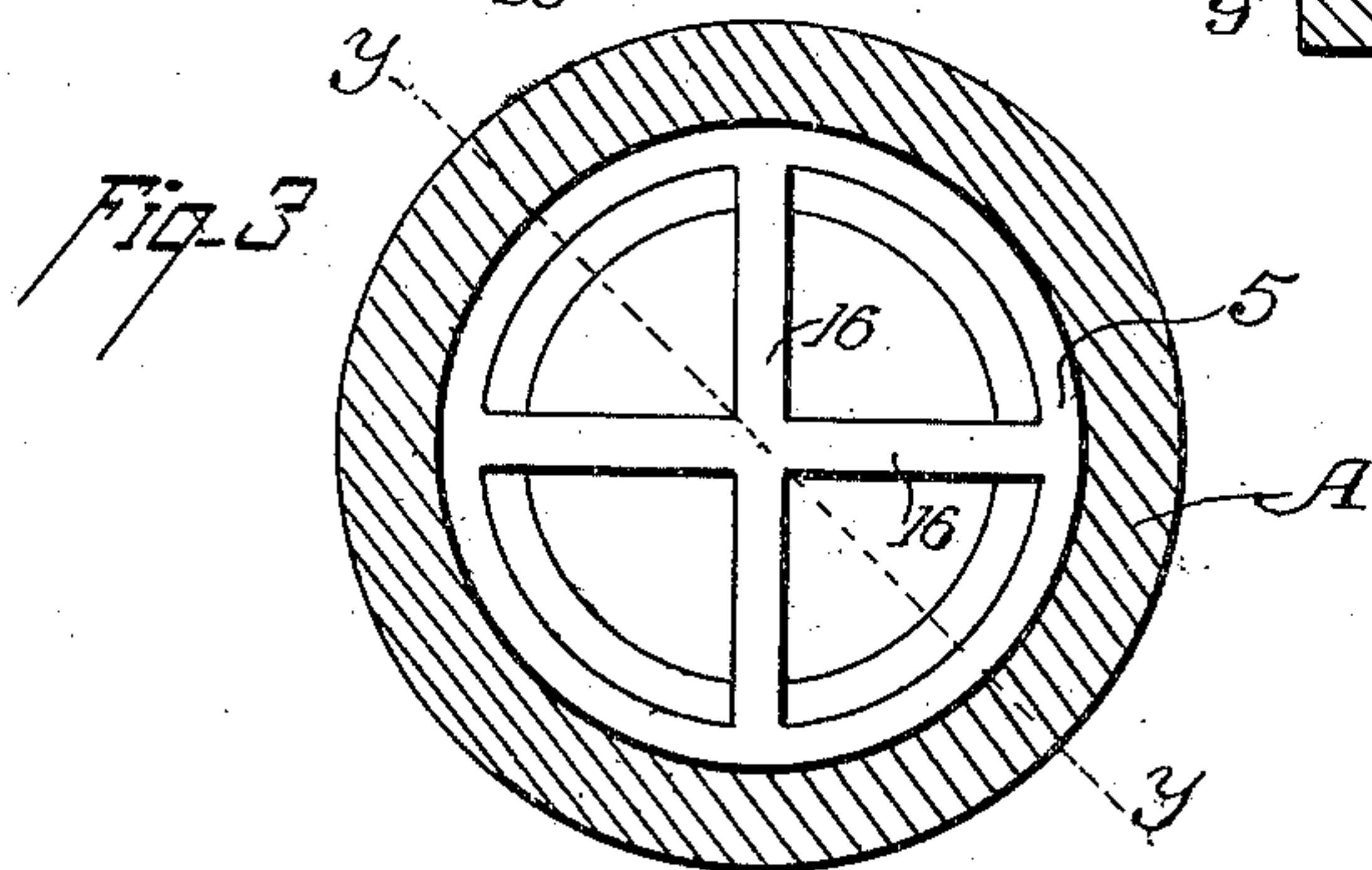
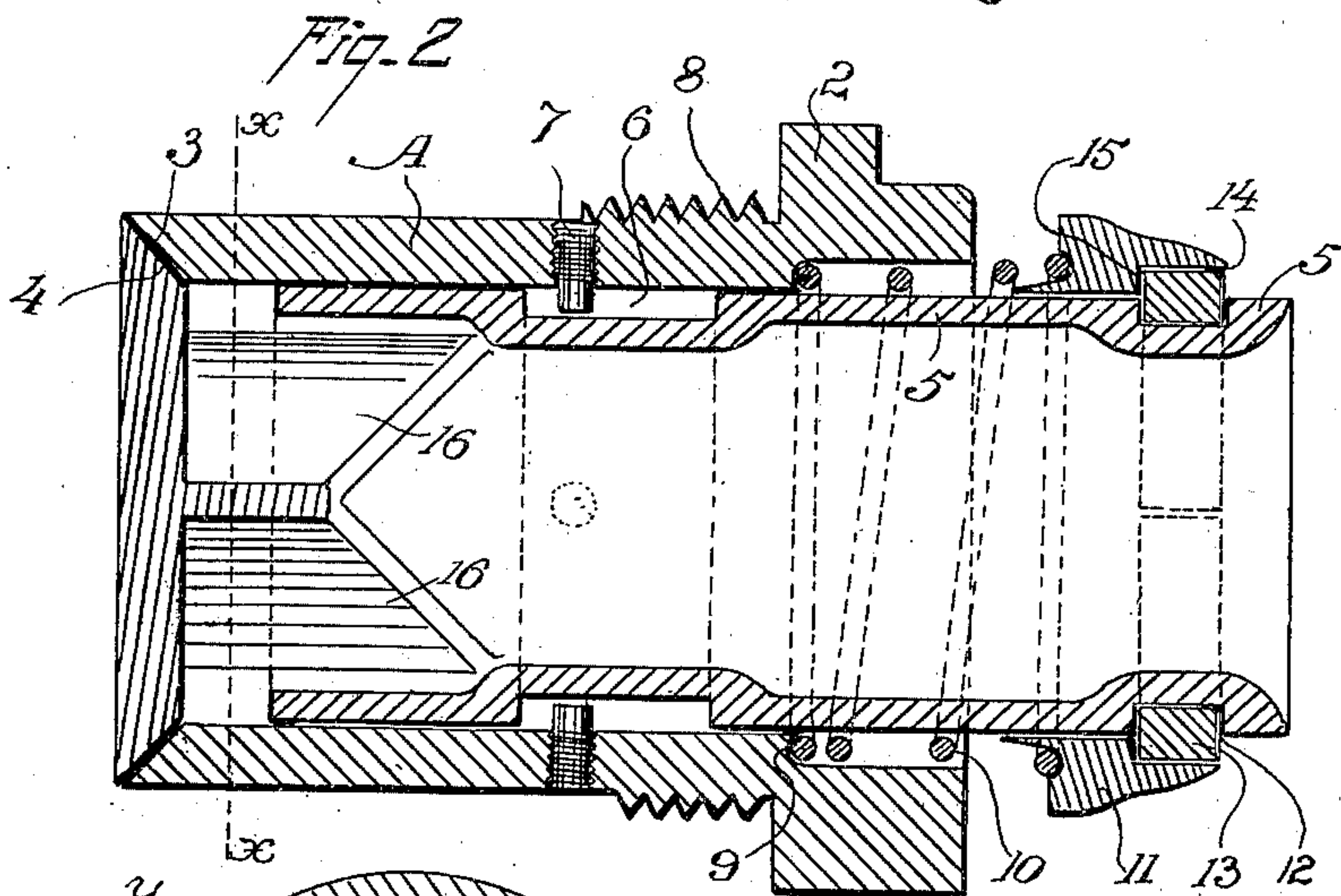
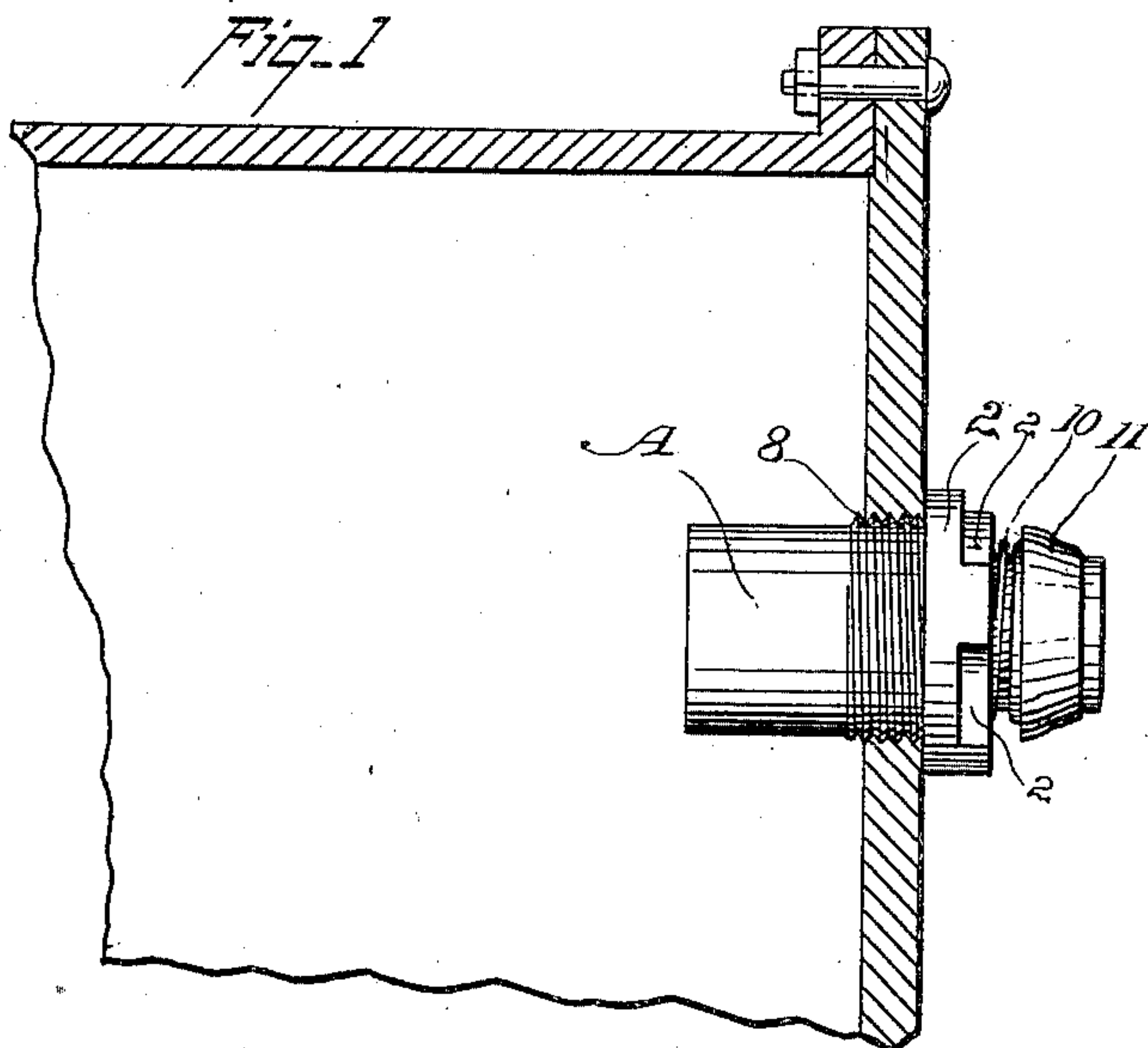
No. 684,565.

Patented Oct. 15, 1901.

W. H. CASTER.  
AIR COMPRESSOR VALVE.

(Application filed Apr. 2, 1901.)

(No Model.)



Witnesses,  
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# UNITED STATES PATENT OFFICE.

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## AIR-COMPRESSOR VALVE.

SPECIFICATION forming part of Letters Patent No. 684,565, dated October 15, 1901.

Application filed April 2, 1901. Serial No. 54,005. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM HOUGHTON CASTER, a citizen of the United States, residing at Angels Camp, in the county of Calaveras, State of California, have invented an Improvement in Air-Compressor Valves; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to an improved valve for air-compressors.

It consists of the parts and the constructions and combinations of parts hereinafter described and claimed.

The cylindrical valve-body has an annular channel cut around it near the opposite end from the seat, and a ring formed in segments fits this channel, projecting therefrom. A collar fits the outside of the valve-body, having a shoulder which abuts against the ring, and this collar has a groove on the inner side, against which a spring abuts to normally hold the valve in a closed condition. The inner face of this collar forms a broad surface, which when the valve is opened contacts against the corresponding surface of the valve-casing.

The whole device is easily removable and separable without difficulty. It also comprises details of construction, which will be more fully explained by reference to the accompanying drawings, in which—

Figure 1 is a side view of my improved air-compressor valve secured in the head of the air-receiving chamber, partly shown in section. Fig. 2 is a longitudinal section of the valve and casing, taken on the line *y y* of Fig. 3. Fig. 3 is a transverse section of the valve and casing, taken on the line *x x* of Fig. 2.

The object of my invention is to provide a durable valve and one easily separated or assembled.

In air-compressors and like apparatus such as are largely used in mining for operating drills and the like great difficulty is experienced by reason of the wear of the valves and the necessity for constantly replacing them. These valves are usually fitted into the heads of the compressor-cylinders, the in-

let-valves opening inwardly and outlet-valves opening outwardly.

In my invention the cylindrical casing A is formed with a flange 2 of larger diameter upon the outer end and a seat, as 3, upon the inner end, and the valve-face 4, having the same bevel or surface, is adapted to close against the seat 3.

The body of the valve is cylindrical, as shown at 5, and extends through the interior of the casing A, being guided thereby. Between the outer and inner ends of this valve-body an annular channel 6 is formed. Through the sides of the casing A screws 7 are fitted, the inner ends of which enter the channel 6, but without touching the bottom or sides. The channel has sufficient length in the direction of movement of the valve to allow the valve to open and close without any contact with these pins; but if by any reason some part should be broken, these pins will prevent the inlet-valve from falling into the cylinder, and thus causing damage when the piston would strike it. The outside of the casing A is screw-threaded, as shown at 8, these screw-threads turning into corresponding threads in the cylinder-head, so that the valve and casing being assembled the whole device can be screwed into place by the application of a suitable wrench. The flange 2 is here shown as having sections cut out to receive such a wrench, by which it can be turned so as to seat the casing or to remove it. The interior of the flange 2 is of larger diameter than the interior of the main body of the casing A and has an annular concaved seat 9 for the reception of the inner end of a spiral spring 10. The outer end of this spring fits corresponding depressions in the inner surface of a collar 11, which fits snugly around the cylindrical outer portion 5 of the valve.

Near the outer end the valve has an annular groove or channel 12 turned in it, and a sectional ring 13 has its inner periphery adapted to fit this groove or channel. The outer periphery of the ring extends sufficiently beyond the cylindrical surfaces 5, and when the ring has been placed in the groove 12 the col-



lar 11 is slipped up, so as to fit over and inclose the outside of the ring, which, being made in two parts, is thus held in its place in the groove 12. The collar 11 has the outer part counterbored to form an enlarged diameter, as at 14, which is sufficient to slip over the outside of the ring 13. The inner edge of the ring then rests upon the ledge or shoulder 15, which is formed at the bottom of the channel 14, and between it and the smaller interior diameter of the collar, which fits the outside of the valve. When the collar is in place, the spring 10, seating in the groove or channel 9 of the casing and in the corresponding groove in the bottom of the collar 11, acts by its tension to push the valve outwardly, and thus cause the opposite end 4 to close against its seat at 3.

The interior of the valve-body is hollow, as shown, having wings 16 near the bottom, which extend down to the part 4. These wings are here shown as crossing each other at right angles, leaving open spaces or chambers between them, through which the air may freely pass down to the part 4 and thence between it and the seat 3 when the valve is opened.

The opening of the valve takes place by sufficient compression to overcome the tension of the spring 10, and the latter acts to immediately close the valve as soon as the pressure is removed.

If it is desired to dismount the valve, it is only necessary to apply the wrench, unscrew the casing and remove it from its place in the cylinder-head, and then remove the pins 7. The collar 11 is next pushed down, so as to compress the spring 10, and when the upper edge of the collar is clear of the divided ring 13 the sections of which the ring are composed may be taken out of the groove or channel 12, after which the collar can be slipped off over the end of the valve, and the latter can then be withdrawn from the casing in the direction of the seat, thus leaving everything clear for any repair or tension that may be needed.

To assemble the parts, the cylindrical stem or body of the valve is first pushed into the casing A until the valve portion 4 is seated against the part 3 of the casing. The spring 10 is then slipped over the opposite end of the valve until it rests in the groove 9 at that end of the casing. The collar 11 is then pushed down, compressing the spring until the upper edge of the collar is below the channel 12. The sectional ring 13 is then put in place and the collar pushed back, so as to inclose the ring, the latter then resting upon the seat 15 of the collar, and the tension of the spring 10 acting against the bottom of the collar will always hold these parts in their relative position. The safety screw-pins 7 are then turned into their place, and the valve seat or casing A is screwed into place in the cylin-

der-head and the parts are again ready for operation.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination in an air or like valve of a cylindrical casing, means for fixing it in place, said casing having a valve-seat formed at one end, a counterbored chamber at the opposite end, a valve consisting of a head fitting the seat of the casing, a body slidably guided within the casing extending beyond the opposite end, and having an annular groove made around the projecting end, a ring formed in sections fitting said groove and projecting outwardly therefrom, a collar removably fitting the end of the valve having the outer end counterbored to inclose the sectional ring when the latter is in place, and a spring seated in the counterbore of the casing and pressing the collar against the ring, and acting to normally close the valve-head against its seat.

2. The combination in an air or like valve of a cylindrical casing having a valve-seat formed at one end, an enlarged counterbored turning flange at the opposite end, and screw-threads by which it is fixed in its operating position, a valve consisting of a head fitting and closable against the seat, a cylindrical body slidably guided within the casing having a groove or channel turned around its central portion and a groove around its outer end, pins passing through the sides of the casing entering said central groove or channel, acting to prevent the valve from being disengaged from the casing, a sectional ring fitting the groove in the outer end of the casing and projecting beyond the circumference of said casing, a collar removably fitting the outer end of the valve having its lower face grooved or channeled and corresponding with the counterbore in the outer end of the casing and overhanging said ring, and a spiral spring surrounding the valve having one end contacting with the bottom of the counterbore in the casing and the other against the groove in the valve-collar whereby the valve is normally closed.

3. The combination in an air or like valve of a casing having a seat at one end, a counterbore at the opposite end, with a groove or channel at the bottom, a valve having a head fitting and closable against the seat, a cylindrical body guided and slidable within the casing, projecting beyond the opposite end thereof, a depressed channel about the central portion of the valve-body, pins passing through the sides of the casing extending into said channel, a depressed groove turned about the end of the valve-body exterior to the casing, a sectional separable ring fitting said groove projecting exterior thereto, a collar removably fitting the end of the valve-body having a counterbored channel at its

outer end adapted to slip over the sectional  
ring and lock it to its seat, and having a  
groove or channel formed in the inner end,  
a spiral spring, one end of which fits the  
5 groove or channel in the casing and the other  
the groove in the collar whereby the valve is  
normally closed against its seat.

In witness whereof I have hereunto set my  
hand.

WILLIAM HOUGHTON CASTER.

Witnesses:

S. A. HOFFMAN,  
C. H. FREEMAN.