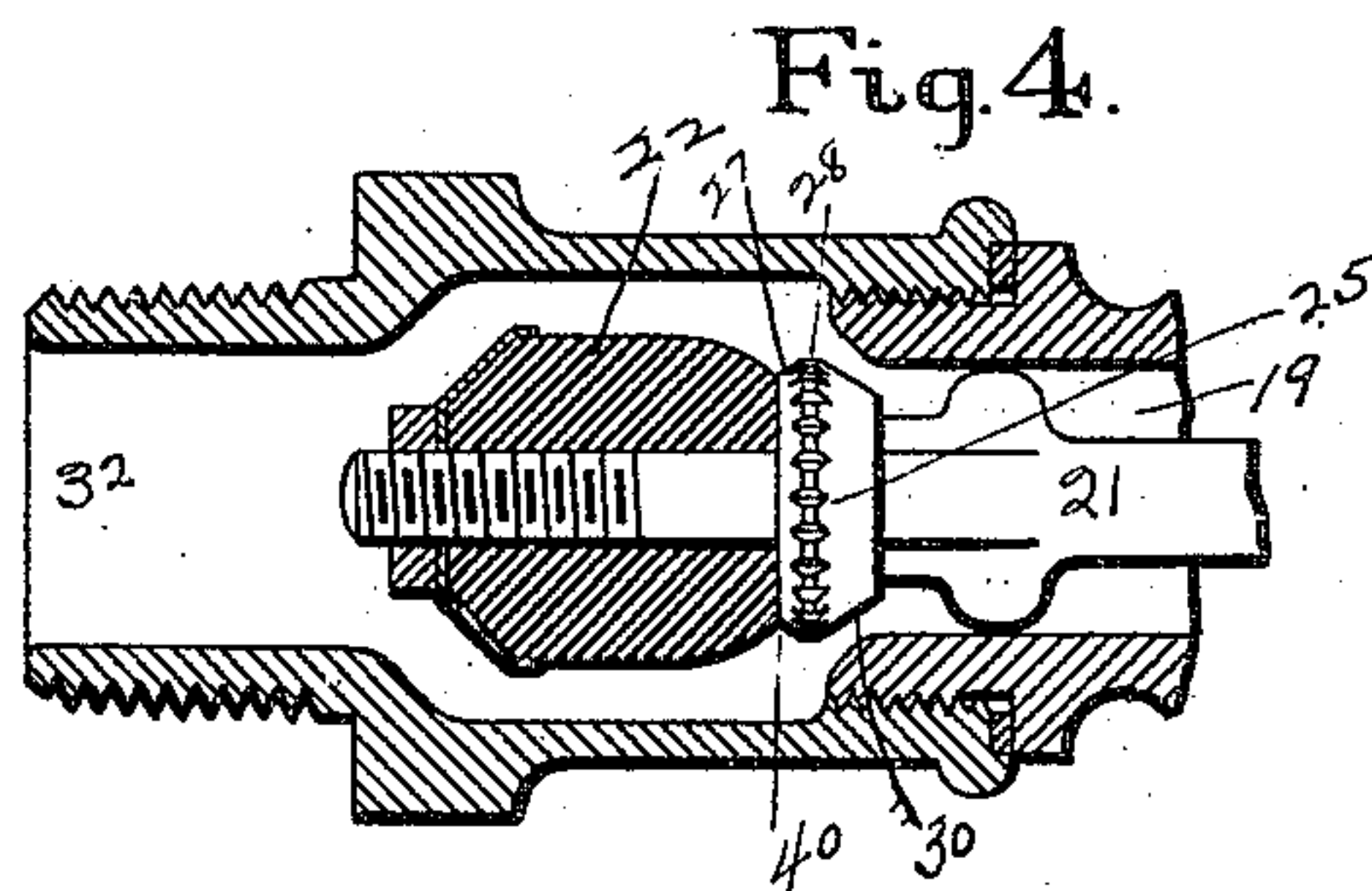
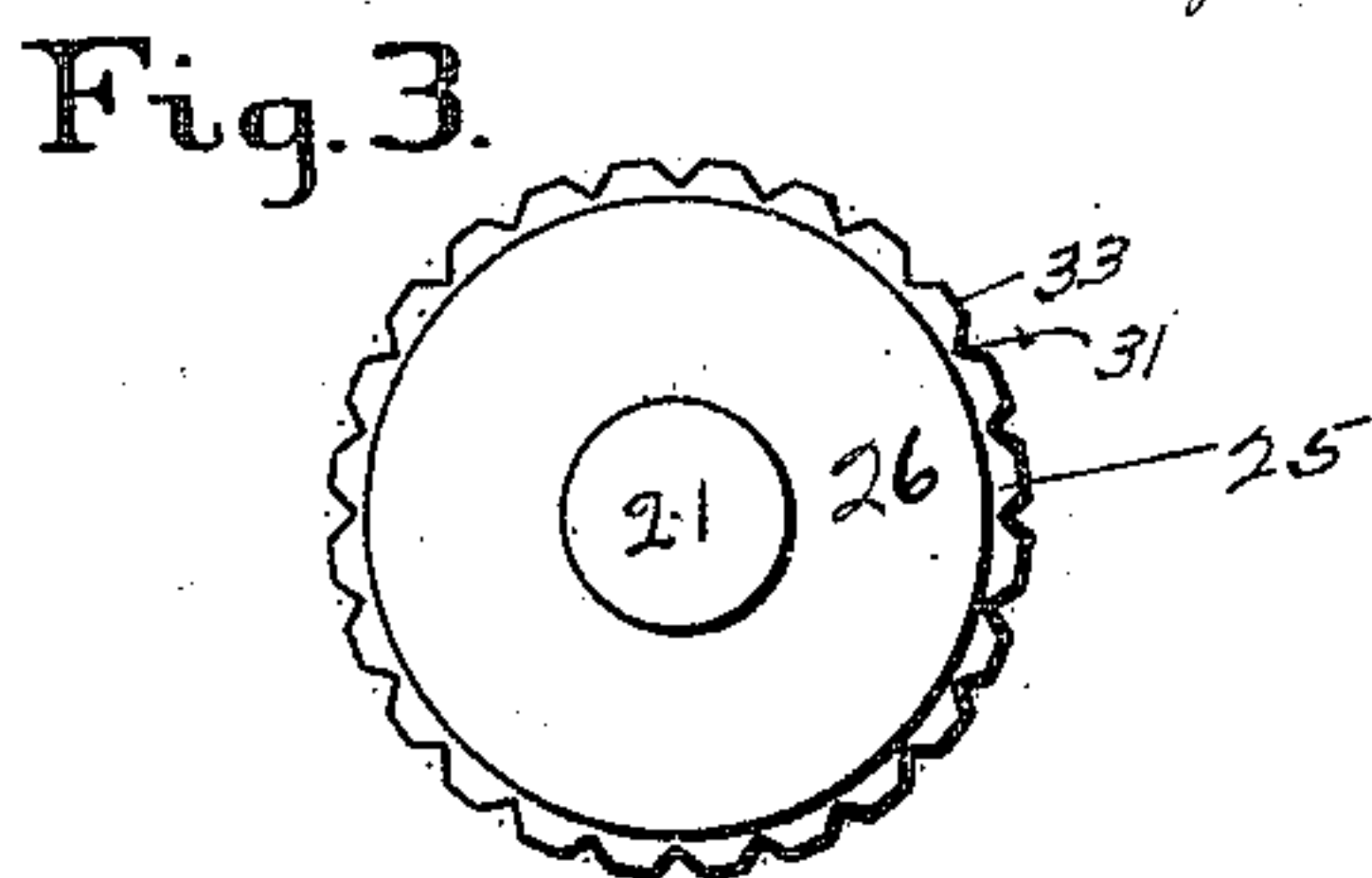
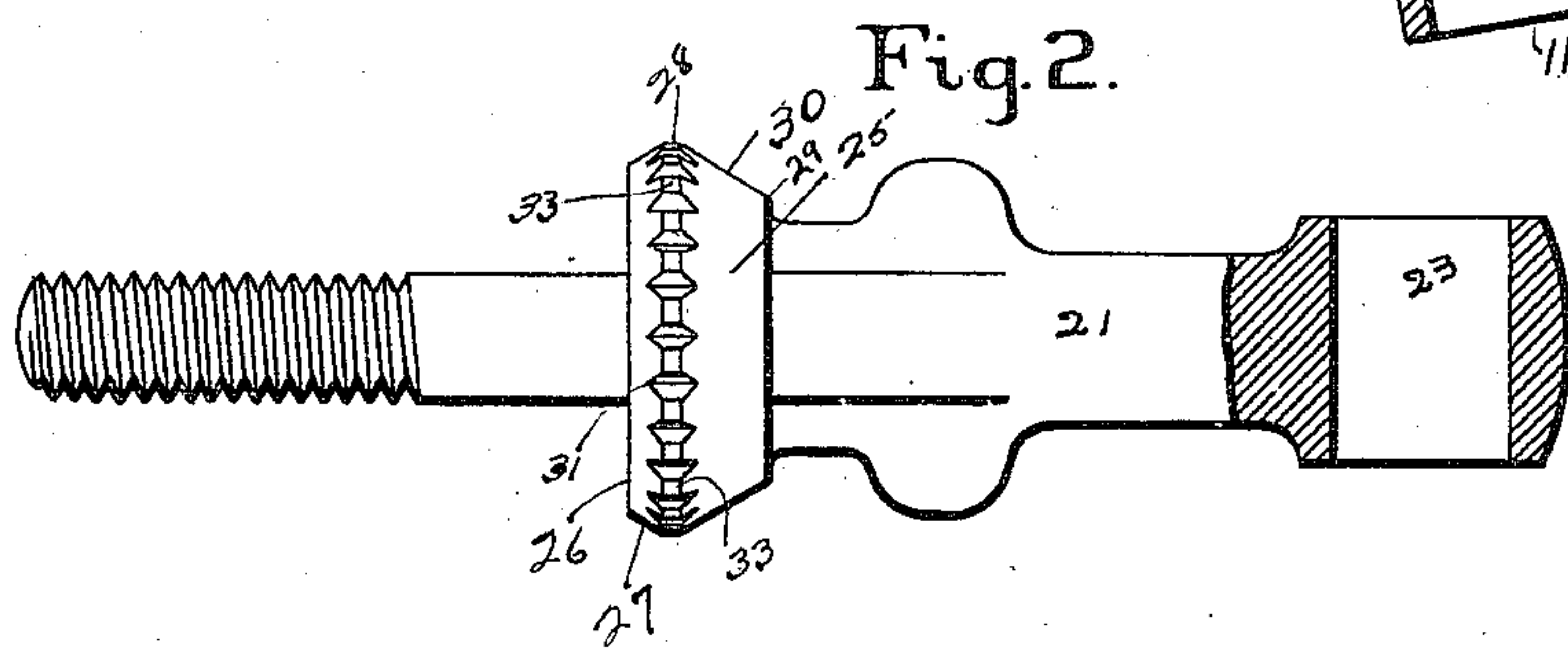
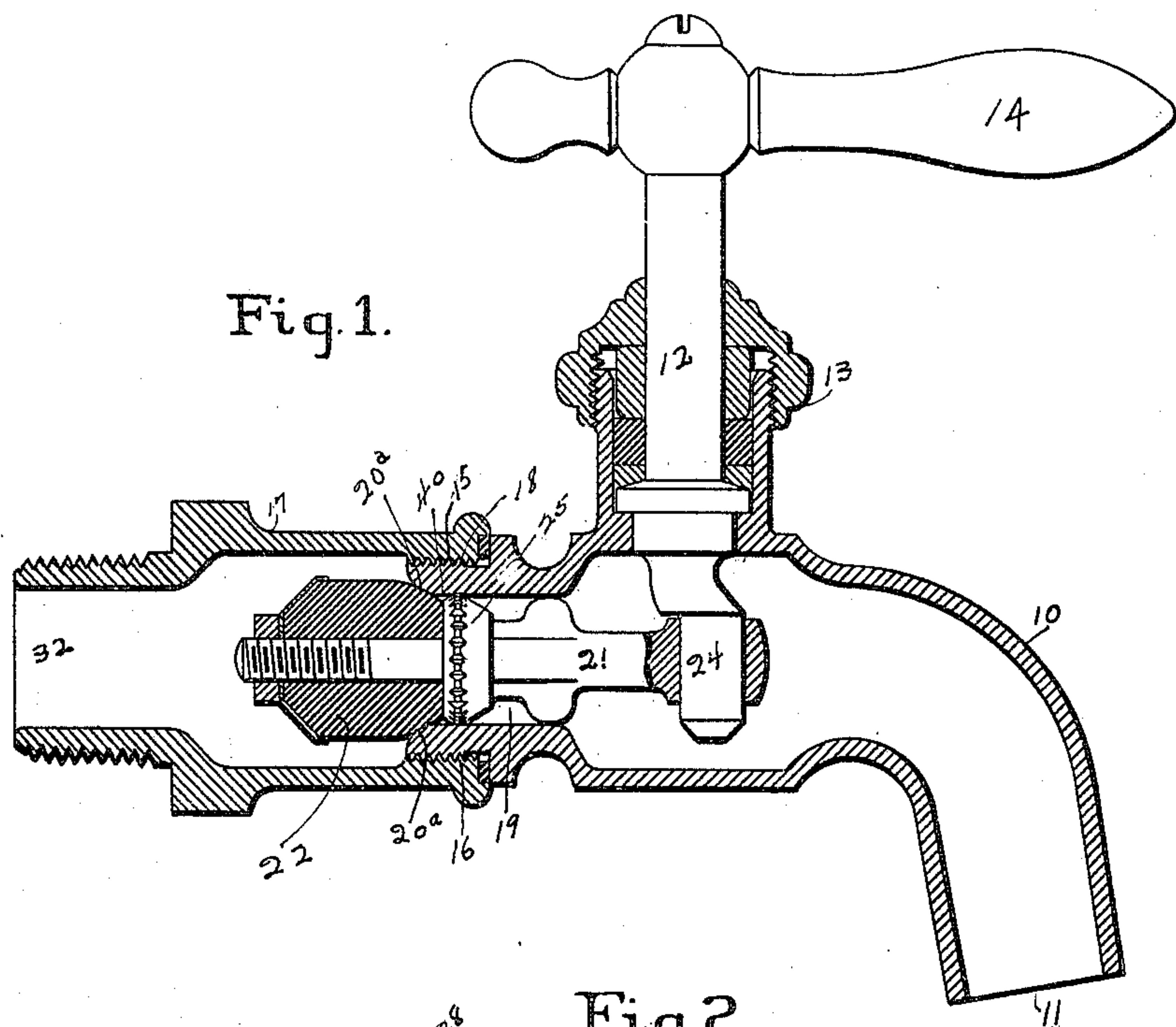


H. MUELLER.
 COCK OR FAUCET.
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982,981.

Patented Jan. 31, 1911.



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UNITED STATES PATENT OFFICE.

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COCK OR FAUCET.

982,981.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, HENRY MUELLER, a citizen of the United States, and a resident of Decatur, Macon county, State of Illinois, have invented certain new and useful Improvements in Cocks or Faucets; and my preferred manner of carrying out the invention is set forth in the following full, clear, and exact description, terminating with claims particularly specifying the novelty.

This invention relates to water distribution and particularly to cocks and faucets used in closing off streams of water under pressure and has for its object to provide new and improved means for eliminating what is commonly known in the art as "water-hammer."

In the distribution of water throughout buildings and dwellings where the same is supplied under pressure, there is a constant tendency to the production of this noise termed "water-hammer" when the valves controlling the streams are suddenly closed, such "water-hammer" or "hammering," being much like a stroke on the pipe. Water-hammer exists at any point where there is pressure but it is more likely to occur where the valve is shut off quickly, thus suddenly stopping the flow of water through the pipe. The conditions for the production of water-hammer are best where the water is under a high pressure and the greater the pressure the more likely water-hammer will be produced at the time the valve is closed.

In view of the efforts that have been made by other inventors heretofore, I will state that I am thoroughly acquainted with the prior art and particularly with the devices that have been brought before the public to prevent the annoyance of water-hammer, and while I am not the first to make an effort in this direction, still I am confident that the device herein referred to is a departure from the path which is laid down by former inventors and I know that the construction herein disclosed will eliminate water-hammer.

On account of the peculiar operation of "Fuller work" and the greater probability therein for water-hammer because of the varying manipulation of the same by the operator, I show my device applied to the Fuller construction; however experiment has shown that it can be equally as well ap-

plied to different types and designs of liquid shut-offs without departing from the spirit of my invention. It is my purpose to partially close off the water before the main valve is seated, and to accomplish this, I provide an improved preliminary valve in advance of the main valve and on the mean diameter thereof, further provision is made to partially close off the flow of water before the main valve is seated substantially as shown and described and more particularly set out in the appended claims and illustrated in the drawings forming a part of this specification.

In the drawings, Figure 1 is a longitudinal sectional view through a valve embodying my invention showing the valve closed; Fig. 2 is a longitudinal view of the stem removed and exaggerated with a portion in section; Fig. 3 is an end view of the stem with the main valve removed looking toward the preliminary valve; Fig. 4 is a detail being a longitudinal sectional view of Fig. 1 showing the valve open and the forward portion broken away.

Referring particularly to the drawings in which like numerals indicate corresponding parts, numeral 10 represents the body of a valve of the Fuller design having an outlet 11, an eccentric stem 12 passing through the housing 13 and provided at the upper extremity of the stem with a handle 14; the body is exteriorly threaded at 15 for the reception of interior threads 16 of a tail piece 17, said body 10 and the said tail piece 17 when properly jointed by the said threads 15 and 16 forming a joint between the said connecting parts as at 18. On the inlet end 20 of the body 10 is formed a main valve seat 20^a and in said body and adjacent to said seat is a water passage 19. The valve stem 21 bearing a main valve 22 at one extremity is provided at the opposite end with an aperture 23 to receive the crank end 24 of the eccentric stem 12, and by means of this connection with the crank end 24 the said valve stem 21 is operated approximately longitudinally to the interior of the body 10 and the tail piece 17; the parts so far referred to are of ordinary construction. The main valve 22 is adapted to seat against the seat 20^a and thereby shut off any flow of liquid therethrough. When the handle 14 is operated to open the valve, the stem 21 moves toward the inlet opening 32 and the

valve is removed from the seat 20^a allowing passage of water and the opening and the closing is in each succeeding case the same or similar.

5 Ahead of the main valve and integral with the stem 21 I provide a preliminary valve 25 having a flat bearing surface 26 which fits or abuts against the inner end of the main valve 22 and adjacent to said face, and from
10 its entire perimeter I provide a beveled surface 27 which extends from said face 26 to the bearing surface 28 of the preliminary valve 25 which contacts entirely with the inner wall of the water passage 19 as the
15 said preliminary valve 25 enters the same. The said contacting surface is referred to here as an entirety but is composed of an annular series of individual portions as 33, there being between said portions an annular
20 series of grooves or valleys 31; the said portions 33 and the valleys 31 may vary in number and not alter the spirit of the invention, and they are mounted on and in the exterior diameter of the said preliminary valve 25
25 and when the said portions 33 are combined to form the bearing surface 28; they compose the greatest exterior diameter of said preliminary valve 25 and on account of the peculiar construction of this preliminary
30 valve, it aids materially in the prevention of water-hammer.

In view of the peculiar closing of Fuller work, that is, the angular seating of the valve caused by the action of the eccentric
35 12 as imparted to the stem 21, and the fact that the bearing surface 28 of the preliminary valve 25 must fit the water passage 19 closely, in order to accomplish my object at one side of the bearing surface 28 is a bevel
40 27 arranged in such a manner as to provide an incline in a reverse direction to the incline of the customary seat of the main valve 22, and on the opposite side of the bearing surface 28, I provide a long beveled surface
45 30 beginning at the outer rim of the square portions 33 and extended at a somewhat lengthy bevel to the point 29 where it approximately merges into the stem; and this
50 said bevel 30 extends around the entire perimeter of the preliminary valve 25. In view of its weight the main valve has an inclination to force itself toward the bottom or lower side of the tail piece 17 when the
55 valve is opened, and an inclination to so remain; in closing this would cause the preliminary valve 25 to enter the channel 19 at an angle; the beveled surface 30, however, touches against the seat 20^a as the main valve
60 22 is closed and on account of this peculiar form as at 30, gradually raises the preliminary valve 25 so that when the preliminary valve 25 enters the passage 19, it has been raised to such a degree that the surface 28
65 will contact with the walls and fit closely the water passage 19, or in other words, en-

ters in a straight line thus making the partial closing off of the flow of water equal around the entire water passage 19.

Between the mean diameter 28 of the preliminary valve 25 and a point 22^a of the main valve 22, is formed a circumferential valley or groove 40, one wall of which is the bevel 27 of the preliminary valve 25 which enters the inlet opening of the cock and does not contact with the seat; the purpose of
75 this groove 40 will hereinafter be more fully explained.

Upon the close fitting perimeter 28 of the preliminary valve 25, I provide a plurality of valleys or grooves 31 which may be of
80 any desired shape, but by preference are here shown as V-shaped and of a depth not to prevent a diameter taken at the lowest point thereof being less than the smallest diameter of the face plate 26, although a
85 variance of this point might not materially affect the working of the valve; portions of the surfaces remaining which are in the form of individual faces as 33 contact with the interior wall of the channel 19 of the body
90 as forming 28. In view of the shape of said valleys 31 the device is thought to be quite sanitary as dirt or sediment cannot be retained any length of time therein on account
95 of the pressure contact with these parts in the opening and closing of the valve, or in other words the movement of the valve would create a constant churning motion within the cock body and thus make it im-
100 possible for any sediment to lodge in the valleys 31. In order to accommodate the escape of such sediment, I provide between the preliminary valve and the main valve, the valley 40 which permits the sediment to
105 be moved backward or retained by the pressure of the liquid, or other actions of closing, and lodge therein until such time as the pressure is sufficient to remove it entirely, thus preventing such sediment from lodging be-
110 tween the main valve and the seat and prevent the entire closing of the valve. In the present use of Fuller work in which is embodied a preliminary valve, the flat closing of the ball or main valve against the seat
115 does not allow for the escapement of any sediment or other solid matter in the water, and when caught between the seat and the main valve the solid matter or sediment will prevent the valve from seating and causes
120 leakage, and when being drawn tightly to prevent leakage, is embedded in the valve, thus often rendering the valve useless and contributing rapidly to the decay and wear of the valve. This provision for the escape
125 of the sediment which may be in the form of grit or sand is valuable to the efficiency of the valve, and to my knowledge an improvement which has never been adopted in this direction.

In operation, with particular reference to 130

Fig. 1, the manually operated handle 14 is turned to a position opposite to the one it occupies in the figure, and in such action longitudinal movement is applied to the stem 21 bearing the main valve 22 and the preliminary valve 25, which movement takes the parts out of contact with the main seat 20^a and removes the preliminary valve from the passage 19 through the body inlet sufficiently to allow a full flow of water to pass around the same through the inlet and out through the outlet opening 11 of the cock and in this open state the parts assume the position as shown in Fig. 4. In closing, manual movement brings the handle 14 gradually around to the position occupied in Fig. 1 and in so doing the valve stem as above set forth is drawn longitudinally toward the seat, the preliminary valve 25 entering the passageway 19 and the outer circumference of the preliminary valve 25 as 28 contacting with the wall of said passage 19 forcing a partial closure of the same and allowing leakage through the valleys 31 therein, as the valve resumes its seat, causing a complete shut-off; such closure is retarded to a more or less extent in view of the close fitting of the outer rim 28 formed by individual faces 33 of the preliminary valve 25 and by the leakage through the ports or valleys 31 thus preventing a sudden, complete shut-off of the volume of water passing therethrough and eliminating the objectionable hammering in the pipe or pipes adjacent the valve.

What I claim as new is:

1. As a new article of manufacture, a valve element adapted to partially close a water passage, the perimeter of said valve element having an annular series of individual faces separated by ports or passages, and

beveled surfaces on either side of said individual faces, as and for the purpose specified.

2. In a valve structure, a main valve, a preliminary valve adapted to close a water passage in advance of the main valve, the greatest diameter of said preliminary valve slidably fitting said water passage and being divided into a multiplicity of individual faces separated by ports, and beveled faces of varying lengths on either side of said individual faces.

3. In a valve structure, a main valve, a preliminary valve in advance thereof and adapted to slidably fit a water passage in the valve structure, said preliminary valve having its greatest diameter divided into a multiplicity of individual faces separated by ports, a beveled face extending from the perimeter of the preliminary valve on one side to a point coincident with the main valve, and a relatively long bevel on the opposite side of the preliminary valve.

4. In a valve structure, a main valve, a preliminary valve in advance thereof and adapted to slidably fit a water passage, said preliminary valve having its greatest diameter divided into a multiplicity of individual faces, and a beveled face on one side of the preliminary valve extending from the perimeter thereof to a point coincident with the main valve to provide an annular valley between the main and preliminary valves, as and for the purpose set forth.

In testimony whereof, I have hereunto subscribed my signature, this 10th day of May, A. D. 1909.

HENRY MUELLER.

Witnesses:

VIRGINIA HAMILTON,
JOHN L. WADDELL.