

No. 705,696.

Patented July 29, 1902.

A. G. NOACK.
WATER FILTER.

(Application filed Aug. 5, 1901.)

(No Model.)

2 Sheets—Sheet 1.

FIG. 1.

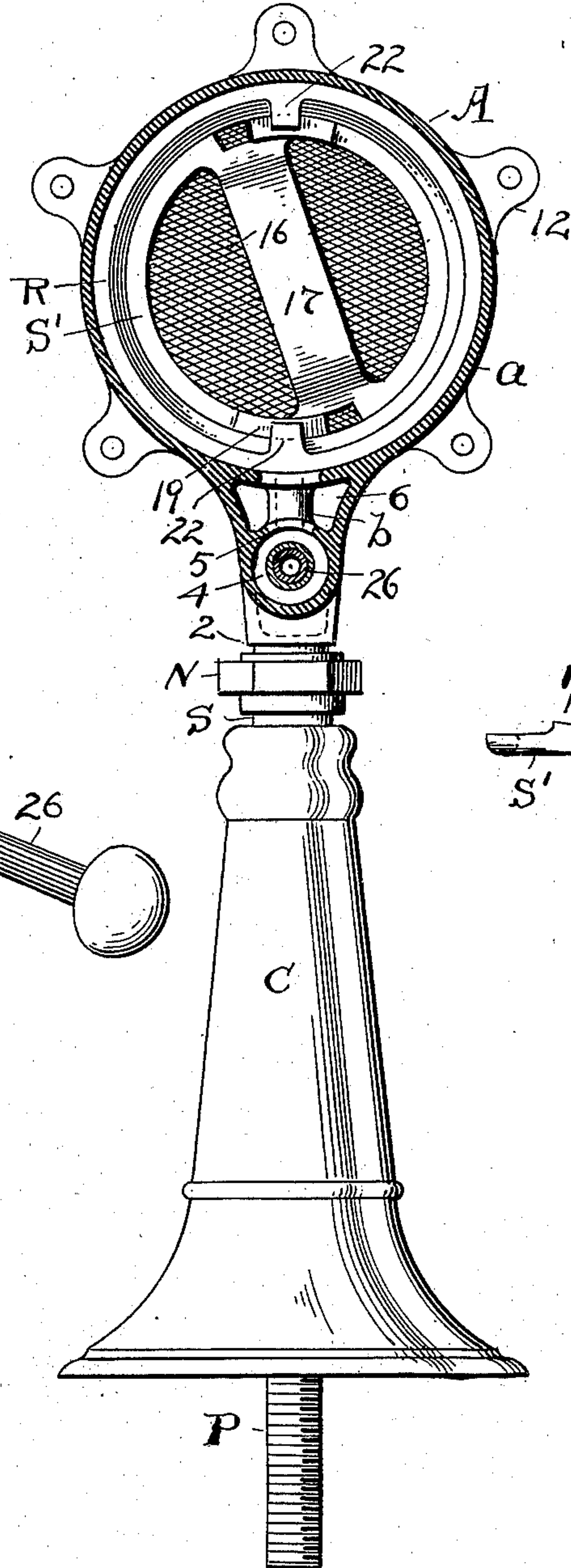


FIG. 3.

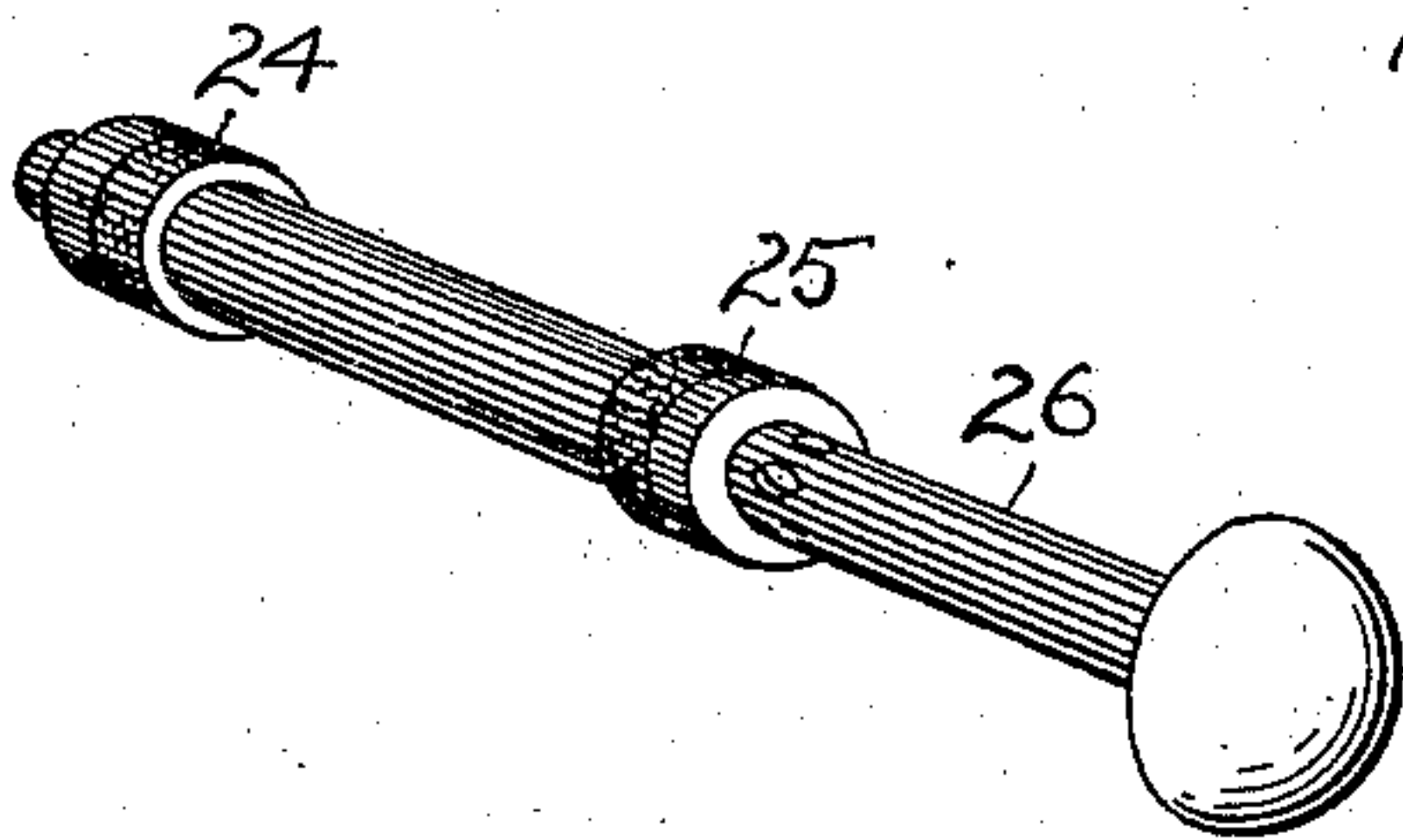
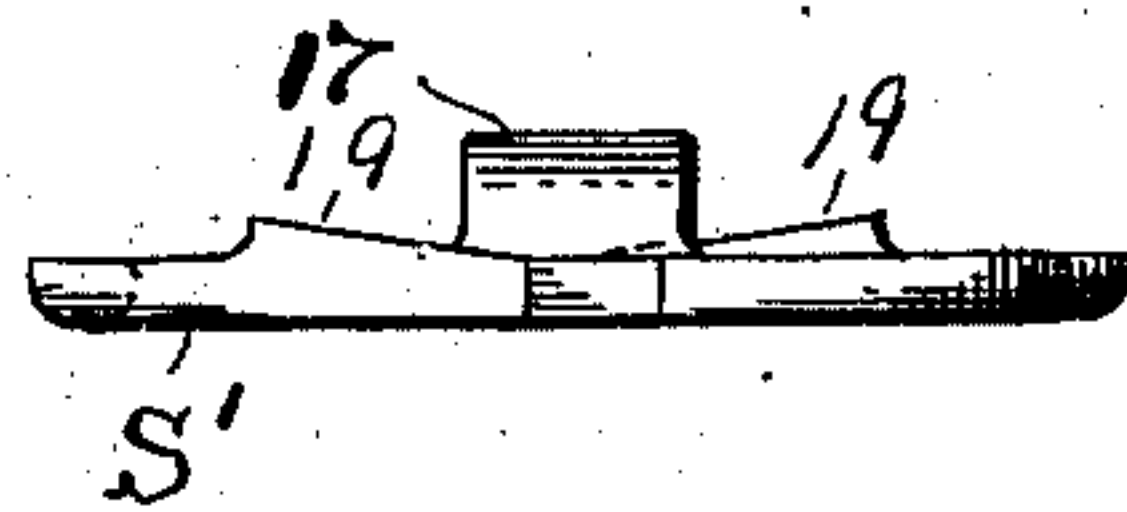


FIG. 4.



ATTEST

R. B. Moser
H. E. Mudra.

INVENTOR.

Adolph G. Noack

By W. T. Fisher ATTORNEY

No. 705,696.

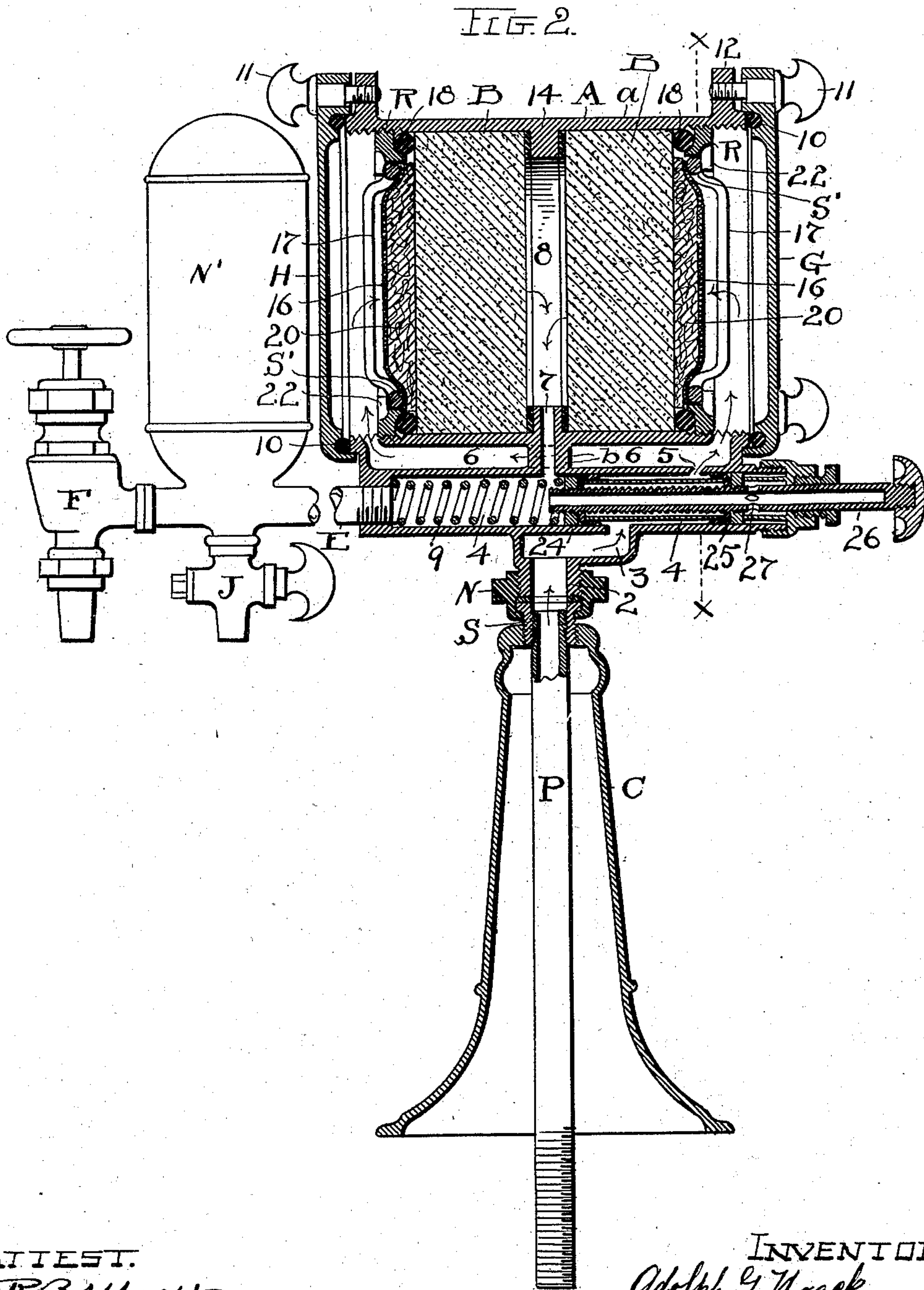
Patented July 29, 1902.

A. G. NOACK.
WATER FILTER.

(Application filed Aug. 5, 1901.)

(No Model.)

2 Sheets—Sheet 2.



ATTEST.
W. B. Moser
H. E. Mudra.

INVENTOR
Adolph G. Noack

BY *W. V. Fisher* ATT'Y

UNITED STATES PATENT OFFICE.

ADOLPH G. NOACK, OF CLEVELAND, OHIO.

WATER-FILTER.

SPECIFICATION forming part of Letters Patent No. 705,696, dated July 29, 1902.

Application filed August 5, 1901. Serial No. 70,911. (No model.)

To all whom it may concern:

Be it known that I, ADOLPH G. NOACK, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Water-Filters; and I do declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to water-filters; and the object of the invention is to provide a filter which is intended to be used wherever filtration of water for any purpose is desirable and which is adapted to be easily cleansed without taking apart, all substantially as shown and described, and particularly as pointed out in the claims.

In the accompanying drawings, Figure 1 is an elevation of the filter on line X X, Fig. 2, in which the head and a portion of the end of the cylinder are removed and the parts one which the line X X is taken are sectioned. Fig. 2 is a central sectional elevation of filter, taken lengthwise of its cylinder or casing and of the pipe connections therewith. Fig. 3 is a detail in perspective of the tube which serves to reverse the flow of water through the filter to cleanse the same, as hereinafter fully described. Fig. 4 is an edge view of one of the plates by which the filtering stones and material are confined, as also is hereinafter fully described.

The filter thus shown is designed to be set upon or supported by any suitable base, stand, or counter, and it may be attached to or secured upon a wall or other support over a sink or basin or other place in which the water is adapted to drip and run away. Any of the usual means of support or places of attachment may be employed. In this instance its connection is directly with the supply-pipe P, which has an ornamental inclosing tube C, extending up to the joint or the pipe with the filter-cylinder A. At this point the said cylinder or body A is constructed with special features providing channels for the flow of the water into and from the filter, as well as for the reversing mechanism adapted to change the direction of flow and cleanse the filter, as already referred to. These features of construction are a threaded neck 2, en-

gaged by a coupling-nut N, which connects with supply-pipe P through an intermediate internally and externally threaded sleeve S, engaged over the pipe P and by the nut N. Thence there is a channel 3 through neck 2 opening into a tubular chamber 4 lengthwise on the bottom of the body A outside its main wall α and cast integral therewith. This chamber has a fluid-outlet 5 through its wall into the fluid space or channel 6 next within and between the filter-cylinder proper, α , and channel 4. Said space also has an inlet 7 from the space 8 centrally within the filter and through which the filtered water passes through neck b into the tubular chamber 4, and thence by pipe E to the cock or faucet F to be drawn off for use. From the passage in the lower portion of body A of the filter the water is free to flow into the open ends of the filter across the entire end area, and outside of these end spaces the cylinder is closed by the plates or heads G and H, respectively. Both of these heads are fastened, preferably in the same way, and rubber or equivalent gaskets 10 are placed against the ends of cylinder A, and thumb-screws 11 through said plates or heads enter ears or flanges 12 on the cylinder and serve to pack the heads water-tight. By means of these screws it is an easy matter for any one to remove the heads and open the cylinder for any purpose. In the cylinder thus constructed and headed up I employ two separate filtering stones or blocks B, one inserted from each end and resting up against an internal ring 14 centrally in the cylinder, where packing of a suitable kind serves to make the joint water-tight. These blocks B may be of filtering-stone of the right kind or composite blocks of suitable material, and they may be natural or manufactured, as shall be found best. By preference I use a manufactured block which possesses only sufficient porosity to enable water to be forced through when under a fairly high pressure, as in the average city mains. For lower pressure a more porous block can be used. These filtering stones or blocks are confined against inner ring 14 by metallic rings R, threaded to be screwed into place and press against gaskets 18 in the angle of the stone and casing, forming a water-tight

connection. Next to each block or stone I place a layer of felt or other fibrous filtering material of such quality and density as will intercept practically all foreign matter of the finer kinds and prevent its entrance to or upon the filtering-blocks B. This material, whether it be felt, cellulose, or other material of a fineness which will arrest floating impurities, is confined by a suitable cloth 16, overspreading the same outside, and a locking-ring S', Fig. 4, has inclined lugs or cams on one side, adapted to engage under lugs 22, projecting inward on rings R. A yoke-shaped handle 17 on ring S' enables it to be easily turned to place or for removal, and it presses on the edge of cloth 16 and holds it firmly in place. The closely-woven outer cloth 16 acts as a strainer for the filter besides confining the material 20. By taking off the rougher or larger foreign particles through the cloth cover 16 and intercepting the smaller particles by the felt or other densely-packed material 20 the filtering stones or blocks are left free to do the work of purification and to take up such matter as may be said to be in solution, and hence escapes the fabric and other filtering media, but cannot escape the searching and closely-knit substance of the blocks themselves. In this way I am also enabled to eliminate microbes and disease germs generally which may float in the water, and thus purify water which otherwise is impure and utterly unfit to be used for drinking or other domestic purposes without cleansing.

From the foregoing description the flow of the water through the filter is readily traced as it enters through neck 3, enters tubular chamber 4, and flows thence through opening 5 into space 6 and by openings at the ends of this space into the open areas in the heads of the filter. The filtered water comes into the central space 8 between stones or blocks B and goes thence by chamber 7 into tubular chamber 4 in front of piston 24 and out, to be drawn through faucet F. A flow cushioning and evening bulb or chamber N' is shown as open to pipe E, and waste-cock J serves to draw off waters run through the filter for cleansing. This is a very simple operation by my construction, and consists chiefly in means for reversing the direction of flow of the water through the filter, thus causing the accumulations to be washed out and carried off through the open cock J. The mechanism to accomplish this reversal consists of a set of valves 24 and 25 on tubular stem 26, adapted to operate in tubular chamber 4. Said stem has openings 27 behind valve 25, through which water can enter its interior and discharge at its forward end into chamber 4, and normally said holes are behind passage 5, and valve 24 is behind passage 7, as seen in Fig. 2. A spring 9 in front of tube 26 serves to hold it back at the end of its rearward movement, as seen in Fig. 2; but when the filter is to be cleansed by the action of water flowing through it in reverse

direction the valve-tube 26 is pushed in against this spring till valve 24 goes beyond passage 7 and valve 25 beyond hole 5, so as to bring holes 27 in the valve-stem into open relation with hole 5. Then the inflow will be by passage 7 through the filter and out by holes 5 and 27, through tube 26, to waste-cock J.

I have thus somewhat minutely described the construction of the filter, but desire it to be understood that all the details mentioned may possibly be more or less varied in form and relation and others substituted therefor without departing from the spirit of the invention or doing more than employing their equivalents in function and use.

Directions for connecting the filter.—The connections from the water to the filter should be made with three-eighths-inch iron or lead pipe, and a stop and waste cock should always be used between the water connection and the filter to provide a shut-off when the filter is to be taken apart for the purpose of cleaning or renewing filtering-cloths or sterilizing the stones B. A small rubber tube can be attached to the waste-cock, so that the water may be drawn off into a receptacle. After having run the pipe from the water connection to the filter allow a considerable quantity of water to run out of the end of the pipe before connecting to the filter, thereby causing any dirt, chips, or red lead to be washed out of the pipe and prevent the same from getting into the filter. Permit the water to run through the filter at least fifteen or twenty minutes after it has been connected in order to work out all air contained in the filter. When the stop-cock (not shown) is shut off for the purpose of taking the filter apart, the faucet F on the filter should be open to prevent a vacuum from forming in the filter and insuring an open passage to the stop and waste cock.

Directions for taking the filter apart.—The filter should be taken apart about once every three months and the filtering-cloths 16 removed and thoroughly washed in clean lukewarm water and then replaced. It is unnecessary to remove the filtering-stones, as they seldom become clogged; but, if desirable, they can be removed and sterilized by boiling in water ten or fifteen minutes, then permit them to cool slowly and replace. To take the filter apart, loosen the thumb-screws 11 at the ends of the filter and remove head-plates G, which can be done by using a small screw-driver to pry said plates from the filter, if required. Then remove rings S' by taking hold of the yokes 17 and turning same to the left, so as to disengage them from lugs 22, when the filtering-cloths can be readily removed. After the filtering-cloths have been washed stretch them with the hands and replace to their original positions. Replace rings S' and head-plates G, tighten thumb-screws 11, and the filter will again be ready for use.

Directions for cleaning the filter.—To obtain the best results, open faucet J and press against the head of valve-stem 26 to carry the valve inward as far as possible. This
 5 instantly reverses the flow of water and flushes the dirt from the inside of filter. Hold valve in this position until about one or two quarts of water are drawn through the waste-cock J. Then release valve, when
 10 it will return to its proper position by pressure of spring G. If the valve does not return of its own accord, pull the same out as far as it will come. Then allow one or two quarts of water to pass through the filter while
 15 the valve is pulled out. Repeat this operation three or four times, after which permit about half a gallon of water to pass through the filter or until water again becomes perfectly clear. This entire operation takes but
 20 a very few minutes and must be done every day to obtain the best results.

What I claim is—

1. A filter-casing and a filtering-block therein, in combination with a ring confining said
 25 block, a cloth and loose filtering material over the outside of said block and a rotatable ring engaging the edge of the cloth and locked on the ring which confines said block, substantially as described.

30 2. A filter having a suitable filtering block or stone and a ring to confine the same, a loose filtering material over said block or stone and a cloth spread over the same, and a ring with a handle adapted to be rotated
 35 and serving to press against the edge of the cloth and fasten it in place, substantially as described.

3. A filter comprising a casing having an inwardly-extending ring at its center, in combination with a pair of filtering-blocks resting
 40 against the sides of said ring, means to confine each block in place, a head on each end of the casing set apart from said blocks to leave a fluid-space between them, and means
 45 to reverse the flow of water through said blocks, said means comprising channel 6 open to each end of the casing, fluid-inlet chamber 4 and a fluid-passage therefrom into said channel, duct 7 from said chamber into the casing
 50 between the filtering-blocks, and means in said chamber to control the flow of fluid into the said casing, substantially as described.

4. A filter-casing having open ends and inclosing heads therefor and constructed to support a filter block or stone in each end, and
 55 having in its bottom a water-channel leading to each end and a separate walled water-chamber lengthwise outside said channel, said outer water-chamber connected by a fixed duct with the interior of the casing and by
 60 an opening with said water-channel, substantially as described.

5. The filter-casing open at both ends, and inclosing heads therefor, and adapted to receive separate filtering-stones in each end
 65 with a fresh-water outlet between them, a water-channel on the bottom of said casing open to both its ends and a tubular chamber outside said channel and in communication therewith by an opening, a water-supply connection with said chamber and a valved water-outlet therefrom, a duct connecting the
 70 interior of the said casing with said chamber and mechanism in said chamber adapted to slide therein and change the direction of flow
 75 of water through the filter, substantially as described.

6. The filter-casing and a water-channel and a water-chamber, respectively, at its bottom, a duct 5 connecting said chamber and
 80 channel, a duct 7 from said chamber into the casing, and ducts at the ends of said channel into the ends of the casing, and a double slidable valve in said chamber constructed to change the direction of the flow of water
 85 therethrough, substantially as described.

7. A filter constructed to be cleansed by flowing the pressure-water through the same in a reverse direction, and having an inclosing cylinder, in combination with a water-in-
 90 let chamber and openings therefrom into both the ends and the center of the said cylinder, a tubular valve-stem and a pair of valves thereon in said chamber controlling said openings, said stem having a passage through the
 95 same from its inner end, and a spring pressing against the inner end of said stem, substantially as described.

Witness my hand to the foregoing specification this 27th day of July, 1901.

ADOLPH G. NOACK.

Witnesses:

R. B. MOSER,
 H. E. MUDRA.