

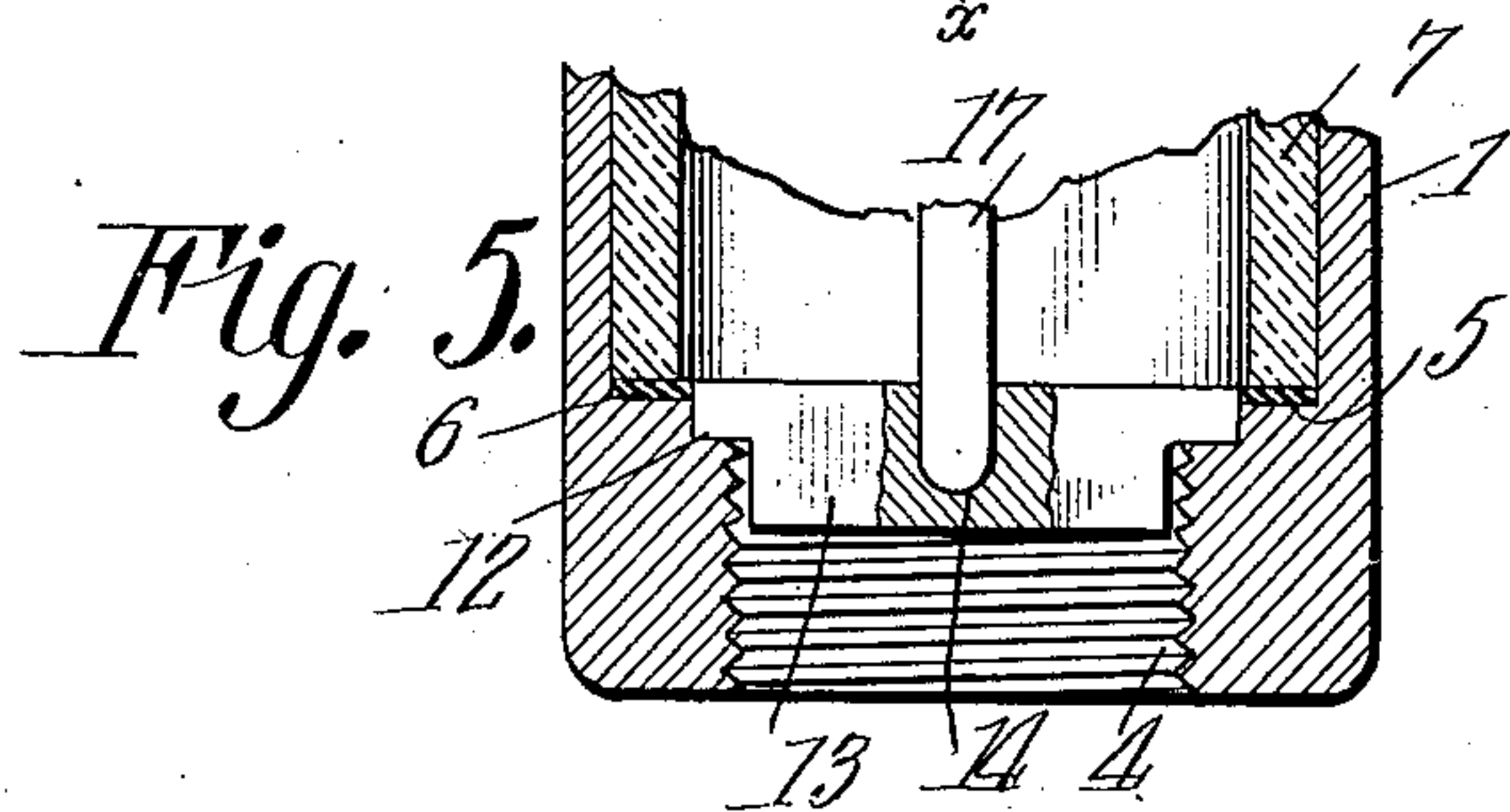
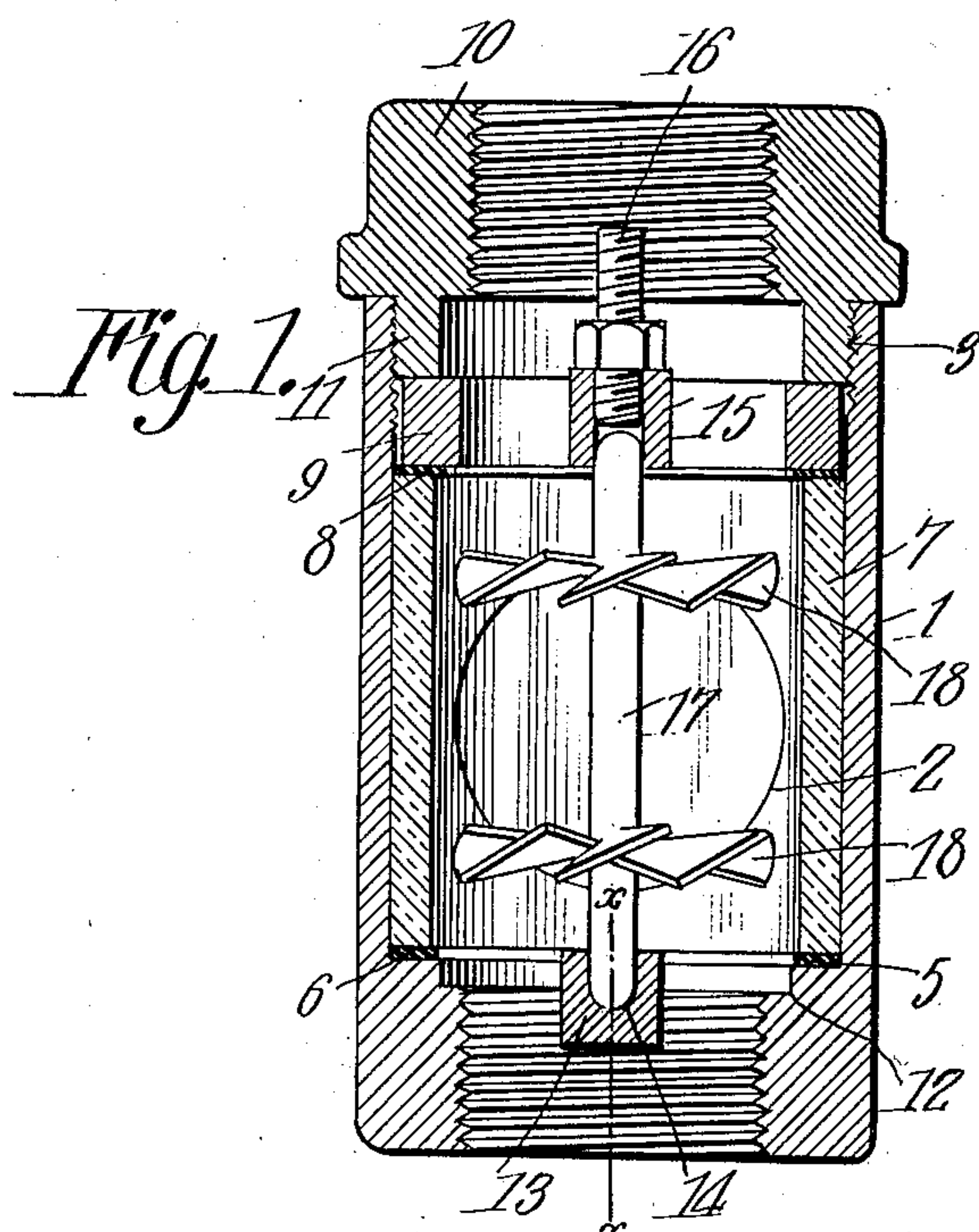
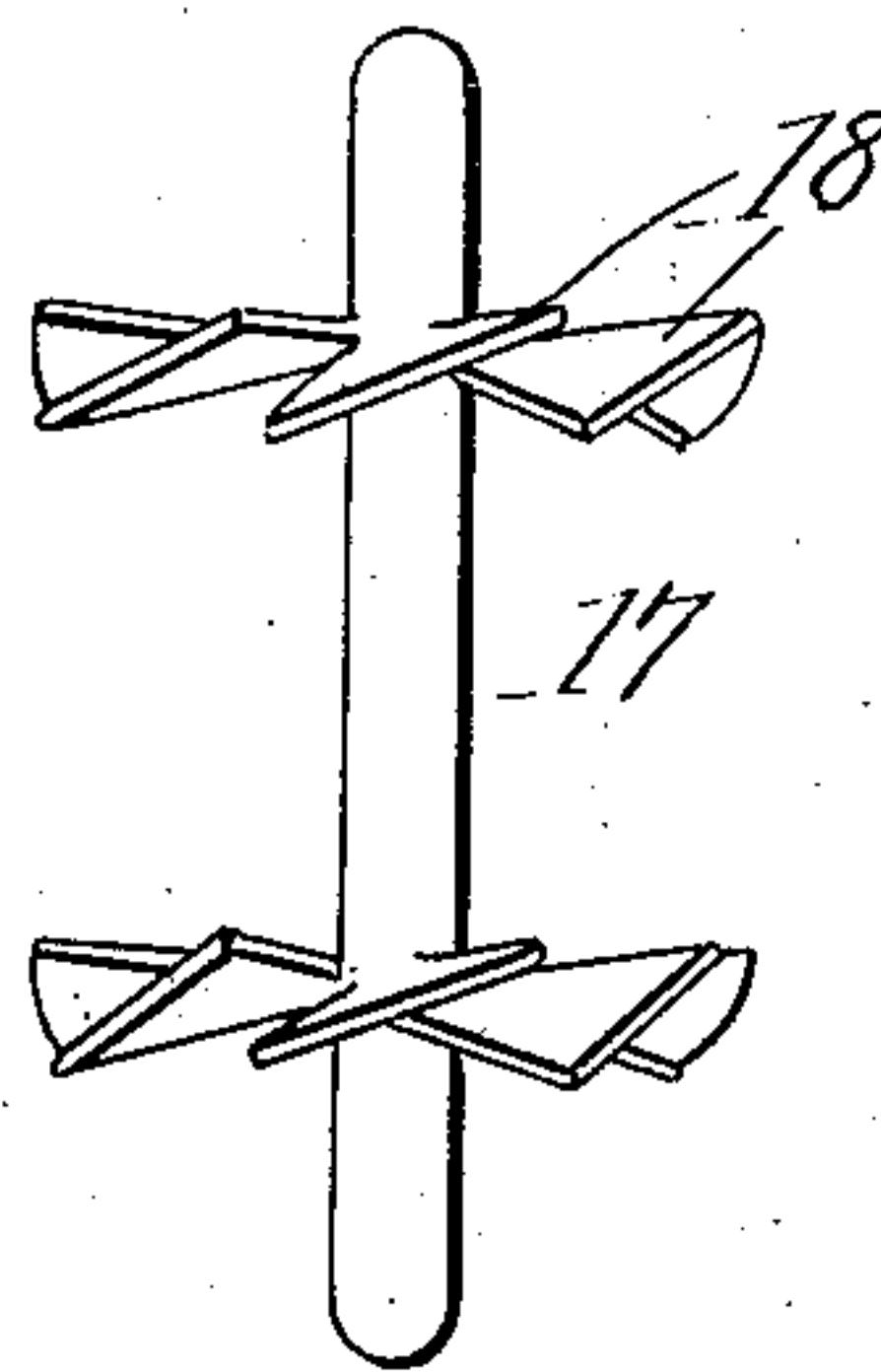
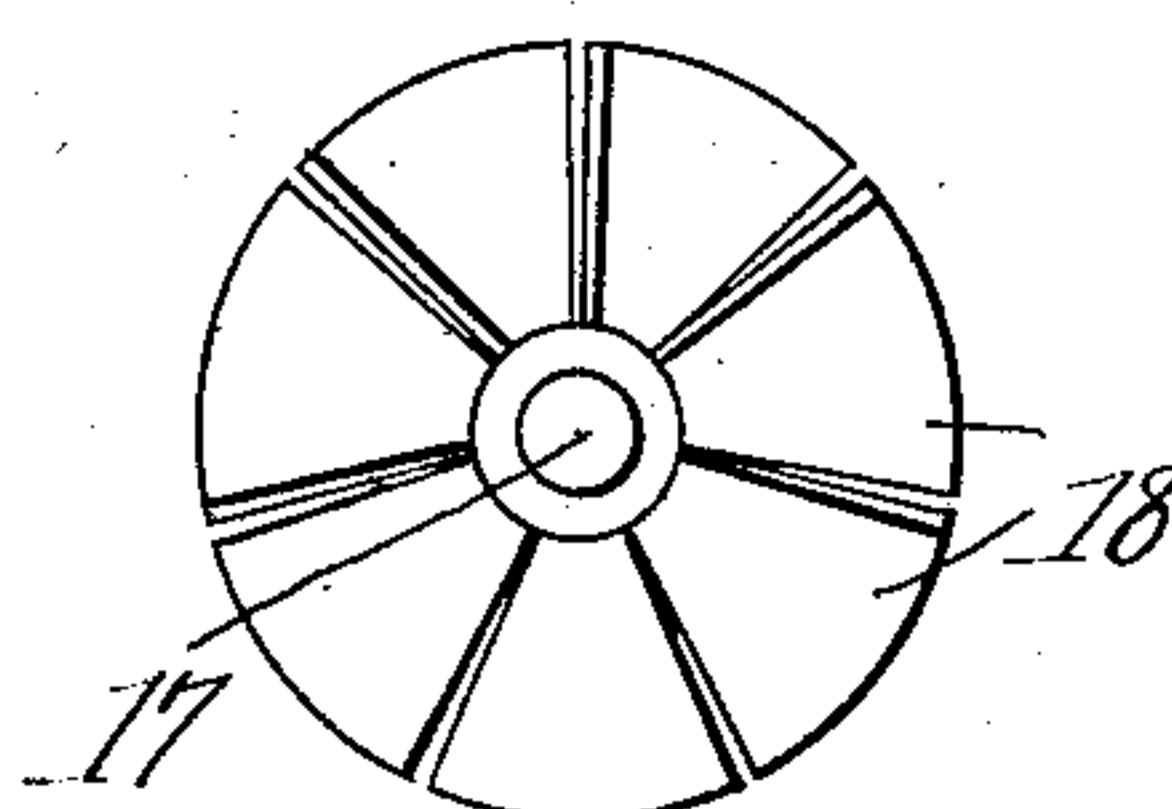
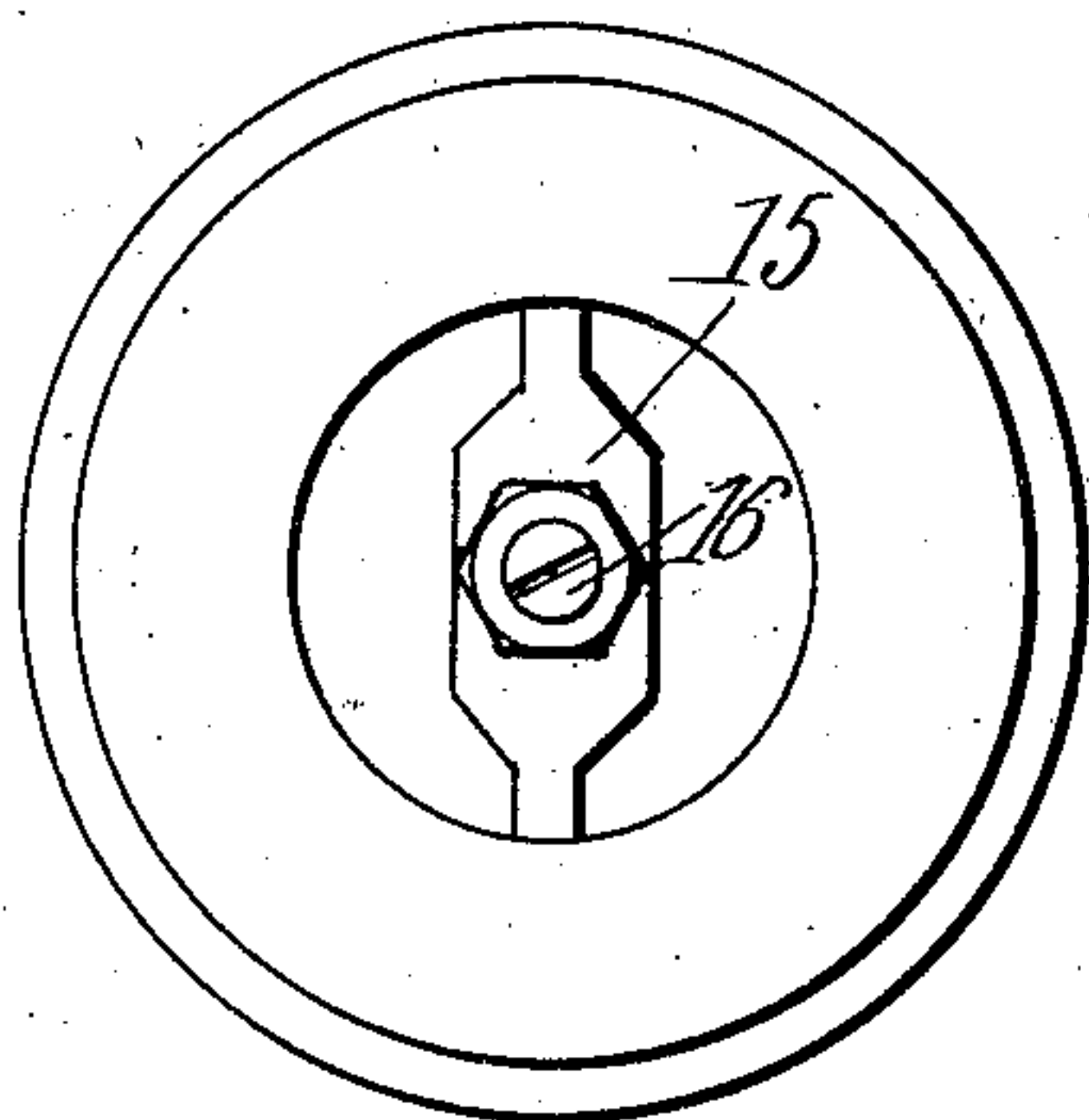
No. 889,323.

PATENTED JUNE 2, 1908.

W. S. MORGAN.  
MIXING DEVICE.

APPLICATION FILED APR. 22, 1907.

2 SHEETS—SHEET 1.



*WITNESSES:*

E. P. Stewart  
Herbert D. Lawson

*William S. Morgan,*  
INVENTOR.

By *C. A. Snow & Co.*  
ATTORNEYS

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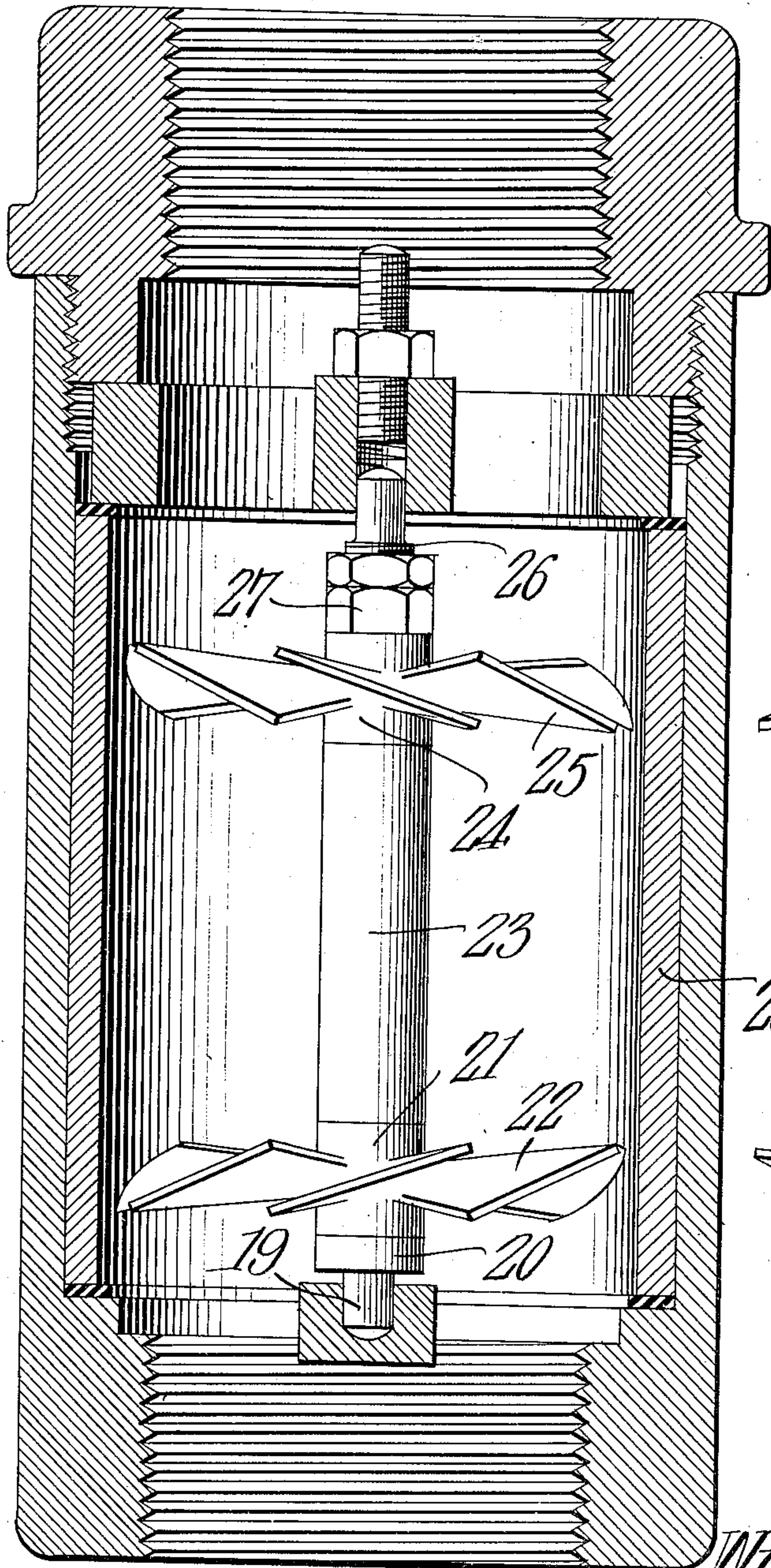
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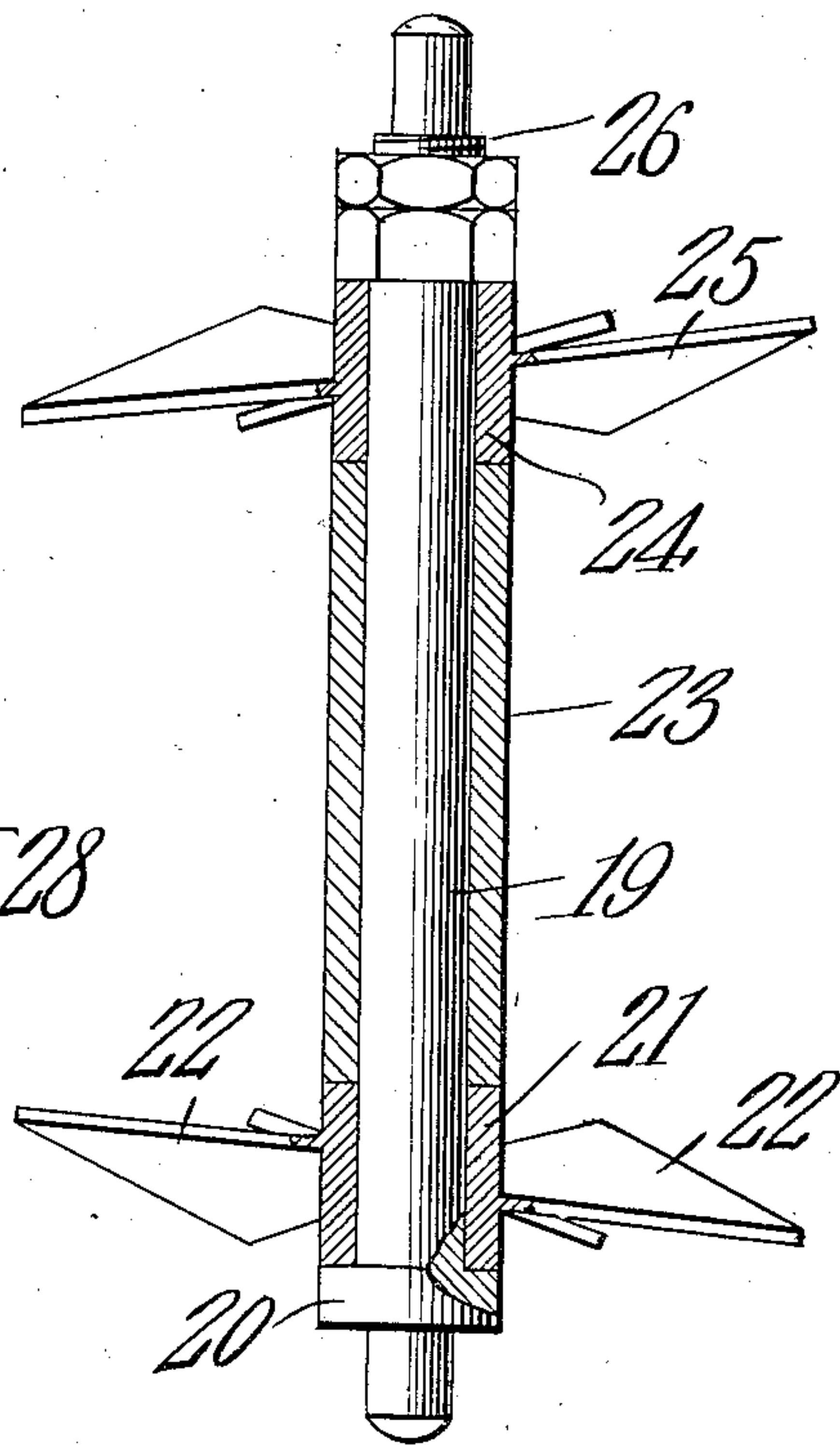
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2 SHEETS—SHEET 2.

*Fig. 6.*



*Fig. 7.*



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# UNITED STATES PATENT OFFICE.

WILLIAM S. MORGAN, OF ANTIGO, WISCONSIN.

## MIXING DEVICE.

No. 889,323.

Specification of Letters Patent.

Patented June 2, 1908.

Application filed April 22, 1907. Serial No. 369,589.

*To all whom it may concern:*

Be it known that I, WILLIAM S. MORGAN, a citizen of the United States, residing at Antigo, in the county of Langlade and State of Wisconsin, have invented a new and useful Mixing Device, of which the following is a specification.

This invention relates to mixing devices such as employed in combustion engines and its object is to provide simple and efficient means whereby air and hydro-carbon gas can be thoroughly mixed, said mixing device being operated by the movement of the gases to be mixed.

A still further object is to provide an atomizer which is of simple, durable and inexpensive construction and which will effectually operate to mix the gases supplied thereto.

Another object is to provide a mixing device which can be easily adjusted for the purpose of taking up wear upon the parts and the various members of which can be conveniently taken apart for the purpose of cleaning or repairing the atomizer.

With these and other objects in view the invention consists of certain novel features of construction and combinations of parts which will be hereinafter more fully described and pointed out in the claims.

In the accompanying drawings is shown the preferred form of the invention.

In said drawings: Figure 1 is a longitudinal section through the atomizer casing; Fig. 2 is an end view thereof; Fig. 3 is a detail view of the mixer; Fig. 4 is an end view thereof; Fig. 5 is a section on line  $x-x$ , Fig. 1; Fig. 6 is a view similar to Fig. 1 and showing a modified form of atomizer; and Fig. 7 is a section through the wheels and the part adjacent thereto.

Referring to the figures by characters of reference, 1 designates a cylindrical casing having one or more sight openings therein and one end of this casing has interior screw threads as shown at 3, while the other end of the casing has a reduced opening 4 the wall of which is screw threaded. An annular shoulder 5 is formed within the casing adjacent the opening 4 and has a washer 6 of rubber or other suitable material thereon against which rests one end of a glass tube 7 which fits snugly within the casing and is exposed only through the opening 2. Another washer 8 is disposed upon the other end of the tube 7 and bearing thereagainst is a ring 9 disposed to be held in place by means of a cap 10 having an

exteriorly screw threaded circular flange 11 on one face adapted to be screwed into engagement with the threads 3 and to clamp the ring 9 upon the washer 8.

Recesses 12 are formed within the shoulder 5 and the reduced end of casing 1 at diametrically opposite points and constitute seats for the ends of a cross piece 13 having a central recess 14. The ring 9 also has an integral portion 15 extending across the center thereof and provided with a central opening in which is disposed a set screw 16. The parts 13 and 15 constitute end bearings for a spindle 17 from each end portion of which extends a series of fan blades 18, each series constituting an agitating or mixing wheel and both wheels being similar in construction and arrangement. The ends of the spindle 17 are preferably rounded and one end bears within the recess or socket 14 while the other end extends into the opening in the bearing 15. The set screw 16 serves to limit the longitudinal movement of the spindle and wear upon the spindle and bearings can be taken up by adjusting said screw.

In using this atomizer the same is coupled at one end to a suitable hydro-carbon supply while its other end is connected to means for conveying the mixture to the point of use. As air and gas are sucked or forced into the atomizer it is brought into direct contact with the blades 18 and as these blades are inclined the pressure of the gases thereagainst will cause them to rotate. The gases will therefore be thoroughly agitated and commingled before passing from the atomizer. It will be noted by referring to Fig. 1 that the diameter of each mixing wheel is greater than the diameter of either the inlet or the outlet and therefore the gases are positively directed against the wheels and the agitation of all portions thereof is insured. Importance is attached to the fact that the mixing wheels are propelled solely by the pressure of the gases to be mixed and therefore the necessity of providing mechanical propelling means for the wheels is eliminated. The operation of the mixer can be readily observed through the glass 7 closing the opening 2 and should any part become worn or broken or should it be desired to clean the atomizer the different portions thereof can be easily removed from the casing simply by unscrewing the cap 10.

Although the atomizer as hereinbefore described utilizes two mixing wheels the blades



of which are pitched in the same direction and which rotate together it is to be understood that if desired the wheels can be caused to rotate in opposite directions by pitching the blades of one wheel opposite to those of the other wheel. Such a construction has been shown in Fig. 6. With this construction it will be noted that the spindle 19 has a collar 20 thereon constituting a bearing for a hub 21 from which the blades 22 of one of the wheels extend, and a spacing sleeve 23 is interposed between this hub and another hub 24 from which blades 25 extend. The blades 25 are pitched oppositely to the blades 22 so that when fluid passing through the atomizer contacts with the blades the two wheels will be rotated in opposite directions. One end of the spindle is preferably screw threaded as shown at 26 so as to engage jam nuts 27 to hold the parts against longitudinal displacement. Also instead of providing a transparent tube such as shown at 7 in Fig. 1 a tube of brass or other similar material such as shown at 28 may be substituted and the side openings can be dispensed with. Various other changes can be effected in the construction of the device without departing from the spirit of the invention.

What is claimed is:

30 1. A device of the character described com-

prising a casing, a tubular member within the casing, bearing members within the casing and adjacent the ends of the tubular member, means for detachably securing said members within the casing, agitating devices revolubly mounted between said members, and means within one of the members for taking up wear upon the agitating devices.

2. A device of the character described comprising a casing having an aperture in the wall thereof, a transparent tubular member within the casing and closing said aperture, bearing members within the casing and adjacent the ends of and spaced apart by the tubular member, means for detachably securing said bearing members within the casing, agitating devices revolubly mounted between said members and adjacent the aperture within the casing, and means within one of the members for taking up wear upon the agitating devices.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

WILLIAM S. MORGAN.

Witnesses:

F. J. FINUCANE,  
A. C. CONWAY.