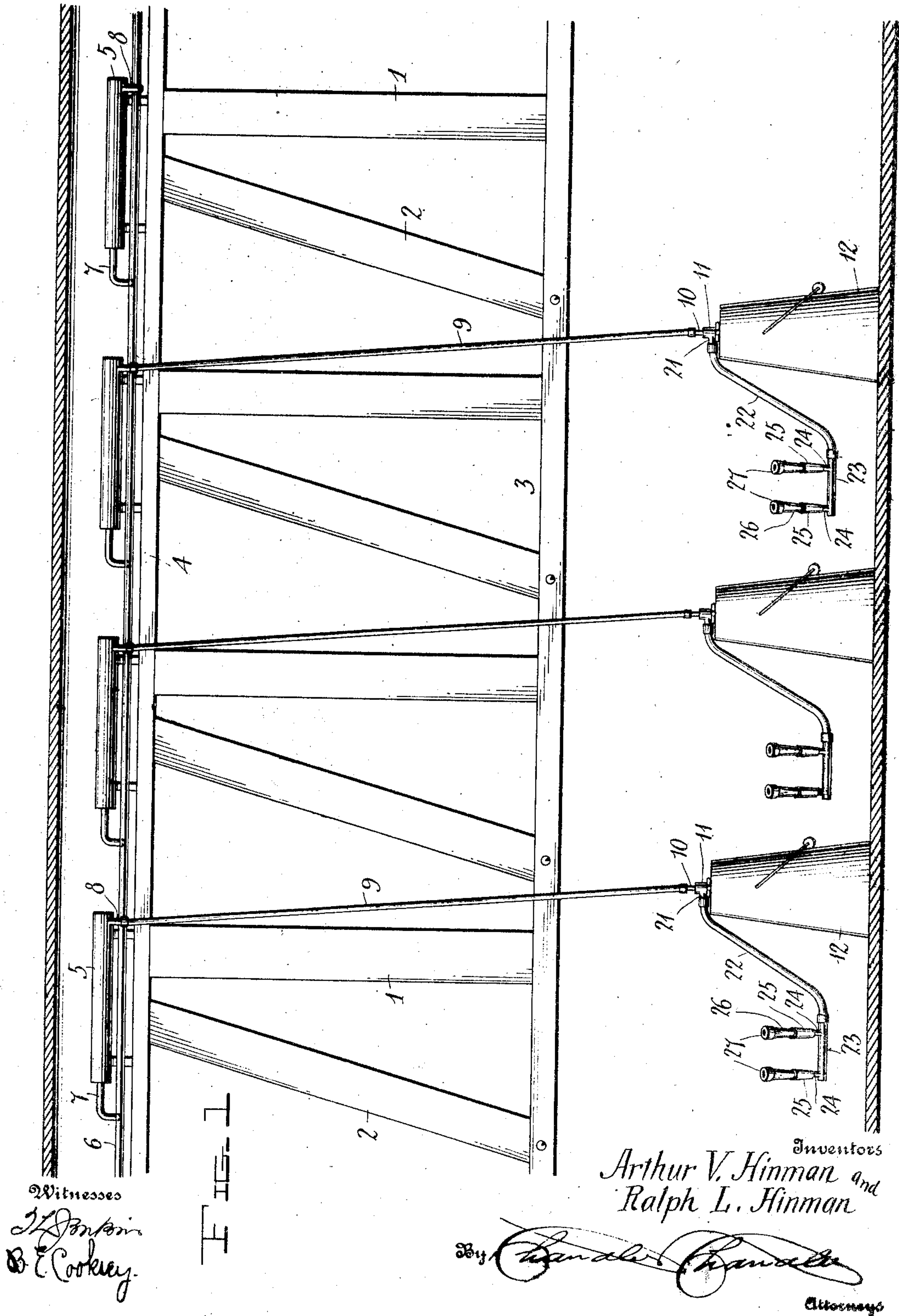


907,236.

A. V. & R. L. HINMAN.  
COW MILKING MACHINE.  
APPLICATION FILED JAN. 13, 1908.

Patented Dec. 22, 1908.  
3 SHEETS—SHEET 1.



Witnesses  
J. H. Martin  
B. E. Cooksey.

FIG. 1

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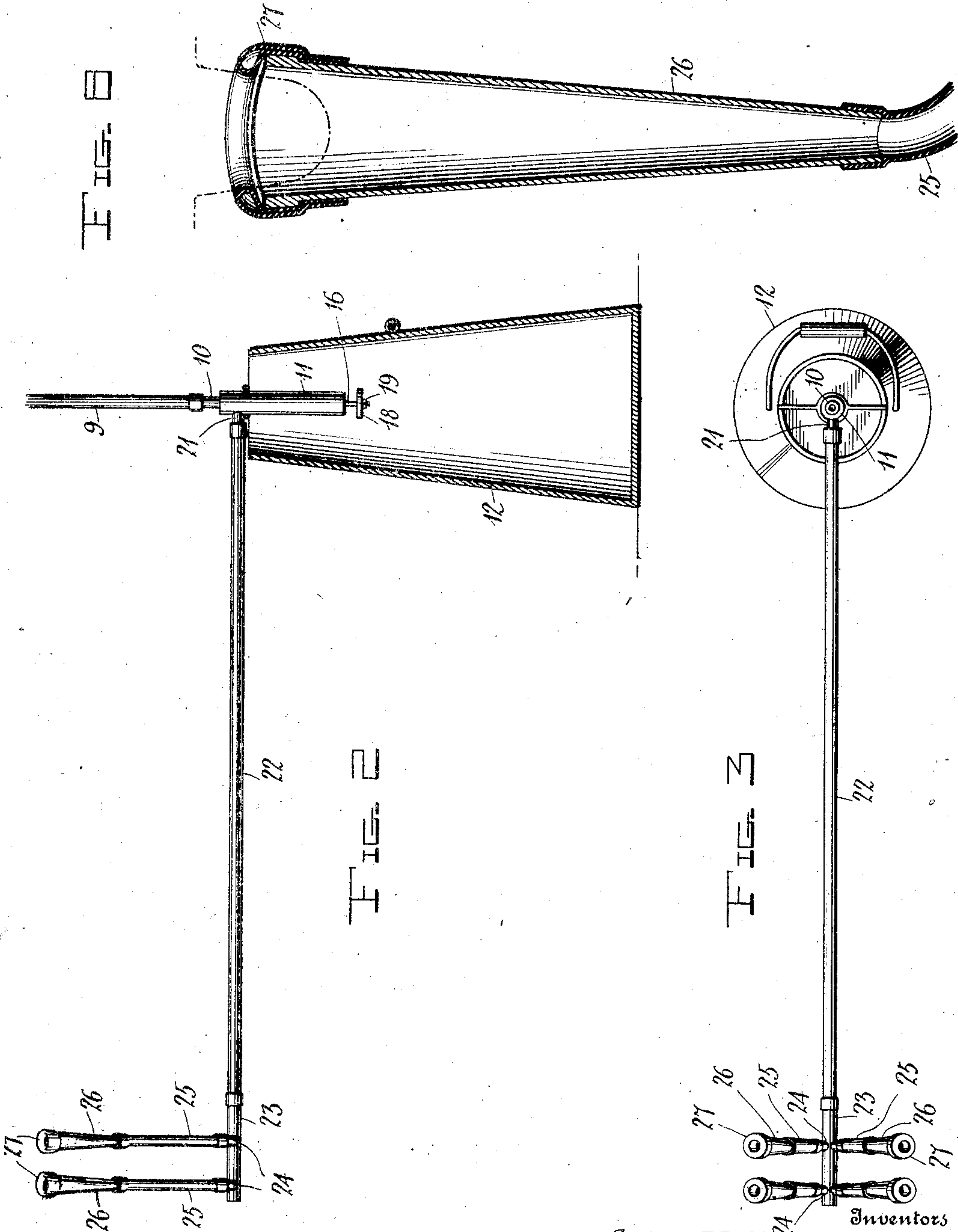
COW MILKING MACHINE.

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3 SHEETS—SHEET 2.

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Witnesses

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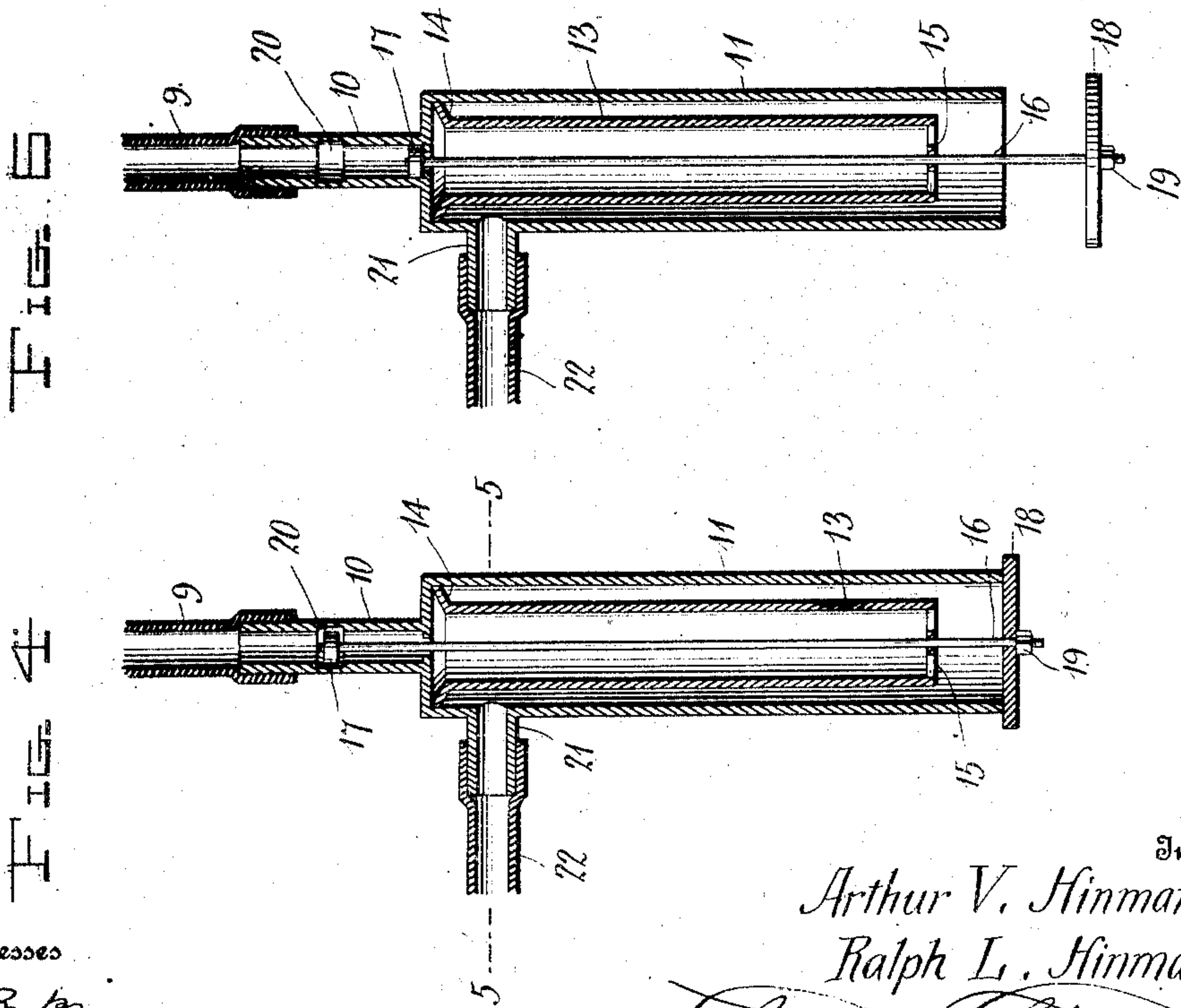
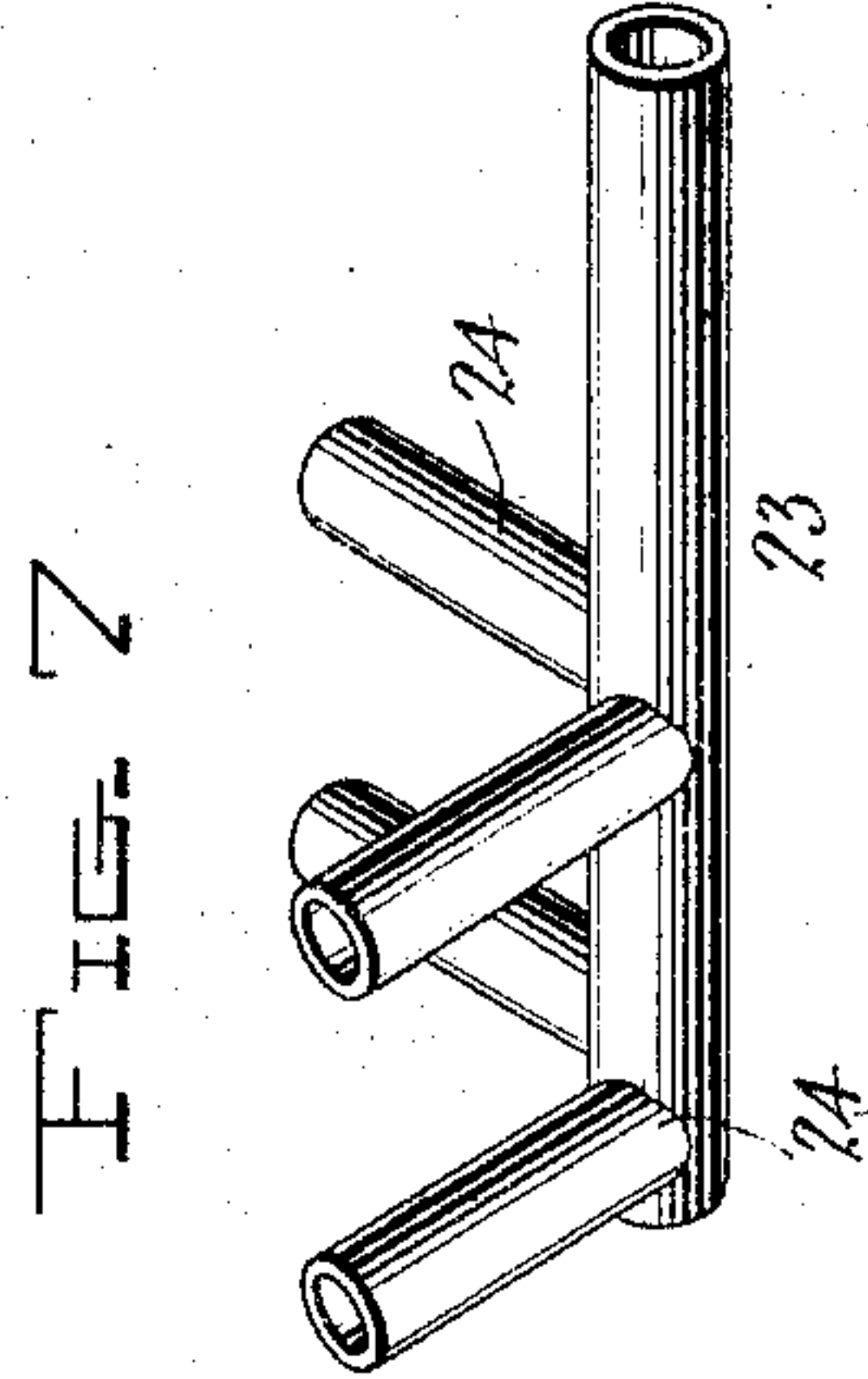
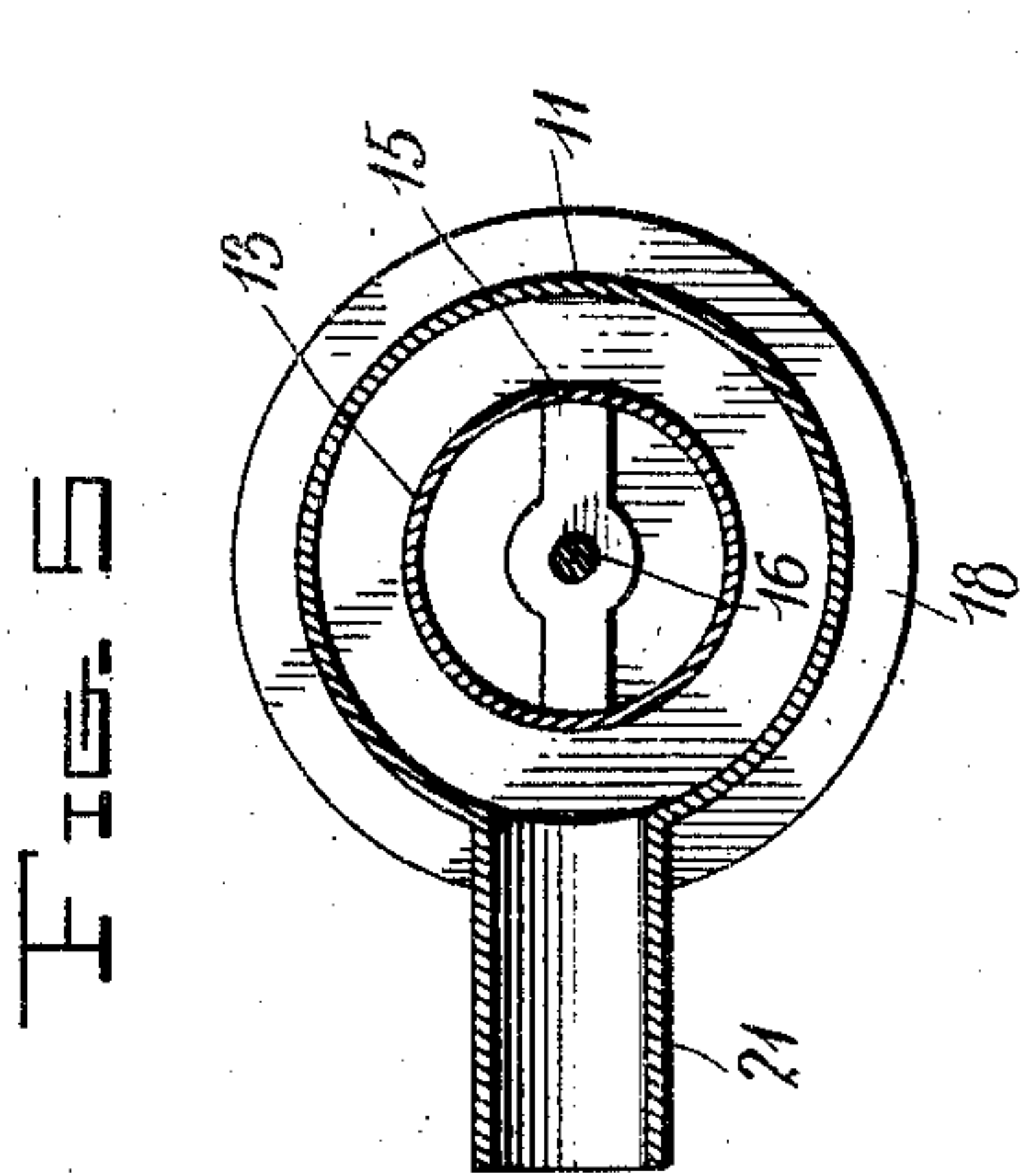
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APPLICATION FILED JAN. 13, 1908.

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3 SHEETS—SHEET 3.



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# UNITED STATES PATENT OFFICE.

ARTHUR V. HINMAN AND RALPH L. HINMAN, OF MUNNSVILLE, NEW YORK.

## COW-MILKING MACHINE.

No. 907,236.

Specification of Letters Patent.

Patented Dec. 22, 1908.

Application filed January 13, 1908. Serial No. 410,608.

*To all whom it may concern:*

Be it known that we, ARTHUR V. HINMAN and RALPH L. HINMAN, citizens of the United States, residing at Munnsville, in the county of Madison, State of New York, have invented certain new and useful Improvements in Cow-Milking Machines; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The present invention has reference to improvements in cow-milking apparatuses, and it aims, generally, to provide an exceedingly simple, readily operated, and highly efficient apparatus of that class for milking a number of cows simultaneously.

More especially, the invention resides in the provision of a cow-milking apparatus in which the hose leading from the suction pump is connected to a cylinder whose lower end is closed and opened by a flexible valve which is depressed during the in-stroke of the pump piston, to discharge from the cylinder the milk previously drawn thereinto upon the out-stroke of said piston, thus permitting the apparatus to be used in connection with any pail or other receptacle of ordinary construction without the necessity of providing a special air-tight cover for the same, the valve being forced against said cylinder and the air exhausted upon the succeeding outward movement of the pump piston.

The invention further resides in the specific form of teat cup made use of, and still further resides in the employment of a series of low-pressure pumps whose pistons are connected to a single reciprocating rod operated in any preferred manner, injury to any one of the pumps thus affecting in no way the operation of the remaining pumps or necessitating the stopping of the entire apparatus.

These and various other features which constitute the subject matter of this case will be readily understood from a consideration of the following detailed description, the preferred embodiment of the invention being illustrated in the accompanying drawings, in which corresponding parts are designated by the same reference numerals in the several views.

Of the said drawings:—Figure 1 is a fragmental vertical section taken through a barn.

illustrating the position of the apparatus in the stalls therein, and the connection of the main operating rod with the same. Fig. 2 is an enlarged detail view of the valve cylinder and its attendant parts, the receptacle in which the cylinder is disposed being shown in section. Fig. 3 is a top plan of Fig. 2. Fig. 4 is an enlarged vertical section through the cylinder, showing the sleeve and the valve rod in place therein, the latter being in its raised position. Fig. 5 is a horizontal section on the line 5—5 of Fig. 4. Fig. 6 is a view similar to Fig. 4 showing the valve rod in its lowered position. Fig. 7 is an enlarged perspective view of the claw. Fig. 8 is a similar view partly in section, of one of the teat cups.

Referring more particularly to the drawings, 1 and 2 designate the fixed and movable vertical beams at the front end of the stalls 3 within the interior of the barn, and 4 the horizontal beam which rests upon the top of the first-mentioned beams and has mounted thereon a series of pump cylinders 5, the number of pumps corresponding to the number of stalls. Movable along the beam 4 is a horizontal rod 6 which extends across the entire line of stalls and has imparted thereto by any preferred mechanism (not shown), an endwise reciprocating movement, said rod having connected thereto the bent free ends of the pump pistons 7, the several pumps being thus simultaneously operated.

The rear end of each pump cylinder is provided with a nipple 8, to which is attached one end of a section of hose 9, the other end of which is connected with a nipple 10, formed upon the closed upper end of a valve cylinder 11, supported in any preferred manner upon the cover of a pail or other receptacle 12 and extending thereinto, the lower end of the cylinder being open. Each valve cylinder has disposed therewithin a sleeve 13, held in place frictionally or otherwise by its outwardly-bent upper end 14, the lower end of the sleeve carrying a strap 15, provided with a central opening which alines with an opening formed axially in the closed cylinder end. Through said openings extends a rod 16 which forms the stem of the valve and has its upper end projecting into the nipple 10, at which point, it is provided with a head 17, which normally rests upon the closed end of the cylinder. The threaded lower end of said rod extends below the cylinder and carries a flexible disk



18, which serves as the valve proper and is supported upon a nut 19 turned upon the rod end. Each nipple has a horizontally-disposed annular channel 20 formed in its inner wall intermediate the ends thereof, as shown in Figs. 4 and 6.

Adjacent its upper end, each valve cylinder is provided with a second nipple 21, which projects laterally therefrom, to which nipple one end of a hose section 22 is attached, the other end thereof being fitted upon the stem of a claw-shaped member 23 having four laterally-projecting fingers or nipples 24 formed thereon, upon each of which fingers is fitted one end of a short hose-section 25 whose other end is attached to a teat cup. This element, as shown in Fig. 8, comprises a conical metal sleeve 26 and a rubber sleeve 27, the rubber sleeve being first doubled and then slipped over the larger end of the metal sleeve, which end is thus partially closed by the doubled edge of the rubber sleeve. The smaller end of the metal sleeve is then inserted in the hose-section 25. When, therefore, the teat cups are passed over the teats of the cow and the pumps are in operation, it will be apparent that upon each out-stroke of the pump pistons, the valve rods will be raised by the suction so created, drawing the disks 18 tightly against the lower edges of the cylinders, said rods moving in the opposite direction during the in-stroke of the pistons. It will be understood, however, that by reason of the fact that the diameter of each piston head 17 is virtually the same as the inner diameter of the nipple 10, in which it slides, no vacuum will be created in the cylinder, and, in consequence, no milk drawn through the teat cups and hose sections 22 into the cylinders, until the piston heads reach the channels 20 in the nipples, at which point, the exhausting of the air from the cylinders commences.

It is thus obvious that it is unnecessary to make use of a special air-tight receptacle in connection with the apparatus, nor is it necessary to render the vessel air-tight by the use of a special cover therefor, as the cylinder itself is rendered air-tight by means of its flexible valve and may therefore, be employed with any ordinary receptacle, being supported in any manner upon the cover thereof, or otherwise, as preferred. It will be further obvious that the more or less impure air forced out of the pump cylinders during the inward movement of the pistons is prevented from entering the valve cylinders, by reason of the tight fit of the rod heads 17 within the nipples, thus rendering the machine highly sanitary by avoiding any exposure of the milk to such impure air, as will be understood. It will also be obvious that the injury to any pump or to the apparatus connected therewith in no way

affects the operation of the remaining pumps as the same are entirely independent of each other.

What is claimed is:—

1. In a cow-milking apparatus, the combination of an air-pump; a series of teat cups; a cylinder connected at its upper end with the pump and having an open lower end; flexible connections between the cylinder and the teat-cups; a movable rod disposed within the cylinder and projecting at one end below the lower edge thereof; a disk carried by said rod and movable therewith into and out of contact with the lower edge of the cylinder, to form an air-tight bottom for the latter, the movement of said rod being controlled by the movement of the pump piston, and means for effecting communication between the air-pump and the cylinder at a predetermined point in the movement of said rod, to create a vacuum in said cylinder, and for cutting off communication at other times.

2. In a cow-milking apparatus, the combination of an air-pump; a series of teat-cups; a cylinder provided at its upper end with a nipple and having an open lower end; a flexible connection between the air-pump and said nipple; a separable flexible connection between the cylinder and the teat-cups; a movable rod disposed within the cylinder and projecting at one end below the lower edge thereof and at its other end into the nipple; a disk carried by said rod and movable therewith into and out of contact with the lower edges of the cylinder, to form an air-tight bottom for the latter, the movement of said rod being controlled by the movement of the pump piston; and means for effecting communication between the air-pump and the cylinder at a predetermined point in the movement of said rod, to create a vacuum in said cylinder, and for cutting off communication at other times.

3. In a cow-milking apparatus, the combination of an air-pump; a series of teat cups; a cylinder provided at its upper end with a nipple having an annular channel formed in the inner wall thereof; a flexible connection between the air-pump and said nipple; a separable flexible connection between the cylinder and the teat-cups; a movable rod disposed within the cylinder and projecting at one end below the lower edge thereof and at the other end into the nipple; a disk secured to the lower end of said rod forming the bottom of the cylinder, the movement of said rod being controlled by the movement of the pump piston; and a head secured to the upper end of said rod and adapted, upon reaching said channel, to open communication between the air-pump and the cylinder, for creating a vacuum within the latter.

4. In a cow-milking apparatus, the com-



bination of an air-pump; a series of teat-cups; a cylinder connected at its upper end with the pump, and having an open lower end; flexible connections between the cylinder and the teat-cups; a sleeve disposed within the cylinder in spaced relation to the inner wall thereof; a rod movable within said sleeve and projecting below the lower edge of the cylinder; a strap carried by said sleeve and provided with an opening through which said rod slides; and a flexible disk secured to the lower end of said rod

and movable therewith into and out of contact with the lower edge of the cylinder, to form an air-tight bottom for the latter, the movement of said rod being controlled by the movement of the pump piston.

In testimony whereof, we affix our signatures, in presence of two witnesses.

ARTHUR V. HINMAN.

RALPH L. HINMAN.

Witnesses:

LEILA THOMPSON,  
L. W. McCLOSKEY.