

No. 674,113.

Patented May 14, 1901.

D. W. M. BURMINGHAM.

MILK COOLER.

(Application filed July 11, 1900.)

(No Model.)

Fig. 1.

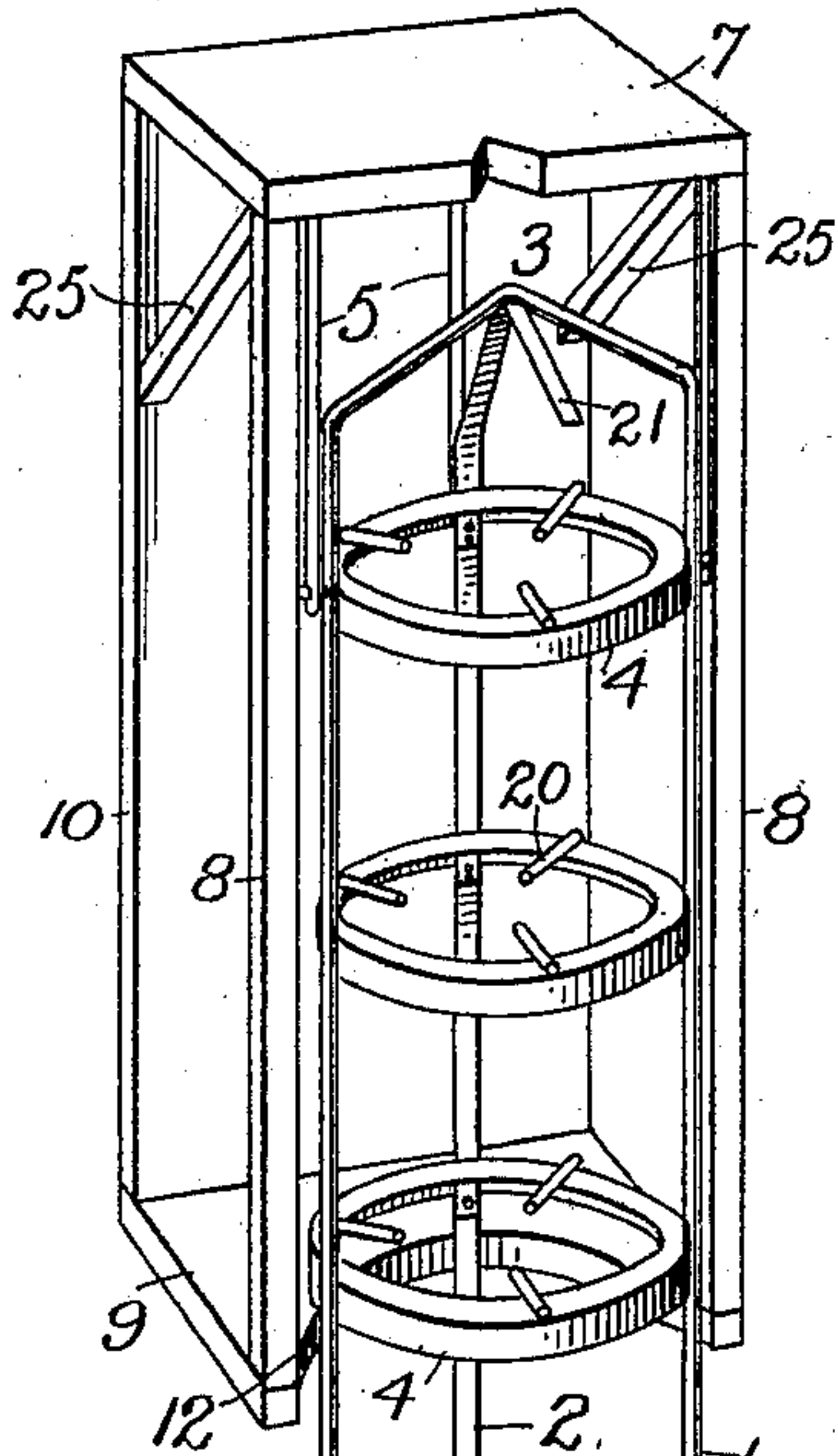


Fig. 2.

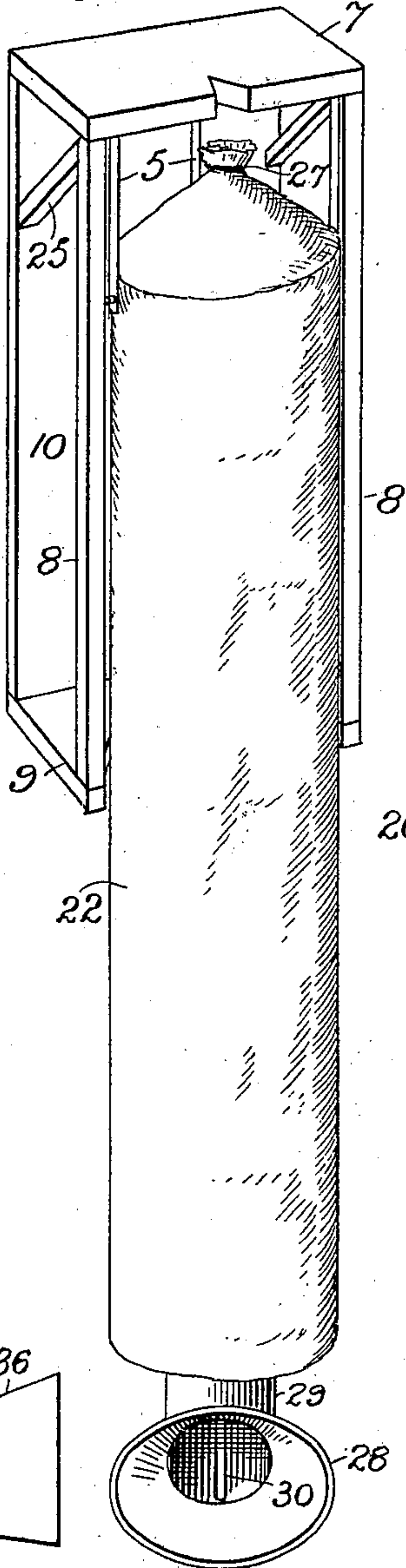


Fig. 3.

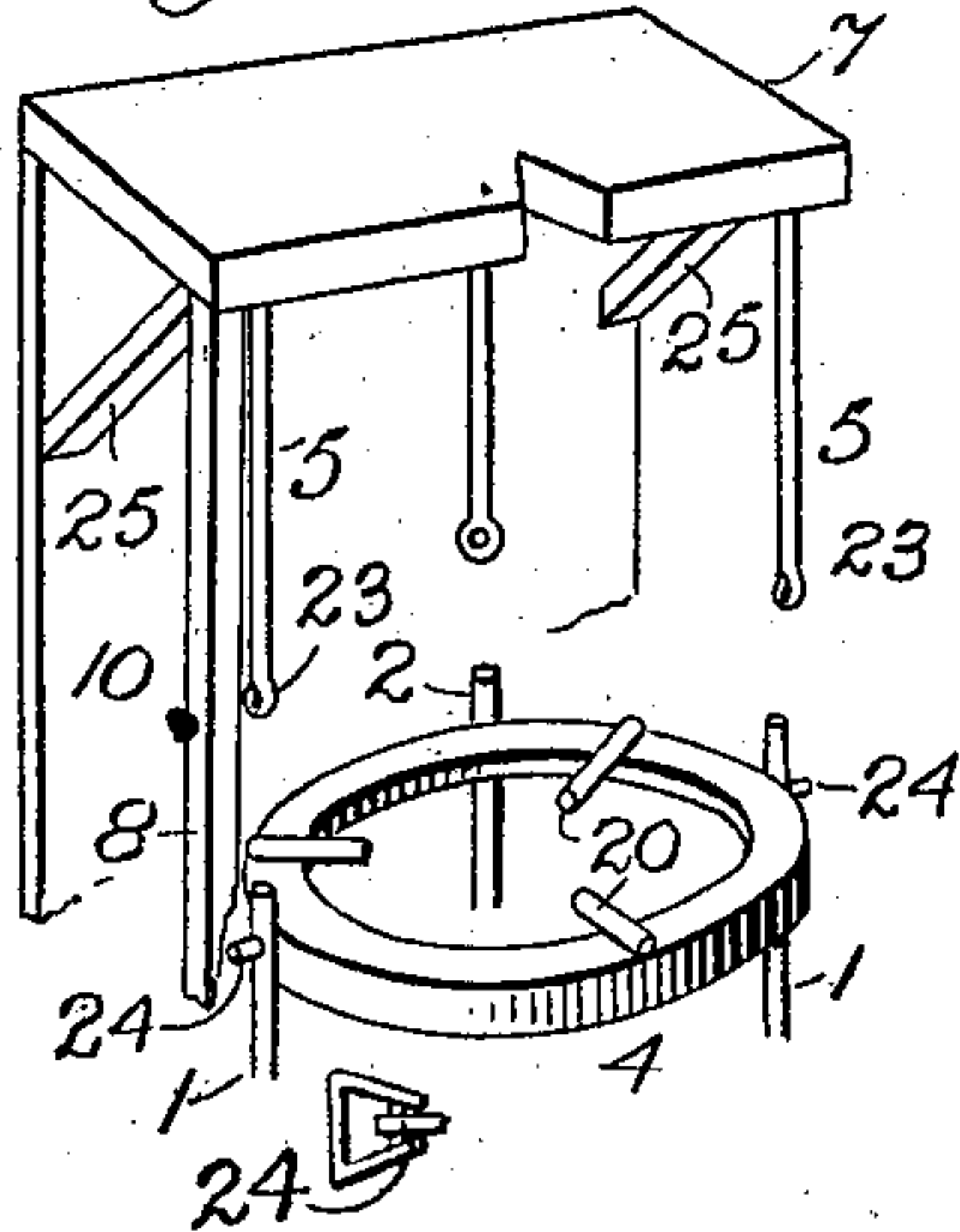


Fig. 4.

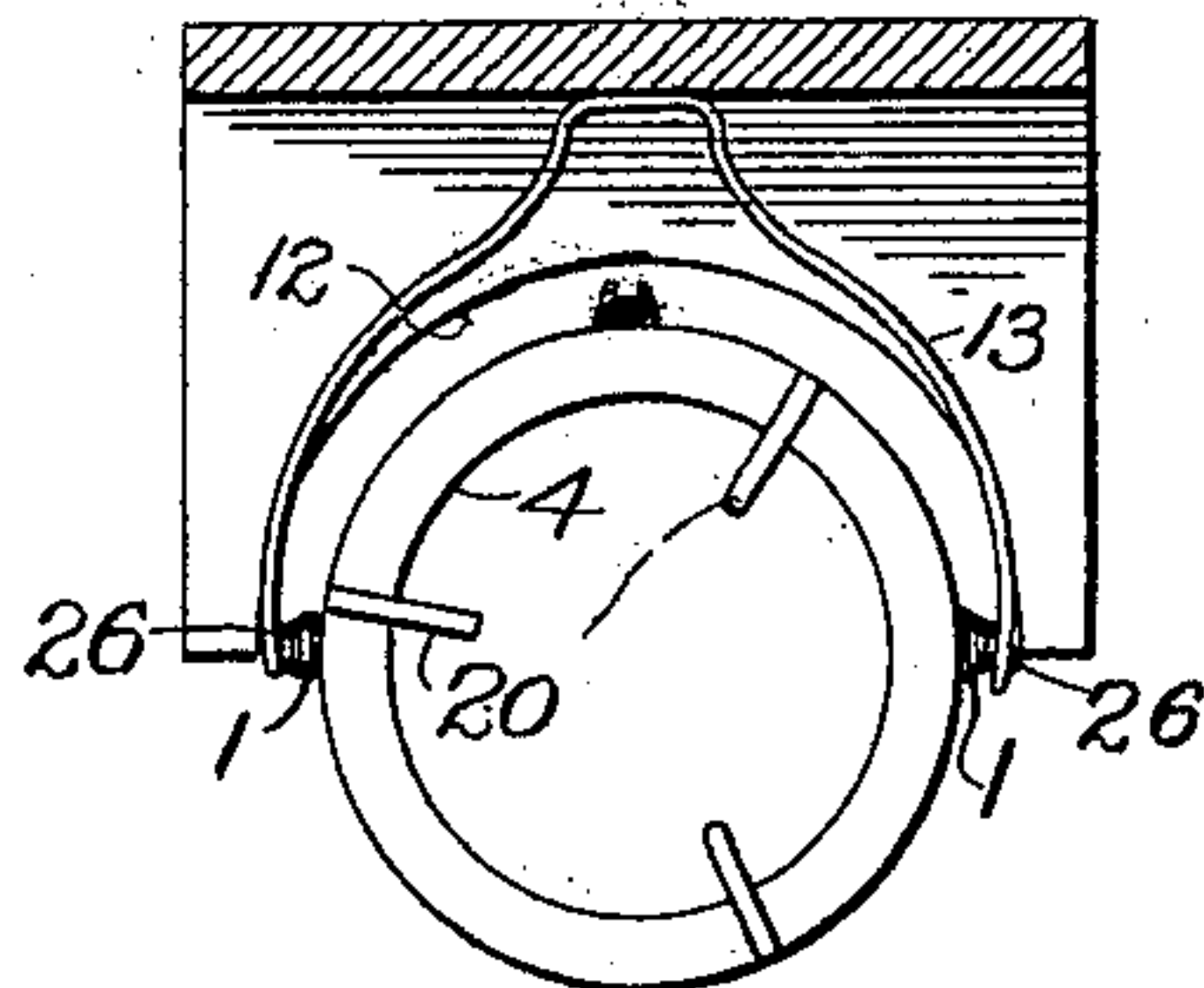


Fig. 5.

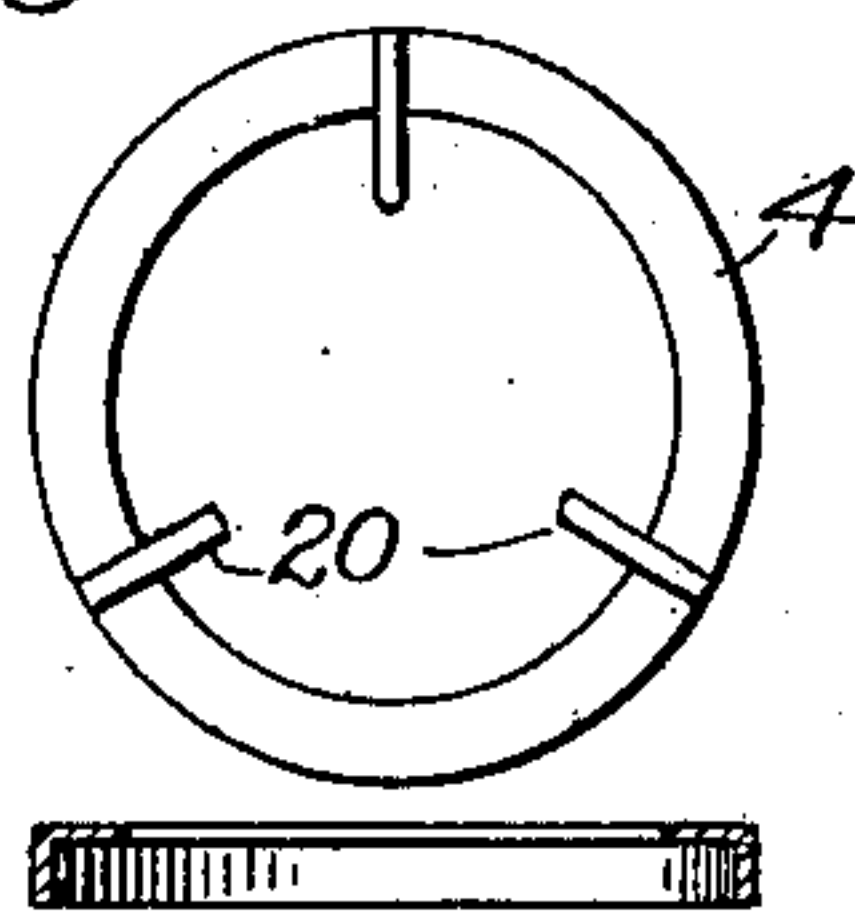


Fig. 7.

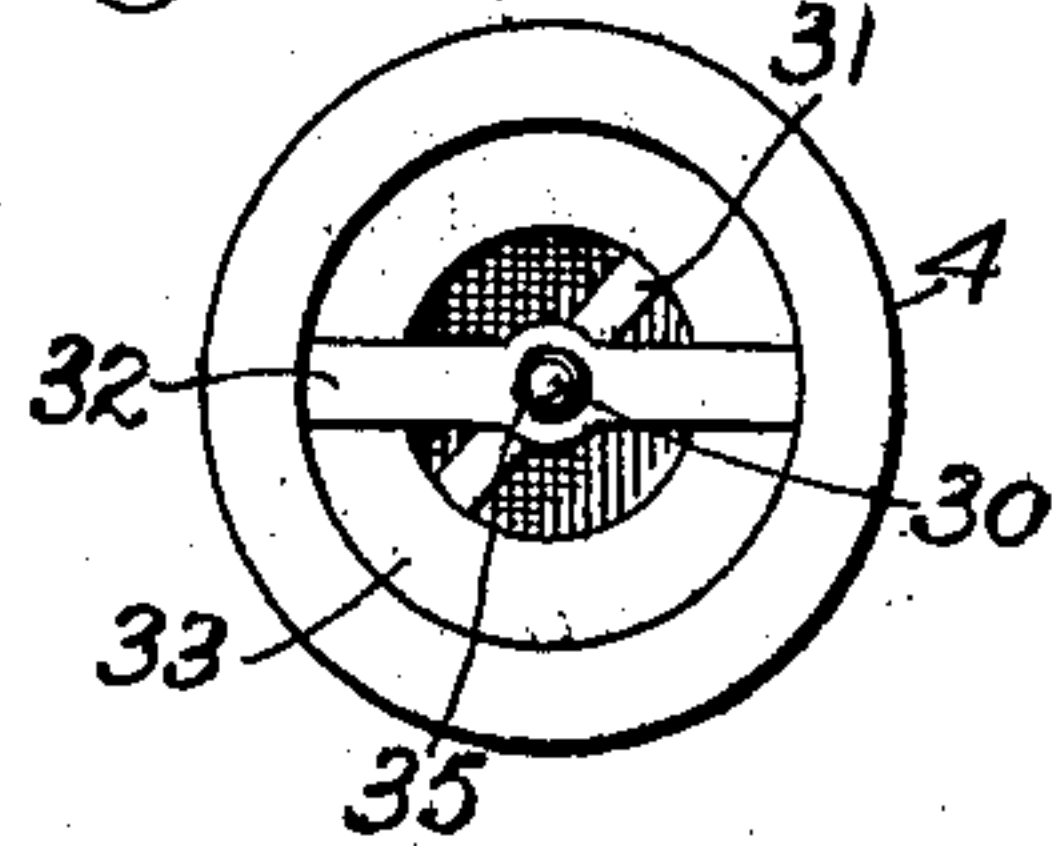


Fig. 8.

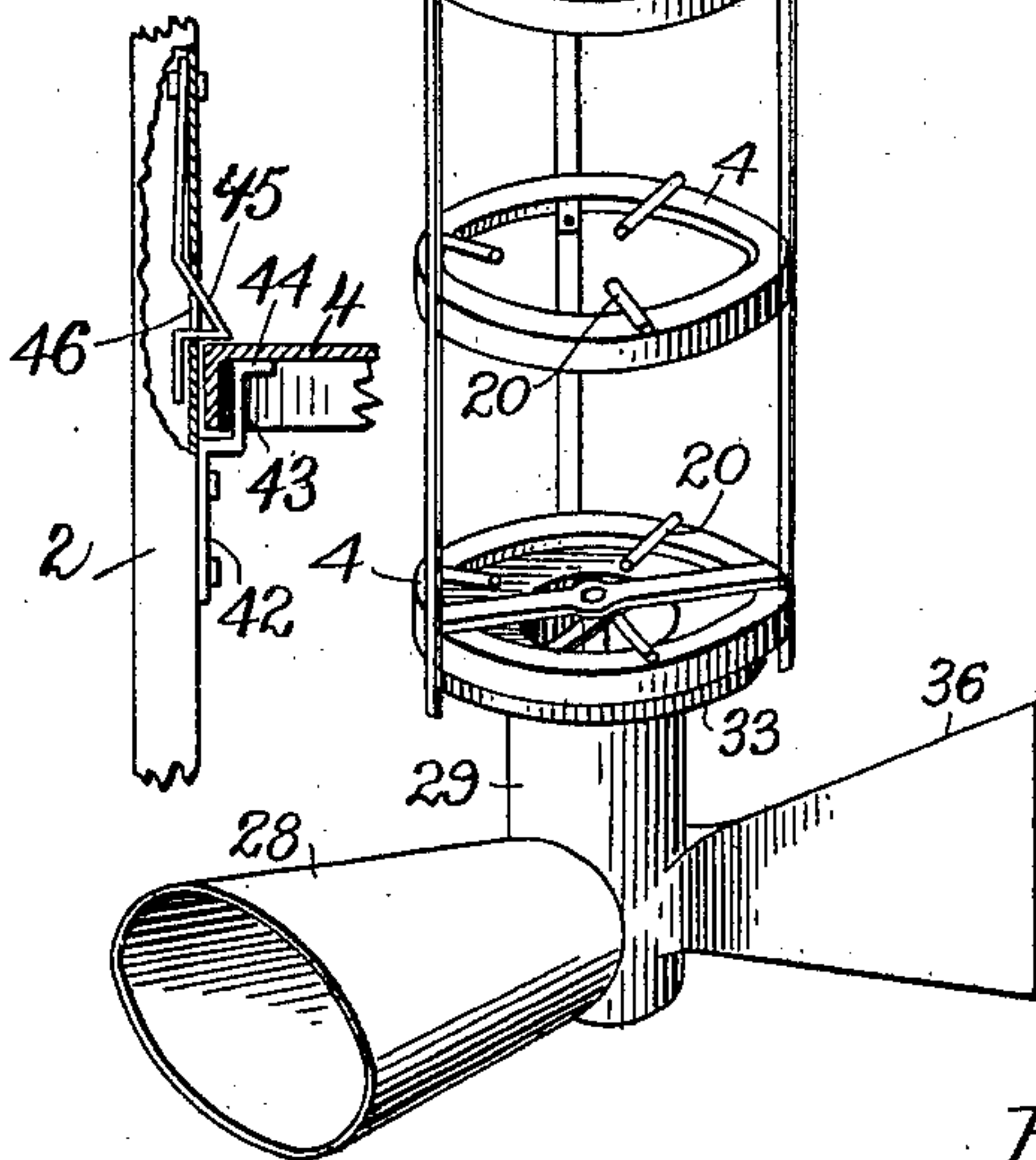
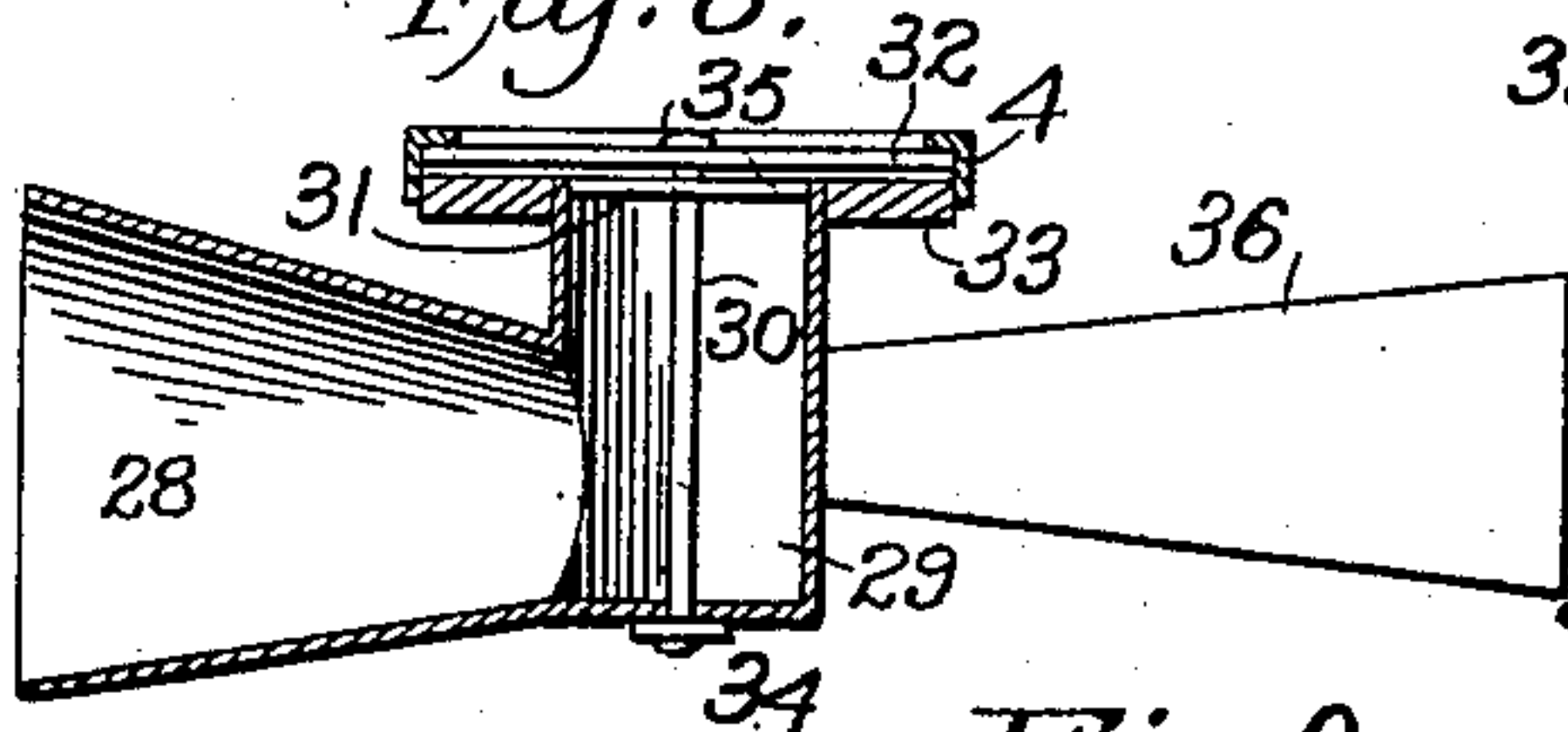


Fig. 6.



WITNESSES:

James T. Duhamel

Henry N. Wier.

INVENTOR

Daniel W. M. Burmingham

BY

Charles W. Foster

ATTORNEY

Fig. 9.





# UNITED STATES PATENT OFFICE.

DANIEL WILSON MUNROE BURMINGHAM, OF TAYLOR, TEXAS.

## MILK-COOLER.

SPECIFICATION forming part of Letters Patent No. 674,113, dated May 14, 1901.

Application filed July 11, 1900. Serial No. 23,171. (No model.)

*To all whom it may concern:*

Be it known that I, DANIEL WILSON MUNROE BURMINGHAM, a citizen of the United States of America, and a resident of Taylor, county of Williamson, State of Texas, have invented certain new and useful Improvements in Milk-Coolers, of which the following is a specification.

This invention relates to an improvement in milk-coolers, its object being to perfect, simplify, and make more efficient a small refrigerating apparatus of this character which may be at once economical, serviceable, and of large utility; and the invention consequently consists, essentially, in the construction, arrangement, and combination of parts, substantially as will be hereinafter more fully set forth and then claimed.

In the accompanying drawings, illustrating my invention, Figure 1 is a front perspective view of my improved milk-cooler with the cloth covering removed. Fig. 2 is a similar view showing the apparatus shrouded from top to bottom within the cloth covering. Fig. 3 is a partial perspective view of the upper end of the milk-cooler, showing the detailed construction thereof. Fig. 4 is a detail view of the lower portion of the bracket device and the spring carried thereby which engages the shelf construction. Fig. 5 is a detail plan view of one of the shelves and also shows the cross-section of the same. Fig. 6 is a sectional view, and Fig. 7 a plan view, of the fan mechanism at the base of the apparatus. Fig. 8 is a detail sectional view of the means for supporting the shelf and the spring-catch for engaging the latter. Fig. 9 is a cross-section of one of the vertical strips.

Similar numerals of reference designate corresponding parts throughout all the different figures of the drawings.

My improved milk-cooler comprises, essentially, a vertical series of horizontal shelves 4 4 4 4, of which there may be any suitable number, the same consisting of flat rings of heavy galvanized iron, with the outer periphery turned down to provide a flange at right angles to the horizontal portion of the ring, as shown in cross-section in Fig. 5. This form of construction is to allow free circulation of air from the top to the bottom of the apparatus, and the flanged construction of the

shelf insures the necessary rigidity to enable it to sustain such heavy weights as may be deposited thereon. (See Fig. 5.) Each shelf 4 is provided with three or more cleats or inwardly-projecting strips 20, extending from the outer edge of shelf 4 inwardly toward the center of the same for the distance of an inch or more beyond the inner periphery of the shelf, as is clearly indicated in Fig. 5. These cleats are thick enough to afford enough room between the bottom of a bucket or other vessel which may be placed thereon and the shelf to permit the free passage of air between the same and up and down, and in projecting over the inner edge of the shelf they enable vessels to be supported which are of smaller circumference on their base than that of the inner periphery of the shelf. These shelves are supported by some suitable framework, which consists, preferably, of three vertical strips 1 1 and 2, which strips are made of heavy galvanized iron and are preferably in cross-section of the form shown in Fig. 9, the sides 40 being bent inwardly at an angle, as shown, and being stayed by small cross-rods 41 and 24, the upper cross-rod being 24 and used to engage the suspending-rod 5, as shown in Fig. 3. Said strips 1 1 and 2 extend a short distance above the upper shelf, at which point, as 3, they are bent together and soldered centrally above said upper shelf. The rear one of the central strips mentioned—as, for instance, strip 2—is made four or five inches longer than the other two, and this extra length is bent forward and downward, as at 21, (see Fig. 1,) thereby forming a support for the front part of the cloth or shroud 22, with which the system of shelves is covered when in use. Obviously the shelves 4 are secured to the uprights 1 1 and 2 by any suitable and efficient means.

At proper intervals on the inner flat surface of the supporting-strips 1 1 and 2 are supports, on which rest the shelves 4 4. The detail construction of said supports is shown in Fig. 8. The part marked 42 is secured by brads or other means firmly to the strip. The part 43 is bent first outward and then upward, thus leaving a space to receive the downwardly-bent flange surrounding the shelf. The part 44 is bent outwardly in a horizontal plane to afford a broad rest for the horizontal



ring portion of the shelf 4. Just above these supports on the strip 2 are spring-catches (designated 45) for engaging the shelves 4 to hold down the rear side of said shelves to prevent tipping when a weight is placed thereon near the front edge. Said catch 45 is fastened to the inner surface of the supporting-strip 2 near the upper end of said catch and projects outwardly through a slot 46 in the wall of strip 2. Preferably these spring-catches 45 are only placed on the rear strip 2 in order to prevent tipping of the shelf. The arrangement of shelf-supports just described is to provide for easy removal and replacement of shelves, if it be desired. The shelves thus united and sustained by means of the framework of sidestrips, as specified, are suspended upon spring-rods 5 5, of which there may be any suitable number—as, for instance, three. These rods 5 are fixed at their upper ends in the horizontal platform 7, below which they depend vertically, their lower ends being formed with eyes 23, that are adapted to engage hooks or pins 24, projecting across the strips or uprights 1 1 and 2 at points opposite the edge of the top shelf 4. In Fig. 3 said top shelf 4 is shown as dropped to a point below its proper relative position in order to illustrate the location of the pins or rods 24, and the lower ends of the spring-rods 5 having the eyes 23, which engage said rods 24. The shelf 7 is supported in a horizontal position by means of a substantial backboard 10 and is well braced by the inclined braces 25, as shown in Fig. 3.

At the lower end of backboard 10 is a rigid horizontal shelf 9, situated vertically below the shelf 7 and having a concave edge 12. As a further means for securing rigidity between the shelves and other parts which constitute the supporting-bracket I am now describing uprights 8 8 are employed, extending between the shelves 7 and 9. (See Fig. 1.) The whole bracket-framework thus described may be attached to the wall of the building or suspended in any other convenient manner whereby it may perform the function of supporting the system of shelves in a convenient position. The vessel containing water is adapted to be placed upon the shelf 7 and the water allowed to drip therefrom through the V-shaped notch or recess at the outer edge of shelf 7 upon the conical upper end of the cloth 22, which covers the system or series of shelves.

Upon the lower shelf 9 of the supporting bracket device just described is a long curved flat spring 13, which is clearly shown in Fig. 4. This spring is securely fastened to the backboard 10, as shown, and its ends curved outwardly from said backboard, so that the two extremities may engage the projections 26 on the uprights 1 1, said projections passing through perforations or slots in the ends of said spring 13, as is clearly shown in Fig. 4, the purpose of the spring and its connection with the uprights 1 being to enable the series of shelves to be steadily and rigidly

held in position closely within the curved edge 12 of the lower shelf 9.

The cloth covering 22, to which I have already alluded, is bunched together at its upper end 27 and secured by means of a string, cord, or other device, as shown in Fig. 2. This cloth is kept saturated by the cool water which drips from the vessel seated upon the shelf 7. The evaporation of the water reduces the temperature within the cloth casing and cools the milk or other articles carried by pans or receptacles placed upon the shelves 4. It has been found in practice that by means of this apparatus any fluid or substance placed therein can be kept at a temperature of 40° to 50° even though the weather be extremely warm.

In order to facilitate the evaporation of the water from the cloth covering 22, it is found advisable to create a draft greater than the ordinary natural breeze obtained when the apparatus is supported in the usual way, and this additional draft I secure by means of a hood or fan suspended at the lower extremity of the series of shelves. This hood consists of a horizontal flaring portion 28, projecting outward beyond the circumference of the lowermost shelf, and a vertical central portion 29, extending upward centrally within the inclosed space. This hood is shown in Figs. 1, 2, and 6. A rod or bolt 30 is so placed centrally in the vertical or cylinder section as to form a pivot on which the whole device may be revolved to enable it to face the wind from any direction. This hood is connected to the lower shelf 4 directly. A flat bar 31 is fastened across the vertical portion 29 of the hood. Another flat bar 32 is secured by rivets to the under side of the horizontal rim of the shelf, extending from the outer edge of the same on the one side to the outer edge thereof on the other. The upper part of the vertical portion 29 is fitted to a wooden disk 33, (see Fig. 7,) made a little less in diameter than the shelf 4, so that it may fit in under the flange of the shelf and be capable of revolving with the hood. The bars 31 and 32 are perforated centrally to permit the passage downward therethrough of a bolt 30 on which the hood revolves, said bolt at its lower end passing through a perforation in the floor of the hood, where it is provided with a tap and washer 34, serving as a support in revolving, while the upper extremity of the bolt has a broad head 35 to prevent it from dropping. Furthermore, the hood has a vane 36 extending at the rear thereof, whose purpose it is to keep the hood facing the wind.

Many details may be changed in the precise construction and arrangement of the embodiment of the invention as herein set forth, especially so far as the hood or fan is concerned, and I therefore reserve the liberty of making changes in the details of the construction so far as may be necessary to adapt the invention for use in various situations and also for securing to myself the broadest possible



advantage to be derived from my invention. It may also be stated that it is well known that constant and perfect stillness is essential to the complete separation of cream from milk when it is accomplished by the natural tendency of the cream to rise to the surface. In all milk-coolers now in use so far as I am aware this important fact is lost sight of and unprovided for, and it is common to suspend the cooling apparatus in such a way as not to prevent a greater or less amount of vibration or oscillation in the wind. In my present apparatus, however, the shelves are supported in such a way that no vibration is possible and the result of having absolute stillness for the milk is achieved as far as it is possible to do so.

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

1. In a milk-cooler, the combination with a supporting-frame, of a series of ring-shaped shelves, pins projecting from the supporting-frame, and depending spring-rods provided with eyes with which said pins are adapted to engage.

2. In a milk-cooler, the combination with the frame, of a series of ring-shaped shelves secured thereto, said shelves being provided with inwardly-projecting cleats, and a spring upon the frame adapted to clamp the shelves against their supports.

3. In a milk-cooler, the combination with a supporting-bracket, of a series of shelves, uprights to which the shelves are fastened, the upper ends of said uprights, being connected together, a spring to clamp the shelves upon their supports, and rods depending from the bracket and engaging the aforesaid uprights.

4. In a milk-cooler, the combination with a supporting-bracket, of a series of shelves, a spring to clamp the shelves to their sup-

port, a cloth covering therefor and a rotary hood at the bottom end of the series of shelves, substantially as described.

5. The combination of a series of shelves, uprights or rods secured thereto, said rods being connected together at their upper ends, a supporting-bracket having rods or connections fastened to the said uprights, and a spring device on the bracket for embracing and holding the base of the uprights, substantially as described.

6. The combination of a series of shelves, a cover therefor, a bracket consisting essentially of a top shelf and a bottom shelf, said bottom shelf having a curved edge, rods attached to the upper shelf for supporting the series of shelves, and a spring on the lower shelf embracing and holding the shelves in a stationary position.

7. In a device of the character described, the combination with a bracket, of a series of shelves depending therefrom, a revolving hood at the base of the shelves, a tail or fan connected with said hood, a vertical tubular portion connected with said hood and extending upwardly into the device, and a ring connected with the upper end of said tubular portion and adapted to revolve within the flange of the lowermost shelf.

8. The combination with a milk-cooler, comprising essentially a series of shelves, of a rotary fan or hood supported by means of a pivot from the bottom shelf and furnished with a fan or vane, spring-supports for the shelves, and a spring to hold the shelves against the supports.

Signed at Taylor, Texas, this 2d day of June, 1900.

DANIEL WILSON MUNROE <sup>his</sup> × BURMINGHAM.  
mark

Witnesses:

J. S. BROWN,  
SAML. CUNNINGHAM.