

No. 670,512.

Patented Mar. 26, 1901.

D. S. HORTON.
FUNNEL.

(Application filed May 11, 1900.)

(No Model.)

Fig. 1

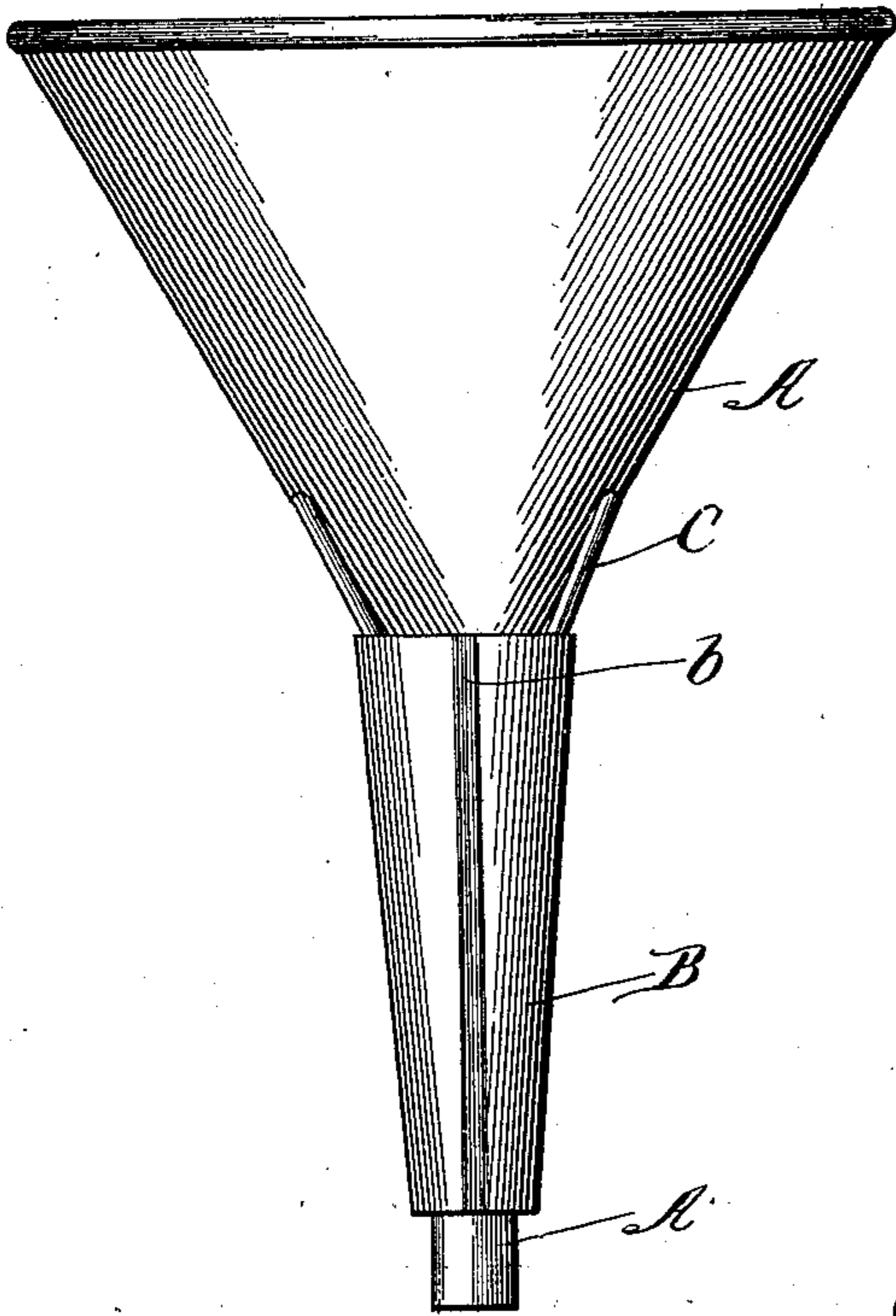


Fig. 2

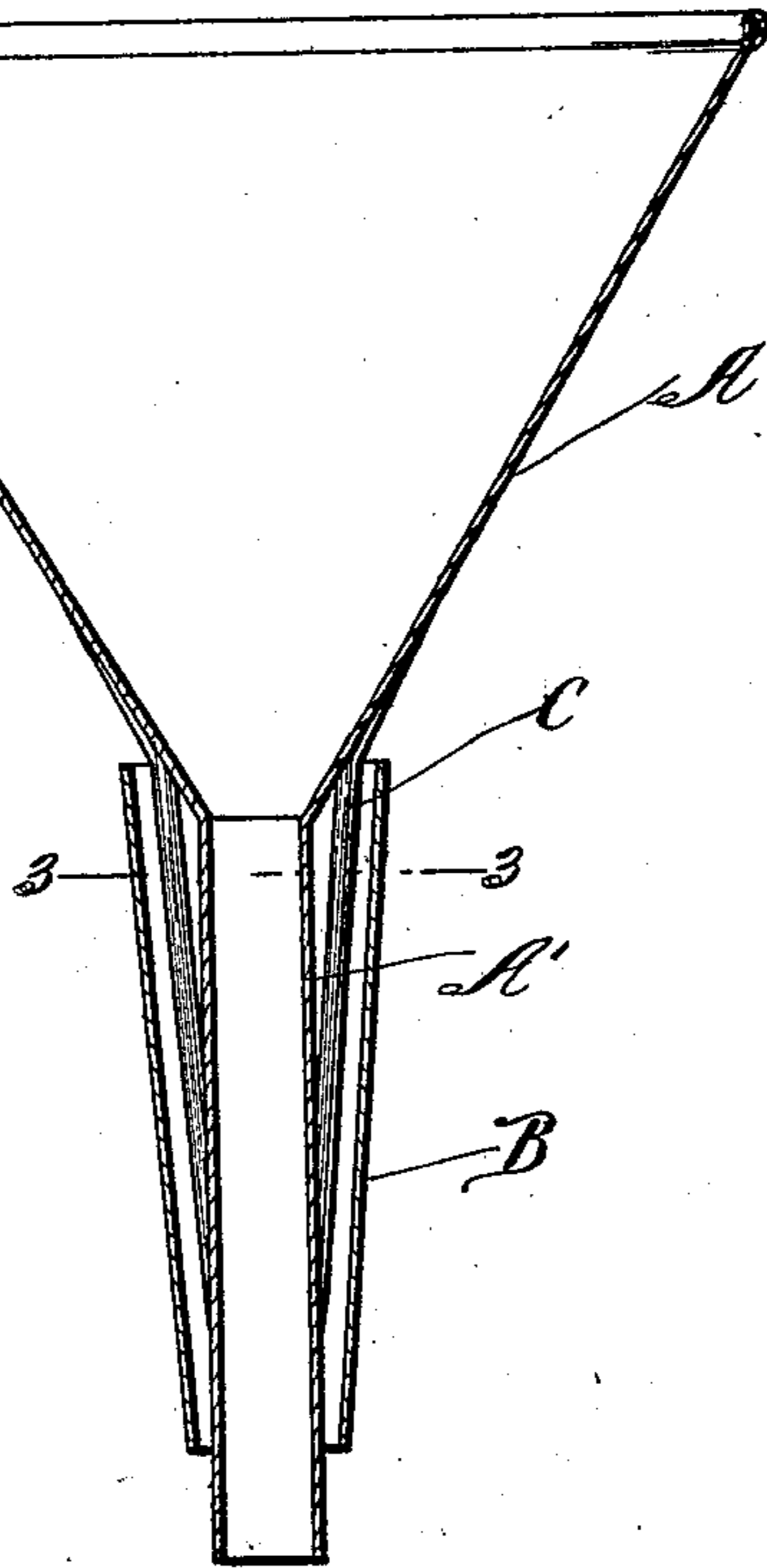


Fig. 3

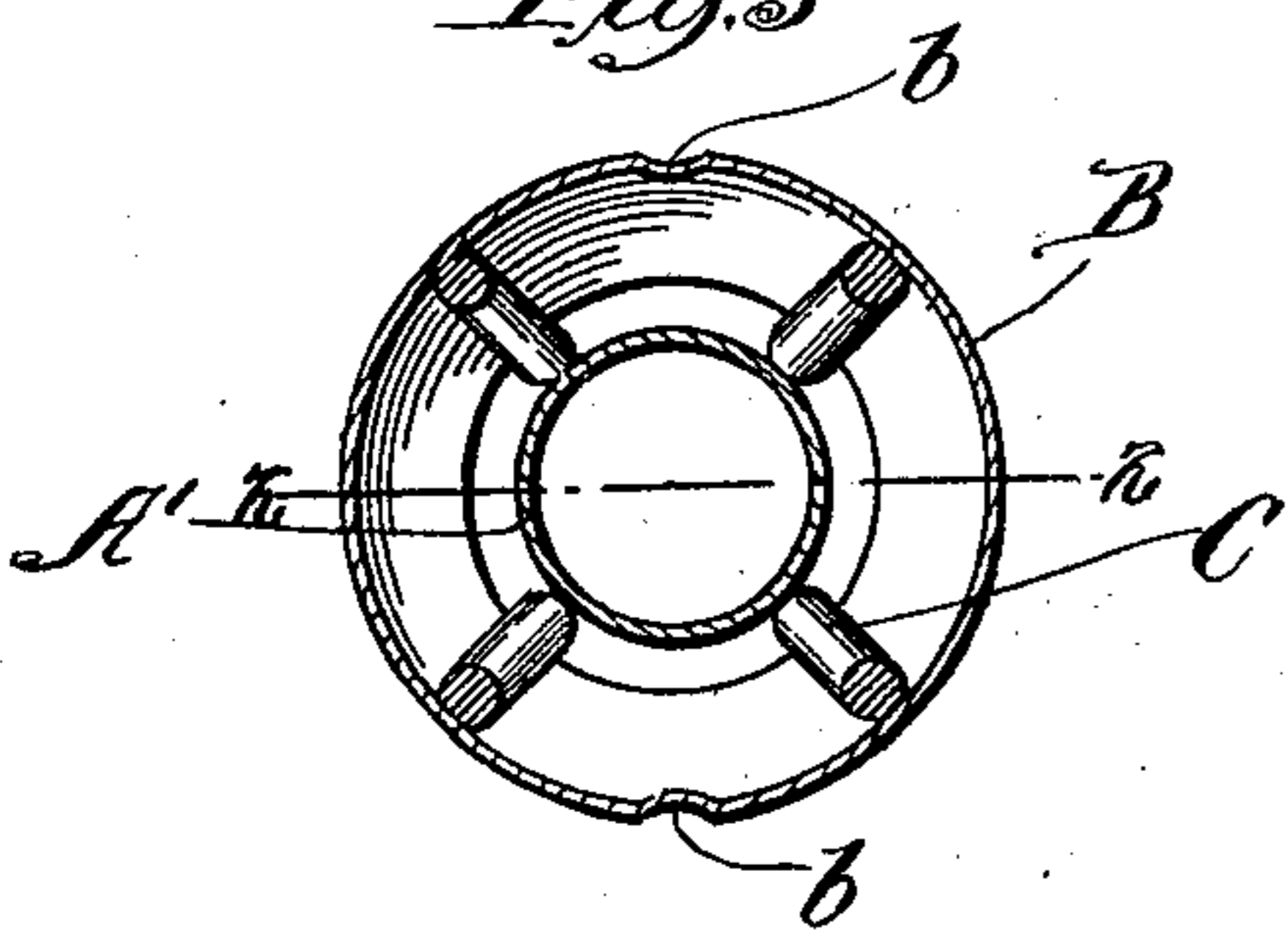
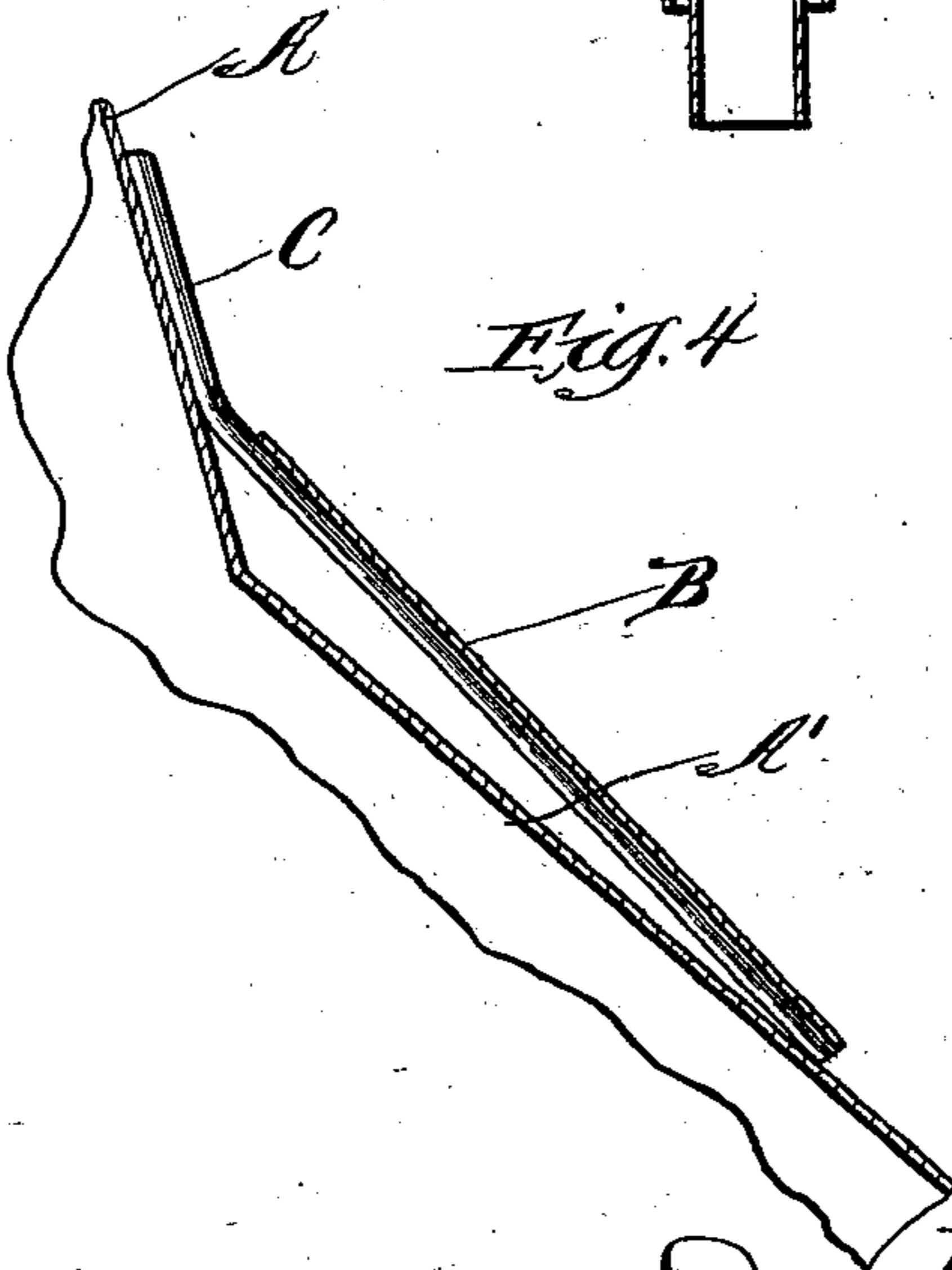


Fig. 4



Witnesses
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UNITED STATES PATENT OFFICE.

DAVID S. HORTON, OF DIXON, ILLINOIS.

FUNNEL.

SPECIFICATION forming part of Letters Patent No. 670,512, dated March 26, 1901.

Application filed May 11, 1900. Serial No. 16,316. (No model.)

To all whom it may concern:

Be it known that I, DAVID S. HORTON, a citizen of the United States, residing at Dixon, in the county of Lee and State of Illinois, have
5 invented a new and useful Improvement in Funnels, of which the following is a specification.

This invention relates to an improvement in funnels of that class used in pouring fluids
10 into a receptacle, such as a bottle or the like.

Heretofore some difficulty has been found in providing a funnel the discharge end of which is adapted to permit free flow of the fluid therethrough and at the same time permit the escape of the air or gases displaced
15 in the receptacle. Several devices have been invented to attain this object; but all of them have heretofore worked more or less imperfectly, owing to the fact that the upward current of air or gas created by the displacement by the fluid passing through the funnel causes a film to form of the said fluid
20 between the neck of the receptacle and the lower end of the funnel which tends to check the upward-flowing current of air or be carried upwardly and outwardly of the funnel, thereby causing leakage and annoyance as well as loss. Of the devices heretofore used to overcome the objections mentioned one form
25 in common use is that having a fluted discharge-pipe, thereby providing a plurality of air-spaces between the wall of the funnel and the neck of the receptacle. This device, however, does not entirely overcome the difficulty,
30 for the reason that the area in cross-section of said air-spaces is relatively smaller at the top of the receptacle-neck than at the bottom of the funnel delivery-pipe, thereby tending to constrict the air in its upward passage, so
35 that if a film or bubble of the fluid forms at the lower end of the delivery-pipe the same perforce is carried upwardly and out at the upper end of the receptacle-neck. My invention contemplates a device in which the
40 area in cross-section of the air-vent increases uniformly from the lower end of such vent upwardly to the exit, with the object in view of entirely preventing the escape of any of the fluid poured through such funnel from the re-
45 ceiving-receptacle.

The invention consists in the matters here-

inafter described, and more fully defined and pointed out in the appended claims.

As shown in the drawings, Figure 1 is a side elevation of a device embodying my inven- 55
tion. Fig. 2 is a vertical section of the same. Fig. 3 is a section taken on line 3 3 of Fig. 2. Fig. 4 is a fragmentary section illustrating a detail of construction.

As shown in said drawings, A indicates a 60
funnel top or body, of the usual conical form, provided at its larger end with a strengthening or stiffening band in a familiar manner.

A' indicates the delivery-pipe of said funnel, which is cylindric and secured to and 65
opens into the apex or smaller end of said funnel-body. The said delivery-pipe A', as shown, is of uniform interior and exterior diameter and of sufficient length to extend downwardly into the neck of the receptacle a 70
desired distance.

B indicates an outer sleeve, herein shown as conical and having an interior diameter greater than the outer diameter of the delivery-pipe A' of said funnel. Said sleeve B is 75
relatively shorter than the delivery-pipe A' and adapted to receive the same axially, as shown in the drawings, and to be rigidly secured thereto in any desired manner. For the purpose of securing the greatest possible area in 80
cross-section of the vent-space between said funnel's delivery-pipe and said sleeve at the upper end thereof the larger end of said sleeve is secured adjacent to the funnel-body A, and the smaller end thereof extends downwardly 85
about said funnel delivery-pipe to within a short distance of the extremity of the same. Obviously the distance said funnel delivery-pipe extends below said conical sleeve B varies according to the size of the funnel and 90
character of the fluid to be passed there-through. The construction is especially designed to prevent the formation of a film of liquid between said parts and also to provide a device in which the greatest force of the as- 95
cending current of displaced gas is remote of the extremity of the delivery-pipe. As shown and preferably, said sleeve is secured upon said funnel and delivery-pipe by means of 100
rods or wires bent to conform with the body A and the sleeve B and which are secured by soldering or like means to said conical body

at their upper ends and to said delivery-pipe near the lower ends thereof, thereby forming a frame to which said sleeve B is secured by soldering or the like and which holds the same at all times in the desired position. Obviously the said rods or wires bent and secured to the parts as described accomplish another and important purpose—namely, they form braces and very greatly strengthen the connection between the delivery-pipe and said funnel-body, thereby protecting the same from injury at the joint common to other devices.

The operation of my device is as follows: The delivery-pipe and sleeve of a funnel embodying my invention are inserted in the neck of a receptacle in a familiar manner. The sleeve B engages the sides of the neck of said receptacle and supports the funnel. If now fluid be poured in said funnel, the same will flow downwardly through said delivery-pipe into the receptacle, displacing the air or gases therein and causing the same to pass outwardly between said sleeve and said delivery-pipe. Obviously from the construction described it is practically impossible for any of the fluid whatsoever to find its way by adhesion upwardly along the outer sides of said delivery-pipe, for the reason that the said pipe extends sufficiently below the sleeve B to permit the greatest force of the ascending current to be directed obliquely to said opening and not vertically upward along the extremity of the pipe A'. Should the upward current of air, together with adhesion, be sufficient to cause an upward flow of the fluid along the outer side of said delivery-pipe, such fluid, if at all, will form a bubble at the lower end of said sleeve B, which will move upwardly between the same and the delivery-pipe. As the same moves upwardly, however, the space between said sleeve and delivery-pipe becomes greater, thereby diminishing the air-pressure from beneath, owing to the greater space for the escape of the air between said sleeve and said delivery-pipe. At the same time the film of fluid becomes more attenuated, and as a result the bubble formation is soon broken up and the liquid or fluid adheres to the sides of the sleeve and delivery-pipe and at a point intermediate of the ends of said sleeve ceases to obtain sufficient upward force of the escaping air to cause the same to rise higher. As a result any fluid that finds its way into

said air-exit passage inevitably flows back into the receptacle.

As a further improvement I provide one or more vertical grooves in the periphery of the sleeve B, as shown in Figs. 1 and 3. Said grooves when the delivery-pipe and sleeve are inserted in the neck of a receptacle provide supplemental air-exit passages between the sides of the receptacle, which obviously greatly lessens the upward pressure between the sleeve and delivery-pipe, thereby proportionately decreasing the upward tendency of adhering liquid therein.

I claim as my invention—

1. In a funnel the combination with a funnel-body of a cylindric delivery-pipe secured to and opening into the smaller end thereof, stay-rods of wire or the like secured to said delivery-pipe and said funnel-body, and a conical sleeve axially secured about said delivery-pipe and stay-rods having its larger end adjacent to the funnel-body.

2. In a funnel the combination with a conical funnel-body of a cylindric delivery-pipe, secured to and opening into the smaller end thereof, stay-rods of wire or the like rigidly secured to the sides of said funnel-body, and extending downward along and secured to said delivery-pipe, a conical sleeve, axially secured about said delivery-pipe, and stay-rods, said sleeve having its larger end adjacent to the funnel-body, and means for directing escaping air from a receptacle obliquely against the delivery-pipe, at a point remote from its delivery end.

3. In a funnel the combination with a conical funnel-body, of a cylindric delivery-pipe secured to and opening into the smaller end thereof, stay-rods of wire or the like, secured to the sides of the funnel-body and to the delivery-pipe, a conical sleeve provided with a longitudinal groove, or fluting, secured about said delivery-pipe, terminating at a point above the extremity of the same.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 23d day of April, 1900.

DAVID S. HORTON.

Witnesses:

WILLIAM H. WINN,
JOHN C. GRAY.