

No. 761,702.

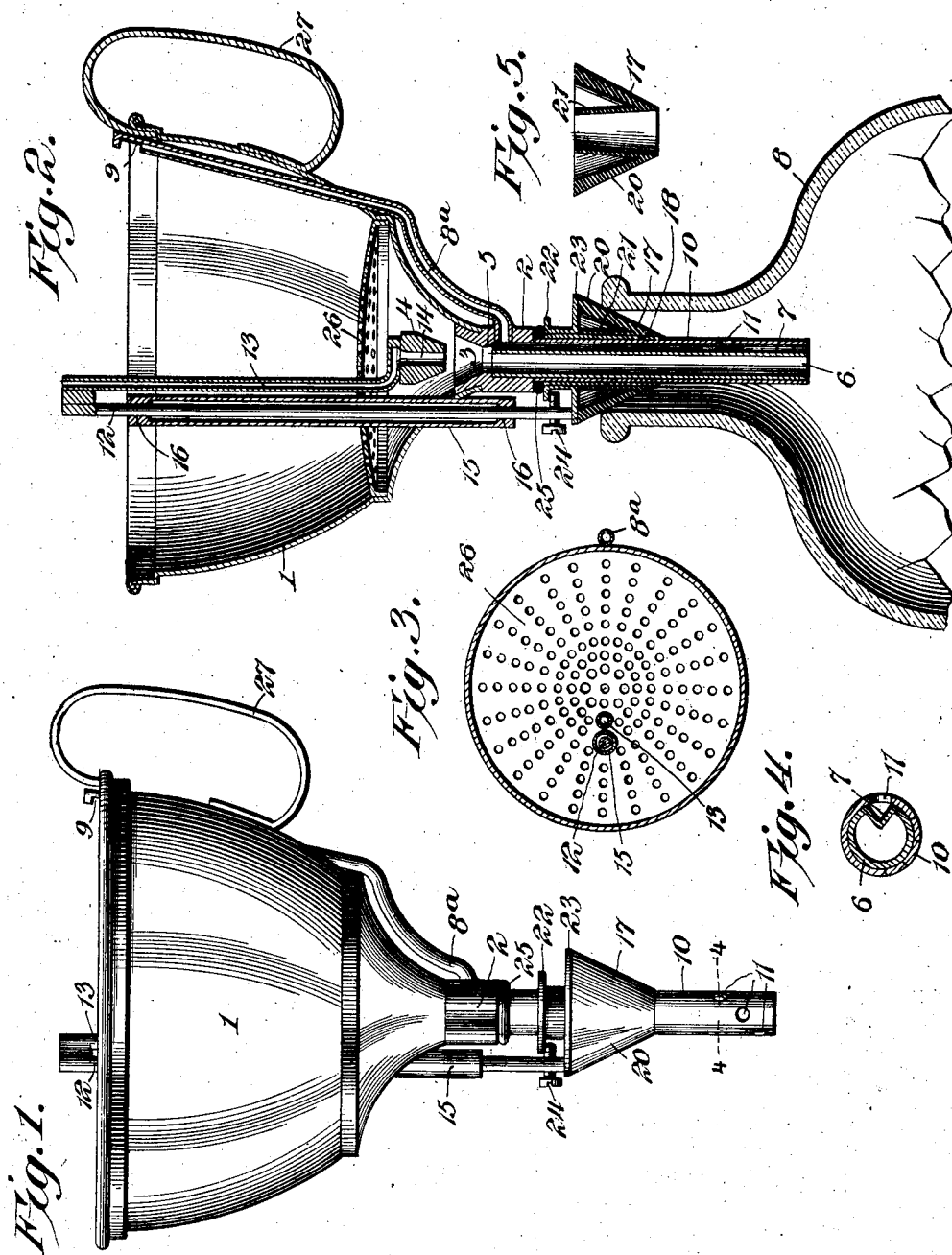
PATENTED JUNE 7, 1904.

J. B. PARADIS.

FUNNEL.

APPLICATION FILED JULY 14, 1903.

NO MODEL.



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JOHN B. PARADIS, OF BIDDEFORD, MAINE.

FUNNEL.

SPECIFICATION forming part of Letters Patent No 761,702, dated June 7, 1904.

Application filed July 14, 1903. Serial No. 165,462. (No model.)

To all whom it may concern:

Be it known that I, JOHN B. PARADIS, a citizen of the United States, residing at Biddeford, in the county of York and State of Maine, have invented a new and useful Funnel, of which the following is a specification.

The invention relates to improvements in funnels.

The object of the present invention is to improve the construction of funnels, more especially that shown and described in Patent No. 647,111, granted to me April 10, 1900, and to cheapen the construction and to provide simple and efficient means for adjusting the funnel for filling bottles and other receptacles having necks of different lengths.

A further object of the invention is to vent the spout of the funnel and to prevent any of the liquid remaining in the same after the valve has been closed and the flow from the bowl of the funnel shut off, whereby the liquid is prevented from spilling and wasting when the funnel is transferred from one receptacle to another.

Another object of the invention is to provide a funnel of this character in which any slight overflow from the receptacle will be caused to fall into the bowl of the funnel.

The invention also has for its object to improve the means for connecting the valve and the sliding stopper and to provide a highly-elastic stopper adapted to conform readily to receptacles having irregular necks, and thereby effectually prevent any leakage thereat.

With these and other objects in view the invention consists in the construction and novel combination and arrangement of parts hereinafter fully described, illustrated in the accompanying drawings, and pointed out in the claims hereto appended, it being understood that various changes in the form, proportion, size, and minor details of construction within the scope of the claims may be resorted to without departing from the spirit or sacrificing any of the advantages of the invention.

In the drawings, Figure 1 is a side elevation of a funnel constructed in accordance with this invention. Fig. 2 is a longitudinal sectional view of the same, illustrating the

arrangement of the parts when the funnel is applied to a receptacle. Fig. 3 is a horizontal sectional view. Fig. 4 is a detail sectional view on the line 4 4 of Fig. 1. Fig. 5 is a detail view of the elastic stopper.

Like numerals of reference designate corresponding parts in all the figures of the drawings.

1 designates the conical bowl or body of the funnel, which is provided at the base of the bowl with a fixed sleeve 2, having a flared upper portion forming a valve-seat 3 for a valve 4. The bore or opening of the sleeve 2 is enlarged a short distance below the valve-seat to provide an interior shoulder 5, against which is fitted the upper end of a tube 6, which forms the spout of the funnel. The upper end of the tube 6 is suitably fixed in the sleeve 2, and the shoulder 5 effectually prevents any displacement of the tube by upward movement in the sleeve.

The tube 6 is provided with an exterior longitudinal groove 7, which communicates at its upper end with an aperture of the valve-seat piece or sleeve 2 to form an air-escape passage for permitting the escape of air from the bottle 8 or other receptacle as the liquid flows into the same. The aperture, which is arranged at one side of the seat piece or sleeve 2, extends laterally from the tube 6 and receives the lower end of a vent-tube 8^a, which extends upward on the exterior of the lower portion of the funnel, and it pierces the same at a point between the top and bottom thereof, as clearly illustrated in Fig. 2 of the drawings. The upper portion of the vent-tube 8^a, which forms a continuation of the air-escape passage, is located within the bowl of the funnel at one side thereof and extends to the top of the same. The upper end of the vent-tube 8 is closed at the top and is provided at the inner side with a lateral opening 9 to permit any liquid flowing upward through the vent-tube to be discharged into the bowl of the funnel, whereby any slight overflow of liquid through the air-escape passage will be returned to the funnel.

The tube 6 is arranged within a gaging tube or sleeve 10, which covers the longitudinal groove 7 and which forms an outer wall for

the same. The lower portion of this gaging tube or sleeve, which is capable of rotation on the tube 6, is provided with a series of perforations 11, arranged at different elevations and extending spirally around the gaging tube or sleeve and adapted to be brought into register with the groove 7 of the tube 6. As the flow of liquid into a receptacle will cease when the opening 11, in communication with the groove 7, is submerged, the funnel may be used for filling bottles or receptacles having necks of different lengths, and the bottles will be prevented from accidentally overflowing. The tube 6 has its opening or bore extending entirely through it, as clearly shown in Fig. 2 of the drawings, and the rotary gage sleeve or tube, which is loosely fitted on the tube 6, has its upper end arranged against the lower end of the seat-piece 2, and it may be retained in position by any suitable means.

The valve 4, which is tapered to fit the valve-seat 3, is adapted to control the flow of liquid through the spout, and when the funnel is placed on a bottle or other receptacle, as shown in Fig. 2, the valve is automatically opened by the means hereinafter described, and when the funnel is removed from the receptacle the valve automatically closes by gravity and shuts off the flow of liquid. The valve is connected with a vertically-movable connecting and operating rod 12 by an inner vent-tube 13, forming an air-escape passage and communicating at its lower end with a central opening or bore 14 of the valve 4, whereby when the valve is closed air will be permitted to enter the upper end of the tube 6 and will vent the spout or tube 6 and cause any liquid remaining in the same when the valve is closed to drop instantly into the bottle or other receptacle being filled. The lower end of the inner vent-tube 13 is suitably secured to the valve 4 at the top thereof by any suitable means, and it is provided with a suitable opening to register with the bore or opening of the valve. In Fig. 2 of the drawings the lower end of the inner vent-tube is bent horizontally to form an arm and a perforation is provided at the bottom thereof to afford a communication with the opening or bore of the valve; but the lower end of the inner vent-tube may be connected with the bore or opening of the valve in any other desired manner.

The upper end of the inner vent-tube 13 is secured to the upper end of the vertically-movable rod 12, which passes through a guide-tube 15 and which extends above the funnel to afford a convenient grip or handle for enabling the valve to be readily manipulated. The guide-tube 15, which extends downward from the top of the funnel, pierces the lower portion thereof and is provided at its ends with bearing portions 16, forming openings of less diameter than the bore of the tube 15, so that the operating-rod 12 will bear against the guide-tube only at the top and bottom

thereof, whereby the friction will be reduced to a minimum. These bearing portions 16, which reduce the bore or opening of the guide-tube at the ends, may be formed in any desired manner, such as extending the ends of the tube 15 inward or securing sleeves or bushings within the same.

The lower end of the rod 12 is connected with a slidable stopper 17, which is adapted to fit within the neck of a bottle or other receptacle to prevent the escape of liquid and air at that point. The elastic stopper 17 is mounted on a slidable sleeve 18 and is composed of an approximately conical outer portion 20 and an inner sleeve 21. The inner sleeve 21, which is constructed of rubber or other suitable material, has its upper portion of less diameter than the slidable sleeve 18 in order to firmly grip the same, whereby the stopper is securely held thereon without employing cement or other fastening means for this purpose. The lower portion of the sleeve 21 is of the same diameter as the slidable metallic sleeve 18 in order to preserve the elasticity of the rubber as far as possible. The metallic sleeve 18 is provided above the elastic body portion of the stopper with parallel horizontal flanges 22 and 23, forming an annular groove, as clearly shown in Fig. 2. The lower flange 23 is extended outward beyond the upper flange and forms a cover for the top of the elastic stopper. The lower end of the connecting and operating rod 12 fits against the upper face of the bottom flange 23, and the lower face of the upper flange 22 is engaged by a screw 24, which is mounted on the lower portion of the rod. By this construction the stopper is adapted to rotate independently of the rod, but is held against longitudinal movement. The flanges 22 and 23 are formed integral with a band or ferrule, which is suitably secured to the upper portion of the metallic tube 18, which is adapted to slide on the gage-tube 10.

When the funnel is placed on a receptacle, its spout is introduced into the neck of the same and the stopper is pressed against the neck of the receptacle and is forced upward until it comes in contact with a washer or gasket 25, arranged on the gage-tube at the upper end thereof and interposed between the lower edge of the neck-piece and the upper flange 22 when the parts are arranged as shown in Fig. 2 of the drawings. This movement opens the valve 4 and permits the liquid contained within the bowl of the funnel to flow into the receptacle. As soon as the funnel is lifted from the receptacle the weight of the valve and the connections between the same and the stopper will automatically close the valve and shut off the flow of liquid to the receptacle. The funnel is designed to be provided with a liquid in any suitable manner, and when the flow from the funnel into the bottle or other receptacle is shut off the spout

of the funnel will be vented by the tube 18 and the liquid within the spout will be discharged into the receptacle and will be prevented from leaking and wasting when the funnel is removed from one receptacle to transfer it to another.

The funnel is provided on the interior of its bowl with a seat for a strainer 26, and when it is desired to remove the strainer and the valve for cleaning purposes the screw is detached. This will enable the operating-rod and the bent tube to be lifted out of the bowl of the funnel, and these parts will carry the strainer with it, as will be readily understood.

The bowl of the funnel is provided at one side with a suitable grip or handle 27, which may be of any desired construction.

It will be seen that the funnel is simple and comparatively inexpensive in construction, that it is strong and durable, and that it is adapted to be quickly transferred from one receptacle to another without spilling and wasting the liquid. Also it will be clear that the outer vent-tube permits the air to escape from the bottle or other receptacle while the same is being filled and that the inner vent-tube communicates with the spout of the funnel when the valve is closed and causes all of the liquid to drop out of the spout into the bottle. Furthermore, it will be seen that the elastic stopper, which is composed of inner and outer portions united at the bottom, has an intervening space between the same and is adapted to conform readily to the neck of a receptacle and is capable of positively closing bottles and other receptacles having poorly-formed irregular necks. Furthermore, the particular structure of the inner sleeve enables the same to be securely fitted to the metallic sliding sleeve and at the same time preserves a maximum elasticity of the material of which the stopper is constructed. The rotary gage-sleeve, which is provided with the spirally-arranged series of openings, is adapted to permit the funnel to be readily set for accurately filling bottles and other receptacles having necks of different lengths.

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

1. In a device of the class described, the combination of a funnel having a valve, a guide-tube piercing the funnel and provided at its ends with reduced bearing portions, a rod passing through the guide-tube and slidable in the bearing portions thereof, a vent-tube connected with the valve and with the upper end of the rod and communicating with the spout of the funnel when the valve is closed, and an exteriorly-arranged stopper connected with the lower end of the rod, substantially as described.

2. In a device of the class described, the combination of a funnel having a valve, and a stopper comprising an inner approximately

cylindrical clamping portion extending substantially the entire length of the stopper, and an outer approximately conical clamping portion adapted to engage the neck of a bottle, substantially as described.

3. In a device of the class described, the combination of a funnel having a valve, and a stopper comprising an inner elastic clamping portion extending substantially the entire length of the stopper and an outer elastic neck-engaging portion, substantially as described.

4. In a device of the class described, a funnel provided at its spout with a stopper comprising an elastic clamping-sleeve and an outer conical neck-engaging portion of elastic material, substantially as described.

5. In a device of the class described, the combination of a funnel having a valve, and a slidable stopper comprising a metallic sleeve, an inner elastic sleeve clamping the metallic sleeve, and an outer elastic tapered portion for engaging the neck of a receptacle, substantially as described.

6. In a device of the class described, the combination of a funnel having a valve, and a slidable stopper comprising a rigid slidable sleeve having a flange, and an elastic body portion arranged on the sleeve and clamping the same and provided with an interior space closed at the top by the said flange, substantially as described.

7. In a device of the class described, the combination of a funnel having a valve, and a slidable stopper comprising a rigid slidable sleeve having a flange, and an elastic body portion comprising an inner sleeve having an upper portion of less diameter than the rigid sleeve and adapted to be stretched over the same, and an outer elastic conical portion spaced from the upper portion of the elastic sleeve, the space between the inner and outer portions of the elastic body being closed at the top by the said flange, substantially as described.

8. In a device of the class described, the combination of a funnel having a valve, a slidable stopper comprising a rigid slidable sleeve having an annular groove, an elastic body portion mounted on the sleeve, and a rod connected with the valve and provided with means for engaging the said groove whereby the rod is connected directly to the stopper, substantially as described.

9. In a device of the class described, the combination of a funnel having a valve, a slidable stopper comprising a rigid slidable sleeve having upper and lower flanges spaced apart, the upper flange being narrower than the lower flange, an elastic body portion arranged on the slidable sleeve and provided with an interior opening closed at the top by the lower flange, a rod connected with the valve and fitting against the lower flange, and a fastening device carried by the rod and en-

gaging the upper flange, substantially as described.

10. In a device of the class described, the combination of a funnel having an air-escape passage extending longitudinally of the spout of the funnel, and a movable gage provided with openings located at different elevations and arranged to be brought into communication with the air-escape passage, substantially as described.

11. A funnel having an air-escape passage and provided with a movable gage having a series of openings arranged spirally on the spout and adapted to be brought into register with the air-passage, substantially as described.

12. In a device of the class described, the combination of a funnel having an air-passage, and a gage-sleeve arranged on the spout of the funnel and provided with a spirally-arranged series of openings adapted to be brought into communication with the air-passage, substantially as described.

13. The combination with a tubular member, of a stopper comprising an inner clamping-sleeve and an outer conical neck-engaging portion, said clamping-sleeve and conical portion being constructed of rubber and formed integral with each other, substantially as described.

14. In a device of the class described, the combination of a funnel, an air-passage, and

means for varying the length of the effective portion of the air-passage, substantially as described.

15. In a device of the class described, the combination of a funnel having an air-passage extending longitudinally of the spout, and means for varying the length of the effective portion of the air-passage, substantially as described.

16. In a device of the class described, the combination of a funnel, and means for automatically stopping the flow of liquid at different points along the spout of the funnel, whereby the latter is adapted for filling receptacles having necks of different lengths, substantially as described.

17. In a device of the class described, the combination of a funnel provided at its spout with a groove, and a gage-sleeve arranged on the spout of the funnel and coöperating with and covering the groove to form an air-passage, said gage-sleeve being constructed to vary the length of the effective portion of the air-passage, substantially as described.

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

JOHN B. PARADIS.

Witnesses:

HOWARD M. JONES,
GEO. A. LANDRY.