

F. G. FARNHAM.
 DEVICE FOR MANIPULATING CUT GLASS ARTICLES.
 APPLICATION FILED MAR. 17, 1906. RENEWED MAR. 31, 1908.

903,072.

Patented Nov. 3, 1908.

4 SHEETS—SHEET 1.

Fig 1.

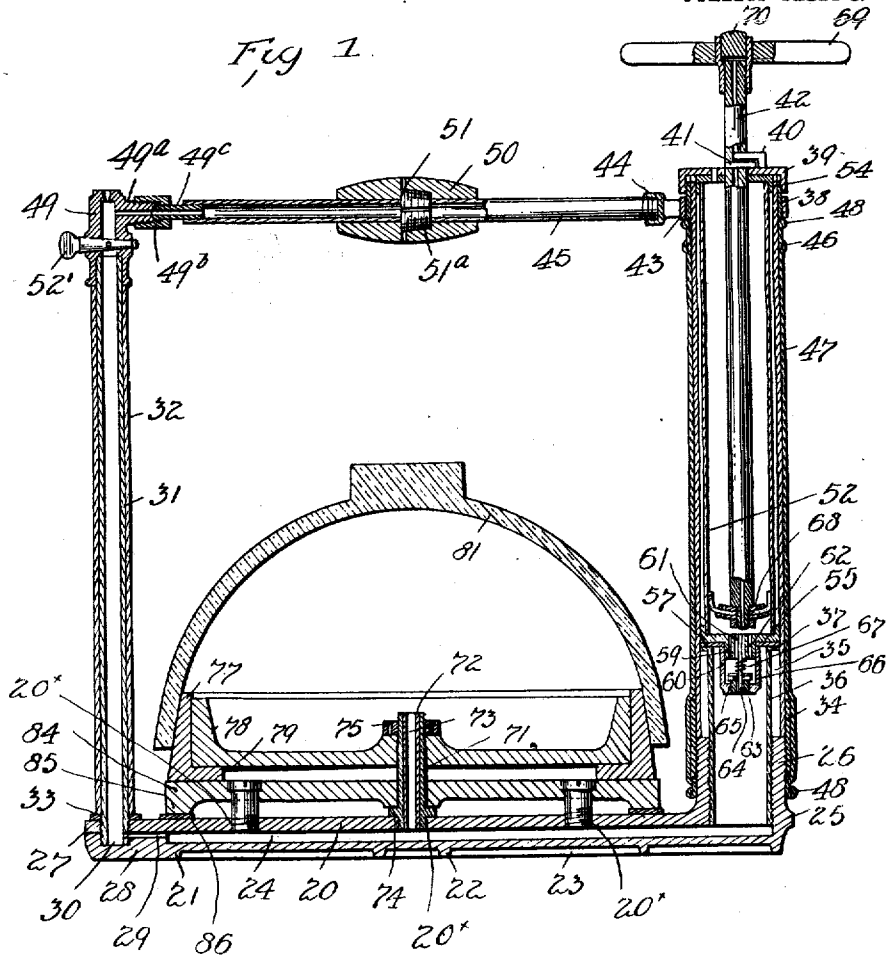
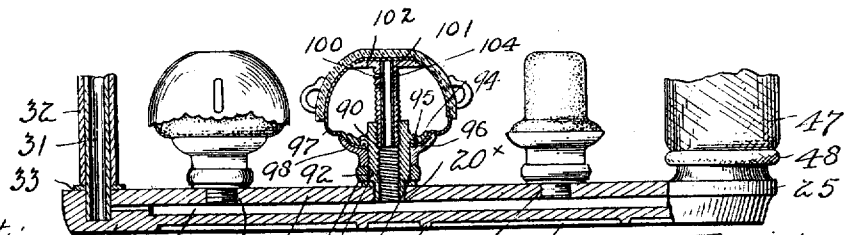


Fig 2.



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Fig. 3

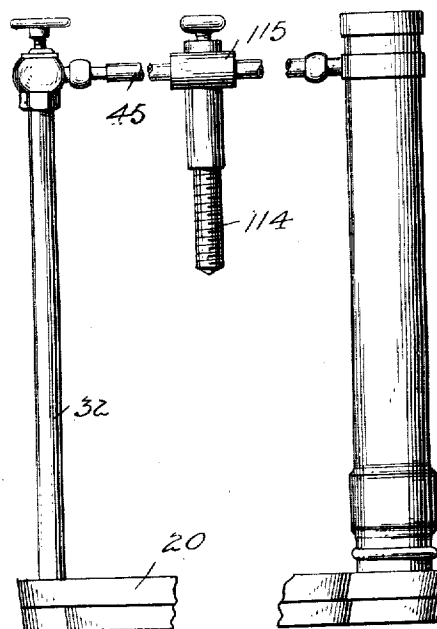
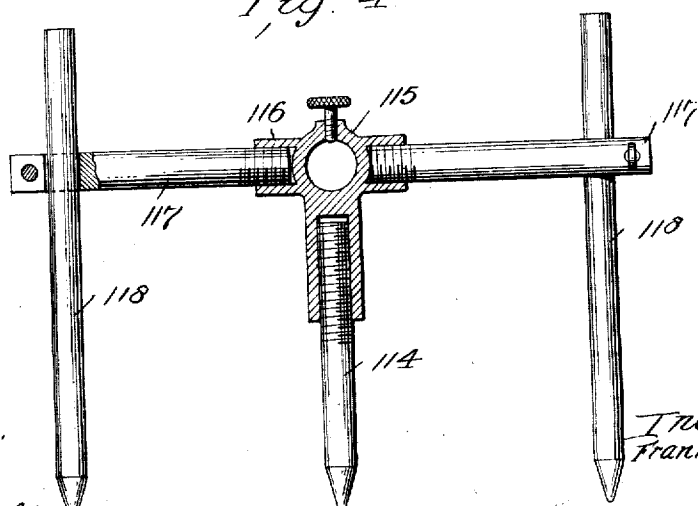


Fig. 4



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Fig. 5

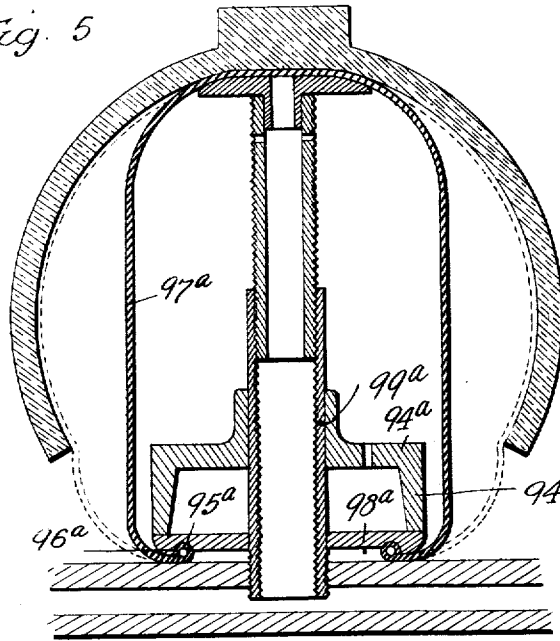


Fig. 7.

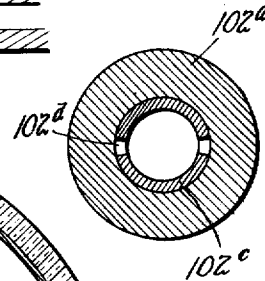
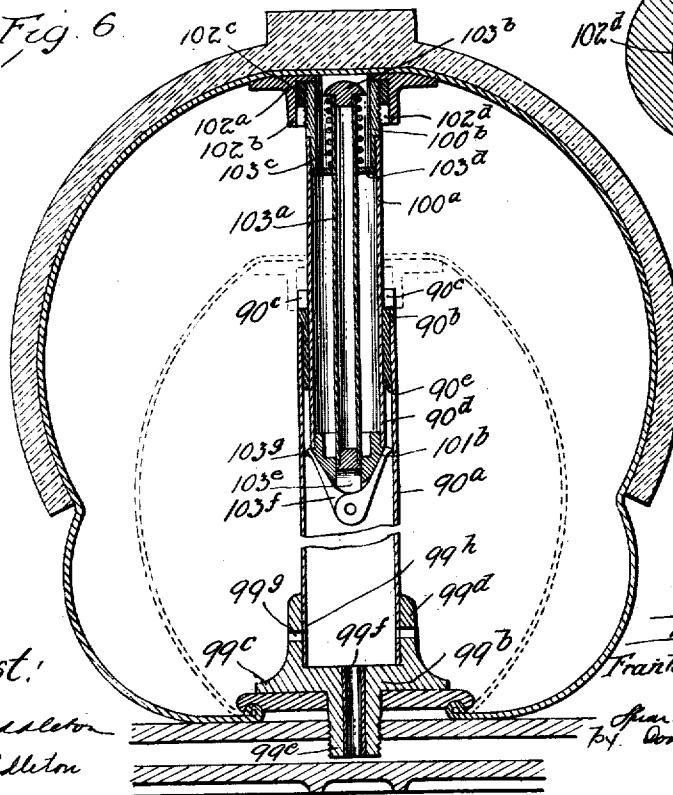


Fig. 6



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 4 SHEETS—SHEET 4.

Fig. 8

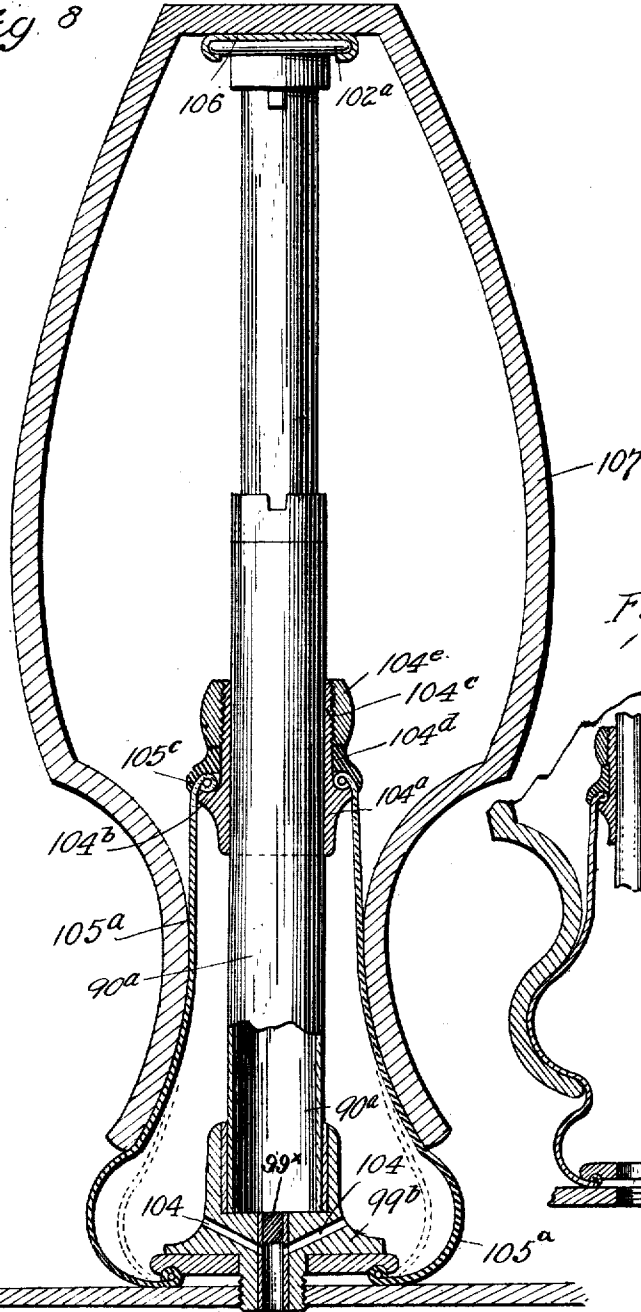
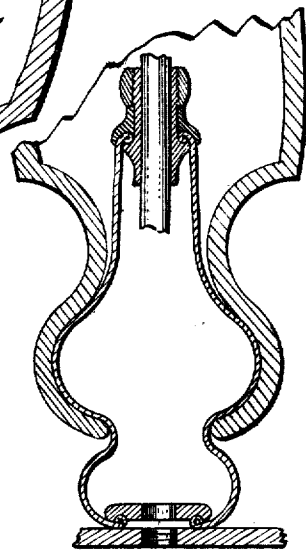


Fig. 9



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Atty

UNITED STATES PATENT OFFICE.

FRANK GUNN FARNHAM, OF HONESDALE, PENNSYLVANIA.

DEVICE FOR MANIPULATING CUT-GLASS ARTICLES.

No. 903,072.

Specification of Letters Patent.

Patented Nov. 3, 1908.

Application filed March 17, 1906, Serial No. 306,631. Renewed March 31, 1908. Serial No. 424,423.

To all whom it may concern:

Be it known that I, FRANK G. FARNHAM, a citizen of the United States, residing at Honesdale, Pennsylvania, have invented certain new and useful Improvements in Devices for Manipulating Cut-Glass Articles, of which the following is a specification.

My present invention relates to improvements in devices for manipulating or handling cut glass articles while dipping them in an acid bath.

In devising the present invention, I have aimed to provide a single device which by reason of its construction and the interchangeability of some of its parts, shall be capable of being used for all sizes and shapes of cut glass vessels, from the smallest to the largest, and from the lightest to the heaviest.

The invention includes therefore a base or supporting member having a hollow passage with means for supporting a hollow article on said base, and an air pump connected to the base and provided with means by which air may be forced into the passage or exhausted therefrom.

The invention further includes the various features of construction and arrangement and combination of parts hereinafter described and particularly set forth in the appended claims.

The invention is illustrated in the accompanying drawings, in which—

Figure 1 is a central vertical section showing the device as used for dipping a single large article held thereon by suction. Fig. 2 shows the device as holding a plurality of small articles with serrated edges by the expansion of bags therein. Figs. 3 and 4 are views showing means for preventing upward movement of articles when held by bags as in Fig. 2. Figs. 5 and 6 are views of modifications. Fig. 7 is a sectional view of the knob. Fig. 8 is a central vertical section showing a further modification of the device as used for dipping a single large article by the expansion of a bag of a modified form. Fig. 9 is a modified form of the device shown in Fig. 8.

Referring by reference characters to these figures 20 designates a carrier or bed plate, the bottom of which is strengthened by the annular ribs 21 and 22 and radial ribs 23. Between the upper and lower faces of the carrier is an air chamber or passage 24. On one side of the carrier, the face is extended as shown at 25, the strengthening ribs being

extended to correspond with the same, and on this extension is a projecting stud 26, its interior opening into the air chamber 24. Opposite to the extension 25 is a smaller extension of the plate 27, a rib 28 extending from the annular body of the device to the outer edge of the extension 27. An air channel 29 connects with a vertical threaded hole 30 in the extension 27 and into this is screwed the lower end of the metal tube 31. To protect this tube from the action of the acid it is covered by a casing 32 which may be of vulcanized rubber or of soft rubber. To form an air tight joint where it connects with the bed plate if the cover is of vulcanized rubber a soft rubber washer 33 is interposed. The stud 26 is threaded on its upper end to receive a reinforcing tube 34. A protecting tube 35 is soldered or otherwise secured to the upper end of the tube 34, its lower end resting on the top of the stud 26 and inside of the stud 26 is screwed a metal tube 36 on the upper end of which is soldered a metal washer 37 acting as a seat for an air pump. The upper end of the projecting tube 35 is also reinforced by a piece of metal tubing 38 onto which is screwed a metal cap 39. A recessed cap 40 integral with the cap 39 is adapted to receive a pin 41 suitably secured to the plunger rod 42. Below and free to screw off and on the reinforced piece 38 is a metal band or sleeve 43. Projecting outward on one side of this band is a neck with an enlarged part forming a screw socket into which is screwed one end of a metal cross tube 45, the other end of the tube being connected to the stud 49^a of the elbow coupling hereinafter described.

Below the reinforcing piece 38 is secured a metal band or bead 46. Over the outer protecting tube a soft rubber tube 47 is stretched which has both its upper and lower ends rolled on itself forming a bead 48—48. The band 46 prevents it from slipping down when in use and the same effect is secured at the lower end by means of the reinforcing tube 34. The outer tube however may be permanently covered with a hard rubber coating. The upper end of the tube 31 is permanently soldered into the lower end of the cock 49 forming an air tight joint at this point, while the cut off 52^c permits ingress to and egress of air from the air chamber 24 as desired. One end of the tube 45 is threaded into the cap 44 the other end being provided with a union joint 49^b the sleeve of which 49^c

is soldered into the opposite end of the tube 45, permitting the joint being disconnected by hand and the tube 45 with the metal band 43 to be swung to the right or left as desired, which is necessary when placing tall articles like vases from 17 to 20 inches high in position for dipping. A handle 50 is provided which is adapted to slide along the tube 45. This is preferably cast in two halves from aluminum, the part 50 having a tapering threaded socket adapted to screw onto the tapering threaded boss 51 of the outer half. This threaded boss is slotted longitudinally at 51^a. When screwed together by the hands the boss 51 is contracted binding it to the tube 45. It is necessary to avoid the use of all kinds of steel tools, such as screw drivers and wrenches in an acid dipping room, as the acid fumes will totally destroy them in a very short time.

Inside of the protecting tube 35 is inserted the air pump 52. Its upper end is closed by the loose cap 54 and its lower end by the cap 55 to which it is soldered. The downward extending flange of part 54 and the upward extending flange of part 55 act as guides to keep the pump in alinement inside of the tubular member 35. The base of the pump rests on the leather washer 57 which in turn rests on the metal washer 37. When the loose cap 54 and the screw cap 39 are screwed down the upper end of the pump barrel projects a short distance above the tubular member 35. This gives a chance to force the base of the pump barrel down upon the leather washer 57 and forms an air tight joint at this point.

The lower cap 55 to the pump barrel is provided with a downward projecting lug 59 to which is secured the valve cap 60; a vertical opening 61 is provided in the center of the lug 59 and small holes 62 are also provided for air exits. In the bottom of the valve cap 60 is a metal valve seat 63 and resting on this is an elastic rubber disk or valve 65 and above this is a metal washer 66 which is soldered to the valve rod 64. A coiled spring 67 assists in pressing the valve 65 down on the seat 63. The lower end of the rod 64 passes through a hole in the valve seat 63 and its upper end is held in alinement by entering the central opening in lug or boss 59.

The plunger rod 42 is preferably made from brass tubing combining strength with lightness. Its lower end carries the ordinary suction valve of leather with nut and metal washers 68. A cast aluminum handle 69 is screwed on to the upper end. A plug 70 closes the cavity in the upper end while the brass pin 41 may close the hole in the center of the plunger rod, being of larger diameter than the hole and soldered to make a strong and air tight connection at that point.

It is desirable that air pumps used in con-

nection with this class of devices should be uniform as to diameter and length. Some classes of glass articles are of only moderate height from 3 to 8 inches, like tumblers, bowls, etc., while others, like vases, etc. reach a height in some instances of 20 inches. It is evident that a device for handling the shallow pieces does not require the tubular member 35 to be of an extra length (12 to 14 inches), while pieces of maximum height require the member 35 to be 24 inches long so as to bring the pump handle 69, cap 39 and tube 45, valve 52' and handle 50 entirely above the acid bath when dipping. While the stud 26 may be of maximum length, say 10 inches and cut off to suit the different lengths of the member 35, a stronger and cheaper device for supporting the pump consists of the metal tube 36 above described, screwed tightly into the stud 26, not only adding to its strength, but acting as a cheap substitute for an equal length of hard rubber.

It can be readily seen that by changing the length of this tube 36, the pump may always be of the same length and therefore interchangeable.

The base plate 20 is provided with a plurality of threaded openings 20^x corresponding in number to the number of articles which are to be supported thereon, and into which are screwed tubular plugs which serve to connect thereto the devices for supporting or holding the cut glass articles. These may be either in the shape of rubber rings or plugs for fitting the mouths of flaring glass articles sufficiently tight to form an air tight joint so that the air may be exhausted by the air pump from within the articles to cause them to be held pressed tight against the ring, and thus the acid excluded from the interior while they are being dipped, as shown in Fig. 1 or they may carry expansible rubber bags designed to be expanded within articles having contracted mouths or edges of irregular shape as shown in Fig. 2. In this latter case the action of the air pump is reversed in the manner herein described so that it operates as an air forcing pump instead of a suction pump. Where the device is to be used for holding the articles in place by exhausting the air from within them, as in Fig. 1 I provide for each opening a stud 71 which may conveniently be cast from aluminum and have a brass lining tube 72 for strengthening the same. The stud or plug is provided with a collar 74 which limits the distance to which it may be screwed into the base plate and the central passage 73 through the same affords communication between the interior of the glass article and the air channel or space within the base. A nut 75 screwed upon the stud serves to hold a clamping disk or member 78 which according to circumstances may conveniently be made of wood or metal, which in its turn clamps against the base

the inwardly extending flange 79 of the rubber plug, or seat 77, the inverted glass article being indicated at 81.

Where articles having contracted mouths or edges of serrated or irregular shapes are to be dipped, as in Fig. 2 I substitute for the plug 71 a plug 91 having a shoulder 92 resting on a soft rubber washer 93. A flange 94, preferably formed integral with the stud, is provided with an annular groove 95 adapted to receive the bead 96 on the mouth of the inflatable rubber bag 97. A clamping washer 98 slipped on to the stud before it is screwed into the base is designed to clamp the bag between itself and the flange 94, being held in position by the nut 99. In connection with this class of holding means, I sometimes find it desirable to relieve the bag of some of the weight of the glass article and I accordingly provide the stud on its inside with threads as indicated at 90 to engage a threaded standard conveniently made of aluminum which may also have a brass lining tube 101 and is provided at its upper end with a disk 102 designed to support the article by bearing against the inside of the bottom thereof, as shown. The standard 100, as shown, has a central passage which is provided with one or more transverse openings 104 to permit the passage of air for the expanding of the inflatable bag. By screwing the standard 100 in or out its height may be adjusted to correspond to the height of the article to be dipped.

In order to adapt this device for dipping either a single large article, see Fig. 1 or as a plurality of smaller articles, as in Fig. 2 I provide a supplemental base 84 see Fig. 1 having an outer flange 85 designed to bear upon a soft rubber washer 86 interposed between it and the base 20, the supplemental base being large enough so that its flange 85 comes outside of all of the openings in the base 20. It has a central opening through which the stud 71 projects and other openings for the reception of screws arranged to screw into the outer openings in the base 20 to assist in securing the supplemental base in place. Upon the supplemental base 84 is clamped the single large ring 77, corresponding to the single large article to be dipped which is held in place by the disk 78 and clamp nut 75 as before described. Where a single large article is to be dipped which has a mouth of such shape that it is necessary to use an inflatable bag, I use the supplemental base 84 clamped by the screws as described to the main base but leave out the stud 71 and the ring 77 and clamping disk 78 and screw into the central opening of the supplemental base 84 a plug 99 with its attendant parts for supporting an inflatable bag of a size corresponding to the article to be dipped as described in connection with Fig. 2.

From the foregoing description it will be readily apparent that the same device may be used for supporting either a single large article or a plurality of small articles that may be held to the base either by suction or by the expanding within the article of an inflatable bag. To adapt the pump for either forcing or suction, it is only necessary to reverse the check valve and to reverse the piston head.

When the device is used either for a single large or a plurality of smaller articles the weight handled is some times very considerable and the cross bar with its attendant handle and the pump handle when locked by the pin 41 enables both hands to be used for submerging the device in the acid bath and lifting it therefrom. The handle 50 also enables the device to be held steadily while the air pump is being worked.

In some instances where very light weight articles are to be dipped, there is a tendency for them to lift up away from the bag while it is being inflated, and to overcome this I may provide a sleeve 115 Fig. 4 slidably and removably secured to the cross bar and having sockets 116 in which are carried branch members 117 provided with pins 118 designed to bear against the bottoms of the articles. The pins 118 may conveniently be mounted on split portions of the parts 117. The collar 115 may have a tubular projection on its lower side for threaded engagement with the pin 114 for engaging the bottom of another article.

While in some cases, for instance small articles, I may prefer to use the device for holding a bag as shown in Fig. 2, it may some times be found desirable to use a construction such as shown in Fig. 5. In this form the stud 99^a is provided with a flange 94^a which may be secured thereto in any suitable manner as by soldering and has the downward extending lip 94^b. A metal plate 98^a is bored to slide over the base of the stud and has on its under surface an annular groove 95^a adapted to receive the bead 96^a of the rubber bag 97^a. When the stud is screwed down the flange 94^a presses upon the plate 98^a forcing the latter down upon the beaded mouth of the bag binding the mouth of the bag upon the surface of the carrier. This forms a very effective air tight joint at the points of contact. The bag is shown in its normal position, its vertical wall in close proximity to the lip 94^b so that in screwing down the stud the lip is grasped by the hand through the walls of the bag. The standard is similar to that hereinbefore described and is operated in the same way to secure the proper adjustment as to height of the article to be dipped. The dotted lines show the position of the bag when inflated and holding a glass bowl with a crimped in mouth in position ready for

dipping. The inflating and deflating is the same as that heretofore shown and explained.

Instead of raising and lowering the standard for supporting the bag by screwing and unscrewing the same as hereinbefore described, I may accomplish it by the means shown in Fig. 6. In this form the stud 99^b has the flange 99^c with the upward extending part 99^d and the downward extending part 99^e with an air channel connecting with the air chamber of the base. I prefer to use a cast aluminum stud with the air channel lined with a brass tube 99^f. The upward extending part 99^d I also prefer to line with brass tubing 99^h.

Air channels 99^g are also provided in the stud. The brass tube 90^a is rigidly soldered to the part 99^d and to its upper end is soldered the brass extension 90^b, the outer diameter of which corresponds to that of the tube 90^a. A portion of its outer diameter is turned so as to fit the tube 90^a, while its inner wall extends downward inside of same, acting as a stop 90^e. The normal thickness of this extension is continued upward a sufficient distance to permit of two or more vertical slots 90^c being cut in the upper rim of same. A knob or cap 102^a having the downward extending flange 102^b and lined with the section of brass tubing 102^c threaded on its inner diameter, is removably connected to the movable vertical tube 100^a as hereinafter described. A portion of the lower rim of the brass tube 102^c is cut away before casting the knob, leaving two or more downward projecting lugs 102^d of a length, width and thickness to conform to the slots cut in the rim at 90^a. On the upper end of the brass tube 100^a is soldered the brass extension tube 100^b, its outer diameter for a portion of its length being cut away so as to fit into the tube 100^a, and its upper outer diameter threaded for screwing into the knob 102^a. Inside and soldered to the base of the extension tube 100^b is a perforated metal washer 103^d which acts as a bearing or support for the coiled compression spring 103^c, and a guide for the metal tube 103^a. The lower end of the metal tube 100^a is plugged by soldering in a cone shaped metal plug 101^b. The metal tube 103^a is plugged at its lower end by a rod 103^e, the lower end of which is flattened and at its upper end by a metal button or thumb piece 103^b. To the lower end of the flattened plug 103^e is loosely riveted two metal arms 103^f. Their upper rims conform in shape to the cone shaped plug. Their inner surfaces rest against the plug. In their normal position their upper rims with the sharpened ribs 103^g which project outward are pressed against the inner wall of the outer tube to which they correspond in diameter and they are held in that position by the spring 103^c, the plug 101^b acting as a

wedge. When the inner tube 103^a and the outer tube 90^a are in position an annular space 90^d of $\frac{1}{16}$ of an inch wide intervenes between the two. The normal position of the sharpened rims of the two arms is at the base of the inner tube and the largest diameter of the conical plug filling a portion of the annular space 90^d. A downward movement of the standard 100^a is prevented by the sharpened rims pressing against the inner wall of the outer tube, which position will be retained unless released by pushing down the button on the small tube, when the standard may be freely lowered and locked by releasing the pressure on the button. The more pressure there is put on the knob 102^a the stronger will be the action of the cone shaped wedge, and the tighter it will become. The standard is prevented from slipping out of the outer tube by the rim of the arms coming in contact with the base of the inside rim of 90^e which acts as a stop. The standard however may be entirely removed by pressing on the button so that the arms will pass the stop, which is a desirable feature. The dotted lines show the device in its normal position, the flanged knob resting on the rim of the outer tube, the lugs therein coinciding with the slots in the latter, a deflated bag being shown in position. When the knob and top of the outer tube are in juxtaposition with the bag resting loosely on the former the device is ready for screwing down, thus forcing the grooved washer down upon the beaded neck of the bag to secure an air tight joint. The standard is now elevated by pulling it up with the bag to the desired point. When it is necessary to move the bag or change the same, or remove the device the standard is again returned to its normal position, the hand grasping the flanged knob through the bag and the device can be unscrewed. The diameter of the flange on the knob depends on the neck and inside base of the article to be dipped. The knobs are therefore made interchangeable. There is also a class of articles having comparatively small openings in their necks. In such cases I remove the knob entirely letting the inside base of the article rest on the rim of the standard 90^a. The bag in all these cases acts as a cushion to prevent injury by having the glass come in contact with the bare metal. There is a type of cut glass articles such as vases standing from 16 to 20 inches high having both crimped and flaring mouths, the diameter of the latter varying with each change of size requiring, when employing the exhaust, a different sized rubber plug for each. A rubber bag however on account of its elasticity is capable of closing the mouths of all four sizes, 16, 17, 18 and 20 inch when expanded, thus reducing the cost about one quarter of that of the four rubber plugs, and at the same time being used for other articles

of similar types, such as pitchers, etc. I have shown the application of such a bag to an 18 inch vase 107 in Fig. 8 in connection with the elevating device and a modified form of the bag as applied thereto.

If a bag were employed extending upward the full length of the article it would require a large amount of material and for these large articles I provide a substitute 105^a in the form of an irregular shaped tube having beaded mouths at both its upper or smaller end and lower or larger end. When this substitution is used the air channel in the base of the stud 99^b is hermetically sealed by a plug 99^x at its upper end so as to prevent air entering the tube 90^a. Air channels 104 104 are provided connecting the air chamber of the base with the interior of the collapsed tube 105^a. About the middle of the brass tube 90^a I solder on the brass sleeve 104^a having the flange 104^b the upper surface of which has an annular concave groove corresponding to the head 105^c on the small end of the tube 105^a. The upper part of this sleeve 104^c is threaded to receive a threaded hand nut 104^e and between it and the flange is the metal washer 104^d adapted to slide freely on the upper part of the sleeve. It also has an annular groove in its enlarged under surface also corresponding to that in the sleeve 104^a. By screwing down the hand nut 104^e the beaded mouth of the tube is compressed between the washer 104^d and the flange 104^a securing an air tight joint at this point. The lower end of the beaded tube is held in the manner previously shown. When the device is used in this manner I employ a rubber pad 106 which is sprung over the flange 102^a of the knob or handle at the top of the standard so as to prevent the interior surface of the glass from coming into contact with the metal.

Fig. 9 shows the application of this form of bag to an article of different shape.

Having thus described my invention what I claim is:—

1. In a device of the character described, a base having an air passage, an air pump connected to said base and communicating with said passage, means for supporting a glass article on said base, and means for reversing the action of said air pump whereby it may be used either for exhausting air from the passage or forcing it thereinto, substantially as described.

2. In a device of the character described, a base having an air passage, means for supporting the glass article on said base, an air pump carried by the base and connected to

the air passage, a reversible valve and a reversible piston-head in said pump whereby it may be used for either air forcing or air suction purposes, substantially as described.

3. In a device of the character described, a base having an air passage or chamber, means carried by said base and controlled by the passage of the air through the base for holding glass articles thereon, a standard rising from one side of the base and containing an air pump, a tubular standard rising from the opposite side having its bore in communication with the air passage in the base and having a cock controlling the passage of air through the standard, and a horizontal handle bar connecting said standards at their upper ends, substantially as described.

4. In combination, a base having an air chamber and an air pump connected therewith, said base having a plurality of openings for the reception of a plurality of holding devices, and a supplemental base having a single opening for the reception of a central holding device with means for securing the supplemental base to the main base, substantially as described.

5. In combination, a base having an air passage or chamber, an inflatable bag connected to said base and having its interior in communication with the said passage, an air forcing pump connected to the base for forcing air through said passage, and means for limiting the upward movement of the glass article supported by the bag, substantially as described.

6. In combination, a base having an air passage, an air forcing device connected to said passage, a tubular plug connected to said base and having its bore communicating with the passage in the base, means for connecting the mouth of an inflatable bag to said plug, and adjustable supporting means carried by said plug, substantially as described.

7. In combination, a base having an air passage, an air forcing device connected to said passage, a tubular plug connected to said base and having its base communicating with the passage in the base, an expansible bag encircling said plug, and a telescoping support carried by said plug, substantially as described.

In testimony whereof, I affix my signature in presence of two witnesses.

FRANK GUNN FARNHAM.

Witnesses:

N. C. FARNHAM,
W. H. STONE.