

Oct. 9, 1951

R. W. HAMLETT
DRAIN CLEANER

2,570,546

Filed March 23, 1950

3 Sheets-Sheet 1

FIG. 2

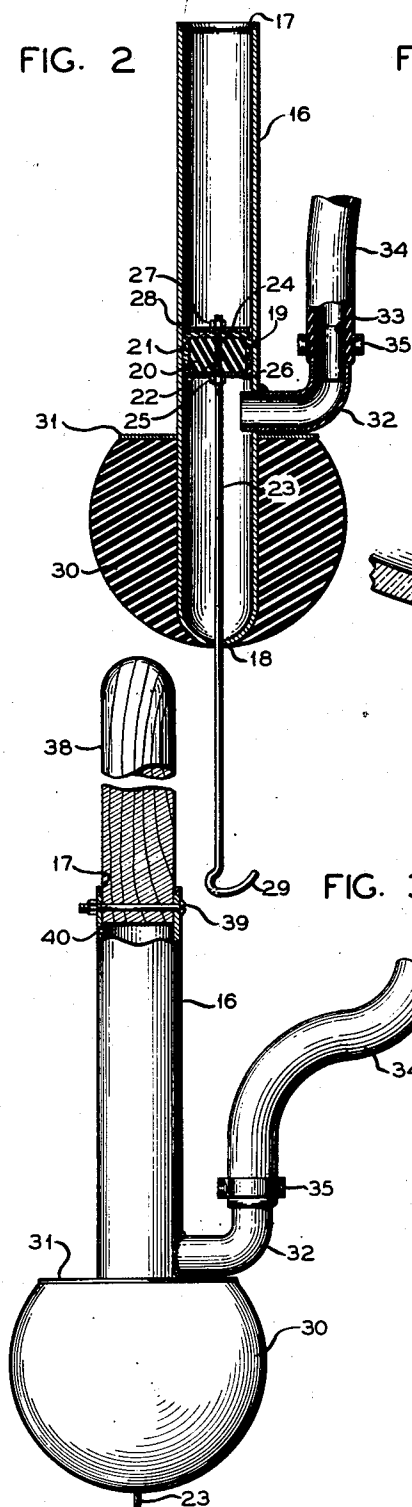


FIG. 1

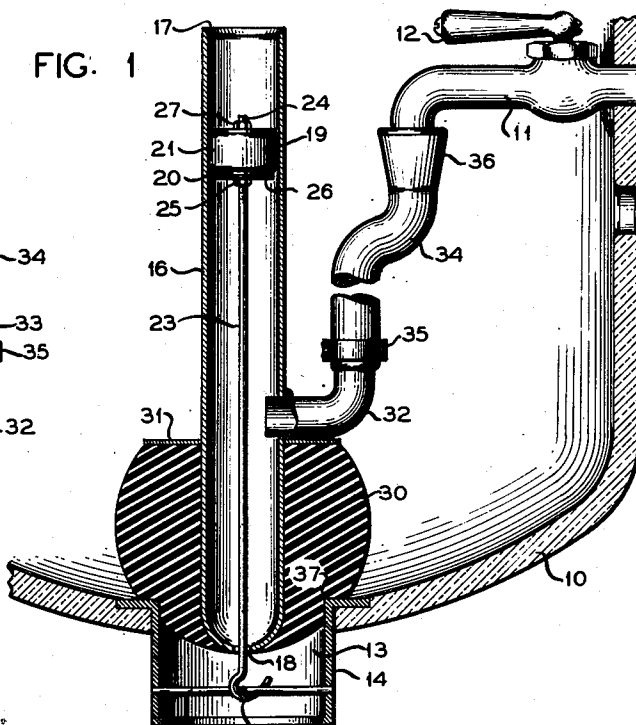


FIG. 3

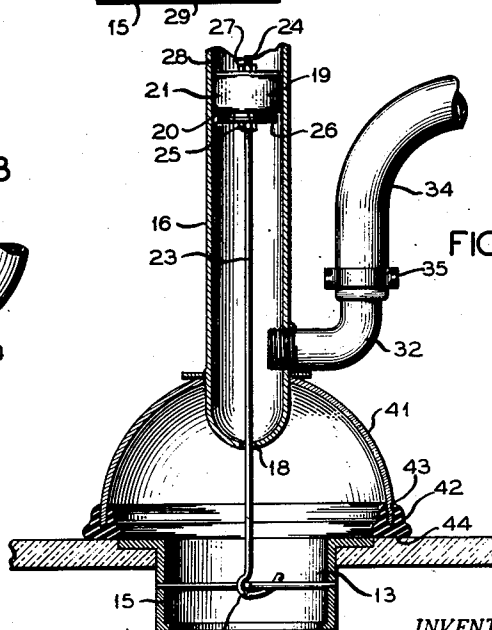
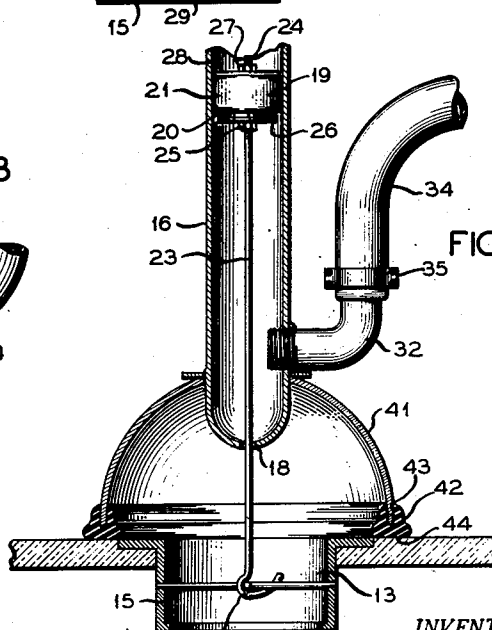


FIG. 4



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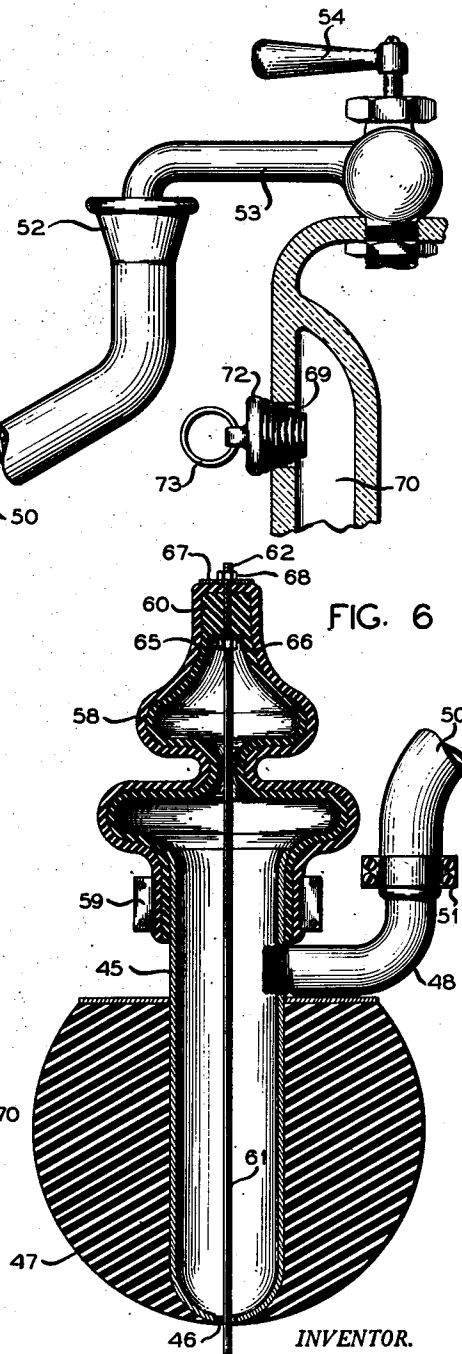
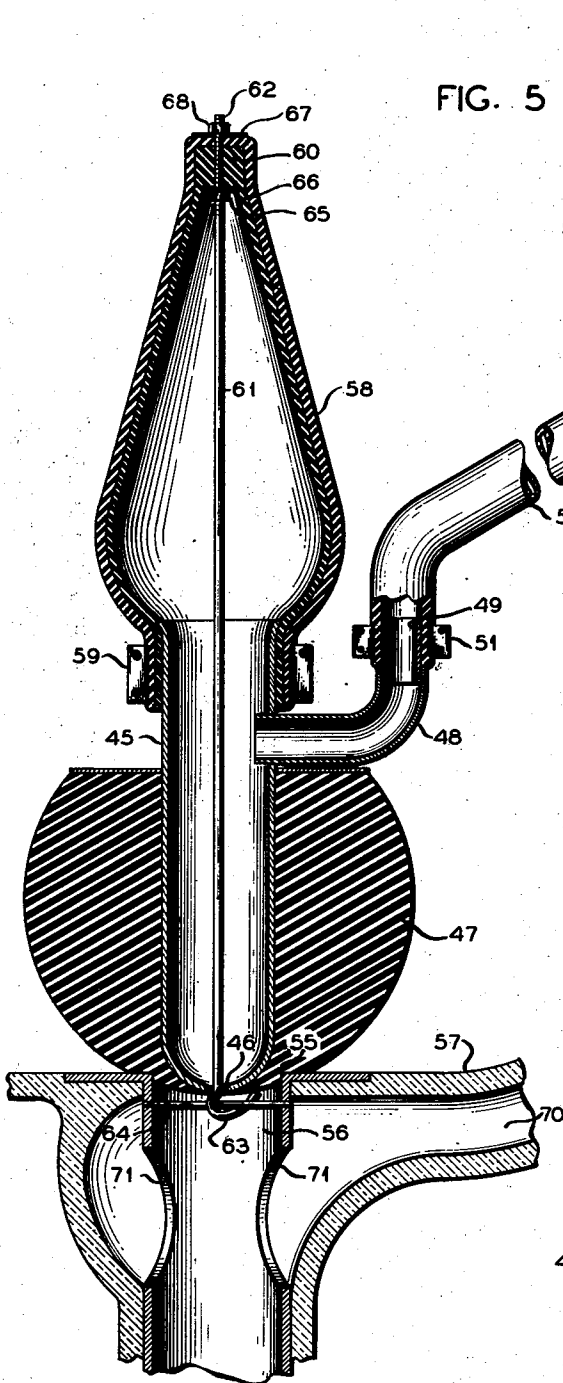
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FIG. 7

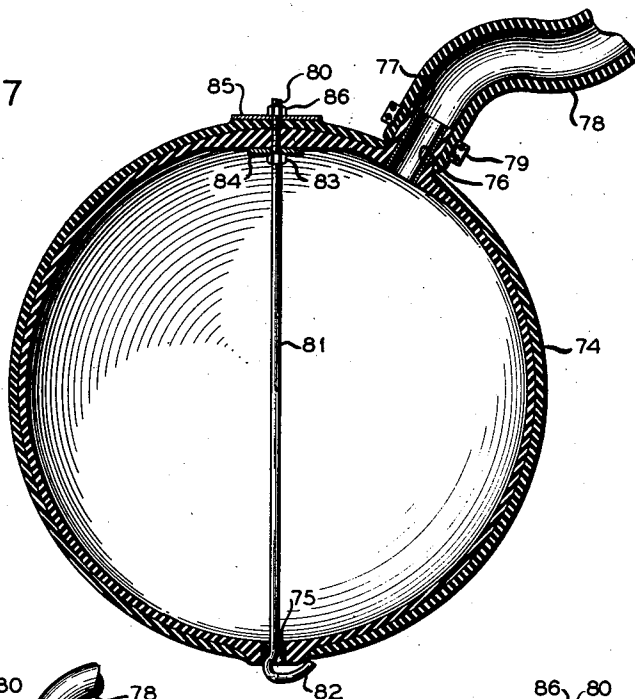


FIG. 10

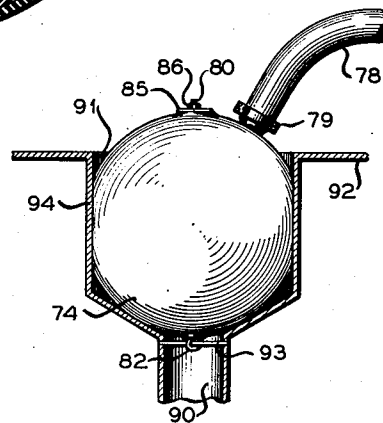
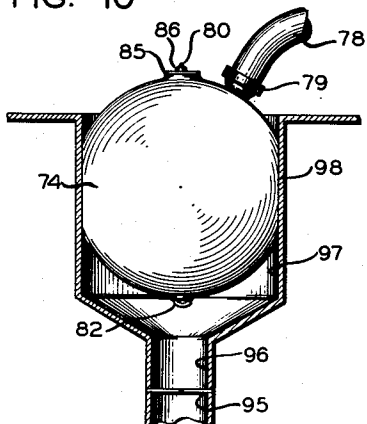
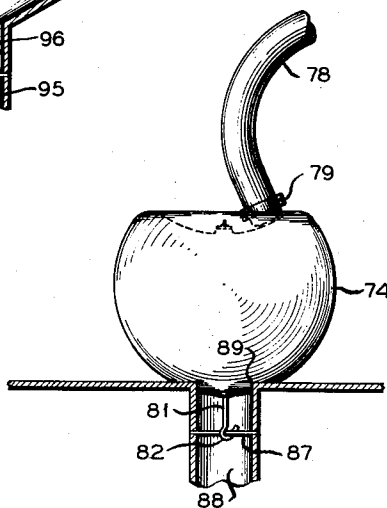


FIG. 9

FIG. 8



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DRAIN CLEANER

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Application March 23, 1950, Serial No. 151,345

6 Claims. (Cl. 285-44)

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This invention relates to cleaning devices and more particularly to devices employed in the removal of stoppages and the cleaning of plumbing outlets including sinks, basins, tubs, commodes, bidets, and the like.

Devices of various kinds have been employed in an attempt to unstop drains or discharge outlets from sinks and other plumbing receptacles with only a limited degree of success and satisfaction. They lacked simplicity, were difficult to use, or failed to operate satisfactorily, as well as other objectionable characteristics.

It is an object of the invention to provide a cleaning device of simple and inexpensive construction, which can be easily applied and will readily and automatically become tightly secured in place by water pressure as well as a device which can be used on substantially all drainage outlets about the home.

Further objects and advantages of the invention will be apparent from the following description taken in conjunction with the accompanying drawings, wherein:

Fig. 1 is a vertical section illustrating the drain cleaner of the present invention in operative position;

Fig. 2, a vertical section showing the clamping member in extended position;

Fig. 3, a slightly modified form of the device incorporating a manipulating or holding handle;

Fig. 4, a fragmentary section of a modified form of the device of Fig. 1 incorporating a different type of sealing gasket;

Fig. 5, a vertical section of a further modified form of the invention in operative position;

Fig. 6, a fragmentary section of the device shown in Fig. 5 with the clamp operating bellows in collapsed condition;

Fig. 7, a vertical section of a further modified form of the invention;

Fig. 8, an elevation with parts in section for greater clarity of the device of Fig. 7 in operative position;

Fig. 9, a view similar to Fig. 8 but showing the device in a different type of drain opening; and

Fig. 10, a view similar to that of Fig. 9 but with the device in a further modified type of drain opening.

With continued reference to the drawings there is shown in Fig. 1 a basin or sink 10 having a conventional outlet faucet 11 with a manipulating handle 12 and a drain opening 13 formed by a thimble 14 secured to the sink or basin 10, the opening 13 having a strainer or the like formed by cross bars 15 disposed therein.

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The drain cleaner of this invention illustrated in Fig. 1 comprises a generally cylindrical tube 16 provided with a beveled opening 17 at the upper end thereof and a restricted opening 18 at the lower end. Tube 16 serves to receive a piston indicated generally at 19, this piston, as best shown in Fig. 2, comprising a resilient cylindrical body 20 serving to support and be surrounded by a cup washer 21 of leather or the like, the body 20 having an aperture 22 there-through to receive a clamping rod 23.

Rod 23 is provided adjacent the upper end thereof with screw threads 24 for receiving a lower piston clamping nut 25 which engages a washer 26 in contact with the lower surface of body 20, there being an upper clamping nut 27 threadedly received on the threads 24 and engaging a clamping washer 28 in contact with the upper surface of cup washer 21. Nuts 25 and 27 serve to firmly retain the piston assembly 19 on the clamping rod 23 and due to the resiliency of body 20, which may be formed of rubber or other suitable material, tightening of the nuts 25 and 27 will expand the body 20 to ensure fluid tight engagement between the cup washer 21 and the inner wall of tube 16. Clamping rod 23 extends through restricted opening 18 in the tube 16 and is provided on the lower end thereof with a hook or other appropriate engaging means 29, the function of which will be presently described.

Surrounding the lower portion of the tube 16 is a generally ball shaped sealing member 30 which may be formed of rubber or other suitable material, member 30 having an upper retaining washer 31, member 30 and washer 31 being received and fixed on the lower portion of tube 16.

Tube 16 is provided slightly below the mid point thereof with a fitting 32 which may be in the form of an elbow or any other desired configuration, this fitting being provided with a nipple 33 for receiving a flexible conduit 34 secured to the nipple 33 by a suitable clamp 35. Conduit 34 may be provided at the upper end thereof with a frictional fluid tight faucet engaging portion 36 which serves to connect the device to the faucet 11 and permit the application of water pressure thereto.

In operation and with the clamping rod 23 in extended position as shown in Fig. 2, the rod 23 is inserted into the drain opening 13 with the hook 29 in engagement with the cross bars 15 forming a strainer and with the sealing body in engagement with the annular edge 37 of the drain opening. The manipulating handle 12 of the

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faucet 11 is operated to introduce water at city pressure through conduit 34 into the interior of tube 16 below the piston 19, the restricted opening 18 serving to impede the flow of water from the tube 16 thus building up a pressure therein and moving the piston 19 upwardly and moving the rod 23 to clamp the sealing member 30 in fluid tight sealing engagement with the edge 37.

Continued application of water pressure results in filling the drain opening 13 above any obstruction therein and since this pressure will build up to the full city water pressure the obstruction will be removed therefrom. It will also be obvious that the sealing engagement between the body 30 and edge 37 will be proportional to the pressure required to remove the obstruction since as the pressure in the drain opening 13 builds up likewise the upward pressure exerted against the lower surface of piston 19 to clamp the member 30 in position will increase and therefore under no condition will there be leakage between the edge 37 and the body 30. Upon removal of the obstruction and cleaning of the drain, it is only necessary to close the faucet 11 and remove the device from the sink or basin.

A slightly modified form of the device shown in Figs. 1 and 2 is illustrated in Fig. 3, and this form is identical thereto in all respects except that a handle 38 of wood or other suitable material is disposed in the upper end of tube 16 and secured thereto by screw threaded fastening means or the like 39. Since in this form of the invention the upper end of tube 16 is closed it is necessary to relieve pressure developed therein by upward movement of the piston 19 and consequently a vent opening 40 is provided in the wall of the tube 16 immediately below the lower end of handle 38, this vent opening 40 serving to relieve any pressure in the upper end of tube 16 and permit the unimpeded upward movement of piston 19 under the action of water pressure applied to the lower surface thereof.

While the sealing body 30 is shown as a portion of a sphere obviously this body may be provided with other configurations and if desired may be formed with a series of concentric steps in order to accommodate the same to drain openings of varying diameters.

In Fig. 4 there is illustrated a still further modified form of the device shown in Figs. 1 and 2 in which the sealing body 30 is replaced by a generally bell-shaped rigid hollow member 41 which may be provided on the lower annular edge thereof with a sealing gasket 42 of rubber or other suitable material, this gasket in the form shown having a channel 43 for receiving the edge of member 41 and an enlarged sink engaging portion 44 which serves to seal against escape of liquid from within the device and the drain opening 13. This form of the invention will obviously accommodate all drain openings from the inner diameter of the gasket 42 down to the smallest practical drain opening found in general use.

In Figs. 5 and 6 there is shown a further modified form of the drain cleaner of this invention which incorporates the basic principle of utilizing the city water pressure to provide a sealing engagement between the device and the surface surrounding the drain opening to be cleaned but in which the specific structure for applying this pressure is somewhat different.

In this form of the invention a tube 45 having a restricted opening 46 at the lower end thereof serves to receive and support a sealing body 47 of resilient material which body if desired may

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be similar in all respects to the sealing body 30 of the form of the invention above described. The tube 45 is provided with a fitting 48 having a nipple 49 for receiving a flexible conduit 50 which is firmly attached thereto in fluid tight engagement by a clamp 51. Conduit 50 is provided at the opposite end thereof with a frictional fluid tight coupling 52 for engaging a faucet 53 provided with the usual manipulating handle 54.

The pressure of the water supply from faucet 53 is utilized in this instance to clamp the sealing body 47 in engagement with an edge 55 surrounding a drain opening 56 in a basin or sink 57 by means of a flexible expansible chamber in the form of a bellows 58. Bellows 58 may be of any desired configuration and is constructed of rubber or other suitable material which is flexible and sufficiently strong to retain the full city water pressure. The lower end of bellows 58 is received around the upper end of tube 45 and fixed thereon in fluid tight engagement by a clamp 59. The upper end of bellows 58 is closed and receives a solid body 60 to provide sufficient mechanical rigidity and strength, this body 60 having an aperture therethrough for receiving a clamping rod 61 provided at its upper end with a threaded portion 62 and at its lower end with a hook or other securing means 63 for engaging cross bars 64 which are normally provided as a strainer or the like in drain opening 56. The clamping rod 61 is provided with a lower clamping nut 65 on the threaded portion 62 and serving to firmly secure the rod 61 in position by washer 66 and to prevent any leakage through the aperture in the upper end of bellows 58 which receives the rod 61 is a washer 67 and upper clamping nut 68 also received on the threaded portion 62.

In operation the device just described is conditioned for application to the sink by collapsing the bellows 58 as shown in Fig. 6 to extend the clamping rod 61 a sufficient distance whereby the hook 63 may engage the bar 64. Upon operation of manipulating handle 54 water will flow through faucet 53 and conduit 50 to the interior of tube 45 and bellows 58 thus expanding the bellows to the position shown in Fig. 5 or to any intermediate position depending upon the location of cross bars 64. This action will firmly clamp the sealing body 47 in engagement with the annular edge 55 of the drain opening 56, thus precluding any leakage of water therefrom.

In Fig. 5 there is also shown the normal overflow opening 69 provided in the basin or sink with an overflow passage 70 communicating with the drain opening 56 through apertures 71 therein. Since the water pressure exerted on an obstruction below aperture 71 would escape through passage 70 and drain opening 69 a plug in the form of a stepped or tapered stopper 72 may be inserted in the overflow opening 69 to prevent such escape. For convenient, manipulation stopper 72 may be provided with a ring 73 to which may be attached if desired a flexible retaining member for preventing loss of the same.

A still further modified form of the invention is shown in Figs. 7 to 10 and this form is particularly versatile in that an extremely large range of sizes of drain openings may be accommodated. The device in this instance comprises a hollow flexible member 74 of generally spherical configuration although this configuration may be considerably varied if desired. The member 74 is constructed of flexible material having sufficient mechanical strength to withstand full city

water pressure applied to the interior thereof and at one side is provided with a restricted opening 75 through which water under pressure may be expelled.

The member 74 is provided in a surface thereof substantially opposite the restricted opening 75 with an inlet opening having a metallic or other rigid liner 76 inserted therein. The liner 76 and surrounding wall 77 serves to receive one end of a conduit 78 which is secured in fluid tight engagement therewith by a clamp 79. The opposite end of conduit 76 is provided with coupling means for engaging a conventional faucet in accordance with the forms of the invention above described.

Diametrically opposite the restricted opening 75 an aperture is provided in the wall of the member 74 to receive the threaded portion 80 of a clamping rod 81. The opposite end of clamping rod 81 is provided with a hook or other engaging means 82. A lower clamping nut 83 is disposed on the threaded portion 80 and is in contact with a washer 84 in engagement with the inner wall of member 74. An outer clamping and sealing washer 85 engages the outer surface of member 74 and is held in firm engagement therewith by an upper clamping nut 86 received on the threaded portion 80.

The device of Figs. 7 to 10 may be used in a manner similar to the various devices above described and as illustrated in Fig. 8, the upper portion of the member 74 may be collapsed a sufficient distance to extend the clamping rod 81 and hook into engagement with a cross bar 87 disposed in drain opening 88, the outer surface of member 74 engaging the annular edge 89 surrounding the drain opening. Upon application of water pressure to the interior of member 74 the same will expand thus exerting an upward pull on rod 81 to firmly clamp the member 74 in engagement with the edge 89 thus preventing any leakage therebetween and the full water pressure may be applied through the restricted opening 75 to the drain opening 88 thus dislodging any foreign material causing a stoppage thereof. This form of the invention operates similarly to the forms described above, the chief difference being in the form of the device for producing a clamping pressure.

The device shown in Fig. 9 may also be utilized for cleaning a drain opening 90 having a particularly large opening 91 extending into a sink or basin 92 in which case the member 74 is disposed entirely within the opening 91 with the hook 82 in engagement with a cross bar 93. In this application of the device the fluid is sealed within the drain opening 90 by engagement of the outer wall of the member 74 with the wall 94 of the drain opening 91, this engagement of course being proportional to the pressure within the member 74.

In cases where no cross bar is provided within the drain opening or in which the cross bar 95 as shown in Fig. 10 is disposed in the drain opening 96 in such a location that it is impossible to engage the hook 82 therewith, the member 74 may be disposed within the relatively large drain opening 97 in engagement with the wall 98 thereof, this engagement caused by the pressure within the member 74 being sufficient to seal against leakage from the drain opening, as before, the water flowing through restricted opening 75 to clean the drain.

It will thus be seen that by the above forms of the invention there has been provided a relatively simple device for cleaning drains and for

removing obstructions therein in which the troublesome problem of eliminating leakage is solved by utilizing the city water pressure to clamp the device in firm sealing engagement with the sink or basin in which the clogged drain is situated and also in which the city water pressure is utilized to dislodge the obstruction in the drain. The device requires no accurately machined parts and is therefore particularly economical in construction and may be expected to give satisfactory service over a long period of time.

It will be obvious to those skilled in the art that various changes may be made in the invention without departing from the spirit and scope thereof and therefore this invention is not limited by that which is shown in the drawings or by that which is described in the specification but only as indicated in the appended claims.

What is claimed is:

1. A drain cleaner comprising in combination a seal for a drain having a passage for water therethrough with an inlet adjacent its upper portion and a restricted discharge from its lower portion into the drain to be cleaned, a source of water supply into said inlet, an anchor for engaging said drain, and pressure responsive structure for increasing the force on said anchor in proportion to the pressure of the water in said passage with the flow of water from said restricted discharge serving to enter the drain and exert pressure therein to dislodge stoppage.

2. A drain cleaner comprising in combination a resilient ball type seal having an axial opening therethrough, a tube in said axial opening having an open upper end and a restricted opening in its lower end, a second tube forming an inlet intermediate the ends of said tube for the admission of water from a source of supply, said second tube projecting into the first tube, a piston in said first tube above said inlet and limited in its downward movement by said second tube, an anchoring rod connected to said piston and extending through said restricted opening for engagement with said drain whereby water admitted through said second tube into said first tube will fill said tube and force said piston upwardly with said anchoring rod, and water discharge through the restricted opening will exert pressure therein to dislodge stoppage.

3. A drain cleaner comprising in combination a resilient ball type seal having an axial opening therethrough, a tube in said axial opening having an open upper end and a restricted opening in its lower end, a second tube forming an inlet intermediate the ends of said tube for the admission of water from a source of supply, said second tube projecting into the first tube, a piston in said first tube above said inlet and limited in its downward movement by said second tube, an anchoring rod connected to said piston and extending through said restricted opening for engagement with said drain whereby water admitted through said second tube into said first tube will fill said tube and force said piston upwardly with said anchoring rod and water discharge through the restricted opening will exert pressure therein to dislodge stoppage, a handle in the upper end of said first tube forming a stop for the upward movement of said piston and anchoring rod and forming means by which the device may be used in a commode without said anchor.

4. A drain cleaner comprising in combination a resilient dome type seal having an axial opening

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therethrough, a tube in said axial opening having an open upper end and a restricted opening in its lower end, a second tube forming an inlet intermediate the ends of said tube for the admission of water from a source of supply, said second tube projecting into the first tube, a piston in said first tube above said inlet and limited in its downward movement by said second tube, an anchoring rod connected to said piston and extending through said restricted opening for engagement with said drain whereby water admitted through said second tube into said first tube will fill said tube and force said piston upwardly with said anchoring rod and water discharge through the restricted opening will exert pressure therein to dislodge stoppage.

5. A drain cleaner comprising in combination a resilient dome type seal having an axial opening therethrough, a tube in said axial opening having an open upper end and a restricted opening in its lower end, a second tube forming an inlet intermediate the ends of said tube for the admission of water from a source of supply, said second tube projecting into the first tube, a piston in said first tube above said inlet and limited in its downward movement by said second tube, an anchoring rod connected to said piston and extending through said restricted opening for en-

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gagement with said drain whereby water admitted through said second tube into said first tube will fill said tube and force said piston upwardly with said anchoring rod and water discharge through the restricted opening will enter the drain and exert pressure therein to dislodge stoppage.

6. A drain cleaner comprising in combination a hollow resilient partly spherical seal having an anchoring rod connected thereto and extending through a restricted opening in the wall of the same for engagement with said drain, an inlet for water in the said seal whereby the seal will be filled and said anchoring rod forced upwardly anchoring said cleaner to the drain and water will be discharged through the restricted opening and will enter the drain to dislodge stoppage therein upon the building up of adequate pressure.

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