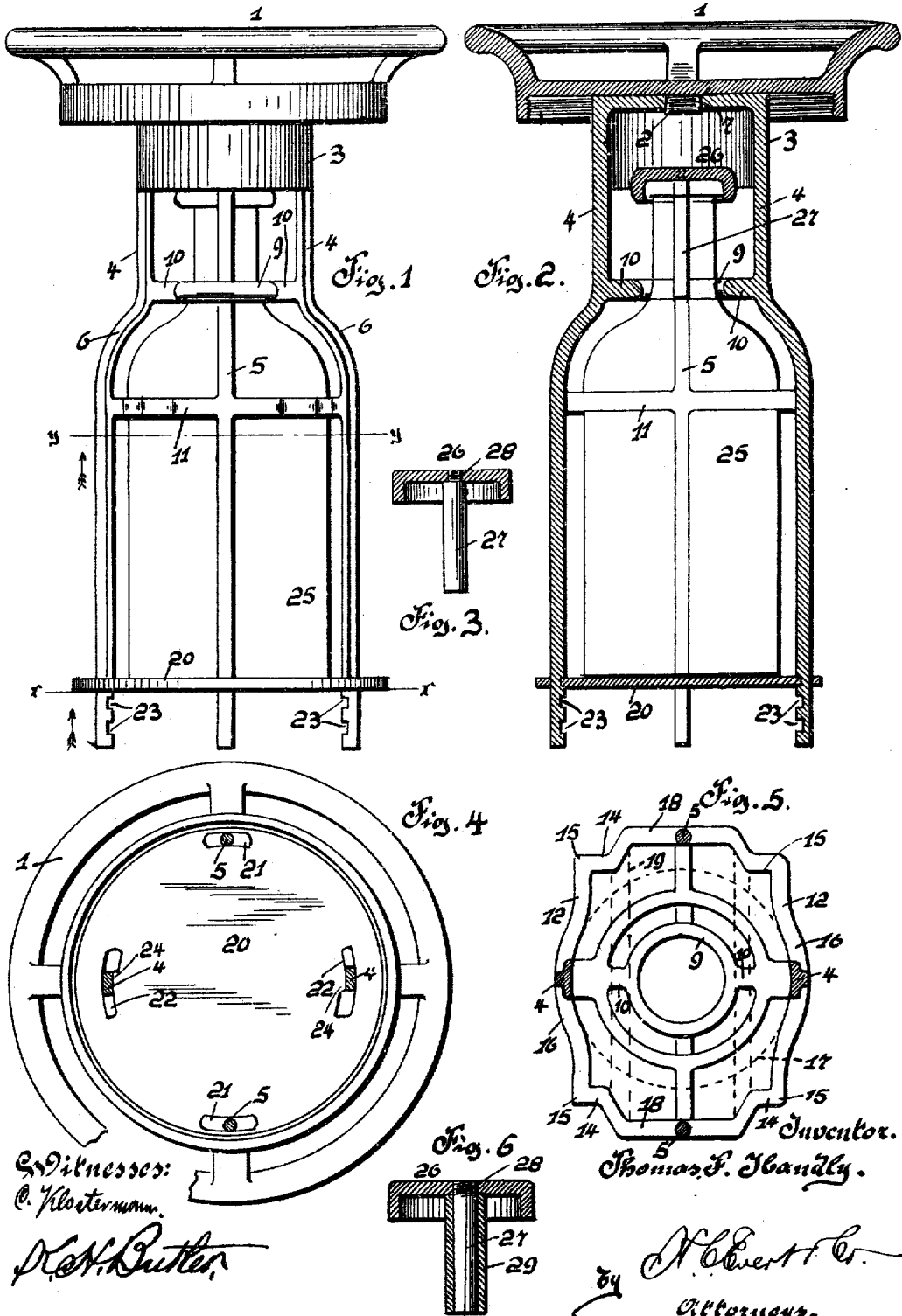


T. F. HANDLY.
FIRE EXTINGUISHER.
APPLICATION FILED DEC. 21, 1905.

954,281.

Patented Apr. 5, 1910.

2 SHEETS—SHEET 1.



954,281.

2 SHEETS—SHEET 2.

Figs. 9

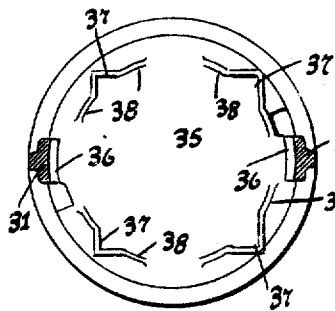
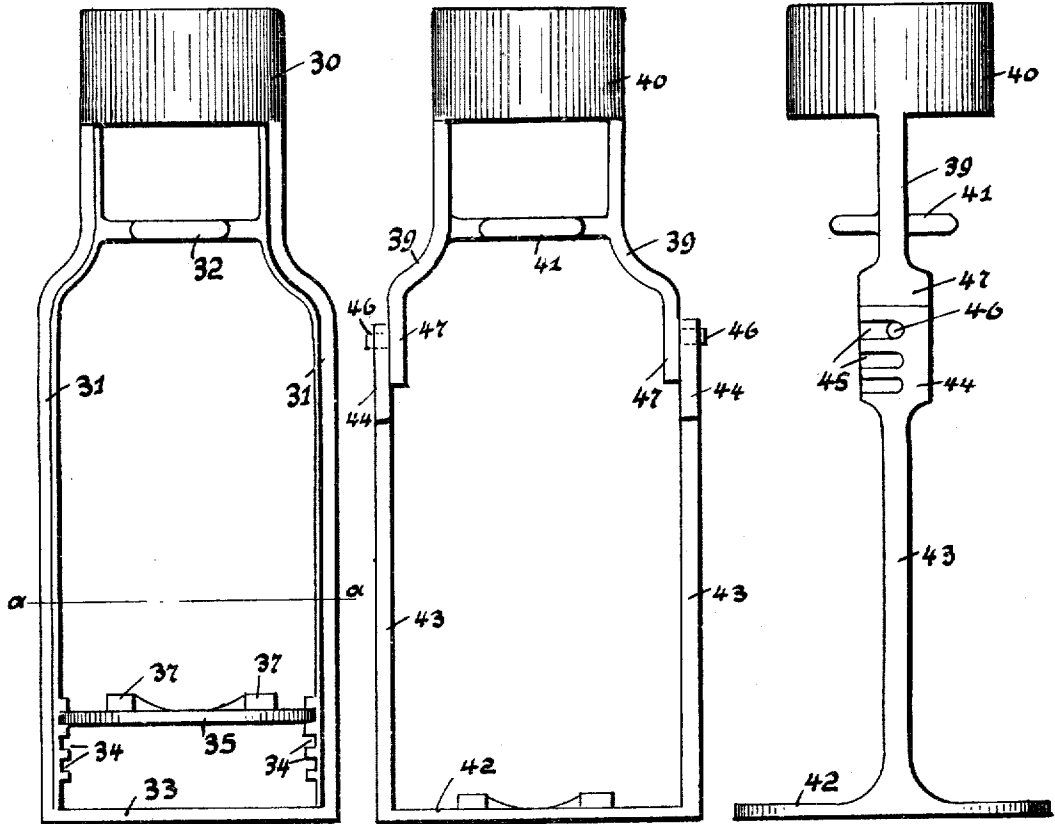


Fig. 10

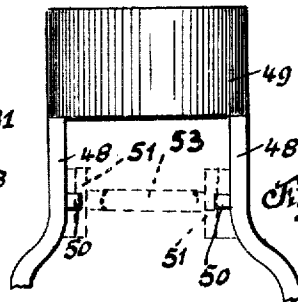


Fig. 11

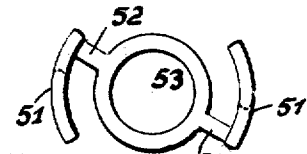


Fig. 12

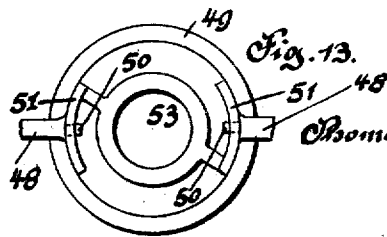


Fig. 13.

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UNITED STATES PATENT OFFICE.

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FIRE-EXTINGUISHER.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, THOMAS F. HANDLY, a citizen of the United States of America, residing at Allegheny, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Fire-Extinguishers, of which the following is a specification, reference being had therein to the accompanying drawing.

This invention relates to certain new and useful improvements in fire extinguishers, and relates more particularly to that type of apparatus commonly known as a chemical fire extinguisher.

My invention aims primarily to provide an adjustable cage for acid receptacles, such as are employed in combination with a suitable casing containing an alkali solution, to produce gas having expelling force sufficient to extinguish a fire. In this connection, I have devised an adjustable cage adapted to support bottles of various sizes and contours.

To this end, the invention in its broadest aspect involves in combination with a cage, positive and reliable means for adjusting the cage and supporting a bottle or receptacle within a confined space relative to the casing, also means for effecting a discharge of the acid when the fire extinguisher is inverted whereby the alkali solution or fluid contained within the extinguisher will be thoroughly impregnated with the acid and form an extinguishing solution.

Another very important feature of my invention resides in the simplicity of construction which I have used throughout the various forms of the invention, the simple construction employed entirely dispensing with the cumbersome cages heretofore used.

With the above and other objects in view, which will more readily appear as the nature of the invention is better understood, the same consists in the novel construction, combination and arrangement of parts to be hereinafter more fully described and claimed, and referring to the drawing accompanying this application, like numerals of reference designate corresponding parts throughout the several views, in which:—

Figure 1 is a front elevation of my improved cage for fire extinguishers, illustrating the same detachably secured to the lid or cap of an extinguisher, Fig. 2 is a vertical sectional view of the same, Fig. 3 is a ver-

tical sectional view of a movable stopper used in connection with the acid receptacle of the cage, Fig. 4 is a cross sectional view taken on the line $x-x$ of Fig. 1 looking in the direction of the arrow of said figure, Fig. 5 is a similar view taken on the line $y-y$ of Fig. 1, looking in the direction of the arrow of said figure, Fig. 6 is a vertical sectional view of a modified form of stopper, Fig. 7 is a front elevation of a slightly modified form of cage, Fig. 8 is a similar view of still another form of cage, Fig. 9 is a side elevation of the same, Fig. 10 is a cross sectional view taken on the line $a-a$ of Fig. 7, Fig. 11 is a detail side elevation of a portion of a cage, illustrating the same to be used in connection with an adjustable retaining ring, Fig. 12 is a plan of a retaining ring, Fig. 13 is a bottom plan of a portion of a cage equipped with an adjustable retaining ring.

It is well known, that bottles of any given capacity or chamber-area are, as a rule, manufactured in different shapes, heights, etc., and the capacity or chamber-area of one bottle may be exactly the same as that of another bottle of an entirely different shape. It is the aim of my invention to provide a cage for fire-extinguishers with means for engaging, and steadily-supporting, bottles of different diameters, heights, cross-sectional contours, or other differing features, but having the same internal capacity or chamber-area.

In the accompanying drawing, I have illustrated a conventional form of cap or lid 1, such as is generally used upon chemical fire extinguishers, the cap being provided with a depending screw threaded stem 2 in order that it may be secured to my improved cage. It has been the practice to provide the cap with a cage which supports an acid bottle or receptacle, while the casing is provided with an alkali solution adapted to be impregnated by the contents of the bottle or receptacle, when the casing is inverted.

My invention particularly resides in the construction of an adjustable cage which is detachably connected to the cap or lid 1 of the extinguisher, and in the accompanying drawings, I have illustrated various forms, all of which are within the scope of the invention, and are adjustable in one respect or the other.

Reference first being had to Figs. 1, 2, 4 and 5, it will be observed that my improved cage consists of a mixing cup 3 having depending arms 4, 4 and 5, 5, said arms being slightly bent outwardly, as at 6, 6. The mixing cup is provided with a central screw threaded recess 7 adapted to receive the screw threaded stem 2 carried centrally of the cap or lid 1. The mixing cup, which is preferably cylindrical, but may be any shape, is adapted to bear against the underneath face of the cap 1 when secured thereto, the top of the mixing cup forming a substantial bearing surface when the extinguisher is inverted. The depending arms 4 adjacent to the mixing cup are provided with a retaining ring 9, said ring being supported centrally of said arms by outwardly extending ribs 10, 10 carried by the arms 4, 4.

In practice, the mixing cup, together with the arms 4, 4 and 5, 5 and the retaining ring are formed integral and to further brace the arms, I employ a transversely disposed frame 11 which is carried by the arms 4, 4 and 5, 5 beneath the retaining ring 9, the frame 11 being preferably arranged a slight distance below where the arms are bent outwardly, as at 6, 6. A particular feature of my invention resides in the formation of the frame 11 which is substantially rectangular in plan view, the frame being formed by side rails 12, 12 and end rails 14, 14, the juncture of said rails forming rectangular corners 15, so as to embrace a bottle or receptacle substantially rectangular in cross section. The side rails 12, 12 are curved outwardly, as at 16, 16, to embrace a bottle 17 of cylindrical form as illustrated in dotted lines in Fig. 5 of the drawings. The end rails 14, 14 are also formed with outwardly extending portions 18, 18, thus adapting the frame 11 to also fit a bottle 19 rectangular or oval in cross section. By the construction of the frame 11, it will be observed that almost any shaped bottle or receptacle can be mounted in the frame 11 and retained therein and prevented from becoming displaced from my improved cage.

The lower ends of the arms 4, 4 and 5, 5 form legs to support the cage and the cap 1, when they are disconnected from the casing of the extinguisher. In connection with the lower ends of the arms 4, 4 and 5, 5, I use an adjustable bottom plate 20, forming a support or rest for the bottle said plate being circular in plan view and having its edges provided with slots 21, 21 to receive the ends of the arms 5, 5, and with bayonet shaped slots 22, 22 to receive the lower ends of the arms 4, 4. The ends or legs of the arms 4, 4 have their inner or confronting faces provided with a plurality of notches 23, 23 and in these notches the shoulders or sides 24, 24, of the bayonet shaped slots 22, 22 are adapted to engage. The plate 20 is

adapted to support the bottle or receptacle 25 mounted in the cage, and is positioned according to the depth of the bottle or receptacle.

In placing an acid receptacle or bottle within the cage, the neck of the bottle or receptacle extends upwardly through the retaining ring 9, while the body of the receptacle or bottle is embraced by the frame 11 and supported by the plate 20. It will be observed that the top of the bottle protrudes slightly into the mixing cup 3 and in connection with the neck of the bottle or receptacle I use a stopper 26, said stopper being constructed of lead or a metal not affected by the acid or contents of the bottle or receptacle 25. The stopper is adapted to fit loosely over the top of the bottle and is provided with a depending stem 27, which is detachably secured to the stopper as at 28, in order that the stem may be removed and a larger stem placed therein in case a larger sized bottle or receptacle is used, the stem being adapted to fit within the neck of the bottle and prevent the stopper from becoming displaced relative to the cage or receptacle, as will be presently described. In some instances, the stem 27 may be provided with a sleeve 29 in order to increase the cross area of the stem to fit larger sized receptacles or bottles than that shown.

Reference will now be had to Figs. 7 and 10 of the drawings, wherein I have illustrated a less complicated structure than the cage heretofore described, the arms 5, 5 and the frame 11 being entirely dispensed with. The mixing cup 30 is provided with two depending arms 31, 31, and a retaining ring 32 similar to the cage heretofore described, and the lower ends of the arms 31, 31 are connected together by a plate 33 and provided with a plurality of inwardly extending lugs 34, 34, which serve to support a false or adjustable bottom 35. The periphery of the false or adjustable bottom 35 is provided with diametrically opposed recesses 36, 36 to engage between the lugs 34, 34 of the arms 31, 31, said recesses corresponding substantially to bayonet shaped slots. The plate 35 is provided with four upwardly extending angular lugs 37, 37, the edges 38, 38 of said lugs forming a surface to embrace a cylindrical bottle, while the angularity of the lugs forms a surface to embrace a rectangular or oval receptacle. The lugs are adapted to embrace the bottom sides of a bottle or receptacle, while the retaining ring 32 is adapted to embrace the neck of a bottle or receptacle and when a bottle or receptacle is properly positioned within the cage, it will be observed that it will be impossible for a bottle to become displaced from the cage, unless the false bottom or plate 35 is removed from its supporting lugs 34.

A slight modification of my improved cage for extinguishers is illustrated in Figs. 8 and 9 of the drawings, where it will be observed that depending arms 39, 39 of the mixing cup 40 are of a less length than the arms heretofore described, but still support a retaining ring 41 similar to the rings 9 and 32. In order to support a bottle between the arms 39, 39 and within the retaining ring 41, I use a plate 42 similar to the plate 35, but provided with upwardly extending arms 43, 43 instead of the recesses 36, 36 of the plate 35. The upper ends of the arms 43, 43 are enlarged, as at 44 and provided with a plurality of transverse slots 45 which are adapted to engage pins 46, 46, carried by the enlarged lower ends 47, 47 of the arms 39, 39. After a bottle or receptacle has been placed within the retaining ring, 41, the plate 42 can be moved to engage the bottom of the bottle or receptacle and the arms 43, 43 locked in engagement with the depending arms 39, 39 of the mixing cup 40. By providing a plurality of slots 45, the plate 42 can be easily adjusted to engage bottles or receptacles of various depths, to hold them in proper position relative to the retaining ring 41.

Another feature of my invention resides in making a portion of the cage, namely the retaining ring, adjustable this feature being clearly illustrated in Figs. 11 to 13 inclusive. The arms 48, 48 of the mixing cup 49 are provided with inwardly extending pins 50, 50, said pins engaging slotted curved plates 51, 51 carried by the ribs 52, 52 of a retaining ring 53. The retaining ring 53 can be adjusted relative to the mixing cup 49 and when a bottle or receptacle having a short or long neck is mounted in either of the frames previously described, the retaining ring can be properly adjusted upon the neck of the receptacle to securely hold the same and limit the movement of the bottle or receptacle within the cage.

I believe the operation of placing a bottle or receptacle within my improved cage to be obvious, but in order that the movement and operation of the extinguisher, when inverted may be fully understood, I will assume that the bottle is held in the position shown in Figs. 1 and 2 of the drawings. When the extinguisher is inverted, the stopper 26 will descend into the mixing cup of the cage and the contents of the receptacle or bottle will be precipitated into the mixing cup, and will commingle and impregnate the alkali solution carried in the casing of the extinguisher. The position of the bottle or receptacle within the retaining ring of the cage may permit of a slight movement of the bottle, but not sufficient to permit the neck of the bottle to rest upon the bottom of the mixing cup, thereby permitting the contents of the bottle or receptacle to enter the

mixing cup and the casing of the extinguisher.

From the foregoing description, it will be observed that I have devised novel means for supporting a bottle or receptacle in a proper position relative to the casing or cap of an extinguisher, said means being adjustable, thereby not necessitating the use of one form of bottle.

The modified forms of construction illustrated in Figs. 7 to 13 inclusive, greatly simplify cages heretofore used, consequently reducing the expense of manufacture and freeing them from all danger of being improperly assembled in an extinguisher.

In connection with the adjustable bottom plate 20, I desire to call attention to the fact that in connection with the false or adjustable bottom 35 together with the lugs 37, the plate may be termed irregular, owing to the fact that it can support bottles of various contours, this being accomplished by making the lugs of a sufficient height to snugly engage the lower edges of a bottle or receptacle and prevent the same from shifting upon the plate 35. The means for supporting the plate 35, namely the lugs 34, are carried by the inner faces of the depending arms 31, 31, but it will of course be understood that these lugs can be carried by the outer faces of the plate 35 and the recesses 36 may be of a sufficient size to engage said lugs, this construction simply providing a larger bottom plate than that shown.

I also desire to call attention to the detachable depending stem carried by the stopper, this stem being employed to govern the flow of acid from the bottle or receptacle of the cage, the cross area of the depending stem being reduced when a larger flow is desired and enlarged when a lesser flow from the bottle or receptacle is necessary. As some bottles have larger necks than others, I have found it necessary to detachably connect the depending stem in order that the same may be changed to govern the flow from the bottles or receptacles used.

The advantage resulting in providing a cage capable of receiving and steadily supporting bottles of different diameters, or cross-sectional contours, or of different heights but all of the same internal capacity or chamber-area, will be apparent, since it is not always possible to obtain a bottle of a desired capacity in a shape to fit a receptacle or cage constructed so as to receive only a bottle of a specific shape. For instance, if the extinguisher is shipped from the factory with a bottle of five ounce capacity and of circular cross-sectional form, and the cage would accommodate only bottles of this form, it will readily be perceived that should the bottle be broken during the use of the extinguisher, or at any other time, it would be a serious inconvenience to the

owner, if he were unable to re-charge with any other bottle of the same capacity, than one of the same shape and contour as the original bottle. With the construction of my improved cage, all such inconvenience is eliminated, and danger of inability to promptly recharge the extinguisher is obviated.

I preferably construct my improved cages together with their appurtenant parts of a material not susceptible to the chemical action of any fluid or ingredients in which they may be submerged, and while I have herein illustrated the preferred form of construction, it is obvious that such changes in the minor details, size and proportion of my improved cages, as are permissible by the appended claims, may be resorted to without departing from the spirit and scope of the invention.

What I claim and desire to secure by Letters Patent, is:—

1. The combination with the cap of an extinguisher, of a mixing cup detachably connected to said cap, depending curved arms carried by said cup, and having their lower ends notched, a plate mounted upon the lower ends of said arms, said plate having slots formed therein through which said arms pass, a retaining ring carried by said arms and adapted to embrace a receptacle supported by said plate, a horizontal frame carried by said arms and having irregular rails adapted to embrace the receptacle supported by said plate, a stopper loosely mounted in said receptacle, and means to adjustably connect said plate to said arms, substantially as described.

2. The combination with the cap of a fire extinguisher, of a mixing cup detachably connected to said cap, depending arms carried by said cap and having notches formed in their lower ends, a plate adapted to fit upon the lower ends of said arms, said plate having bayonet shaped slots formed therein adapted to lock said plate upon said arms, a retaining ring carried by said arms and adapted to embrace a receptacle carried by said plate, a horizontal frame carried by said arms and having irregular rails adapted to embrace the receptacle mounted upon said plate, substantially as described.

3. The combination with the cap of a fire extinguisher, and a receptacle, of a mixing cup carried by said cap, depending arms carried by said cup and adapted to embrace said receptacle, a plate detachably connected to the lower ends of said arms and adapted to support said receptacle, a retaining ring adapted to embrace the upper end of said receptacle, a horizontal frame carried by said arms and adapted to engage said receptacle, means to adjust said plate, and means to lock said plate in engagement with said arms, substantially as described.

4. The combination with the cap of a fire extinguisher, and a receptacle, of a mixing cup carried by said cap, depending arms carried by said cup and adapted to embrace said receptacle, a plate adjustably and detachably carried by the lower ends of said arms, a retaining ring carried by said arms and embracing the upper end of said receptacle, a horizontal frame carried by said arms and adapted to engage said receptacle, a stopper loosely mounted in said receptacle, a detachable stem carried by said stopper, substantially as described.

5. The combination with the cap and a receptacle of a fire extinguisher, of a mixing cup carried by said cap, depending arms carried by said cup, a plate carried by said arms, a retaining ring carried by said arms and adapted to embrace the upper end of said receptacle, means to detachably connect said plate to said arms, means to adjust said plate relative to said arms, and means carried by said plate to fix said receptacle relative to said arms, substantially as described.

6. The combination with the cap and the receptacle of a fire extinguisher, of a mixing cup carried by said cap, depending arms carried by said cup and adapted to embrace a receptacle, a plate adjustably connected to the lower ends of said arms and adapted to support said receptacle, a retaining ring carried by said arms and embracing said receptacle, a stopper loosely mounted in said receptacle, and means carried by said plate to fix the bottom of said receptacle relative to said arms, substantially as described.

7. The combination with the cap of a fire extinguisher, and a receptacle, of a mixing cup carried by said cap, depending arms carried by said cup, a plate detachably connected to said arms and adapted to support a receptacle, a horizontal frame carried by said arms, and engaging said receptacle, a stopper mounted in said receptacle, an adjustable stem carried by said stopper, means to detachably connect said cup with said cap, and means to adjust said plate, substantially as described.

8. The combination with the cap of a fire extinguisher and a receptacle, of a mixing cup detachably connected to said cap, depending arms carried by said cup, a detachable plate adjustably connected to said arms and adapted to support said receptacle, a horizontal frame carried by said arms and adapted to engage said receptacle, said frame embodying irregular rails adapted to engage receptacles of various contours, substantially as described.

9. The combination with the cap of a fire extinguisher, and a receptacle, of a mixing cup detachably connected to said cap, depending arms carried by said cap and adapted to support said receptacle, a re-

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taining ring carried by said arms and embracing said receptacle, a horizontal frame carried by said arms and engaging said receptacle, means to adjust said receptacle within said arms, substantially as described.

10. The combination with the cap of a fire extinguisher, and a receptacle, of depending arms carried by said cap, a plate detachably connected to said arms and adapted to support said receptacle, a retaining ring embracing said receptacle, a horizontal frame carried by said arms and engaging said receptacle, a stopper loosely mounted in said receptacle, a depending stem detachably connected to said stopper, means to adjust said plate, substantially as described.

11. As a new article of manufacture, a stopper for receptacles of fire extinguishers having a depending detachable stem, substantially as described.

12. A cage for fire extinguishers comprising a mixing-cup, arms depending from said cup, and a support for a bottle adjustably-connected to said arms, and means for fixedly-securing the support in its adjusted-position.

13. A cage for fire extinguishers, embodying a mixing-cup, a plurality of arms secured to said mixing cup and depending therefrom, a bottle-neck retaining-ring carried by said arms, a bottle support adjustably-connected to the arms and capable of being fixedly-secured in an adjustable-position, and bottle-embracing means shaped to embrace bottles of various cross-sectional contours.

14. A cage for fire extinguishers embodying a plurality of arms connected together at their upper ends, and between which an acid-bottle is received, a bottle-neck retaining-ring carried by said arms, and a bottle-support adjustably-connected to the arms and capable of being fixedly-secured in its adjusted-position.

15. A cage for fire extinguishers embodying a plurality of arms connected together and between which an acid-bottle is received, bottle-supporting means carried by the arms, and bottle-embracing means separate from the arms though connected thereto and shaped to embrace and steadily-hold bottles of various forms of cross-sectional contour.

16. In cages for fire extinguishers, a bottle embracing means comprising a substantially rectangular frame, the sides and the ends of which are off-set to adapt the frame to receive and steadily-hold bottles of various cross-sectional contours.

17. In a cage for fire extinguishers the combination with a mixing-cup and a plurality of arms secured thereto and depending therefrom, and between which arms an acid-bottle is adapted to be received, of bottle embracing means connected to the arms

intermediate their ends and shaped to encircle and engage and steadily-support between the arms bottles of various cross-sectional contours.

18. A cage for fire extinguishers embodying a mixing-cup, a plurality of arms carried by said mixing-cup and depending therefrom, a bottle-support adjustably-connected to said arms and capable of being fixedly-secured in its adjusted-position, and a retaining-ring adjustably-connected to said arms.

19. A cage for fire extinguishers embodying a plurality of cage-arms connected at their upper ends, bottle-supporting means adjustably-connected to said arms and a retaining-ring adjustably-connected to the arms near their upper ends.

20. A stopper for acid-receptacles of fire extinguishers, comprising the stopper proper, a stem detachably-connected thereto, and a sleeve surrounding said stem.

21. A stopper for acid-receptacles of fire extinguishers, comprising the stopper proper, a depending detachable stem secured thereto, and a detachable sleeve surrounding said stem.

22. A cage for fire extinguishers, comprising arms connected together at their upper ends, and a support for a bottle adjustably-connected to said arms and capable of being fixedly-secured in the adjusted-position.

23. In fire extinguishers, the combination with an extinguisher-lid or cover, of a cage for the acid-receiving bottle, comprising bottle-receiving means suspended from said lid or cover, and bottle-supporting means adjustably-connected to the bottle-receiving means and capable of being fixedly-secured in the adjusted-position.

24. In a fire extinguisher, a cage comprising a pair of cage arms, a bottle support connected to said arms, and means intermediate the ends of the arms to engage and steadily-support between the arms bottles of different diameters and cross-sectional contours having the same interior capacity or chamber-area.

25. In a fire extinguisher, the combination with an extinguisher-lid or cover, of a cage structure suspended from said lid or cover and comprising bottle-receiving means, and a bottle support carried by the bottle-receiving means, and means adjustable toward and away from the lid or cover carried by the cage structure to engage and steadily-support in the bottle-receiving means bottles of different diameters and cross-sectional contours of equal interior capacity or chamber-area.

26. In fire extinguishers, a cage adapted to receive and steadily support bottles of varying cross sectional contours, said cage embodying a bottle support or rest adjust-

able toward and away from the upper end of the cage.

27. In fire-extinguishers, a suspended cage for the acid-receiving bottle, comprising
5 bottle-receiving means embodying cage-arms, and bottle-engaging means other than the cage-arms though connected thereto to engage and steadily-support in the bottle-receiving means bottles of different diameters
10 and cross-sectional contours having the same interior capacity or chamber-area.

28. A cage for the acid-receiving bottle of fire-extinguishers, said cage adapted to receive bottles of various cross-sectional contours, means in said cage for engagement
15 with the bottle to firmly hold the same irrespective of its cross-sectional contour, and means for increasing and decreasing the length of the cage to conform to the length
20 of the bottle supported therein.

29. A stopper for acid receptacles of fire extinguishers, comprising an imperforate stopper-head to rest on the end and normally seal the opening of the acid receptacle,
25 a stem connected to said stopper-head, and a sleeve adjustably secured to said stem, the said stem and sleeve being movable with the stopper-head upon the inversion of the acid receptacle and the resultant movement of

the stopper-head away from the acid receptacle. 30

30. A cage for the acid receptacle of a fire extinguisher embodying a support adjustable toward and away from the top of the cage for supporting receptacles of varying length and means to engage and steadily
35 support receptacles of different diameters and cross-sectional contours.

31. A cage for fire extinguishers embodying a mixing cup, a plurality of arms secured to said mixing cup and dependent therefrom, a bottle neck retaining ring carried by said arms, a bottle support connected to the arms, and a bottle embracing
40 means shaped to embrace bottles of varying cross sectional contours. 45

32. A cage for the acid receptacle of a fire extinguisher comprising a plurality of arms, a bottle support adjustably connected to said arms and capable of being fixedly secured in its adjusted position, and a retaining ring adjustably connected to said arms. 50

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

THOMAS F. HANDLY.

Witnesses:

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