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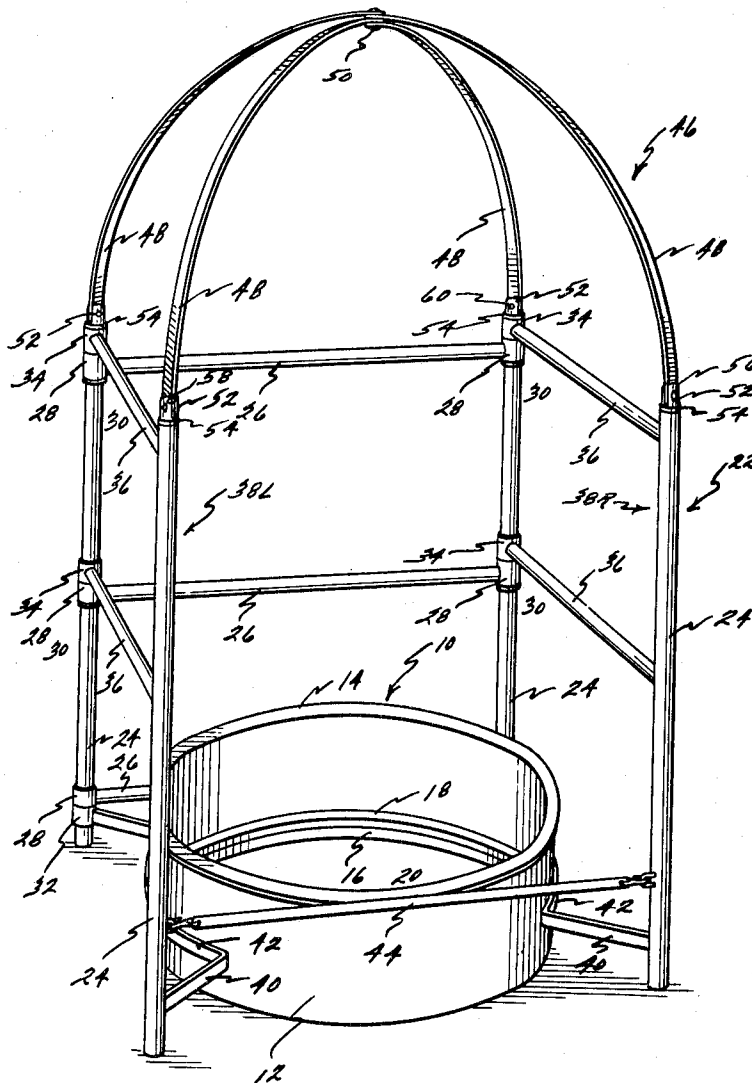
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[54] **MANHOLE TENT**
 9 Claims, 7 Drawing Figs.

[52] U.S. Cl. 94/38,
 135/1
 [51] Int. Cl. E02d 29/14
 [50] Field of Search. 94/38;
 135/1, 5B

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ABSTRACT: This invention relates to a tent for covering open manholes that includes a foldable spring metal frame having four arms interconnected at one end to a common pin-type fastener and with the free ends thereof provided with plugs adapted to telescope down inside the open-topped tubular uprights of a manhole guardrail. When so connected, the spring metal arms cooperate to define a pair of diagonally-disposed intersecting arches adapted to support a similarly-shaped canvas or plastic canopy. The canopy has sidewalls extending down alongside the guardrail which can be rolled up to provide ventilation and at least one of which preferably includes a window. With the guardrail fastened to a manhole shield of the type detachably secured inside an open manhole, the entire installation is essentially wind and weather proof due to its being positively anchored.



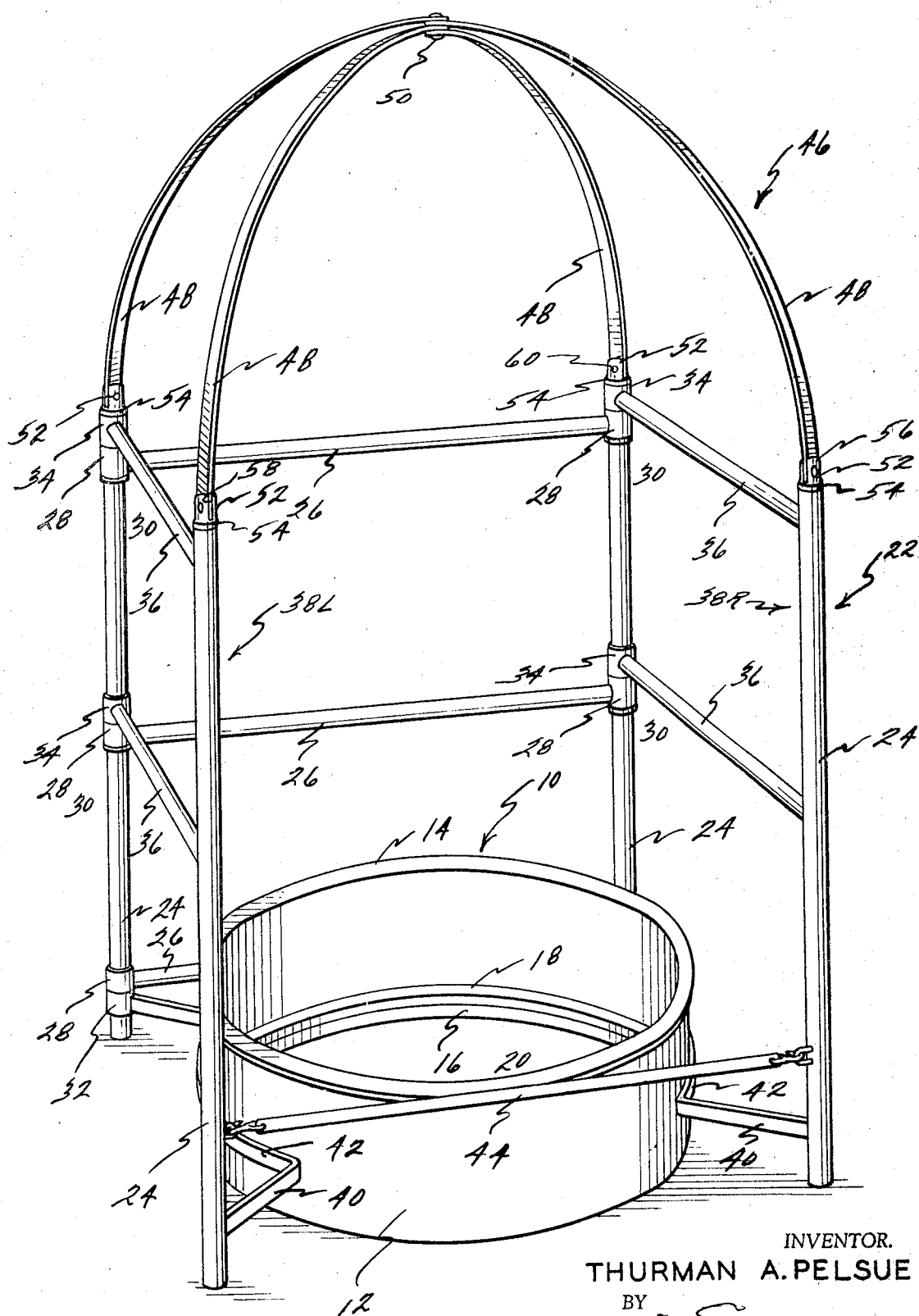
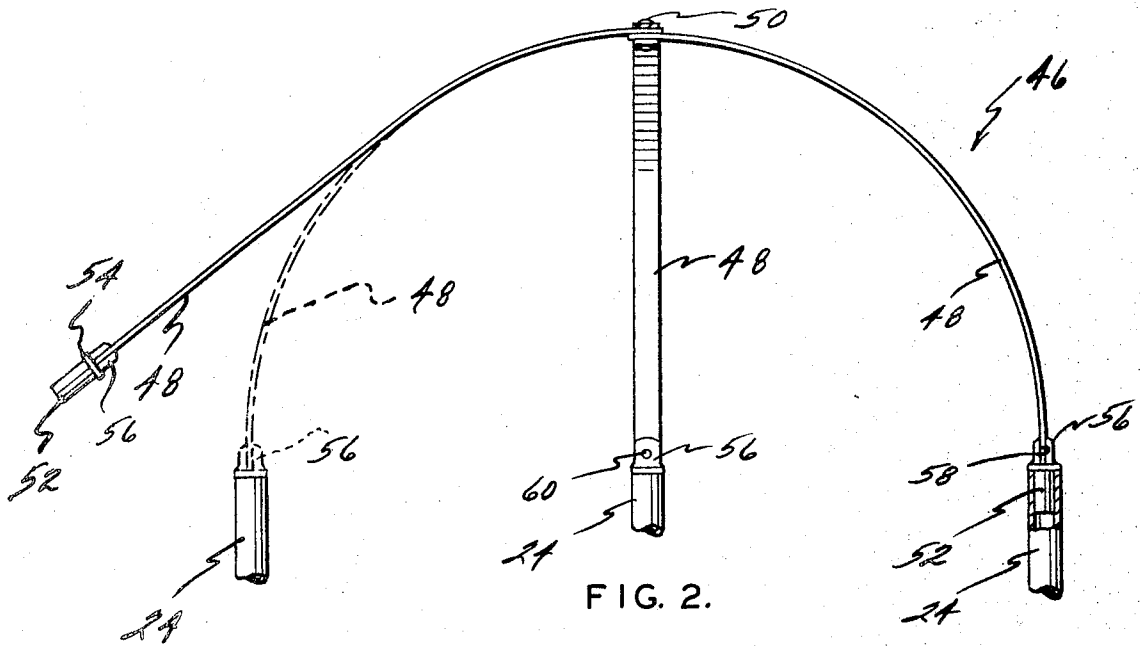
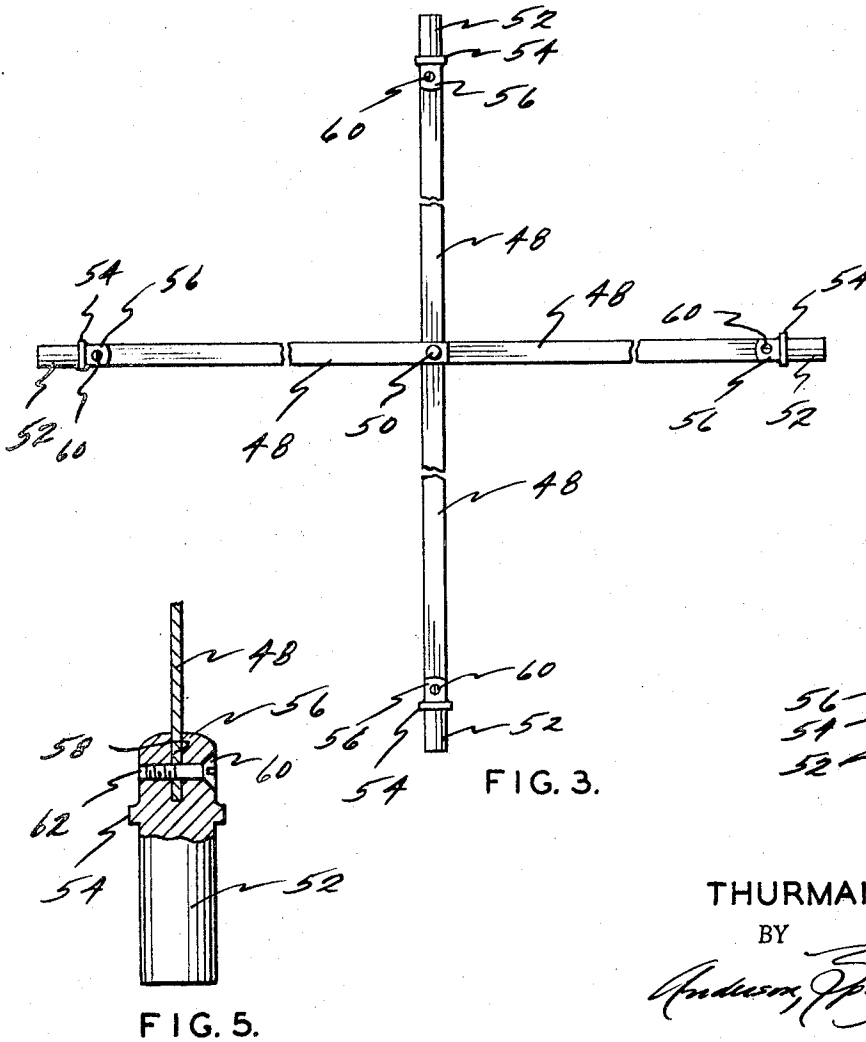
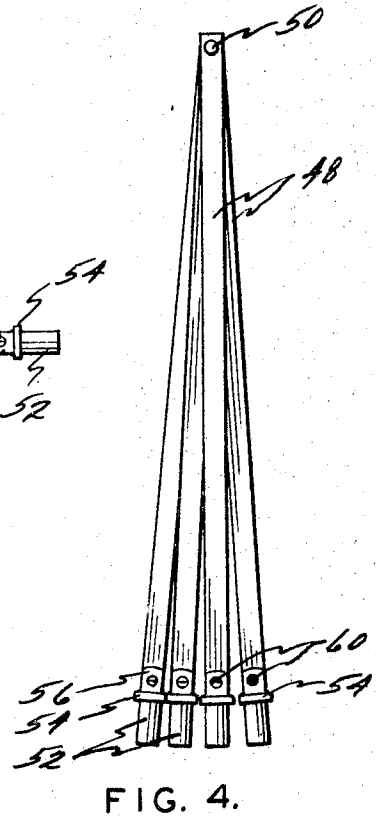


FIG. 1.

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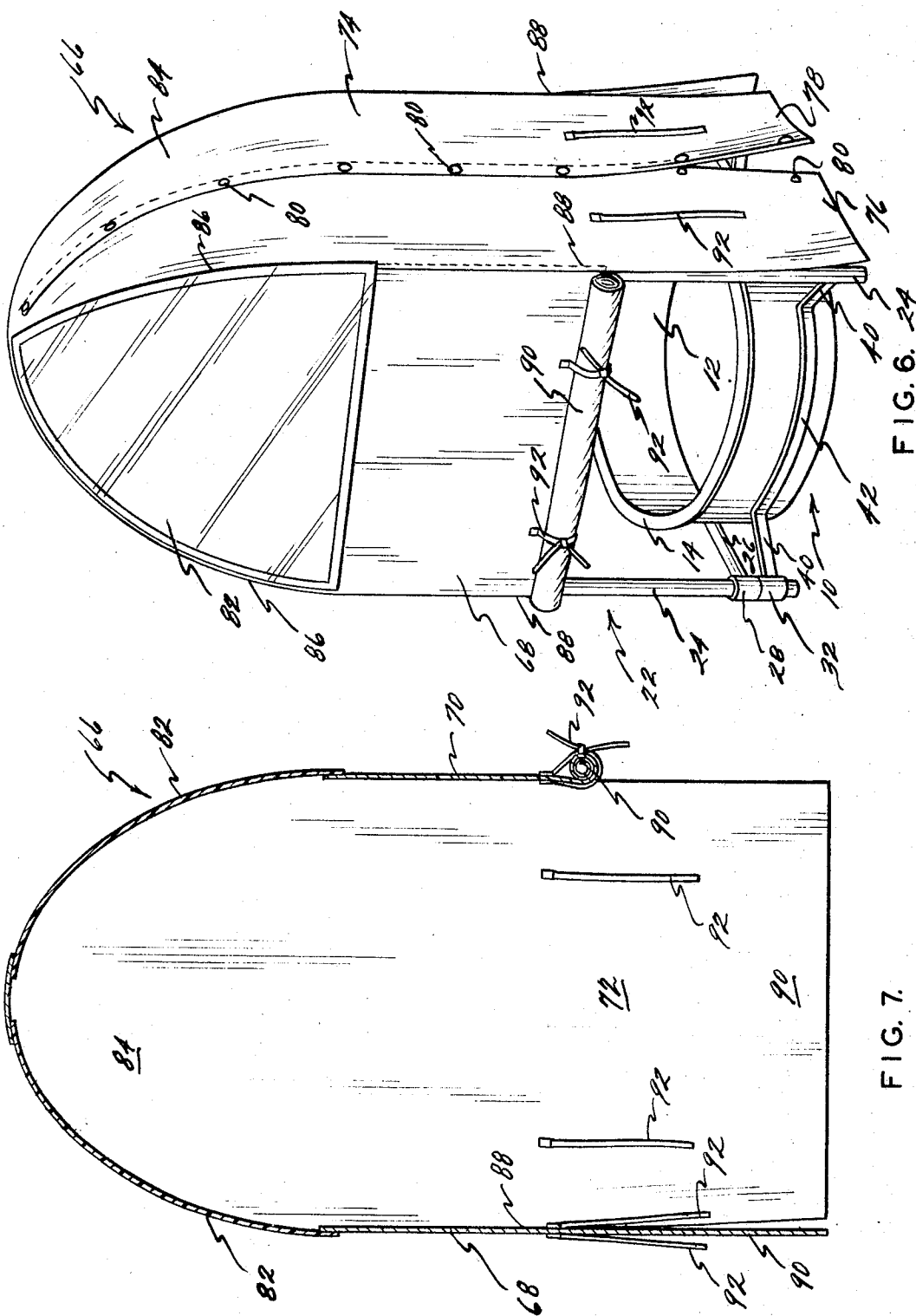


FIG. 7.

FIG. 6. 2A

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MANHOLE TENT

In a copending application I disclose a three-sided foldable manhole guardrail which is specially designed to attach to my manhole shield (U.S. Pat. No. 3,249,000) and provides a contiguous ground-anchored assembly. Under adverse weather conditions, it frequently becomes necessary to cover the open manhole for the purpose of keeping the personnel operating underground warm and dry, as well as preventing damage to the electrical cables and other equipment that are housed therein. Some sort of tent-like structure affords the most practical means of insuring proper light and ventilation while, at the same time, permitting ready ingress and egress.

The ordinary manhole guardrail is merely placed in free-standing position on the pavement surrounding the manhole and draped with canvas sideflaps plus a cover for weather protection. These flaps present a large surface area to the wind and a free-standing guardrail can easily blow down or be moved aside under the influence of even a moderate wind.

It has now been found in accordance with the teaching of the instant invention that a much more effective ground-anchored tent can be provided by merely mounting the manhole shield within the flange bordering the manhole, fastening the guardrail to the shield, erecting a pair of diametrically-disposed intersecting spring steel arches atop the guardrail uprights, and covering the latter with a correspondingly-shaped canopy containing a window and elevatable sideflaps. The resulting tent structure is essentially wind and weather proof, offers little inconvenience to personnel, and it can be folded into a small, neat package for stowage aboard a service truck or utility trailer.

It is, therefore, the principal object of the present invention to provide a novel and improved manhole tent.

A second object is to provide a device of the type aforementioned which constitutes an accessory completely compatible with my manhole guardrail and manhole shield previously mentioned.

Another objective is the provision of a foldable spring metal frame deformable into a pair of intersecting arches to support a canopy when attached to suitable tubular uprights.

Still another object of the invention is to provide a foldable manhole canopy having elevatable sidepanels and at least one window.

An additional objective is the provision of a novel assembly for covering a manhole that includes a manhole shield, guardrail, arched spring frame and canopy.

A further object is the provision of a tent-type manhole cover that is lightweight, rugged, versatile, essentially wind and weather proof, compact, easy to erect, inexpensive and even decorative in appearance.

Other objects will be in part apparent and in part pointed out specifically hereinafter in connection with the description of the drawings that follows, and in which:

FIG. 1 is a perspective view looking down and to the right upon the manhole tent frame including the shield, guardrail and spring metal bows, the canopy having been removed;

FIG. 2 is a side elevation of the spring metal bows and the upper extremities of the guardrail uprights, one of the latter having been broken away and shown in section to better reveal the telescopic coupling therebetween;

FIG. 3 is a top plan view of the bows prior to their being bent into arched form, portions thereof having been broken away to conserve space;

FIG. 4 is a side elevation of the bows in collapsed or folded condition;

FIG. 5 is an enlarged fragmentary detail showing the plug on the end of each spring metal bow, portions thereof having been broken away and shown in section;

FIG. 6 is a perspective view similar to FIG. 1, but to a reduced scale, showing the entire assembly with the canopy in place as it would appear looking down and to the right thereon; and

FIG. 7 is a vertical section through the canopy alone showing one sideflap rolled up and tied while the opposite sideflap is down.

Referring now to the drawings for a detailed description of the present invention and, initially, to FIGS. 1 and 6 for this purpose, reference numeral 10 has been employed to broadly designate my patented manhole shield referred to previously which, as the detailed description in my patent will reveal, comprises a metal ring 12 having an external flange 14 atop thereof. A section of reduced diameter 16 on the lower margin of the ring 12 is inwardly offset to define a shoulder 18 upon which the shield rests atop the pavement while said section of reduced diameter 16 extends down into the open manhole 20. An external annular flange (not shown) cooperates with shoulder 18 to define an outwardly-facing groove that receives in inflatable gasket (also not shown) which seals the unit inside the manhole. Thus, shield 10 is firmly mounted inside the manhole so as to form a rigid base upon which to anchor the remaining elements of the assembly.

Releasably secured to the projecting outer cylindrical surface of ring 12 is the manhole guardrail that has been designated in a general way by reference numeral 22 and which forms the subject matter of my copending application. A more comprehensive description of the guardrail may be found in U.S. Pat. No. 3,444,793 which issued on the aforesaid application subsequent to the filing of the instant one; however, for present purposes, a more general description will suffice.

Guardrail 22 includes four tubular legs or uprights 24 arranged in spaced parallel relation to one another and located at the corners of a square pattern enveloping shield 10. The rear uprights 24 are shown interconnected by a series of three horizontal cross bars 26 having sleeves 28 at the opposite extremities thereof adapted to telescope down over said uprights and permit relative rotation of the latter therein. The sleeves 28 on the middle and upper cross bars are prevented from sliding down by welded collars 30 while the lower cross bar is similarly retained by a welded sleeve 32. Other welded sleeves 34 fastened permanently to the rear uprights above the sleeves 28 of the middle and upper cross bars 26 fasten onto the rear ends of bars 36 that extend forwardly therefrom to the front uprights. Thus, the right and left side sections or wings that have been broadly designated by reference numerals 38R and 38L, respectively, can be folded in upon the rear section.

At the base of the wings 38R and 38L inwardly-extending substantially-radial struts 40 connect onto the opposite extremities of an arcuate element 42 shaped to conform with the exterior cylindrical surface of ring 12 as shown. The resulting brackets formed by elements 40 and 42 are releasably held in contact with the ring by an elastic connector 44 stretched across the front of the guardrail between the front uprights. This combination has already been shown and fully described in my copending application on the guardrail.

The roof-supporting frame, on the other hand, comprises a new element in the assembly and reference will be made to FIGS. 1—5, inclusive, for a description thereof, said frame having been designated broadly by reference numeral 46. It will be seen to comprise four identical spring metal bows 48 pivotally interconnected at one extremity by a pin 50 and having plugs 52 attached to other ends thereof adapted to telescope down into the tubular uprights of the guardrail. These plugs 52 each have an integrally-formed annular flange 54 projecting from the body thereof that constitutes a stop adapted to limit the extent to which said plug can drop down into the upright. The portion 56 above the stop-forming flange contains a transverse slot 58 adapted to receive the end of the spring metal bow, the latter being fastened therein by means of a fastener 60 that passes through an opening 62 intersecting said slot. An aperture 64 is, of course, provided in the end of the bow to receive the fastener.

Now, when the plugs are inserted into the top ends of the tubular uprights, the bows cooperate as shown in FIGS. 1 and 2 to define a pair of semi-circular arches extending diametrically therebetween and which intersect one another at right angles. The roof-supporting frame thus formed supports the canopy which has been referred to broadly by reference numeral 66 and which will be described presently in connection

with FIGS. 6 and 7. When not in use, the frame is detached from the guardrail, allowed to resume its original straight position (see FIGS. 2 and 3), and folded into the compact form illustrated in FIG. 4 for stowage aboard a service truck or the like.

Finally, with reference to FIGS. 6 and 7, the canopy 66 will be seen to include essentially rectangular sidepanels 68 and 70, a similarly-shaped rear wall 72, and a front wall 74 having a pair of overlapping flaps 76 and 78 releasably secured together by snap fasteners 80. These side, front and rear panels are substantially the same width and height as that of the corresponding faces of guardrail 22. The roof-forming portions of the canopy actually comprise continuations of the front and rear panels; however, as seen most clearly in FIG. 7, the roof-forming elements of the side panels comprise plastic windows 82. These windows, along with the corresponding portions 84 of the front and rear panels, comprises generally cylindrical surfaces whose side margins intersect one another in circular arcs 86 corresponding to the shape of the bows 48.

The seams 88 joining the sidepanels to the front and rear panels are slit part way up to release flaps 90 which can be rolled up as secured by ties 92. With the flaps rolled up and tied, good ventilation is provided for while, at the same time, insuring adequate weather protection. Removal of the canopy from the frame is, of course, accomplished by opening the snap fasteners on the front wall.

Having thus described the several useful and novel features of the instant manhole tent, it will be apparent that the many worthwhile objectives for which it was developed have been achieved. Although but a single embodiment of the invention has been illustrated and described, I realize that certain changes and modifications therein may well occur to those skilled in the art within the broad teaching herein; hence, it is my intention that the scope of protection afforded hereby shall be limited only insofar as said limitations are expressly set forth in the appended claims.

I claim:

1. In combination in a tent for covering open manholes and the like: a ring having means located on the lower edge thereof adapted to releasably fasten same inside a manhole; a guardrail comprising four ground-supported tubular uprights disposed in spaced substantially parallel relation in a generally rectangular pattern adapted to be positioned around an open manhole, a plurality of substantially horizontal cross frame members connected between the uprights so as to form a fence enclosing said manhole on both sides and the rear while leaving the front open, bracket means depending from the sides of the fence thus formed positioned to engage the ring, and a removable barrier connected between the uprights on

the front of said fence adapted to hold the bracket means against the ring; a roof-supporting frame comprising at least two spring metal bands deformable into a pair of intersecting semi-circular arches of a length adapted to extend diagonally between the upper ends of the guardrail uprights, and cylindrical plugs attached to the extremities of each of the two arches sized to telescope into the open upper ends of said tubular guardrail uprights; and, a foldable canopy shaped to conform with and fit down over the supporting structure that includes the guardrail and roof-supporting frame as a tent-like covering therefor, the portion of said canopy covering said open fourth side of the guardrail being slit vertically to separate same into openable flaps that define an entry way.

2. The combination as set forth in claim 1 in which: the roof-supporting frame comprises four bendable flat spring metal bands of substantially equal length having the plugs attached to one extremity thereof and their opposite extremities pivotally interconnected so as to provide a foldable subassembly.

3. The combination as set forth in claim 1 in which: the canopy includes at least one transparent flexible window-forming area.

4. The combination as set forth in claim 1 in which: stop-forming means project from the cylindrical surface of the plugs in position to limit the extent to which the latter can telescope into the tubular uprights.

5. The combination as set forth in claim 1 in which: the canopy has four vertically-disposed essentially planar faces corresponding to the sides of the guardrail and a roof-forming portion comprising four cylindrical surfaces that intersect in essentially circular arcs corresponding to the arches formed by the elements of the roof-supporting frame.

6. The combination as set forth in claim 1 in which the bracket means comprises a pair of arcuate brackets projecting inwardly from the sides of the fence, and the removable barrier comprises an elastic member stretched across the front of the fence so as to pull the sides thereof toward one another and bias the brackets into contact with the ring.

7. The combination as set forth in claim 5 in which: at least one of said cylindrical roof-forming surfaces is transparent.

8. The combination as set forth in claim 5 in which: the vertical margins bordering at least one of the planar faces are slit from the bottom up to free a flap, and fastening means are carried by said planar face positioned and adapted to secure said flap when elevated to provide a ventilating opening.

9. The combination as set forth in claim 8 in which: the flap is rollable, and the fastening means comprises ties fastened on both the inside and outside surfaces of the planar surface adjacent the flap when rolled up.

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