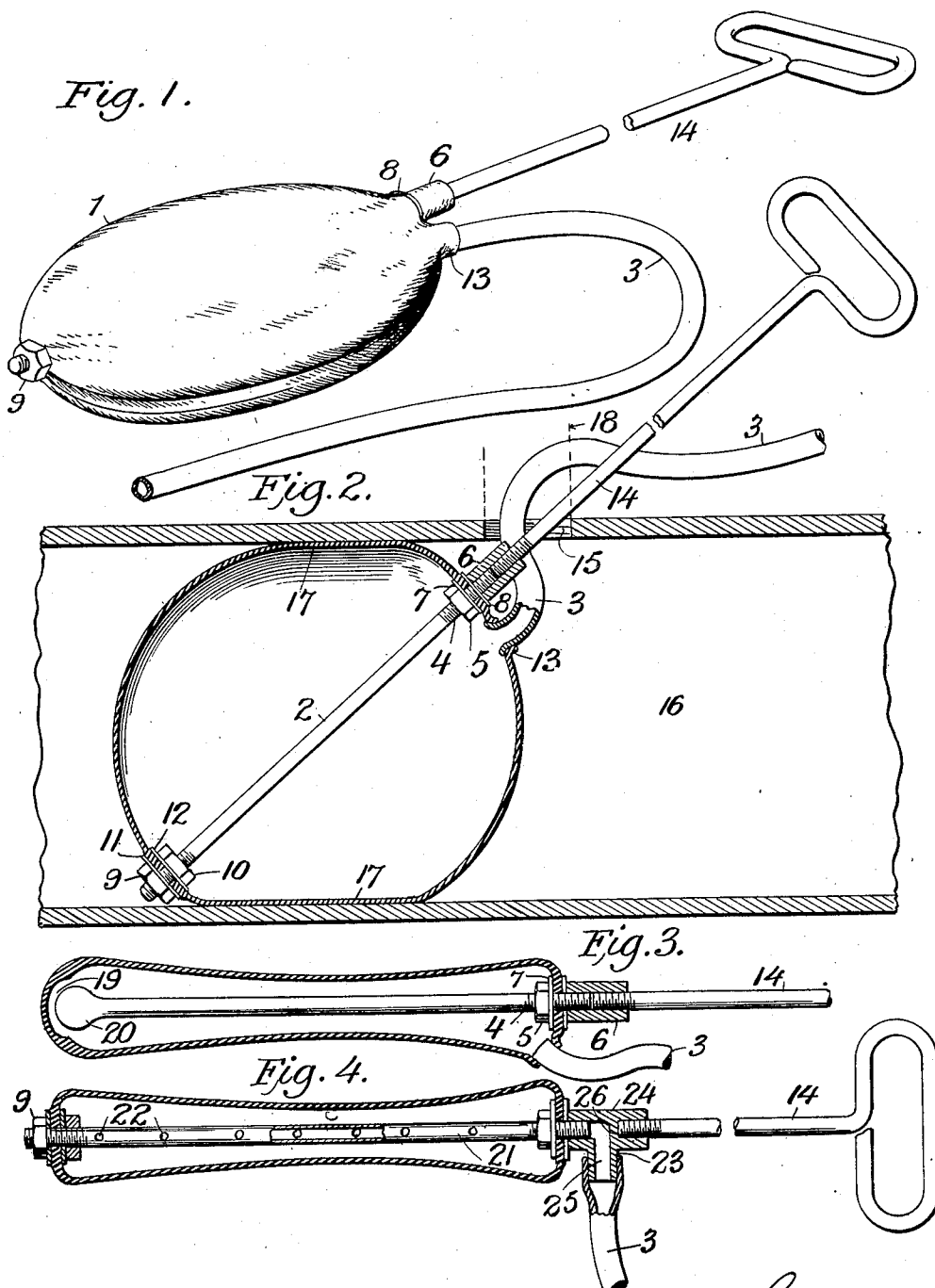


No. 827,835.

PATENTED AUG. 7, 1906.

J. H. WHITE.
GAS MAIN BAG.
APPLICATION FILED NOV. 17, 1904.

3 SHEETS—SHEET 1.



Witnesses
James I. Duhamel
Wm. W. Duce Leard

John H. White Inventor
By *Lee* Attorney *W. H. Malcolmson*

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3 SHEETS—SHEET 2.

Fig. 5.

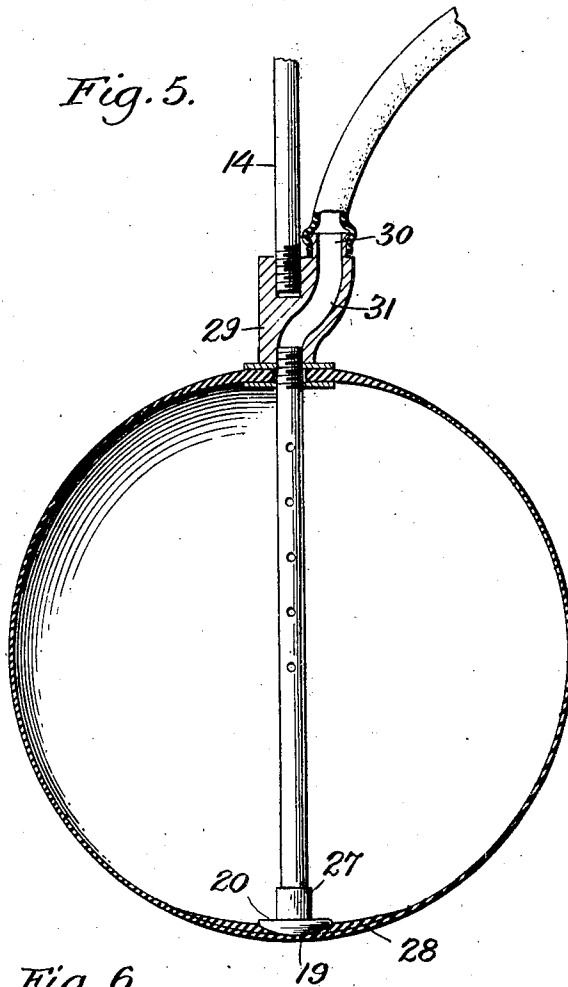
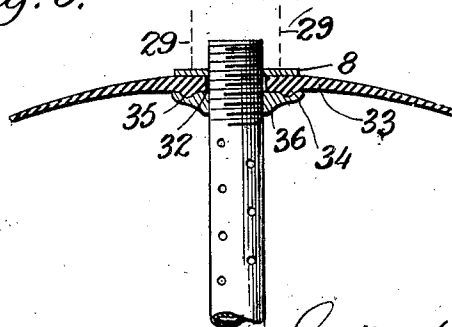


Fig. 6.



Witnesses
James F. Duhamel,
Wm. O. MacLean.

John H. White, Inventor
By Lewis Attorney, Reed, Halsey & Co.

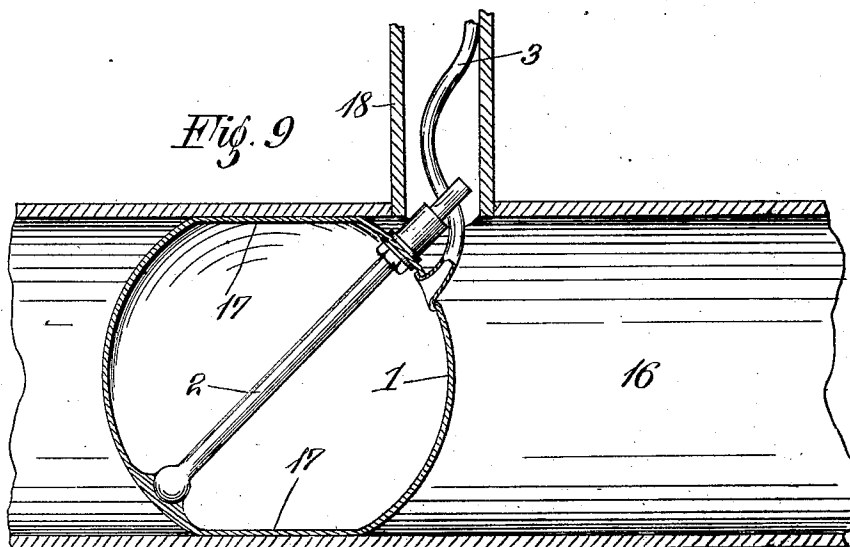
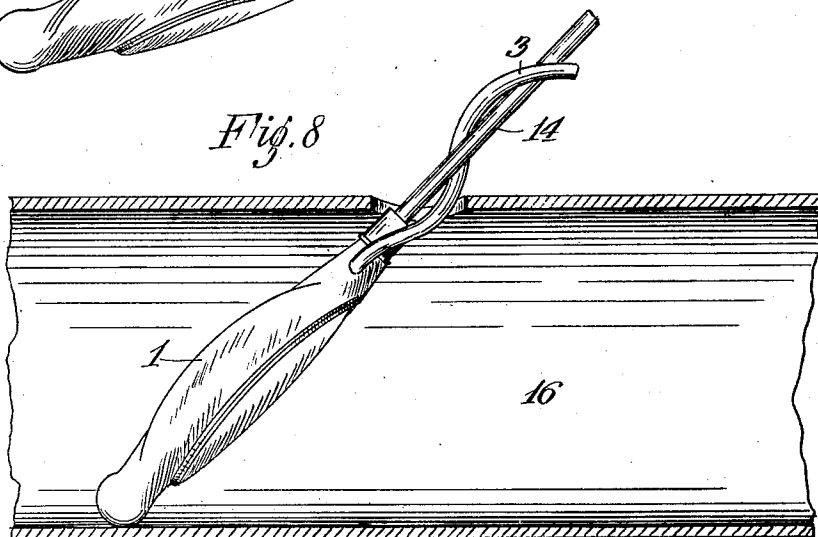
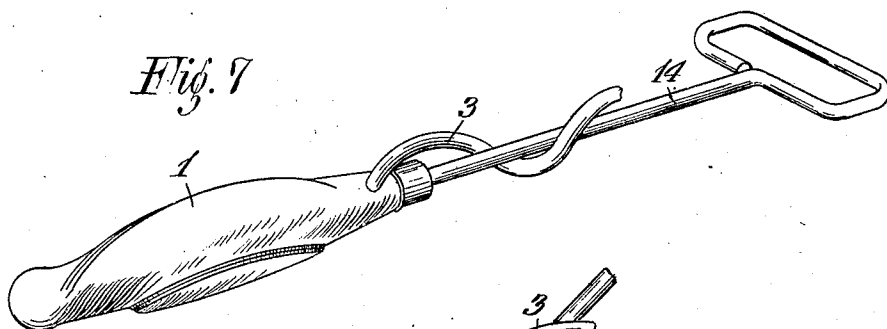
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APPLICATION FILED NOV. 17, 1904.

3 SHEETS—SHEET 3.



Witnesses
Frank Honigsberg
Ida Reiken

John H. White Inventor
By his Attorney *Reed Malcomson*

UNITED STATES PATENT OFFICE.

JOHN H. WHITE, OF JERSEY CITY, NEW JERSEY, ASSIGNOR OF ONE-HALF
TO A. BELL MALCOMSON, OF WEST ORANGE, NEW JERSEY.

GAS-MAIN BAG.

No. 827,835.

Specification of Letters Patent.

Patented Aug. 7, 1906.

Application filed November 17, 1904. Serial No. 233,065.

To all whom it may concern:

Be it known that I, JOHN H. WHITE, a citizen of the United States, residing in Jersey City, in the State of New Jersey, have invented certain new and useful Improvements in Gas-Main Bags, of which the following is a description, reference being had to the accompanying drawings.

This invention relates to means for temporarily plugging gas-mains.

When a leak occurs at some unknown portion of a main, it is the practice to make two small perforations in the main at points each side of the vicinity of the leak and through these holes to insert expansible plugs, which when expanded fill the main at these separated points and cut off the gas. Then by suitable apparatus it is ascertained whether the leak is in the portion of the main between these perforations. Temporary plugs or stoppers are used also upon other occasions. Usually the plug is in the form of a bladder made of rubber, which may be thrust readily through the small perforation in the main and by means of an attached tube is expanded by the workman, who blows through the tube and fills the bag. Owing to the inevitable escape of gas through the perforation in the main, which of course is breathed by the workman, the operation of placing and expanding the bladder is quite dangerous, workmen frequently being overcome by the fumes and taken to hospitals to recover. The danger is increased by reason of the pressure or flow of the gas in the main, which when the bladder is partly full floats it along with the current of gas and carries it past the perforation in the main. This makes it necessary to find means to work the bladder back past the perforation, which is usually done by the use of short sticks or the like; but the management of the bladder during the inflation thereof is exceedingly difficult and the operation tedious, and during the whole time the workman or workmen are exposed to the necessity of inhaling the escaping gas.

The object of my invention is to put the bladder fully under the control of the workman and render it perfectly manageable throughout the inflating operation, so that the workman can approach the main with the bladder, instantly insert the bladder through

the perforation and in the proper position in the gas-main in advance of the perforation, and quickly inflate the bag without the least liability of the displacement or floating of the bladder along by the current of gas in the main and avoiding danger from overinhalation of gas.

I control the bladder by means of a stock inserted therewithin and preferably having an exterior extension or handle which is readily removable from the stock as occasion may arise. By means of the stock the workman can readily maintain absolute control of the position of the bladder and without the necessity of attempting to peer into the main to locate the bladder, the position of the portion of the stock or handle that projects from the main being sufficient to inform him precisely of the position of the bladder, supplemented by the information afforded by the interior end of the stock encountering the obstruction of the inner wall of the main.

In the accompanying drawings, Figure 1 is a perspective view of one form of temporary plug made in accordance with my invention, the bladder being shown deflated. Fig. 2 is a sectional view showing a gas-main perforated and plugged by the device seen at Fig. 1. Fig. 3 is a sectional view of another form of the invention. Fig. 4 is a sectional view showing another form of inflating means. In both Figs. 3 and 4 the bladder is shown deflated. Fig. 5 shows the preferred form of the invention. Fig. 6 illustrates the preferred manner of connecting the stock to the bladder. Fig. 7 shows the bladder when wrapped around the stock ready for insertion into the gas-main. Fig. 8 shows the device when first inserted in the main, and Fig. 9 shows the bag after inflation in the main and adjustment of the testing-tube.

Referring to Figs. 1 and 2, the thin elastic rubber bag or bladder is seen at 1, the interior or axial stock at 2, and the flexible inflating-tube at 3. At its upper end the stock is threaded at 4 to receive interior and exterior nuts 5 6, whereby the material of the bladder is tightly clamped, so as to render the same air-tight, washers 7 8 being placed between the nuts and the bladder through a small perforation in which the stock projects. If desired, the bottom end of the stock may project through the bladder and be secured

thereto in a similar manner by nuts 9 10 and washers 11 12. The tube 3 may be of rubber and inserted within and cemented to a nipple 13, formed in the bladder near the 5 stock.

The nut or head 6 may be prolonged or sleeve-like in form, and the threaded tip of a long handle 14 may be screwed thereinto and readily detached and attached, as required.

10 In operation the thin and flexible material of the bladder is wrapped around the stock, as shown in Fig. 7, which is then thrust readily through the perforation 15 in the gas-main 16, and by giving the handle the proper inclination and thrusting it in until it contacts 15 with the bottom interior wall of the gas-main the proper position is given to the bladder, which is then filled by the workman through the tube 3 and caused to fill the gas-main 20 tightly, the portion of the bladder which contacts with the wall of the gas-main assuming a cylindrical form, as seen at 17, the end of the stock because of its inclination being outside of this cylindrical portion, and hence having 25 no tendency to impair the efficiency of the plug by holding the adjoining portion of the bladder out of contact with the bottom of the main. The tube 3 is then temporarily sealed either by tying a knot in it or by tying 30 it up with a string. The handle 14 may then be unscrewed without disturbing the plug, (although for some purposes it is unnecessary to remove the handle,) and a short pipe 18 may be screwed into the perforation 15, 35 which is threaded for this purpose. This pipe, which is indicated in dotted lines in Fig. 2, is a portion of the apparatus used for testing the main for a leak and need not be further described; but it will be noted that 40 the detachable character of the handle is an advantage when the pipe 18 is to be used. The pipe of course is readily slipped down over the flexible tube 3.

In the form shown at Fig. 3 the bottom 45 end of the stock does not penetrate the bladder, but may occupy a pocket 19, molded in the bladder, the end of the stock being preferably provided with a knob 20 within said pocket. This avoids the necessity of 50 perforating this end of the bladder, thus reducing cost and avoiding liability of leakage, so that if the stock is sufficiently long to maintain the bladder in the desired position during its inflation it will be found satisfactory in practice. I prefer to make the 55 stock extend practically the entire length of the bladder; but the invention is not limited to a stock of that length.

The form of the invention seen at Fig. 4 is 60 the same as that shown at Figs. 1 and 2, except as to the inflating means. The stock is made in the form of a tube 21, having outlets 22, and the bladder is inflated through this tube and these outlets. The rubber tube 65 3 instead of being attached directly to the

bladder is caught upon a nipple 23, projecting from the threaded sleeve or head 24, which corresponds to the part 6 seen at Fig. 2, an elbow-passage 25 in said member 24 establishing communication between the 70 tube 3 and the end of the tubular stock 21. The member 24 is in the form of a T, receiving at one end the threaded end of the stock and at the other end the threaded end of the handle 14; but the socket for the handle is closed 75 at the bottom by a partition 26 to avoid liability of leakage through said socket. It will be apparent that the member 24 may be cast or made in one piece with the stock 2, and it is immaterial whether the stock joins the 80 member 24 on the interior or exterior of the bladder. The operation of this form of the invention is the same as that already explained. By attaching the rubber tube to the member 24 the necessity is avoided of 85 having two perforations in the bladder, a single perforation sufficing for both the reception of the stock and the passage of air, since the air enters through the stock.

In the form seen at Fig. 5 the stock is in 90 the form of a perforated tube for the passage of air and is provided at its lower end with a cap 27, having a knob portion 20 to engage the pocket 19, although the cap, knob, and pocket are not essential in all forms of practicing the invention. The wall of the bladder 95 is preferably thickened or reinforced at the lower end of the same, as seen at 28, to compensate for the extra wear received by this end as the device is thrust into and against 100 the wall of the gas-main. The threaded sleeve or head at the top of the bag is designated as 29 and resembles the head 24, (seen at Fig. 4,) except that the nipple 30 is at the top and close by the side of the handle 14, 105 thus making the construction more compact, so that it can be readily thrust through a relatively small perforation 15 in the gas-main. The passage 31 extends down to the hollow stock, which is preferably in line with the 110 handle 14.

At Fig. 6 is illustrated the preferred method of securing the stock to the bladder, the perforation 32 in the latter being made at the center of a thickened portion 33 of the rubber and surrounded by an annular bead 34, 115 fitting in an annular depression 35 in a nut 36, threaded upon the stock. By turning the head 29 the rubber is clamped between the washer 8 and the nut 36, and the bead 34 120 serves to retain the rubber, so that it will not slip out between the nut and the washer.

Other variations may be resorted to within the scope of the invention, and portions of my improved device may be used without 125 others.

It will be observed that my invention involves the use of a flexible bladder as distinguished from a firm hollow rubber ball used as a stopper to be inserted in the open 130

end of a pipe and then distended. In the latter case a stiff, thick, resilient rubber ball with a diameter equal to or slightly smaller than the bore of the pipe is used.

5 In my invention the bladder is of thin material which has no resiliency and is limp and flabby and without form when not inflated, so that it lies against and may be wrapped closely around an interior guiding stock and
10 readily passed through a comparatively small hole in the wall of the gas-main. The device should also be of such construction that substantially all of the plugging and inflating portions may lie within the circumference of the gas-main or be housed within
15 the upright tube 18 when the main is being tested. This latter object I accomplish by having the stock controlled, while inserting the bladder, by an exterior handle 14, which
20 is readily removed from interference with the adjustment of the test-tube 18 after the bladder is properly inserted and inflated, while the flexible inflating-tube 3 is housed inside the tube 18, as shown in Fig. 9.

25 In practice I prefer to have one end of the rigid guiding-stock terminate inside the bladder, so that there is greater security against leakage or wear and tear from an additional hole at the far end of the bladder; but I do
30 not wish to limit myself to such a construction, as my invention comprehends the use of a collapsible non-resilient bladder with a rigid interior guiding-stock around which the comparatively thin bladder is closely
35 wrapped which permits of its being readily passed obliquely into a gas-main through a comparatively small hole in the side of the pipe and held in such position by an outer handle during the operation of inflation.

40 It will be apparent that my improved construction enables the operator to readily comply with municipal regulations which limit to a comparatively small size holes to be tapped in gas-mains in order not to weaken
45 such mains. At the same time the rigid central stock and handle permit the operator to hold a cloth or cotton-waste firmly around the stock at the hole, and thereby prevent the escape of gas while he is adjusting
50 and inflating the bladder.

By the term "bladder" as used by me in this specification is meant an air-tight bag which will lie limply around the interior rigid guiding-stock when not expanded by
55 the pressure of air on its interior. The material of which the bladder is composed is immaterial so long as it complies with the necessary requirements of being air-tight and capable of being folded into small compass around an interior stock.

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

1. A temporary plug for gas-mains comprising a central rigid stock, a non-resilient

collapsible bladder adapted to be wound closely around the stock, the major portion of said rigid stock being within the bladder, means for inflating the bladder and a rigid
70 controlling handle-piece for the stock, exterior of the bladder, substantially as shown and described.

2. A temporary plug for gas-mains comprising a collapsible bladder, a hollow stock having air-outlets within said bladder and
75 carrying a cap-piece, exterior of the bladder, for attaching an inflating-tube and a controlling-handle, substantially as shown and described.

3. A temporary plug for gas-mains, comprising a non-resilient collapsible bladder, a rigid guiding-stock penetrating said bladder at one end extending through the interior
80 thereof and terminating therein, said stock being provided with a detachable handle, and means for inflating the bladder substantially as shown and described.

4. A temporary plug for gas-mains comprising a non-resilient, collapsible bladder, a hollow perforated rigid guiding-stock penetrating said bladder at one end and terminating
90 therein at or near the opposite end thereof, and means connected with said hollow perforated stock for inflating the bladder therethrough substantially as shown and described.

5. In a temporary plug for gas-mains, the combination with a non-resilient flexible bag, of a rigid guiding-stock therein which passes
100 thereto at another point, means for securing the bag close to said stock at said points without rigid lateral projections such as to prevent close wrapping of the bag upon the stock, and means for inflating the bag, whereby said bag may be inserted through a small
105 opening and guided to and held in proper position in the gas-main, substantially as shown and described.

6. A temporary plug for gas-mains, comprising a collapsible bladder, a hollow stock therein, said stock terminating at one end within and close to the exterior of said bladder, and at the other end passing through
115 said bladder and provided with means for attaching a handle, and a flexible inflating tube, exterior of the bladder, substantially as shown and described.

7. A temporary plug for gas-mains, comprising a bladder, a stock therein, and means
120 for inflating the same; said bladder having at one end a pocket, and said stock penetrating said bladder at the other end of the latter and being secured thereto, and having at its inner end a knob within said pocket.

8. A temporary plug for gas-mains, comprising a bladder, a stock therein, and a flexible inflating-tube; said stock penetrating one
125 end of the bladder, clamping means making an air-tight connection between the bladder

and the stock, and the inner end of the stock being provided with a knob.

9. A temporary plug for gas-mains, comprising a collapsible bladder, a stock therein, and an inflating-tube; said stock extending substantially from one end of the bladder to the other, and terminating therein, and one of the said bladder and stock elements having provision for the attachment of said inflating-tube.

10. A temporary plug for gas-mains, comprising a collapsible bladder, adapted to be closely wrapped around a guiding-rod for placing the same in the main, said placing-rod being composed of a rigid stock within the bladder, and means for inflating the bladder when within the main substantially as described.

11. For use in a gas-main bag of the class described, a rigid stock having one end formed to terminate within and engage the interior of the bladder and provided with means at its outer end to pass through and

make an air-tight connection with said bladder substantially as shown and described.

12. For use in a gas-main bag of the class described a rigid guiding-stock its major portion formed to lie in the interior of said bag, the remaining portion formed to project through the bag and make an air-tight connection therewith and provided with means for attaching a rigid controlling-rod on its exterior portion, substantially as shown and described.

13. A gas-main-bag stock, comprising a rigid bar ending at one end in a button and at the other end in a threaded part and flanges adapted to receive and clamp an air-tight collapsible bladder, and provided with means for attaching a handle and an inflating-tube exterior of the bladder substantially as shown and described.

JOHN H. WHITE.

Witnesses:

M. M. ACHESON,
M. F. CARROL