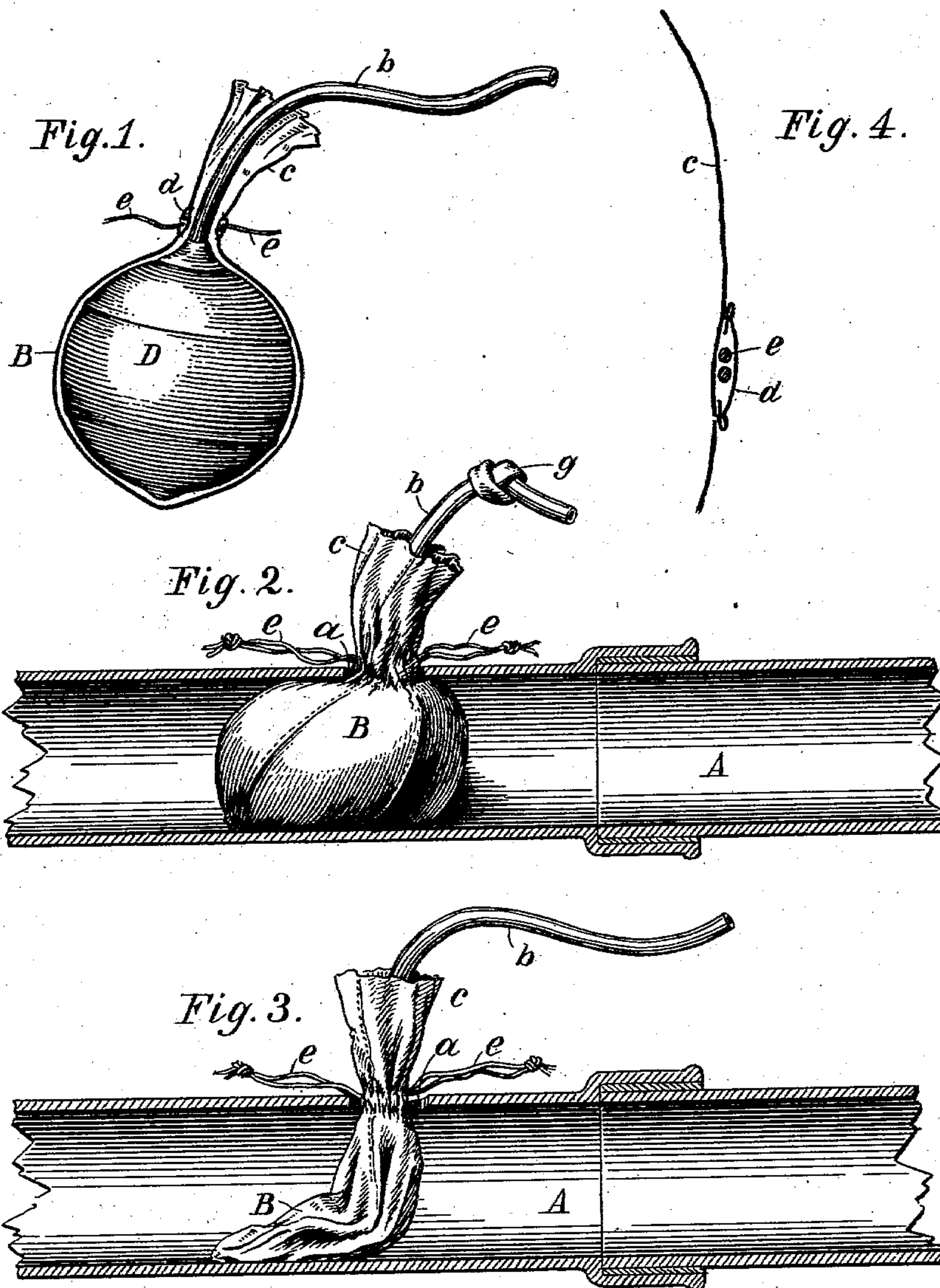


No. 740,795.

PATENTED OCT. 6, 1903.

E. A. BEHRINGER.
GAS MAIN STOPPER.
APPLICATION FILED OCT. 1, 1902.

NO MODEL.



WITNESSES:

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UNITED STATES PATENT OFFICE.

EDWARD A. BEHRINGER, OF BROOKLYN, NEW YORK.

GAS-MAIN STOPPER.

SPECIFICATION forming part of Letters Patent No. 740,795, dated October 6, 1903.

Application filed October 1, 1902. Serial No. 125,581. (No model.)

To all whom it may concern:

Be it known that I, EDWARD A. BEHRINGER, a citizen of the United States, and a resident of Flatbush, in the borough of Brooklyn, in the city of New York, in the State of New York, have invented certain new and useful Improvements in Inflatable Gas-Main Packings; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 is a transverse sectional view of an apparatus made according to my invention. Fig. 2 is a side view thereof, showing the same inflated and applied to use in a gas-main, which latter is shown in longitudinal section. Fig. 3 is a similar view showing the same deflated after use and in a condition for withdrawal from the main. Fig. 4 is a detail sectional view, on a larger scale, still further illustrating my said invention.

This invention relates to the use of "gas-main bags," so called, which are employed in temporarily packing or closing gas-mains to shut off the flow of gas therethrough at places where repairs or changes are to be made. To insure the requisite properties of impermeability, flexibility, and easy inflation, such bags are usually made of india-rubber or some of its compounds. Such material, however, has comparatively only a slight tensile strength, and gas-main bags as heretofore applied to use are liable during inflation in the main to burst from internal pressure injudiciously applied, are liable to speedy deterioration or decay from the chemical action of substances which are deposited in the mains from the gas therein, and are, further, often ruptured or injured where the inflating-tube joins the bag by the tension or strain exerted upon the tube in the withdrawal of the deflated bag from the main.

My invention is designed for overcoming the drawbacks just hereinbefore set forth and comprises certain novel combinations of instrumentalities hereinafter set forth whereby such object is effectually secured.

A is an ordinary gas-main having the opening *a* ordinarily provided for the insertion and withdrawal of a gas-bag D. This bag is of any usual or suitable construction having

a pipe *b*, which should be of a flexible character and through which air is forced in the usual manner into the bag to inflate or expand the same and through which in the deflation or shrinking of the bag preliminary to the withdrawal of the bag from the gas-main the air is permitted to escape from the bag.

B is a sack made of flexible material and of such character as will enable it to resist the solvent or corrosive action of the substances usually deposited in gas-mains from the gas passing therethrough in the normal use and operation of gas making and distributing methods. For example, said sack may be made of cloth or textile material very thoroughly saturated with paraffin or other suitable substance, which under normal conditions of use sufficiently resists the action of the substances deposited in gas-mains, as just mentioned. It should also, as compared with the material of the bag A, be substantially non-elastic, so that when a certain limit of expansion of the bag is reached its further expansion shall be restricted and resisted by the surrounding non-elastic material of the sack, as herein presently further explained. This sack is made of approximately spherical or other shape more or less corresponding or proportioned to the shape and dimensions of the bag A, which is placed within it, but with proviso that the size of the sack at its greatest diameter—that is to say, at the greatest diameter of the bag when it incloses the latter—shall not exceed that to which the bag when in actual use in the main can be inflated without danger of rupture or bursting. The upper part of the sack is narrowed to form a tubular neck, as shown at *c*. At the lower part of this neck is a double welt *d*. (Illustrated separately in Fig. 4.) In this welt is placed a gathering tape or string *e*, whereby on occasion the neck can be gathered, puckered, or tightened around the pipe *a* at the bag A, as shown in Figs. 1, 2, and 3.

In the use and operation of my invention the bag B is deflated by squeezing or otherwise, the air being allowed to escape therefrom through the air-pipe *b* in the usual manner until the bag is shrunken to the requisite diminished diameter. It is then placed within the sack, in which it may remain ready for use, the pipe *b* protruding from the neck

a of the sack. The sack is then compressed
 closely upon or around the deflated bag to a
 degree which enables the sack, with the bag
 within it, to be passed into the main A through
 5 the opening a in the manner usual in the or-
 dinary insertion of the bag alone. This done,
 the bag is inflated through the tube b, thereby
 inflating and expanding the bag to a degree
 sufficient to enable it to completely close the
 10 bore of the pipe. When this desired maxi-
 mum of expansion is attained before a pres-
 sure within the bag sufficient to rupture the
 latter is reached, the outer surface of the bag
 is brought against the internal surface of the
 15 sack, so that the latter, being of strong and non-
 elastic material, as hereinbefore explained, re-
 sists the further expansion of the bag, and by
 taking up from the latter the excess of pres-
 sure from within effectually prevents the rup-
 20 ture of the bag. Further, the sack being im-
 pervious and of a character which resists the
 solvent or corrosive action of deposits in the
 gas-main the bag is effectually protected
 against such action of said deposits, which
 25 latter are known to have an especially inju-
 rious effect upon the rubber of which such
 bags are for the most part composed. The
 bag is of course retained in its inflated con-
 dition to close the bore of the main by sim-
 30 ply closing the pipe d, which may be done in
 the usual way by tying a knot g in said pipe
 or otherwise. When the apparatus is to be
 withdrawn from the main, the air-pipe d is
 opened to permit the exit of air from the bag.
 35 The neck c of the sack is then grasped by
 the hand and the sack, with the bag within
 it, is drawn out, both sack and bag collaps-
 ing to permit this. As the bag is thus re-
 moved without strain or draft upon the pipe

d, all danger of detaching the pipe from the 40
 bag during the withdrawal of the latter is ob-
 viated.

It is to be observed that while I have de-
 scribed my invention in its relation with gas-
 mains my said invention includes its use in 45
 water-mains and mains generally which are
 employed for the transmission of fluids.

What I claim as my invention is—

1. The combination with a gas-main bag of
 a flexible non-elastic inclosing sack provided 50
 with a tubular neck which surrounds the ad-
 jacent part of the air-pipe of the bag, where-
 by the bag may be withdrawn from the gas-
 main without strain on the air-pipe, as de-
 scribed.

2. The combination with a gas-main bag of 55
 a flexible non-elastic inclosing sack propor-
 tioned to the shape and dimensions of the bag
 so as to receive and resist pressure from with-
 in the bag when a desired maximum of ex- 60
 pansion of the latter has been attained and
 provided with a tubular neck which sur-
 rounds the inner part of the air-pipe of the
 bag to enable the latter to be withdrawn from
 the gas-main without draft on the air-pipe, as 65
 described.

3. The combination with a gas-main bag of
 a removable flexible non-elastic inclosing
 sack provided with a neck which surrounds 70
 the inner portion of the air-pipe of the bag
 and which is constructed with a circumfer-
 ential welt, of a gathering-string placed in
 said welt to gather and hold the neck to the
 said part of the air-pipe, as described.

EDWARD A. BEHRINGER.

Witnesses:

JAMES A. WHITNEY,
 AMAZIAH WHITNEY.