

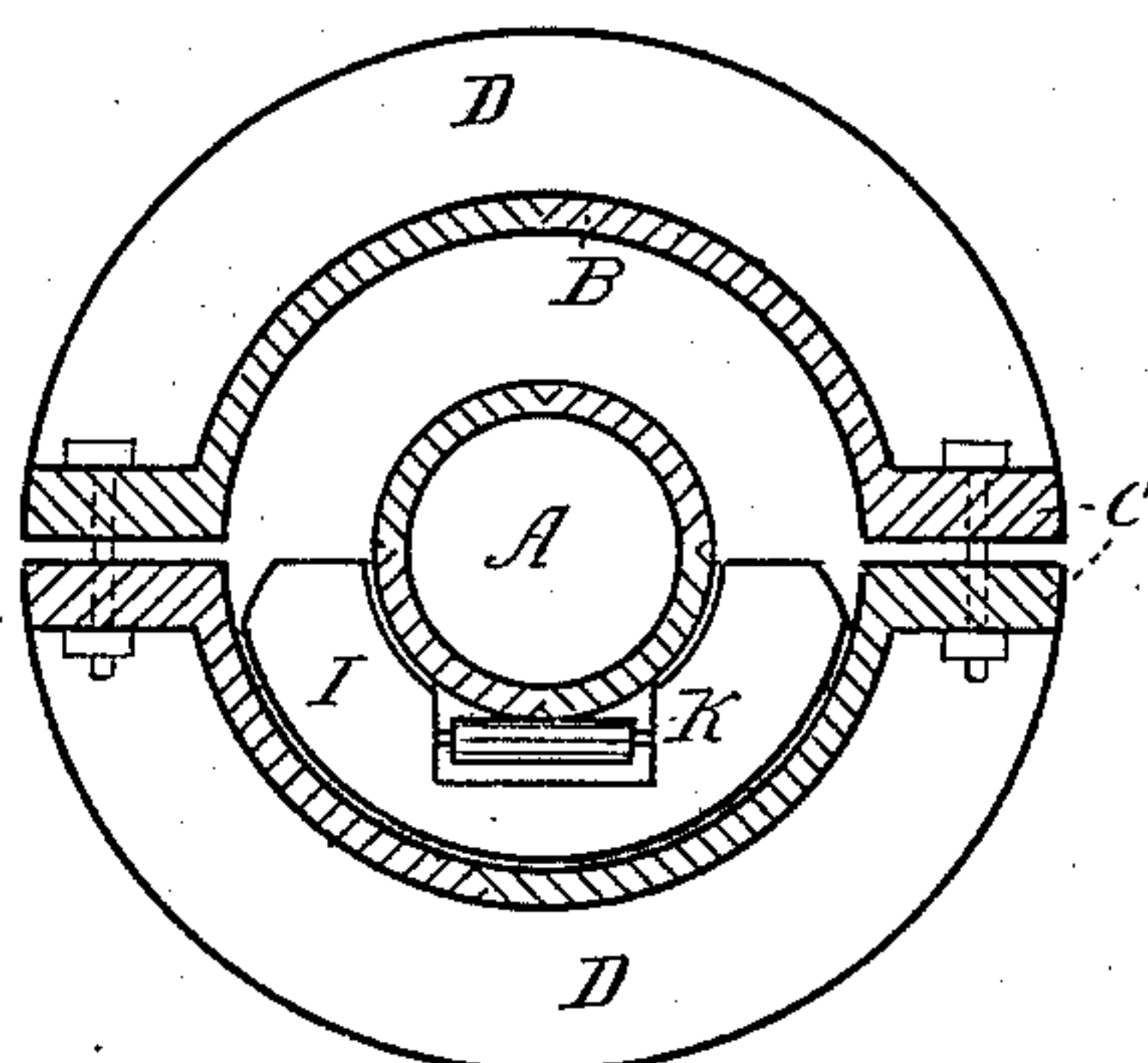
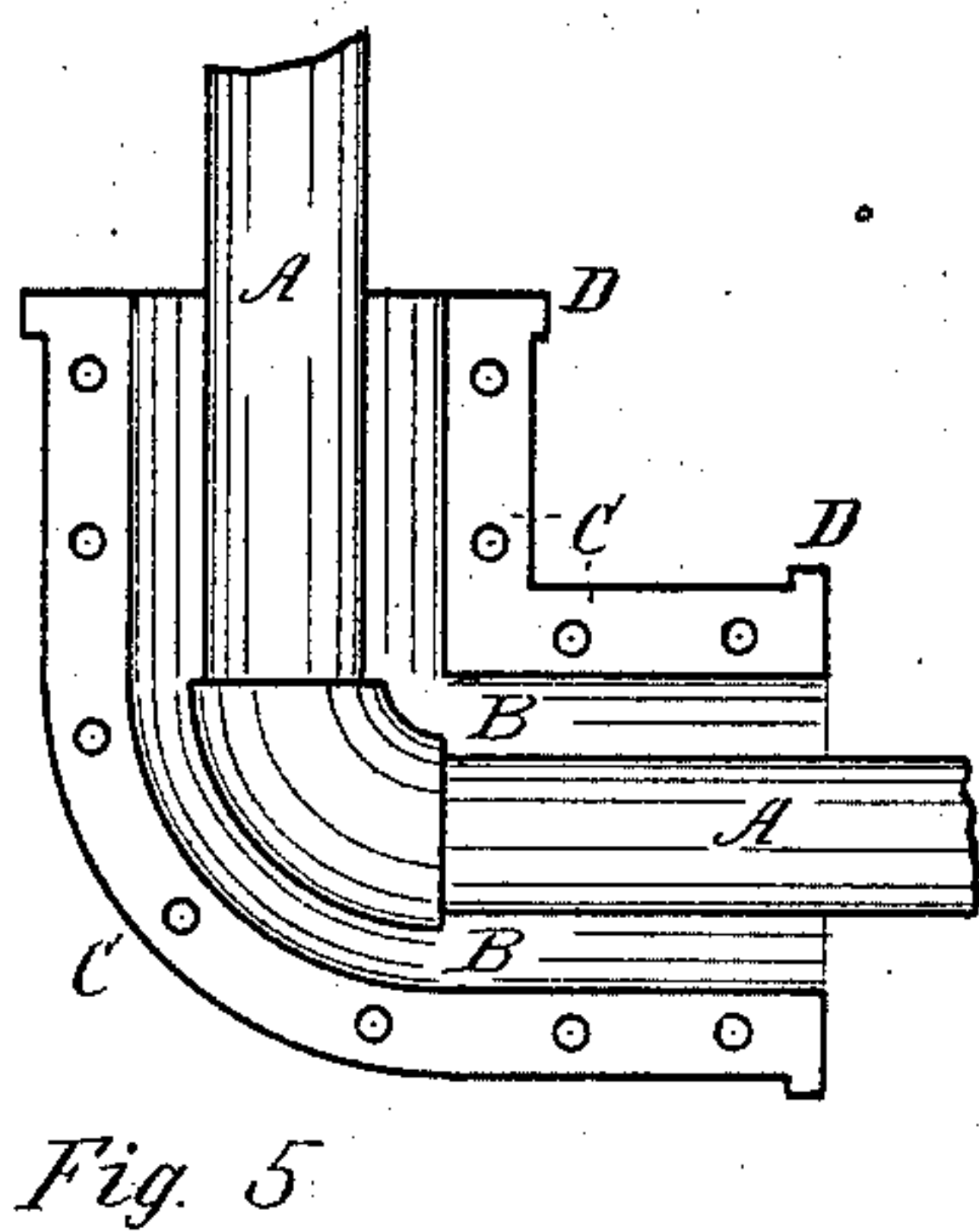
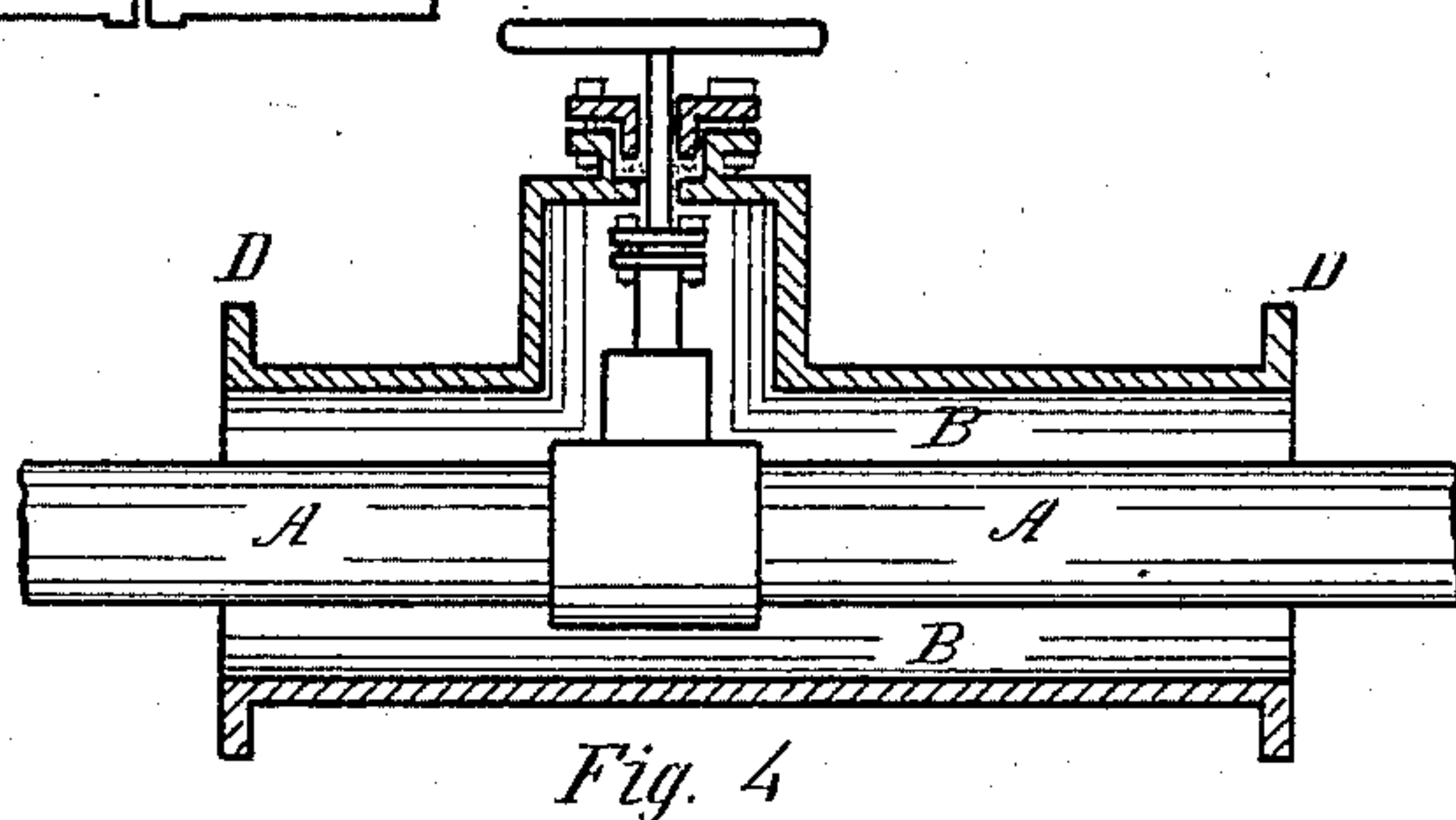
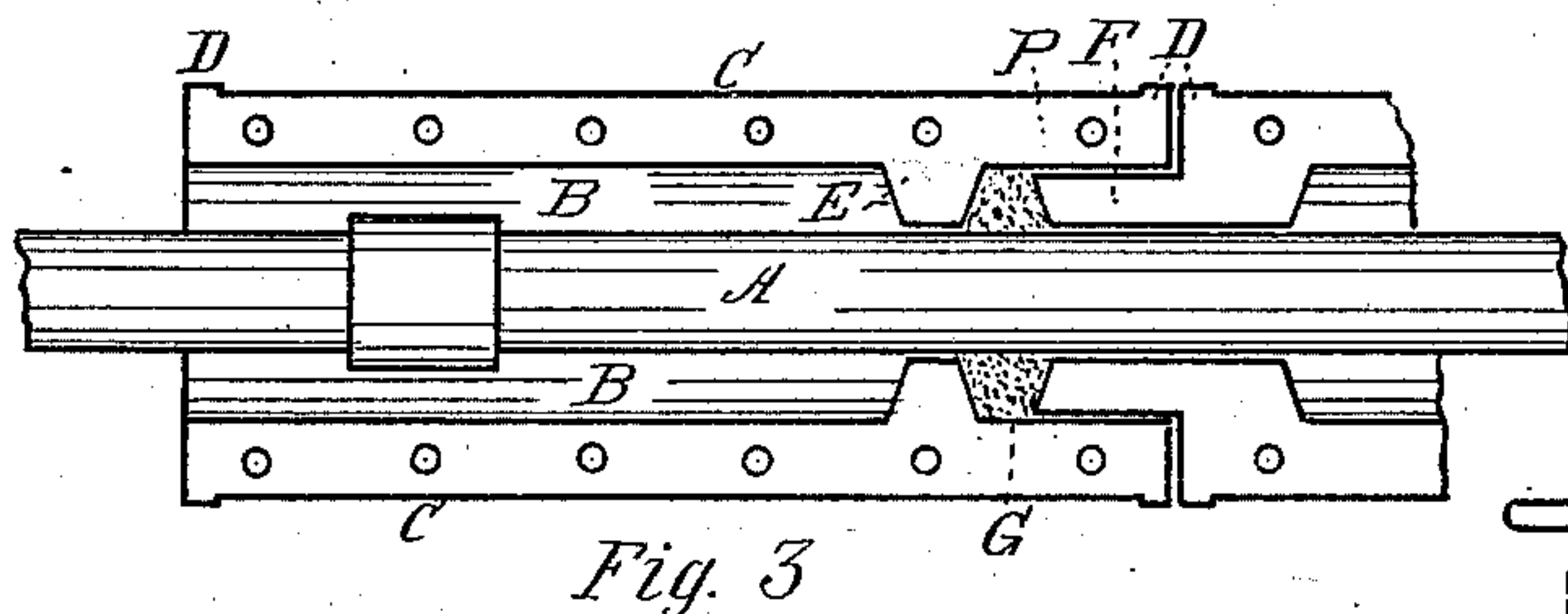
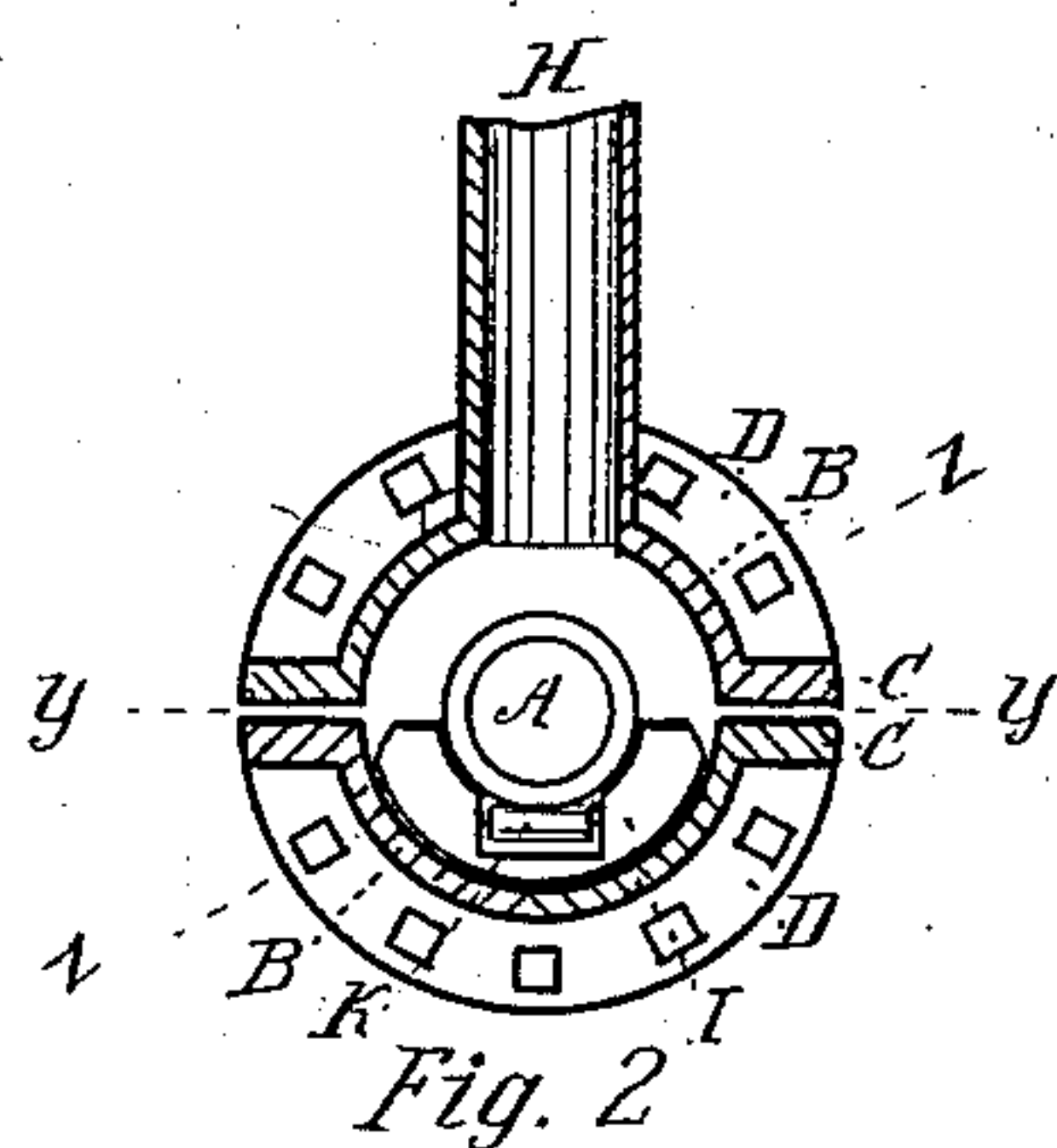
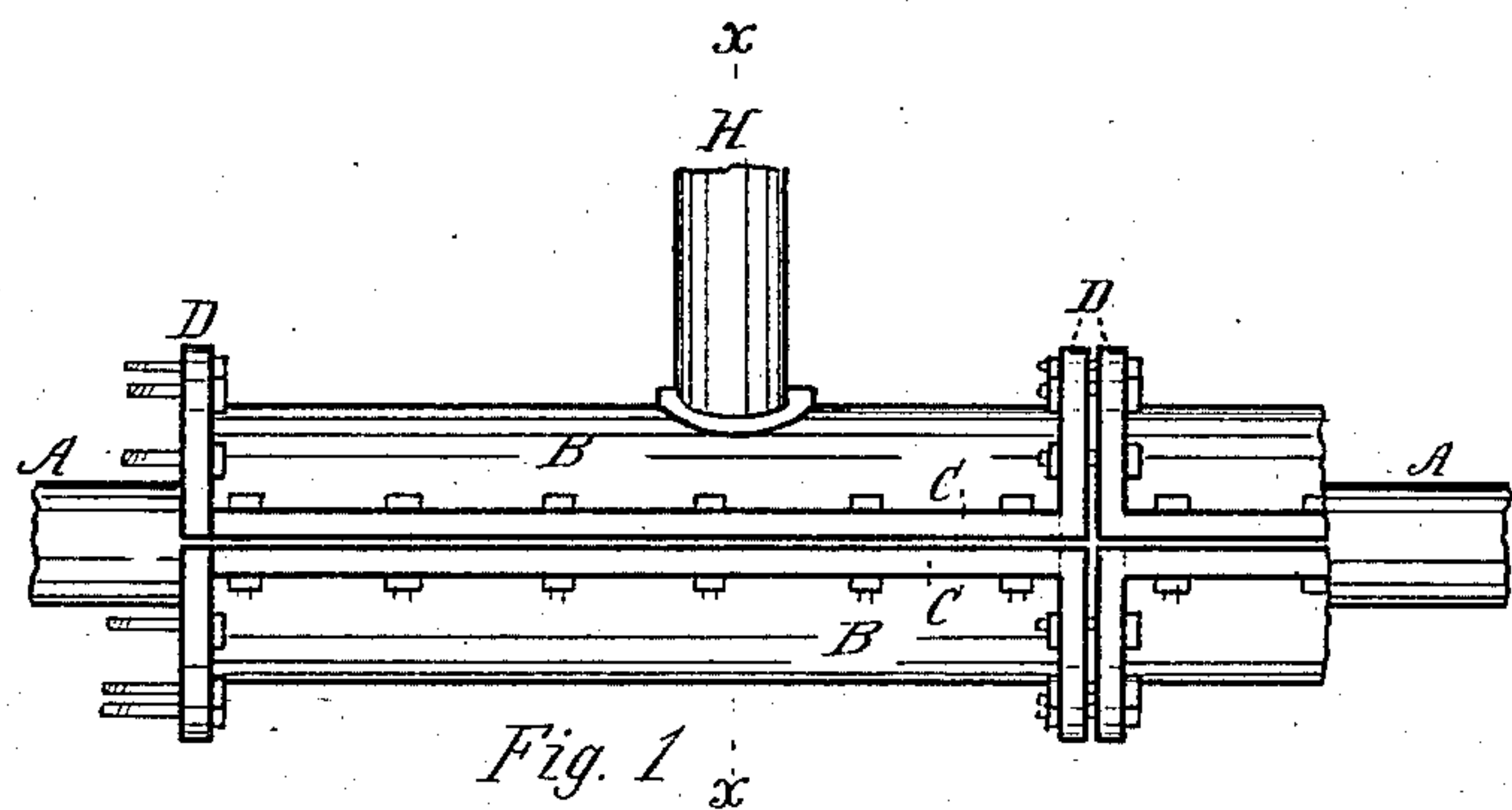
(No Model.)

R. HEBER.

SAFETY SHIELD FOR GAS MAINS.

No. 316,967.

Patented May 5, 1885.



A. W. Weaver  
Per. H. H. Hand } Witnesses.

Robert Heber  
By Joseph Smith } Inventor.  
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# UNITED STATES PATENT OFFICE.

ROBERT HEBER, OF TITUSVILLE, PENNSYLVANIA.

## SAFETY-SHIELD FOR GAS-MAINS.

SPECIFICATION forming part of Letters Patent No. 316,967, dated May 5, 1885.

Application filed February 10, 1885. (No model.)

*To all whom it may concern:*

Be it known that I, ROBERT HEBER, a citizen of the United States, residing at Titusville, in the county of Crawford and State of Pennsylvania, have invented an Improvement in Safety-Shields for Gas-Mains, of which the following is specification.

My invention relates to an outside shield or safety-pipe for pipes conveying gas, steam, or fluid under pressure; but more especially pipes or mains for conveying natural gas where the pressure is very great, and where the escaping gas permeates the soil, and from thence into the sewers or buildings adjacent thereto, and, mingling with the atmosphere, forms a dangerous explosive compound, my object being to construct an outside pipe inclosing the main, which shall retain the fluid escaping from any leak in the main, and in which the fluid can be retained or conveyed by an escape-pipe to a safe point of discharge, and to so construct the outer pipe that it can be entered at any point and the main repaired; also, to separate the space between the main pipe and the shield into separate chambers, each chamber having an escape-pipe, so that escaping gas cannot travel a long distance inside the shield, and the location of the leak be determined by examination of the escape-pipes. This I accomplish by the device illustrated in the accompanying drawings, in which—

Figure 1 is an outside view of one section and a portion of an adjoining section of my shield as laid, inclosing the main and showing the escape-pipe; Fig. 2, a cross-section of Fig. 1 on line *x x*; Fig. 3, a view of the main, with the outer half of the shield removed, on line *y y*, Fig. 2, and showing the packing device for dividing the air-space into chambers; Fig. 4, a similar section, showing the main and with the shield broken, on line *z z*, Fig. 2, and showing the stem of a throttle-valve in the main projecting through the shield; Fig. 5, a section of elbow-joint inclosing an elbow in the main; and Fig. 6, an enlarged cross-section of the main and shield, showing more clearly the cradle for supporting the main.

Similar letters in the several views refer to similar parts.

A is the gas-main, put together in the ordinary manner; B, the shield or inclosing-pipe.

This is constructed in sections and united, when laid, by flanges and bolts to the adjoining section. Each section is also divided longitudinally into half-cylinders, each half having the flange C on each edge, by which and with the aid of bolts it is joined with the other half, so that the two pieces may be placed around the main and then bolted together.

D is the end flange of the section for joining it to the adjoining section.

It is now evident that the whole main pipe may be inclosed by these half-cylinders, and that when properly put together, the joints packed with lead or any suitable packing and bolted, that a tight and strong pipe is formed inclosing the main and leaving an air-space between the two pipes. Whenever it becomes necessary to have access to the main pipe, it may be done by removing the bolts from any one half-section, when it can be removed and replaced at pleasure.

For the purpose of dividing the air-space between the two pipes into separate chambers, and preventing the flow of gas escaping from the main pipe along the main pipe for any considerable distance, packing-joints may be constructed, as often as may be desired, in the manner shown at P in Fig. 3. A shoulder or ring, E, being constructed on the inside of one section, and a follower, F, filling the space between the main pipe and shield being attached to and projecting from the adjoining section, the space G around the main and in front of the ring E being filled with hemp or other packing, the follower F is inserted, and the sections, being drawn together, compress the packing and form a tight joint around the main, preventing the passage of any gas along the outside of the main. From each separate chamber so made is at least one escape-pipe, H, through which the gas (or other fluid) escaping from the main is conducted away to some safe point for burning or escaping into the atmosphere. Each chamber having its separate escape-pipe, the location of any leak in the main can be detected by examining the escape-pipes along the line.

For supporting the main inside the shield, at suitable distances is placed the cradle I, (shown more clearly in Fig. 6,) the cradle being made to fit the lower part of the shield and rising



and supporting the main at the sides and below the center. Under the main is placed the roller K, on which the main rests, and which, while supporting the main, allows to it a free motion longitudinally with the pipes.

Where it is necessary to place a valve in the main pipe, the shield may be cut and stopped on each side of the throttle or valve; or one half-section may be made as shown in Fig. 4, the shield being enlarged sufficiently to inclose the valve, and the valve-stem be packed with an ordinary stuffing-box where it passes through the shield.

I make no claim to the device of a larger pipe with escapes therefrom inclosing the main as a means of controlling the escaping fluid, when such larger pipe is made and put down in the ordinary manner, that device having been used before.

What I do claim as my invention is—

1. An inclosing-shield for a gas-main, consisting of a larger pipe inclosing the main, of sufficient strength to withstand the pressure of gas in the main, if necessary, and with the upper part of the shield constructed in sections, any one of which may be removed at pleasure without disturbing the adjoining sections, thereby securing access to the main at any point, the space between the main and the shield being

divided into separate consecutive chambers by packing-rings constructed at proper distances between the outside of the main pipe and the shield, so that any gas leaking or escaping from the main cannot flow along the main from one chamber to the next, and with a free escape-pipe from each chamber for conveying any gas escaping from the main to a safe point for mingling with the atmosphere, the chambers being contiguous and the shield continuous, the whole main pipe adequately protected, substantially as shown and described.

2. In a safety-shield, a pipe inclosing a main pipe used for conveying natural gas, as a device for separating the space between the main pipe and shield into chambers, a packing-box consisting of a ring on the inside of one joint of the shield near one end and a follower on the adjacent end of the next joint, the space between the ring and the follower being filled with hemp or other packing, which is compressed by the drawing together of the two joints either by flange union with bolts, or by screwing one joint of pipe into the other, substantially as described.

ROBERT HEBER.

Witnesses:

G. W. WEAVER,  
JOHN O'NEILL.