

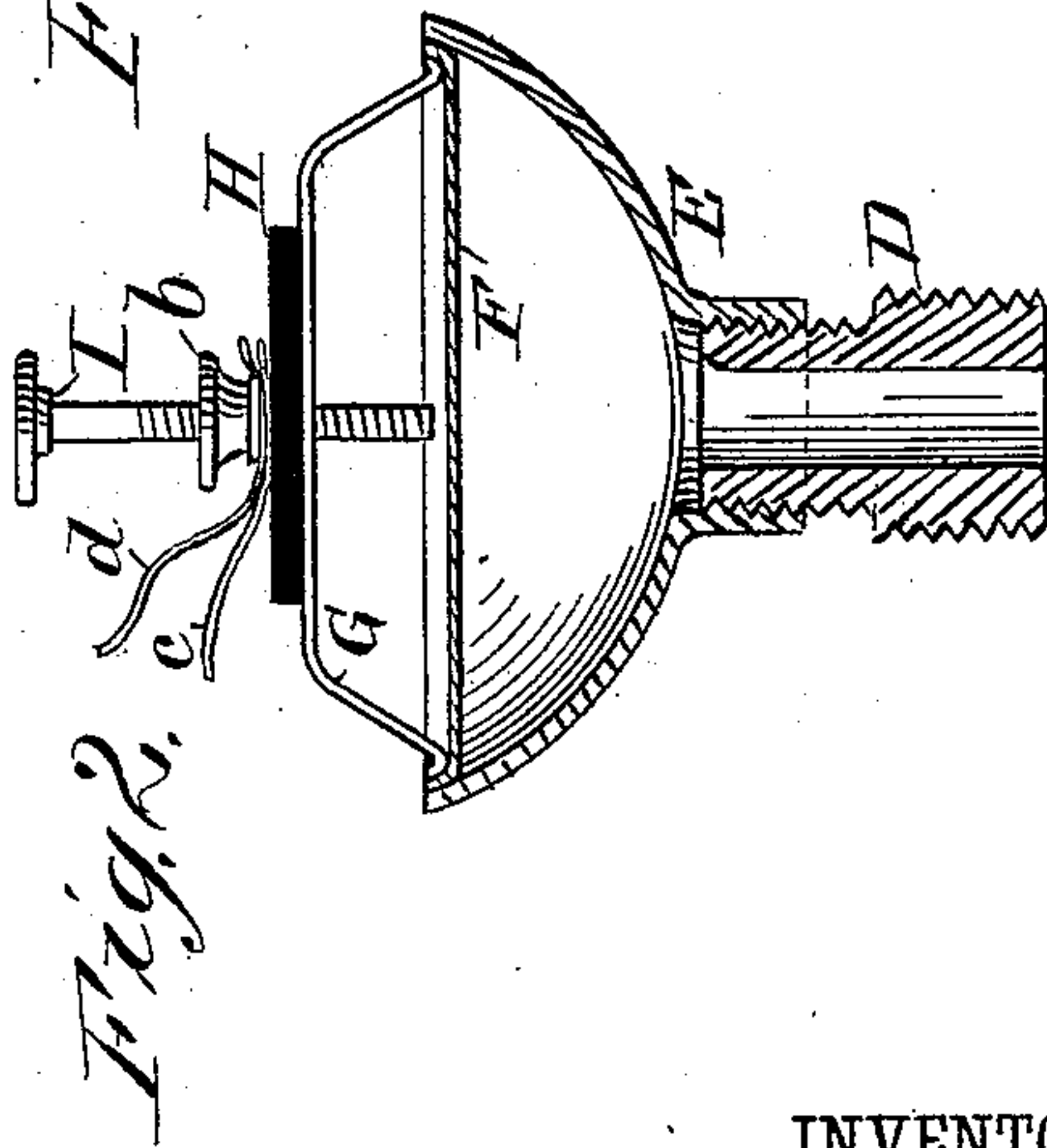
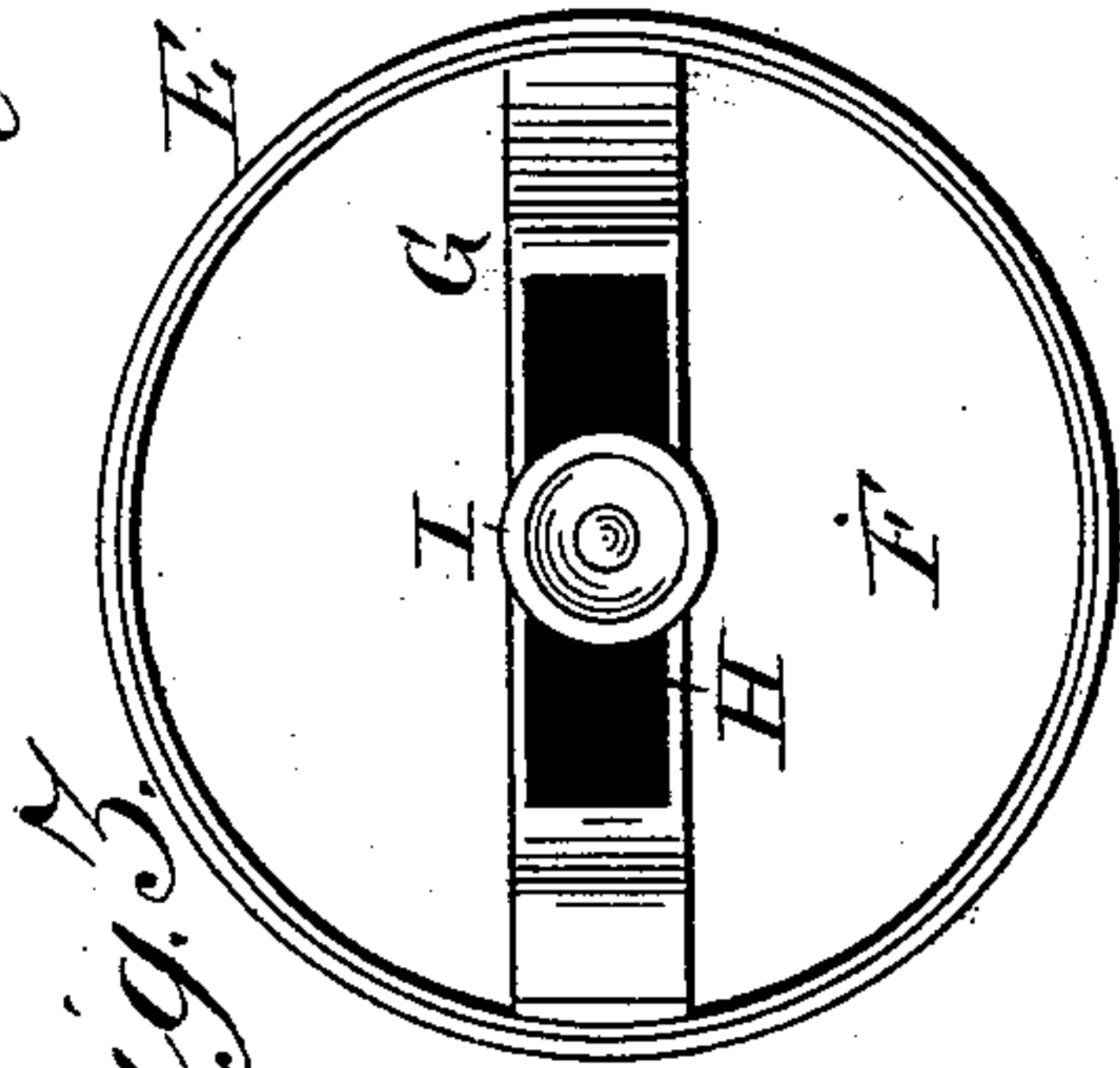
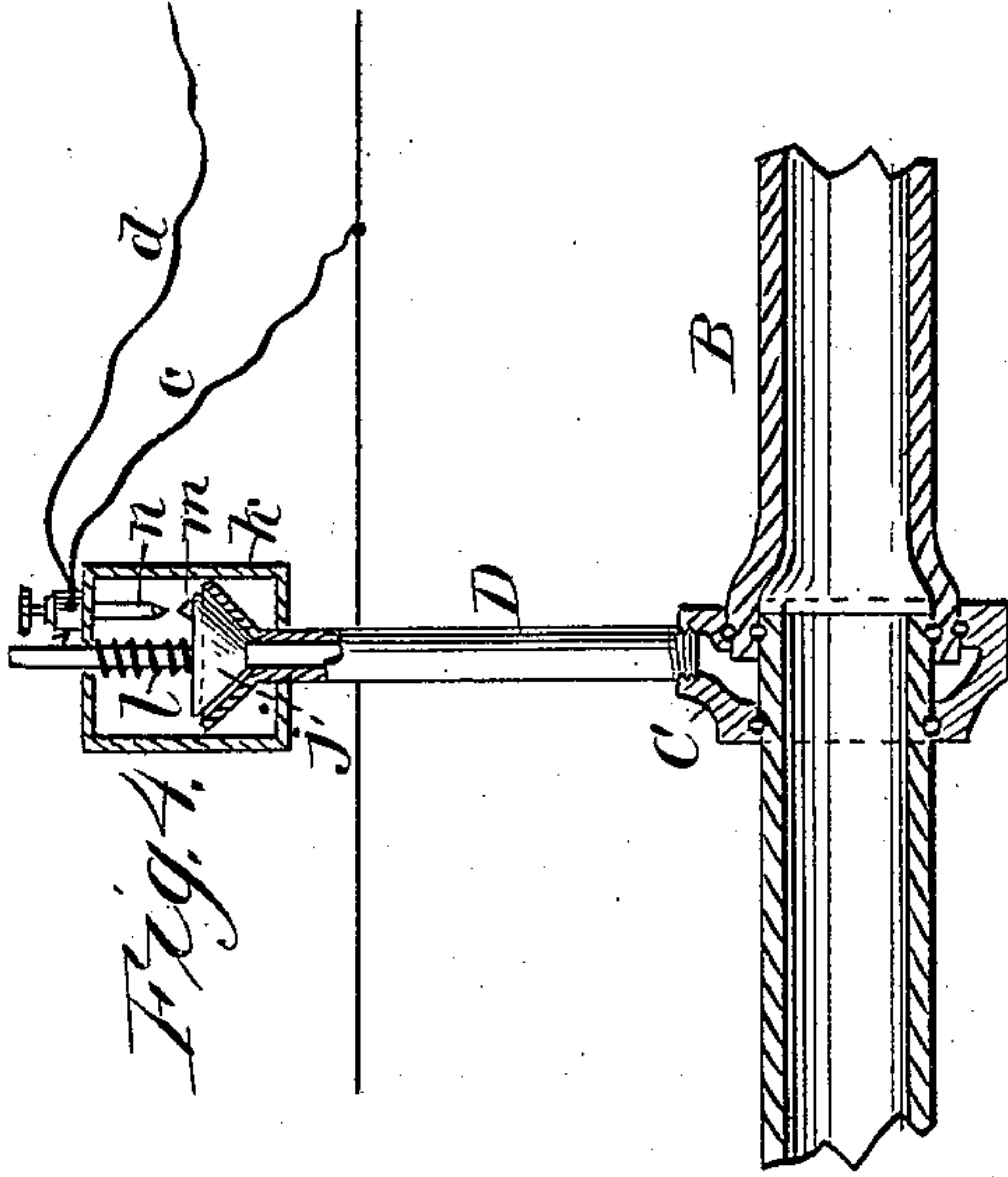
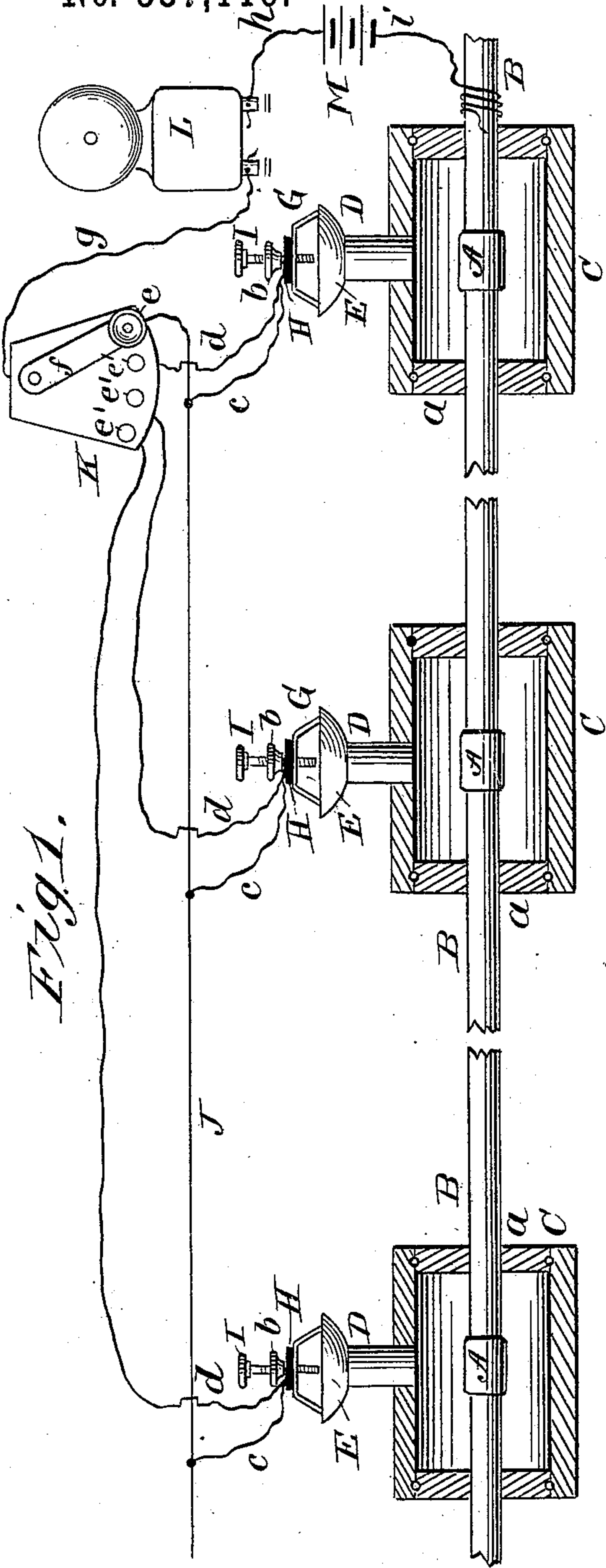
(No Model.)

H. G. BAUMAN.

ELECTRIC LEAK ALARM FOR PIPES.

No. 337,116.

Patented Mar. 2, 1886.



WITNESSES:

J. D. Gayfield  
C. Sedgwick

INVENTOR:

H. G. Bauman

BY *Meunier & Co.*

ATTORNEYS.



# UNITED STATES PATENT OFFICE.

HENRY G. BAUMAN, OF PITTSBURG, PENNSYLVANIA, ASSIGNOR TO HIMSELF  
AND JAMES T. McMASTER, OF SAME PLACE.

## ELECTRIC LEAK-ALARM FOR PIPES.

SPECIFICATION forming part of Letters Patent No. 337,116, dated March 2, 1886.

Application filed January 5, 1886. Serial No. 157,696. (No model.)

*To all whom it may concern:*

Be it known that I, HENRY G. BAUMAN, of  
Pittsburg, in the county of Allegheny and  
State of Pennsylvania, have invented a new  
5 and useful Improvement in Electric Leak-  
Alarms for Pipes, of which the following is a  
specification, reference being had to the an-  
nexed drawings, forming a part thereof, in  
which—

10 Figure 1 is a side elevation, partly in sec-  
tion, of my improved electric leak-alarm.  
Fig. 2 is a vertical transverse section of the  
electric circuit-closer. Fig. 3 is a plan view  
of the same. Fig. 4 is a side sectional eleva-  
15 tion of a modified form of the circuit-closer.

Similar letters of reference indicate corre-  
sponding parts in the different figures of the  
drawings.

The object of my invention is to provide a  
20 reliable and easily-applied apparatus for de-  
tecting leaks in joints of pipe, and, while it is  
especially designed for application to conduits  
for natural gas, it may be applied with equal  
advantage to oil and water pipes.

25 My invention consists in a jacket or cham-  
ber inclosing the joint of a pipe, and pro-  
vided with a flexible metallic diaphragm and  
an insulated contact-screw supported near the  
diaphragm, but not in contact therewith, and  
30 electrical conductors connected with the pipe  
or jacket and with the insulating contact-  
screw, and leading to a distant point where  
the alarm is to be given. The joints A of the  
pipe B are surrounded by gas-tight jackets C,  
35 which may be of any desired form or size. I  
preferably make the jackets C of cylindrical  
form, placing their heads *a* in metallic con-  
tact with the pipe B. I provide one such  
jacket for each joint in the pipe, and in the  
40 upper side of each jacket I insert a short  
tube, D, communicating with the cell E. In  
the upper part of the cell E is secured a very  
thin metallic diaphragm, F, which is capable  
of being deflected by slight pressure in the  
45 cell.

To a bridge, G, secured to the sides of the  
cell E and extending over the top of the dia-  
phragm F, a short distance therefrom, is se-  
cured an insulating-plate, H, through which  
50 a contact-screw, I, passes. The contact-point

of the screw I is near the diaphragm F, but  
not normally in contact therewith, and upon  
the screw I above the insulating-plate H, is  
placed a nut, *b*, which binds the wire con-  
ductors *c d* down upon the insulating-plate H. 55  
The conductors *c* are connected to a common  
line-wire, J, which is connected with a but-  
ton, *e*, of the switch K, located at the point  
where the alarm is to be given, and the con-  
ductors *d* are connected with separate contact- 60  
points *e'* of the switch K. The pivot of the  
switch-arm *f* is connected by a wire, *g*, with  
an electric bell, L, and the bell communi-  
cates by the wire *h* with one pole of the bat-  
tery M, the opposite pole of the battery be- 65  
ing connected by the wire *i* with the pipe B.

In the modification of the circuit-closer  
shown in Fig. 4 I have replaced the diaphragm  
F by a valve, *j*, in the top of the pipe D. I  
have surrounded the valve with a casing, *k*, 70  
and provided a spring, *l*, on the valve-spindle  
and between the casing and the valve, for hold-  
ing the valve to its seat. The valve carries a  
contact-point, *m*, and the contact-point *n* pro-  
jects through the casing *k* in position to be en- 75  
gaged by the contact-point *m* when the valve *j*  
is raised by pressure from below. The con-  
tact-point *n* communicates with the switch and  
with the line-wire through wires *c d*, as in the  
other case. When the pipe is in its normal 80  
condition and there is no escape from its  
joints, the diaphragm F remains flat and out  
of contact with the point of the screw I; but  
when a leak is formed in any of the joints of  
the pipe B the escape of gas or other fluid 85  
contained by the pipe into the jacket C creates  
a pressure therein and forces the diaphragm  
F upward into contact with the point of the  
screw I. This completes the electric circuit  
from the battery M through the conductor *i*, 90  
pipe B, jacket C, pipe D, diaphragm F, con-  
tact-screw I, nut *b*, conductor *c*, line-wire J,  
contact-point *e* of the switch K, the switch-arm  
*f*, conductor *g*, electric bell L, and conductor  
*h*, thus giving the alarm at a point distant from 95  
the leaky joint.

To determine the location of the leaky joint  
of the pipe B the switch-arm *f* is removed from  
the point *e* and moved over the contact-point  
*e'*. If on bringing the switch-arm *f* into con- 100



tact with the first point *e'* no alarm is given, it indicates that the contact-screw I, communicating by the wire *d* with that point, is not in contact with the diaphragm of the circuit-closer of the joint with which that point is connected; but if by the contact of the switch-arm *f* with the point *e'* the bell is made to ring, it indicates that the diaphragm of the circuit-closer and the joint connected with that point has been forced outward by pressure created in the jacket C by the leak, the diaphragm having by contact with the screw I completed the electric circuit at that point, so that when the circuit is completed in the switch the alarm is given and the leaky joint is located.

It is designed to provide an alarm-station for the pipe at suitable intervals—say, at every two blocks in a city—so that whenever an alarm is given the leak may be quickly located and remedied.

The electrical conductors employed in my improved alarm system will be buried with the pipes.

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

1. In an electric leak-alarm for pipes, a

jacket surrounding the joint of a pipe and an electric circuit-closer arranged to be operated by pressure within the jacket, substantially as herein shown and described.

2. The combination, with the pipe B, of jackets C, surrounding the joints of the pipe, a diaphragm-cell, E, and diaphragm F, connected with the jacket, an insulated contact-screw, I, placed near the diaphragm, but normally out of contact therewith, the battery M, alarm-bell L, and the electrical connections, substantially as herein shown and described.

3. The combination of the pipe B, jacket C, diaphragm F, contact-screw I, conductors *c d*, line-wire J, switch K, battery M, electric bell L, and conductors *g h i*, substantially as herein shown and described.

4. The combination, with the jacket C, diaphragm-cell E, diaphragm F, bridge G, insulating-plate H, contact-screw I, nut *b*, conductors *c d*, battery M, electric bell L, and the battery and line connections, substantially as herein shown and described.

HENRY G. BAUMAN.

Witnesses:

R. H. LEE,

A. J. E. MEANS.