

M. & E. Scrannage Jr. *2. Sheets. Sheet. 1.*

Safety Valve.

No. 113,455.

Patented Apr. 4, 1871.

Fig. 1.

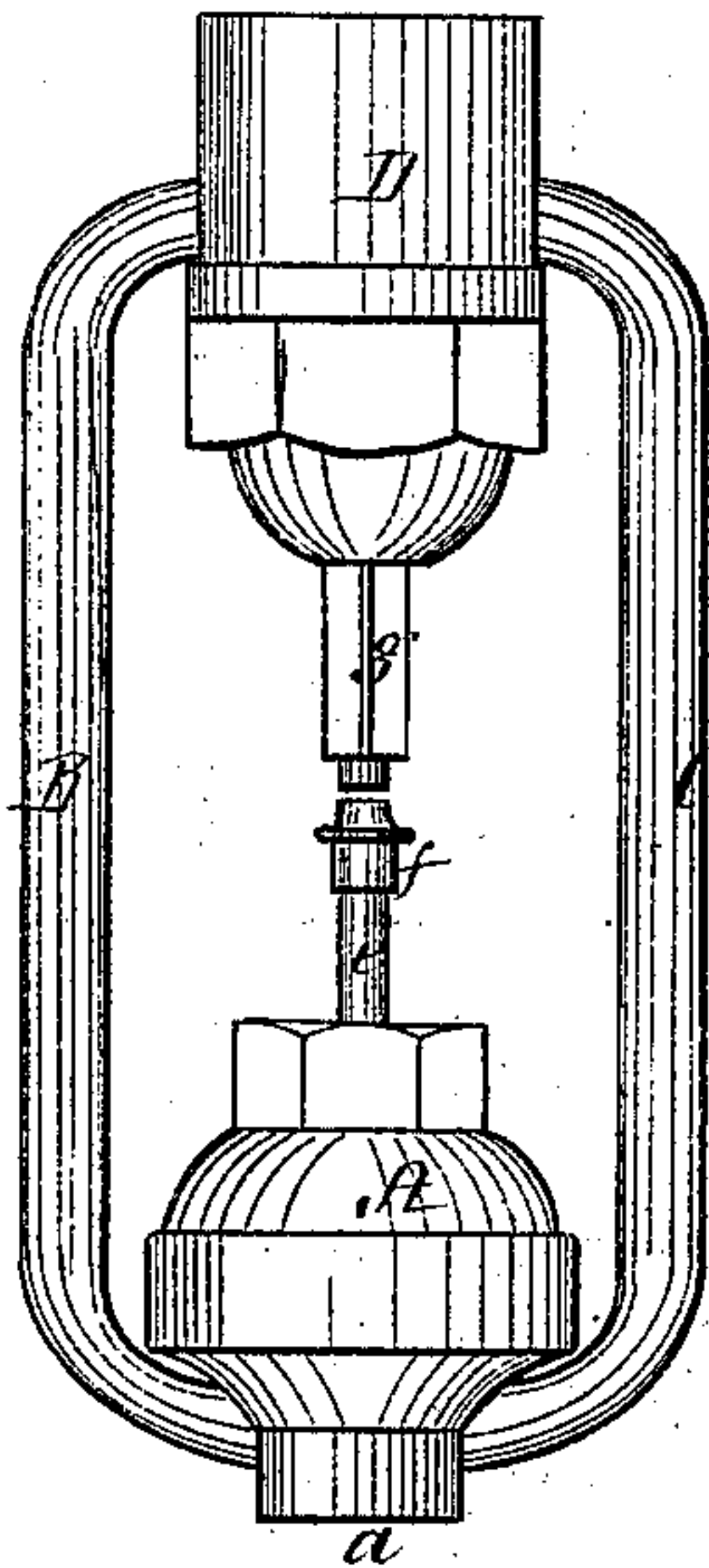
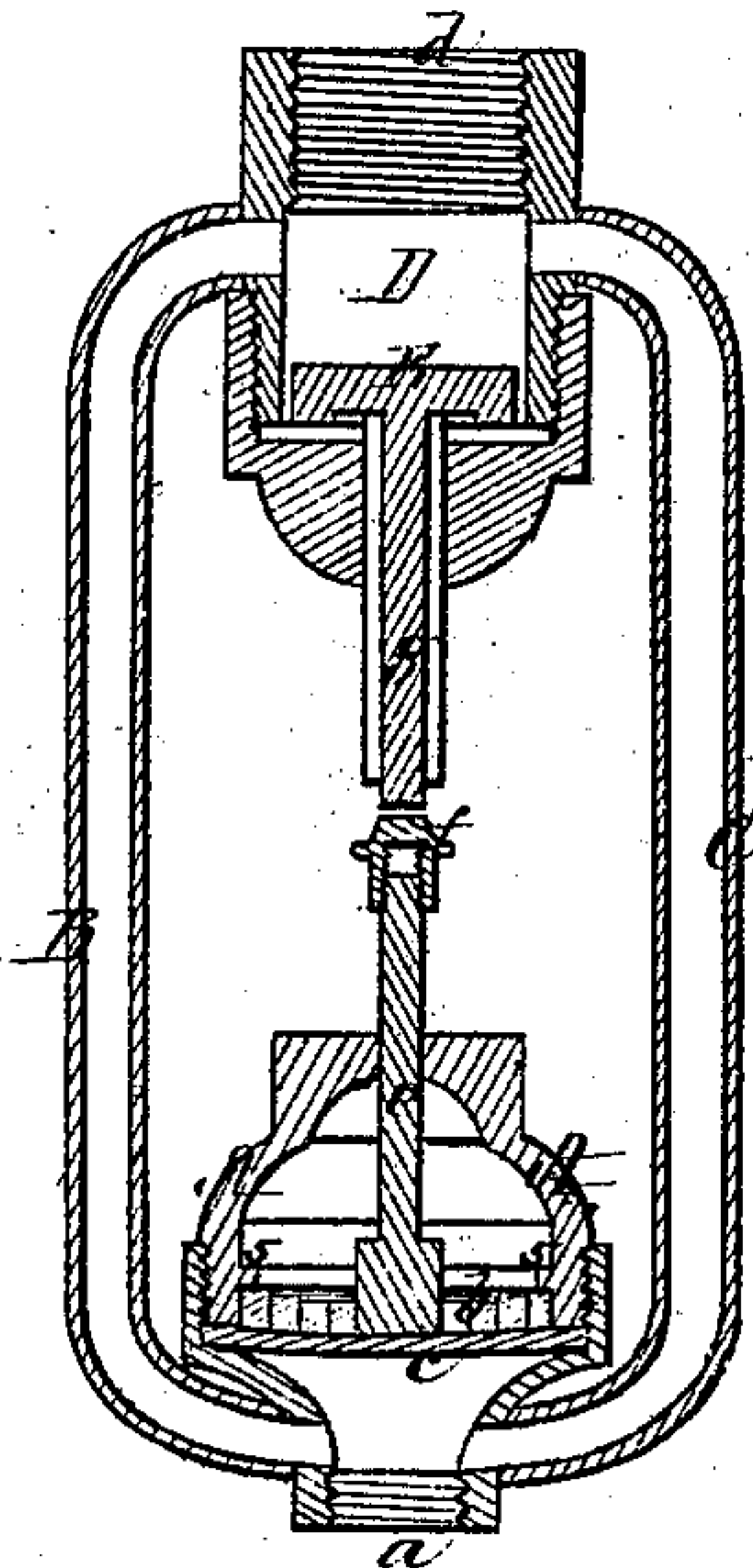


Fig. 3.



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2. Sheets, Sheet 2.
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Fig. 2.

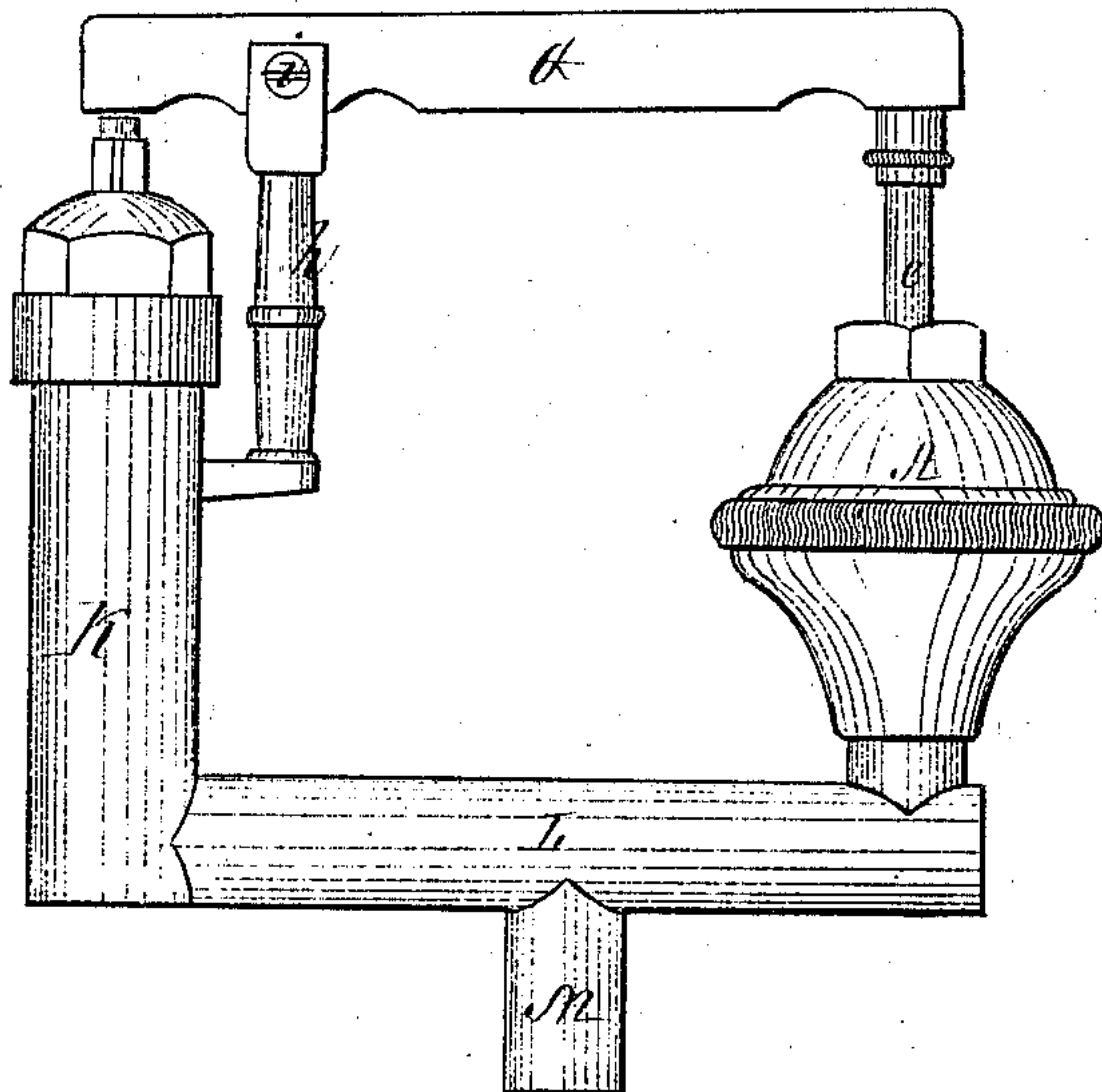
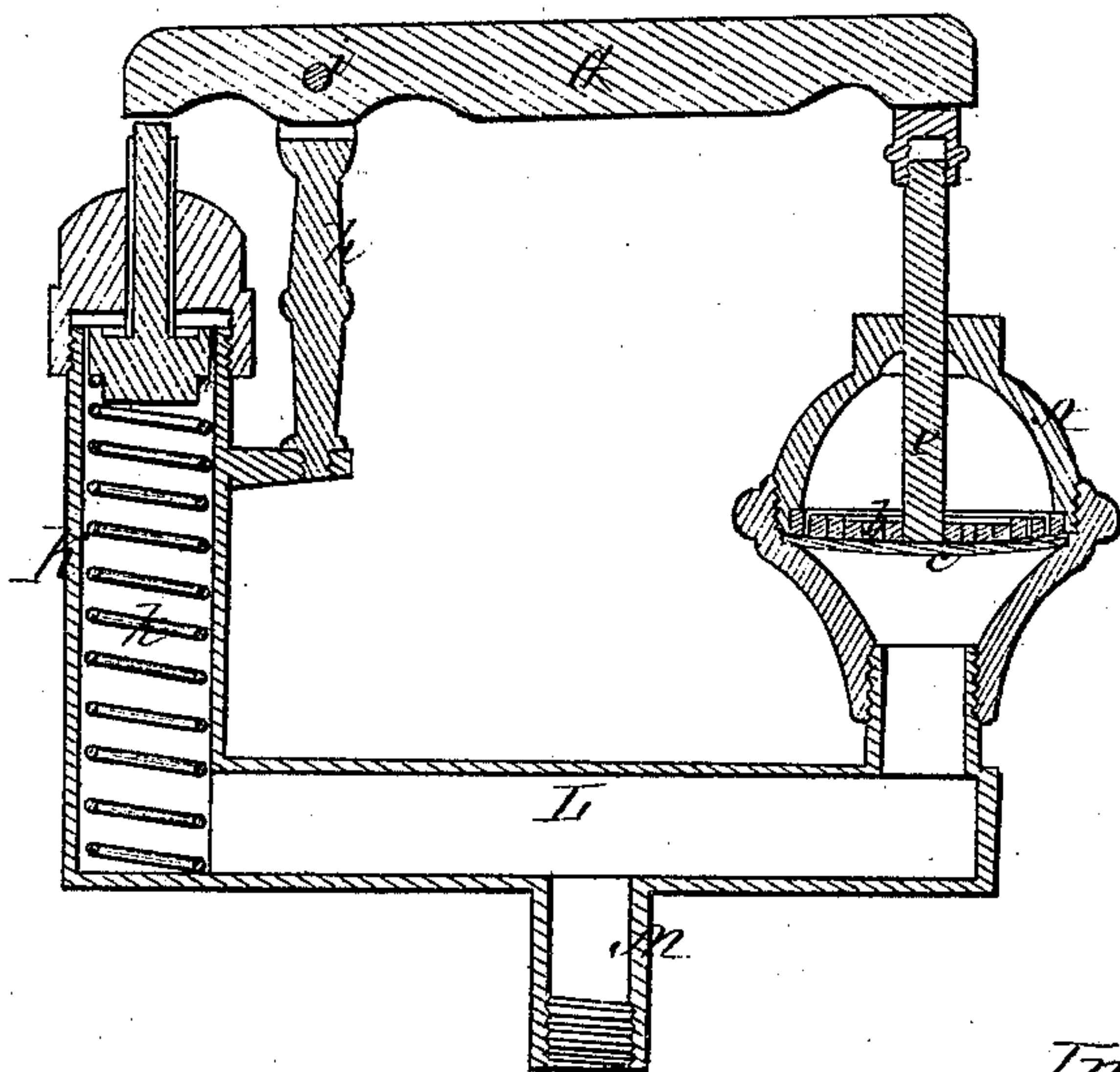


Fig. 4.



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UNITED STATES PATENT OFFICE.

MATTHEW SCRANNAGE AND EDWARD SCRANNAGE, JR., OF BOSTON, MASS.,
ASSIGNORS TO SCRANNAGE, BATE & CO., OF SAME PLACE.

IMPROVEMENT IN SAFETY-VALVES.

Specification forming part of Letters Patent No. **113,455**, dated April 4, 1871.

To all whom it may concern:

Be it known that we, MATTHEW SCRANNAGE and EDWARD SCRANNAGE, JR., both of Boston, in the county of Suffolk and State of Massachusetts, have invented certain Improvements in Safety-Valves, of which the following is a full, clear, and exact description, reference being had to the accompanying drawing, making part of this specification, in which—

Figures 1 and 2 are elevations of safety-valves constructed in accordance with our invention; Figs. 3 and 4, central vertical sections through the same.

Our invention has for its object to produce a compact safety-valve of simple construction, which is kept closed by the pressure of the steam, gas, or other agent, in contradistinction to one closed by the action of a spring or weight; and consists in a casing provided with a spring which is raised by the pressure of the steam or gas in a manner similar to that of a steam-gage, the spring, on being raised to a predetermined height, opening the safety-valve by means of suitable connections and allowing the steam or gas to escape.

To enable others skilled in the art to understand and use our invention, we will proceed to describe the manner in which we have carried it out.

In Figs. 1 and 3 of the said drawing, A represents a tight casing, which is intended to be secured at *a* to a pipe leading from a steam-boiler or gas-generator. Within the casing A is a flat coiled spring, *b*, which rests on a disk or diaphragm, *e*, of rubber, leather, or other suitable material, the upper side of the outer portion of the spring bearing against a flange, 5, on the inside of the casing.

Connected with the lower portion of the casing A are two pipes, B C, the upper ends of which communicate with the interior of the casing D, within which is placed the safety-valve E, which is kept down on its seat by the pressure of the steam or gas upon it.

The upper end of the casing D is intended to be closed by a screw-plug fitting into the thread *d*.

To the spring *b* is secured a spindle, *e*, which passes up through the casing A, and carries

at its upper end a cap, *f*, which is made adjustable thereon by means of a screw, so that its height can be varied in order to cause it to come sooner or later into contact with the lower end of the stem *g* of the valve E.

When the spring *b* is raised by the pressure of the steam or gas the cap *f* is brought into contact with the stem *g*, and as the surface-area of the diaphragm *e* is greater than that of the valve E, the latter is opened on the pressure of the steam or gas being increased.

The valve is made to open and the steam or gas permitted to escape at different pressures by adjusting the height of the cap *f* on the spindle *e*.

If preferred, the adjustable cap *f* may be screwed to the bottom of the stem *g* of the safety-valve, instead of to the top of the spindle *e*; or the adjustable cap may be dispensed with, and some other device employed to vary the distance between the top of the spindle *e* and the stem of the valve.

In Figs. 2 and 4 is represented a modification of our invention, in which the adjustable cap on the top of the spindle connected with the spring is made to act upon one end of a lever, G, pivoted at *i* to a support, *h*, the opposite end of this lever acting upon the stem of the safety-valve, which is kept closed by the pressure of the steam or gas.

A light spiral spring, *k*, is employed to keep the valve up in contact with its seat when there is no steam or gas within the pipe K, which communicates with one end of the horizontal pipe L, at the opposite end of which is the casing A, containing the spring *b*, the horizontal pipe L being connected with the boiler or generator by means of a pipe, M.

With the arrangement shown in Figs. 1 and 3 the surface-area of the diaphragm *e* must necessarily be greater than that of the safety-valve E, otherwise the latter could not be raised by the steam or gas. This is not, however, essential where a lever, G, is employed, as the power exerted on the stem of the valve may be varied by changing the position of the fulcrum of the lever.

We do not claim, broadly, the use of an elastic disk and a spring as a means of indi-

cating or of communicating pressure; nor do we claim it as an equivalent for a piston in a differential safety-valve.

Claim.

What we claim as our invention, and desire to secure by Letters Patent, is—

A spring, *b*, and diaphragm *c*, inclosed within a casing, *A*, and connected with a spindle, *e*, with its adjusting-nut *f*, for operating a

safety-valve, substantially in the manner described.

Witness our hands this 15th day of December, 1870.

MATTHEW SCRANNAGE.
EDWARD SCRANNAGE, JR.

Witnesses:

W. J. CAMBRIDGE,
N. W. STEARNS.