

S. F. GOLD.
Automatic-Damper.

No. 168,737.

Patented Oct. 11, 1875.

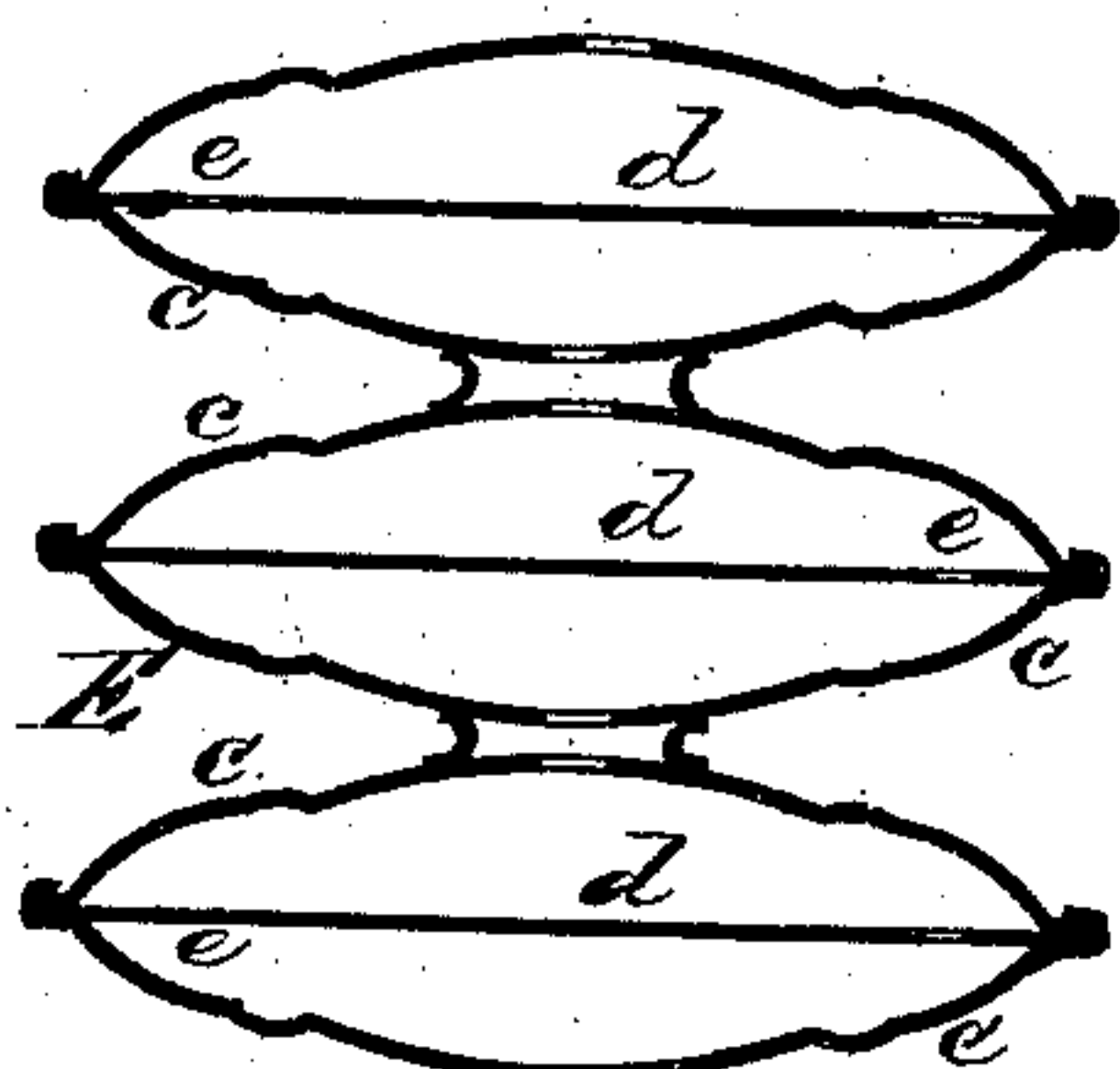
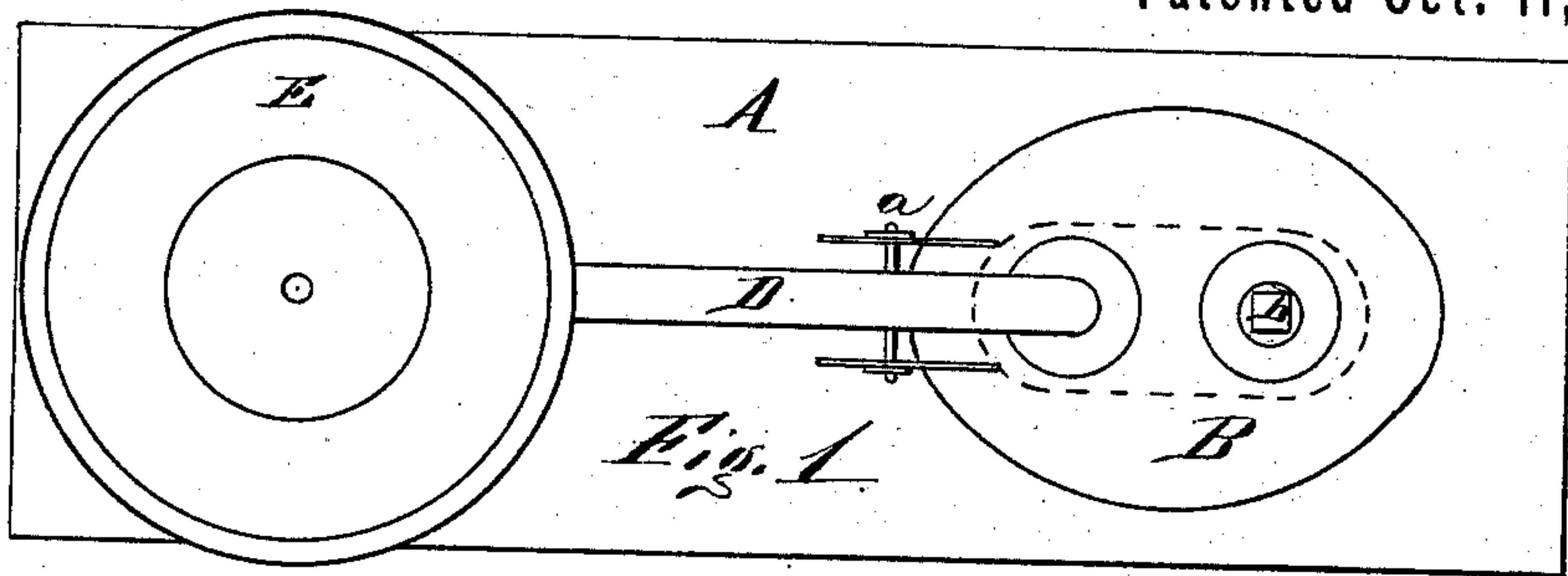


Fig. 2.

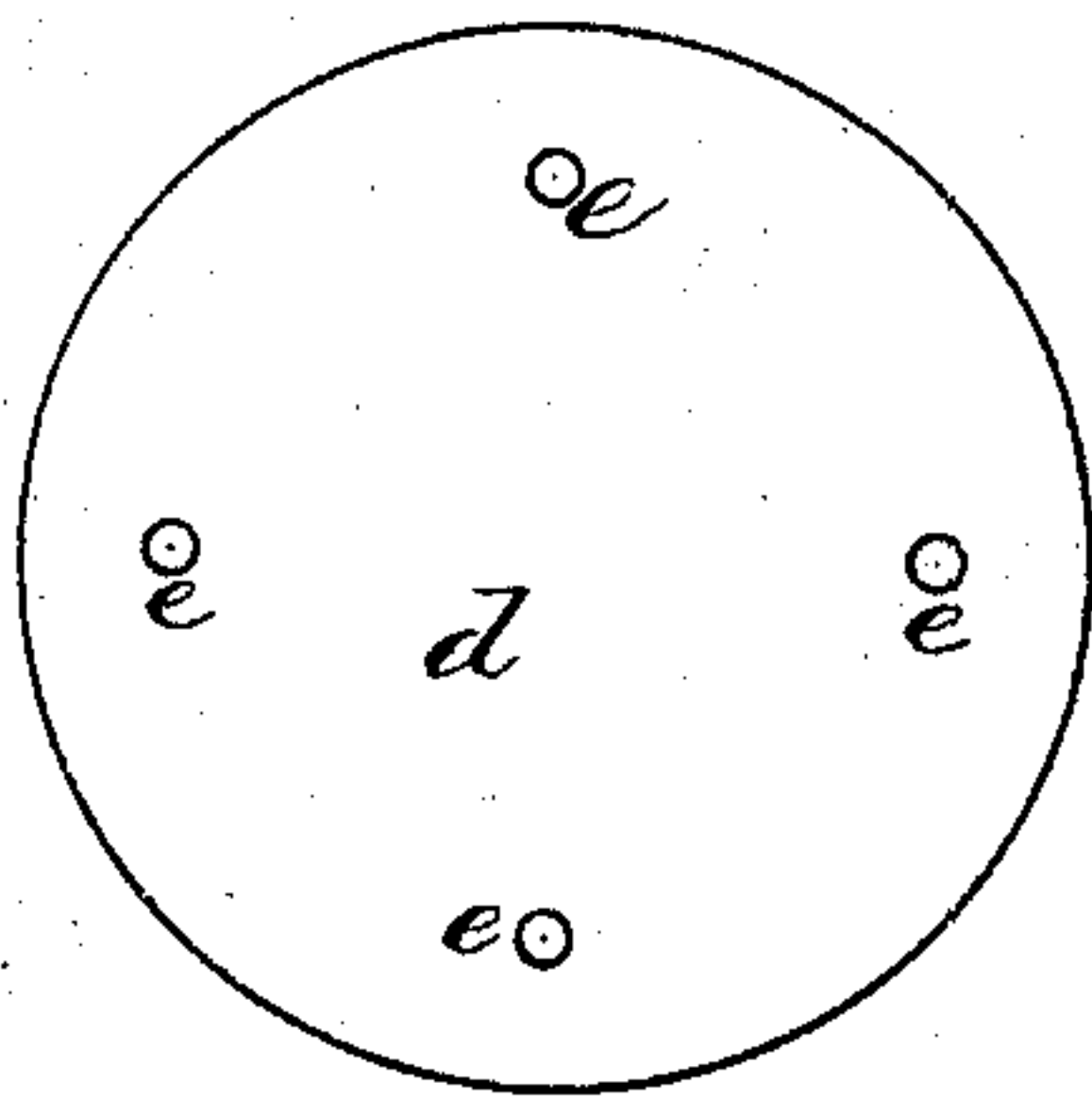
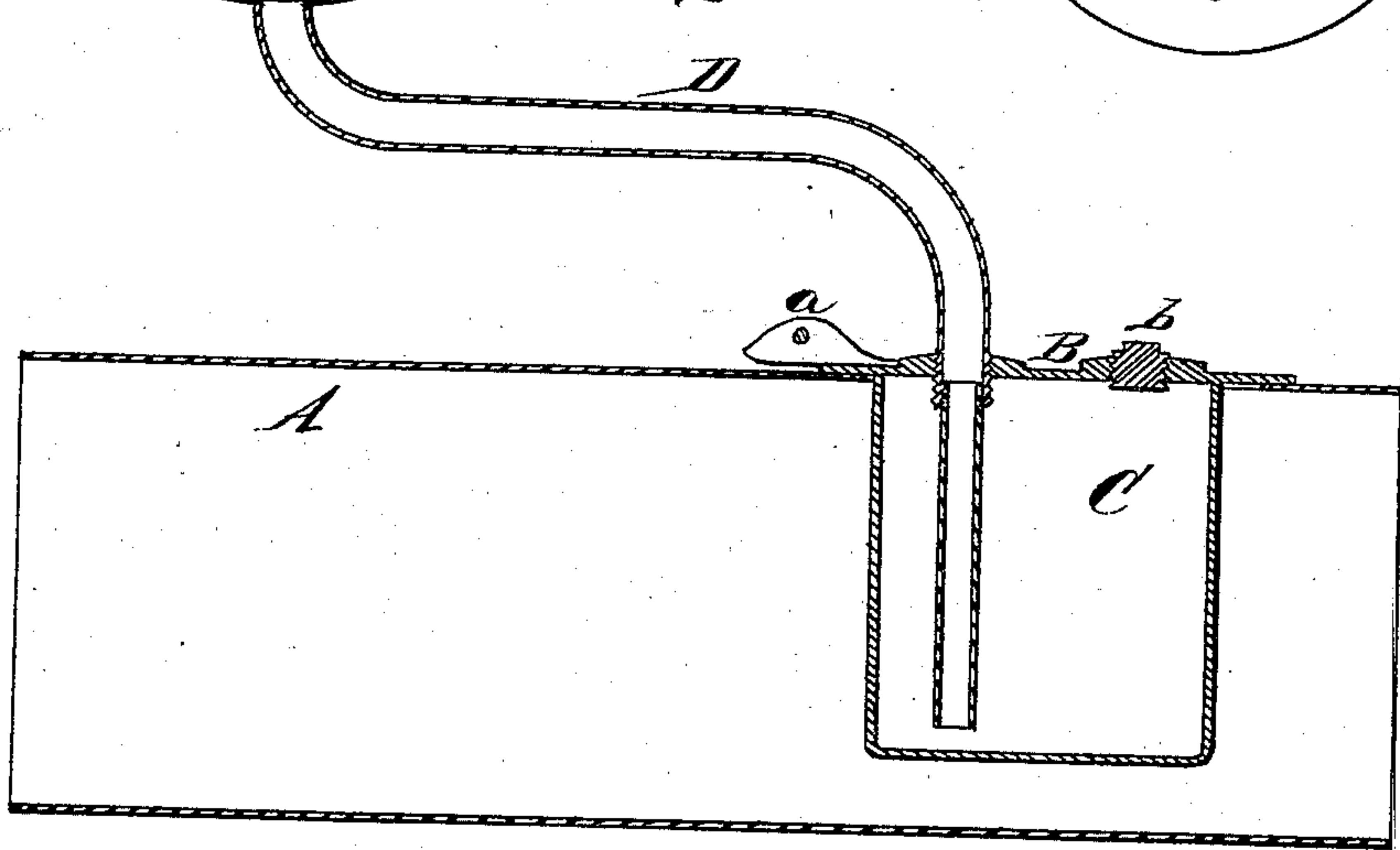


Fig. 5.



Witnesses
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UNITED STATES PATENT OFFICE.

SAMUEL F. GOLD, OF ENGLEWOOD, NEW JERSEY.

IMPROVEMENT IN AUTOMATIC DAMPERS.

Specification forming part of Letters Patent No. 168,737, dated October 11, 1875; application filed July 12, 1875.

To all whom it may concern:

Be it known that I, SAMUEL F. GOLD, of Englewood, in the county of Bergen and State of New Jersey, have invented certain Improvements in Automatic Dampers, of which the following is a specification:

This invention is designed to furnish a simple, cheap, and efficient automatic damper, adapted to be used advantageously to regulate the fires of steam-heating apparatus, hot-air furnaces, and other analogous structures.

My invention is a device adapted to accomplish this purpose by means of the displacement of water by undue heat of the fire; and consists in the improvements hereinafter more fully set forth.

Figure 1 is a top view of a section of a smoke-pipe with my apparatus attached. Fig. 2 is a vertical longitudinal section of the same. Fig. 3 is a plan of a diaphragm which forms a portion of the condensing part of the apparatus.

A is a piece or section of a smoke-pipe lying in a horizontal position. B is a damper, attached to said smoke-pipe by a hinge, *a*, as shown, so that it may be opened away from the smoke-pipe in such a manner as to allow the external air to enter and reduce the draft. C is a tank attached to the under side of the damper B, and connected, by a pipe, D, to the receiver E, the pipe D extending nearly to the bottom of the tank C, as shown in the drawings. *b* is a screw-plug in the damper B, to open and close an aperture into the tank C, through which the latter may be supplied with water when necessary. This plug must fit steam-tight. The tank C, as will be observed, is located inside of the smoke-pipe, and should be thin in the direction of the diameter of the pipe, as shown by dotted lines in Fig. 1, so as not to unduly obstruct the draft.

The receiver E is made of three parts, *c c c*, connected by small openings in the center, the upper one having a small opening into the external air; and these parts *c* are subdivided by diaphragms *d*, which have small openings near the periphery at *e*, thus circuitously connecting the chambers formed by the parts *c* and the diaphragms *d*, the object of these small openings being to afford pas-

sages for the air to escape from or enter the receiver without allowing much opportunity for the evaporation of the water; and for this purpose these apertures between the parts *c*, and through the diaphragms, should be very minute, a sixteenth of an inch in diameter being fully large enough, and in most cases larger than is necessary. This receiver should be made of thin plates of metal, so as to allow the ready transmission of heat.

The tank C should be filled nearly full of water, leaving only small space for the formation of steam; and being thus filled its weight is designed to be sufficient to keep the damper closed, and the tank completely inclosed in the smoke-pipe, and this position of the parts will be retained till the heat of the products of combustion in the smoke-pipe becomes sufficient to produce a pressure of steam in the tank strong enough to force the water in it back through the pipe D into the receiver, when the receiver, with this addition to its weight, aided by this diminution of weight in the tank, will open the damper, the pipe D operating as a lever, with hinge *a* as a fulcrum. The opening of the damper allows air to enter the smoke-pipe, and reduces the intensity of the draft and the action of the fire. It also admits external air into contact somewhat with the sides of the tank.

When the temperature has become sufficiently reduced to allow it the water returns from the receiver to the tank by its own gravity, and the damper is consequently closed.

These movements are not generally very sudden or marked in practice; but usually the damper opens gradually as the fire becomes too intense, and gradually closes again as it falls, remaining partly open when the condition and action of the fire requires a limited action of the damper.

It is obvious that this damper may be also attached to and used upon a vertical smoke pipe or flue, care being taken to preserve the relative arrangement of the parts with reference to each other and to a horizontal plane.

I have described and shown the damper B, tank C, pipe D, and receiver E as being all rigidly connected to each other, and the pipe D also performing the service of a lever, so

that when the damper is operated the parts above mentioned all vibrate together on the axis at *a*; and this I regard as the best construction, and as having decided advantages over any other union of the parts which now occurs to me. This is not, however, indispensable so long as the same result is produced by means substantially the same, as, for example, the lever and pipe may be of separate pieces instead of in one piece. The tank may remain in a fixed position, and be connected to the receiver by a flexible or jointed connection, the receiver being connected by a lever or equivalent device to the damper, and various other changes in the construction might be adopted without substantially changing the result, or, in its principal features, the mode of producing it. It is essential, however, that the capacity of the tank C and that of the receiver E shall so correspond with each other that if all the water is thrown out of the tank by extreme

heat the receiver shall have sufficient capacity to contain it, and prevent its overflowing into the room.

I claim as my invention—

1. The combination of the tank C, receiver E, and pipe and lever D, arranged relatively to each other substantially as hereinbefore set forth.

2. The combination of the tank C, pipe and lever D, receiver E, and damper B, substantially as hereinbefore set forth.

3. The combination of the tank C, pipe and lever D, receiver E, damper B, and smoke-pipe A, substantially as hereinbefore set forth.

4. The receiver E, constructed in parts *c*, having openings between them, substantially as hereinbefore set forth.

SAMUEL F. GOLD.

Witnesses:

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