

E. CAPPER.
DRAFT REGULATOR.
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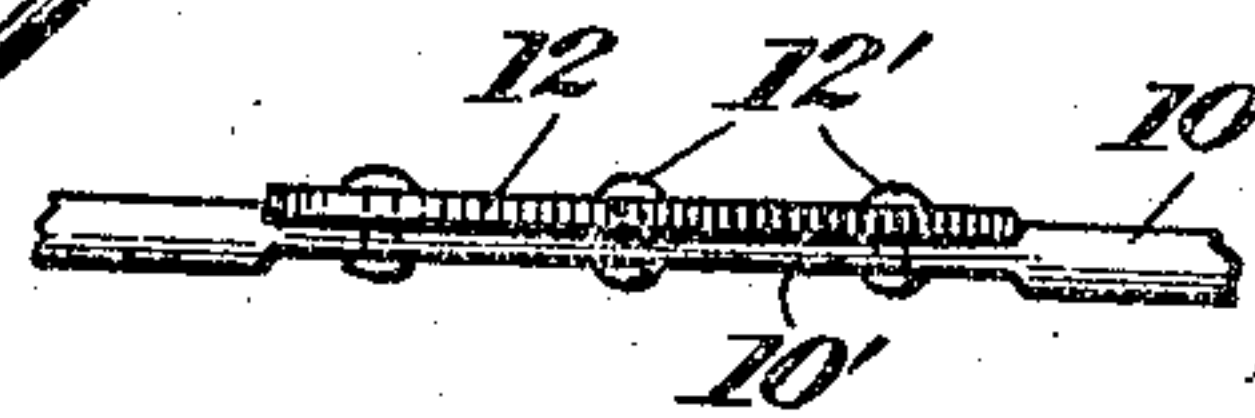
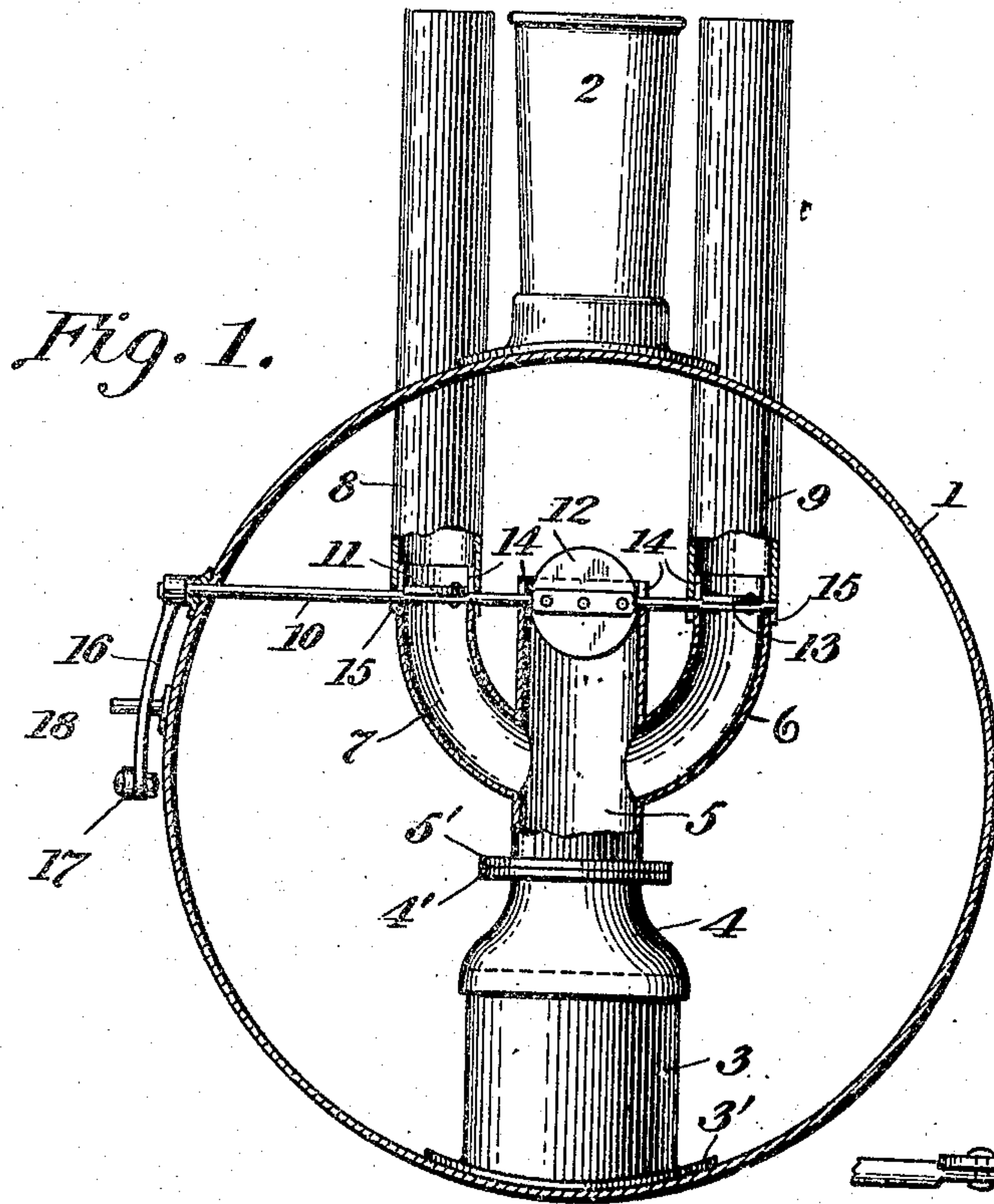
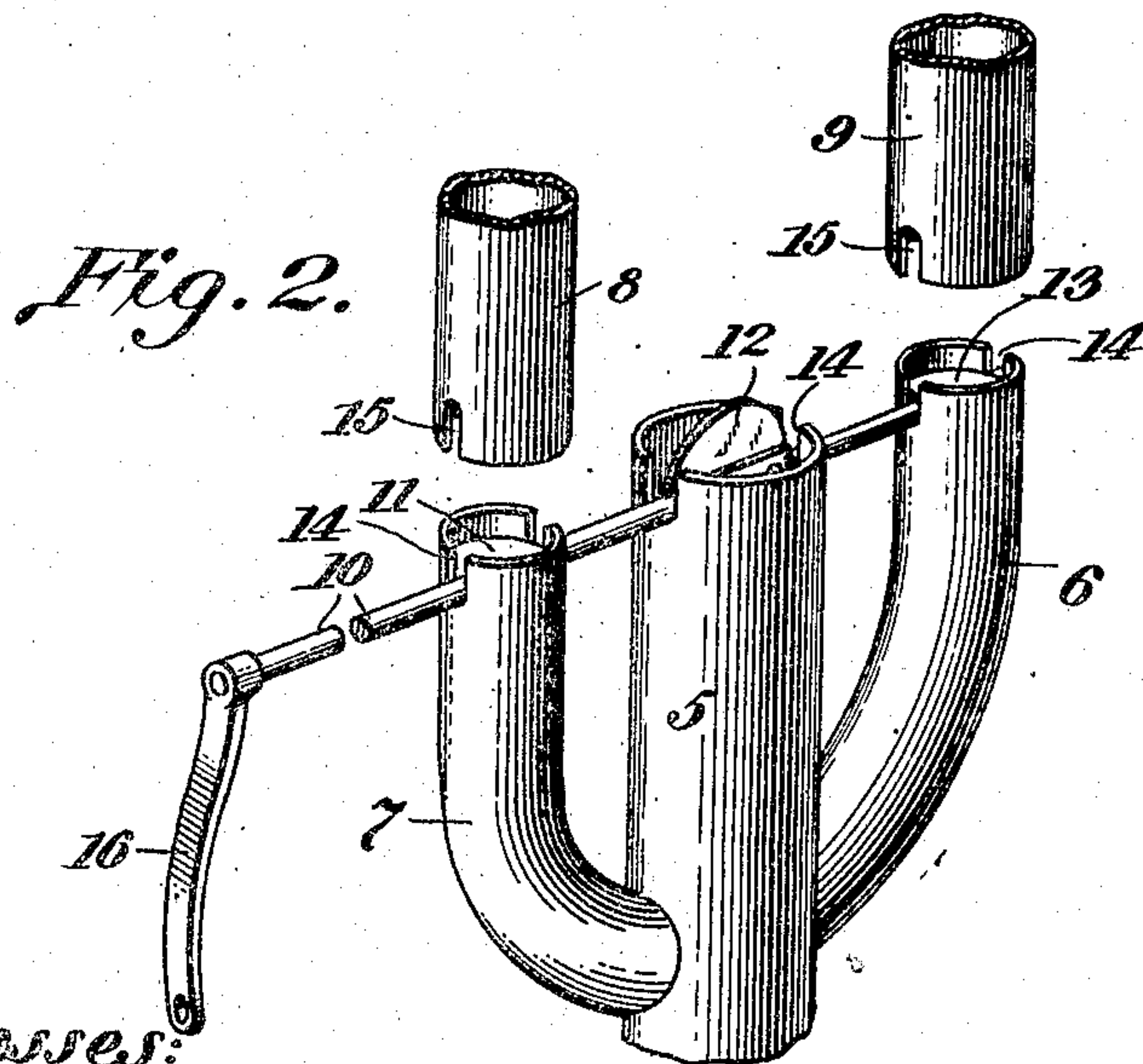


Fig. 3.



Witnesses:

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UNITED STATES PATENT OFFICE

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DRAFT-REGULATOR.

No. 907,968.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, EDWARD CAPPER, a citizen of the United States, residing at Shenandoah, in the county of Schuylkill and State of Pennsylvania, have invented certain new and useful Improvements in Draft-Regulators, of which the following is a specification.

My invention relates to draft regulators, and more particularly to devices of this character designed especially for use on locomotives.

As is well known to locomotive engineers, great trouble is often experienced with the type of exhaust now in use, on account of the excessive draft created through the fire box. This has the effect of drawing the fire out through the tubes, and discharging large sparks and glowing cinders from the stack. This is highly objectionable, both on account of wasting fuel, and of the danger of setting fire to property along the right-of-way. To remedy this trouble, firemen have often been accustomed to open the fire-door, when the engine is starting, or drawing a particularly heavy load, in order to prevent the destructive action on the fire. The admission of cool air in this manner, however, deadens the fire, and, moreover, has a bad effect on the fire-box and flues.

It is the primary object of the present invention, therefore, to provide an exhaust mechanism, by the use of which the excessive discharge of sparks from the smoke stack will be prevented.

A further object of the invention is to accomplish the above result without affecting the back pressure on the engine.

A further object is to provide a draft regulator or exhaust mechanism, which, while producing the above results, shall be extremely simple and cheap to construct.

With the above, and other objects in view, my invention consists in the construction and arrangement of parts, hereinafter described, and illustrated, in the accompanying drawings, in which:—

Figure 1 is an end view, partly in section, showing my improved draft regulator mounted in the front end of a locomotive boiler shell. Fig. 2 is a perspective view, showing parts of the regulator on an enlarged scale. Fig. 3 is a fragmentary side elevation of one of the valves, showing one method of securing same to the valve rod.

Referring to the drawings in detail: 1

represents the usual boiler shell surrounding the smoke box, and on which is mounted the stack, 2. Into this smoke box discharge the fire-tubes, (not shown) commonly employed in this type of boiler. Mounted in the smoke-box is a cylindrical casing, 3, secured to the boiler shell as by means of the flange 3', and surmounted by a tapering cap, 4, having a peripheral flange, 4'. A manifold, comprising a central or main tube, 5, and a pair of side or branch tubes, 6, 7, is provided with a flange, 5', adapted to seat against, and be secured to the flange, 4'. This chamber, formed by the parts 3 and 4, I will designate a "receiver", as it is designed to receive the exhaust steam from the cylinders, with which it communicates, by means of suitable pipes, (not shown), which tap the bottom of the chamber. It will be noted that the branch tubes 6 and 7 are preferably of such diameter that their combined cross sectional area is equal to that of the main tube, 5. Fitted to the upper end of the branch tubes 6 and 7 are discharge pipes 8 and 9, passing up through the boiler shell on each side of the stack, 2, and preferably extending to the same height. Passing through the side of the boiler shell, and suitably journaled therein is a rod or shaft, 10. As clearly shown in Fig. 2, this shaft extends through all three branches of the manifold, 5, 6, 7, and these latter are cut away at their upper edges, as at 14, in order to accommodate the shaft, and afford it suitable bearings. The discharge pipes, 8 and 9, are also cut away, as at 15, at their lower edges, so as to fit over and embrace the shaft 10.

Mounted on the shaft 10 are three dampers, or valves, 11, 12, and 13, disposed within the three branches, 7, 5, 6, respectively, of the manifold, and snugly fitting the same. The valves 11 and 13 are disposed at right-angles to the plane of valve 12, so that when the former are open, the latter is closed, and vice versa. The valves may be fixed to the rod 10 by flattening the rod as at 10', in Fig. 3, and securing with rivets 12', or in any other desired manner. Outside of the boiler the shaft 10 carries an arm 16, to the other end of which a rod 17 is attached, and extends back to the cab of the locomotive. A stop 18 is placed so as to limit the movement of the valves.

With the parts in the position shown in the drawings, the exhaust escapes through the main tube 5, and stack 2, in the usual manner. When however, it is observed
 5 that the draft is too strong, and is drawing the fire unduly, the shaft 10 is rocked by means of the connections above described, so as to bring the valves into position to partially or wholly close the valve 12, and
 10 correspondingly open the valves 11 and 13. The exhaust steam, then, instead of rushing out through the stack, and producing an excessive draft, is deflected, and passes, partly or wholly, out through the tubes 6
 15 and 7, and discharge pipes 8 and 9. It will be particularly noted that, owing to the relation above described, existing between the sizes of the several tubes, the total area available for the escaping steam is only
 20 slightly altered by manipulating the valves, for the reason that the tubes 6 and 7 are opened to substantially the same extent that tube 5 is closed, and thus the back pressure on the engine remains practically
 25 unchanged.

It will thus be seen that I have provided an exceeding simple and efficient device, by the use of which the draft of a locomotive may be controlled at will, and it is thought
 30 the numerous advantages of my invention will be readily appreciated by those skilled in the art.

What I claim is:—

1. The combination with a locomotive boiler having the usual smoke-box and stack, 35 of a receiver mounted in the smoke-box, a manifold connecting with said receiver, and comprising a main tube, and a pair of branch tubes, said main tube discharging into the stack, and said branch tubes communicating 40 with the outer atmosphere, a shaft journaled in said manifold, and extending through said boiler shell, and a plurality of valves secured to said shaft, and disposed, one within each of said tubes, the valve in the main tube 45 lying at right angles to the valves in the branch tubes.

2. The combination with a locomotive boiler having the usual smoke-box and stack, of a receiver mounted in said smoke box, a 50 main and a pair of branch tubes extending from said receiver and discharging into the stack and into the atmosphere, respectively, a separate valve mounted wholly within each of said tubes, beyond said receiver, and a 55 common rock shaft on which said valves are mounted, said valves being so related that when the one in the main tube is open the others are both closed.

In testimony whereof I affix my signature, 60 in presence of two witnesses.

EDWARD CAPPER.

Witnesses:

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 JAMES W. DAVIS.