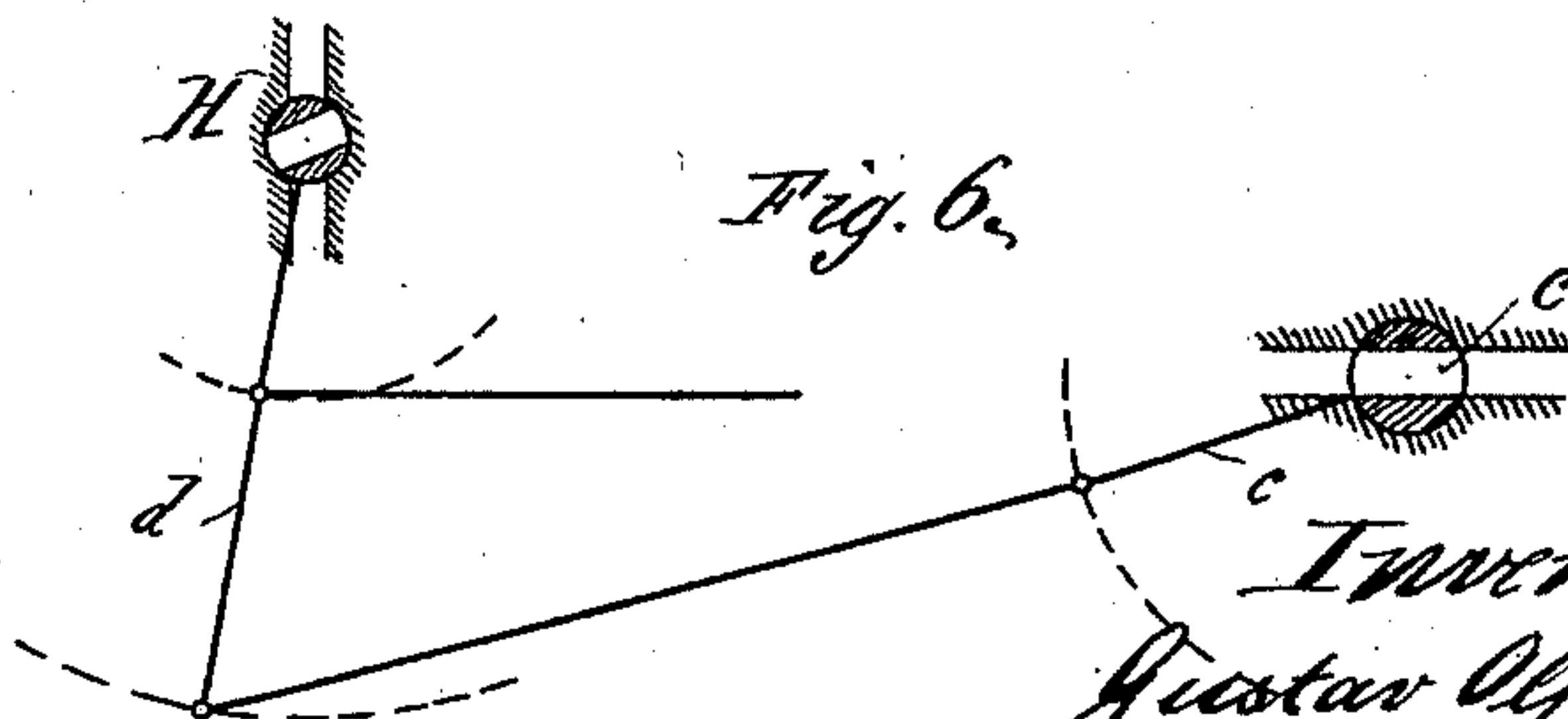
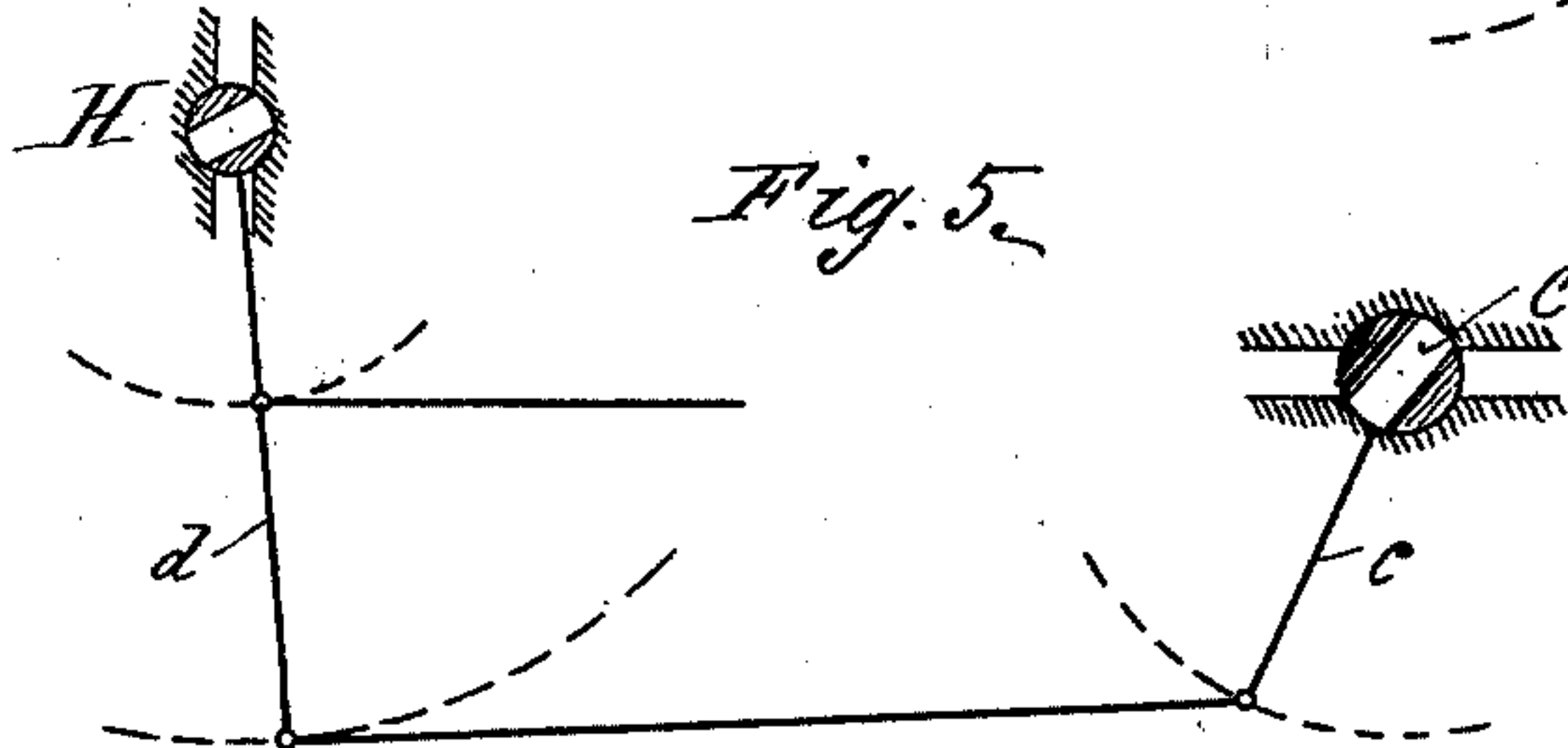
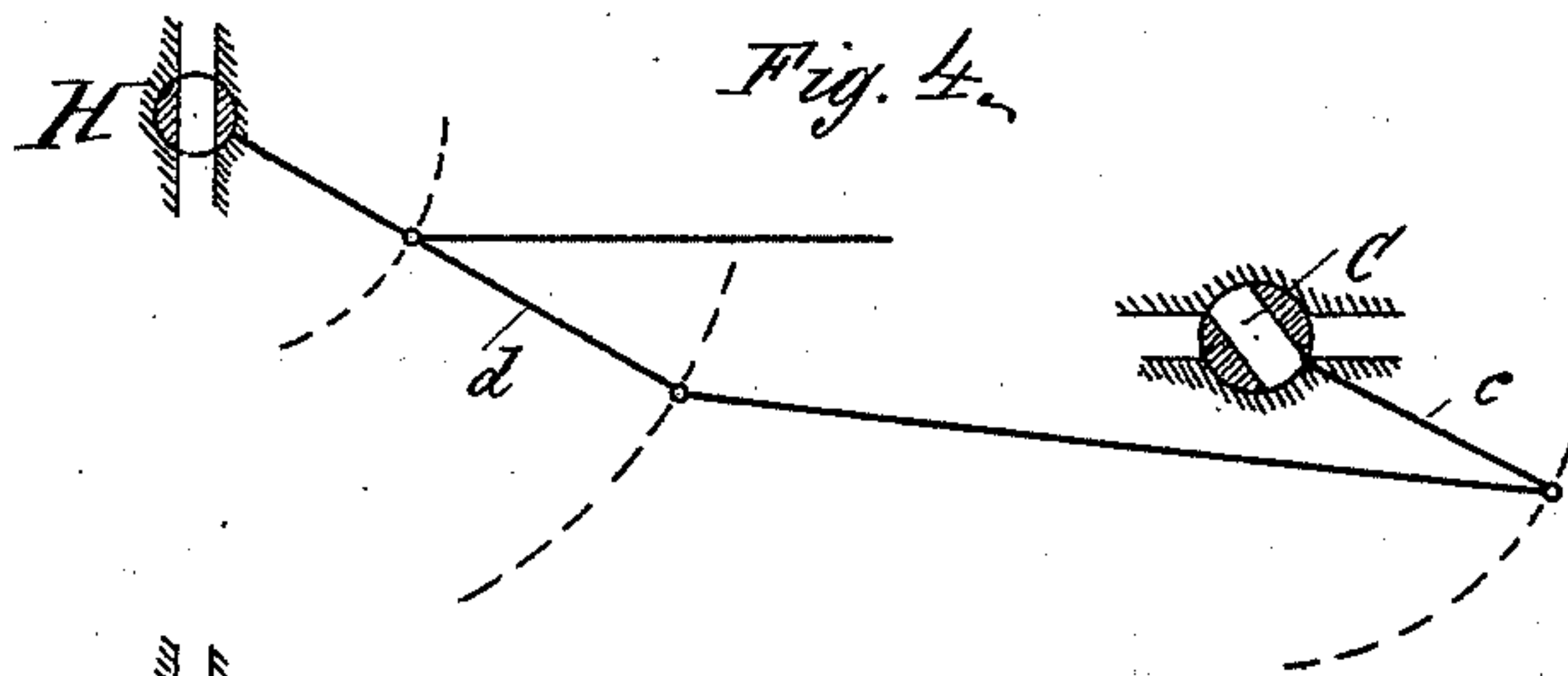
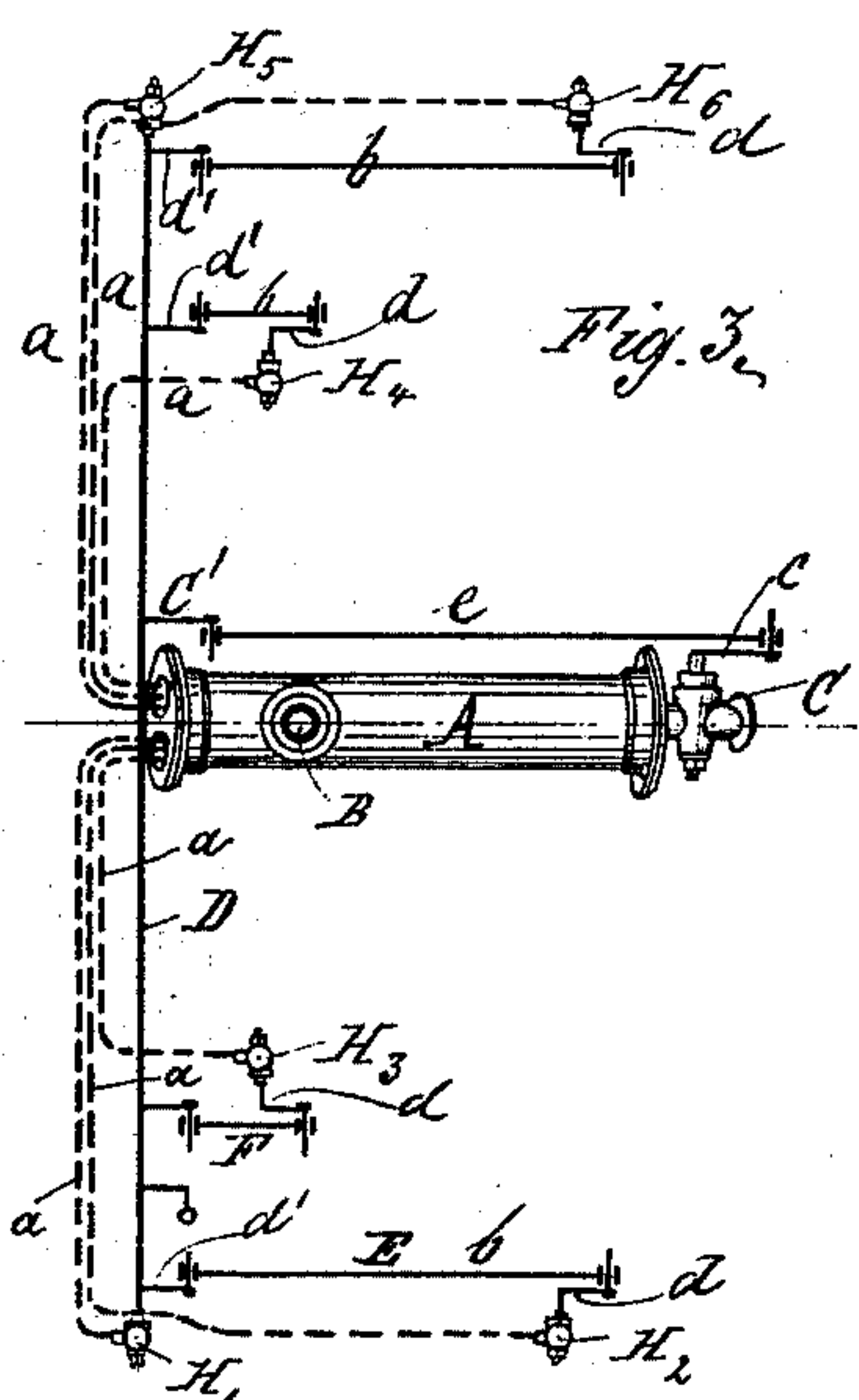
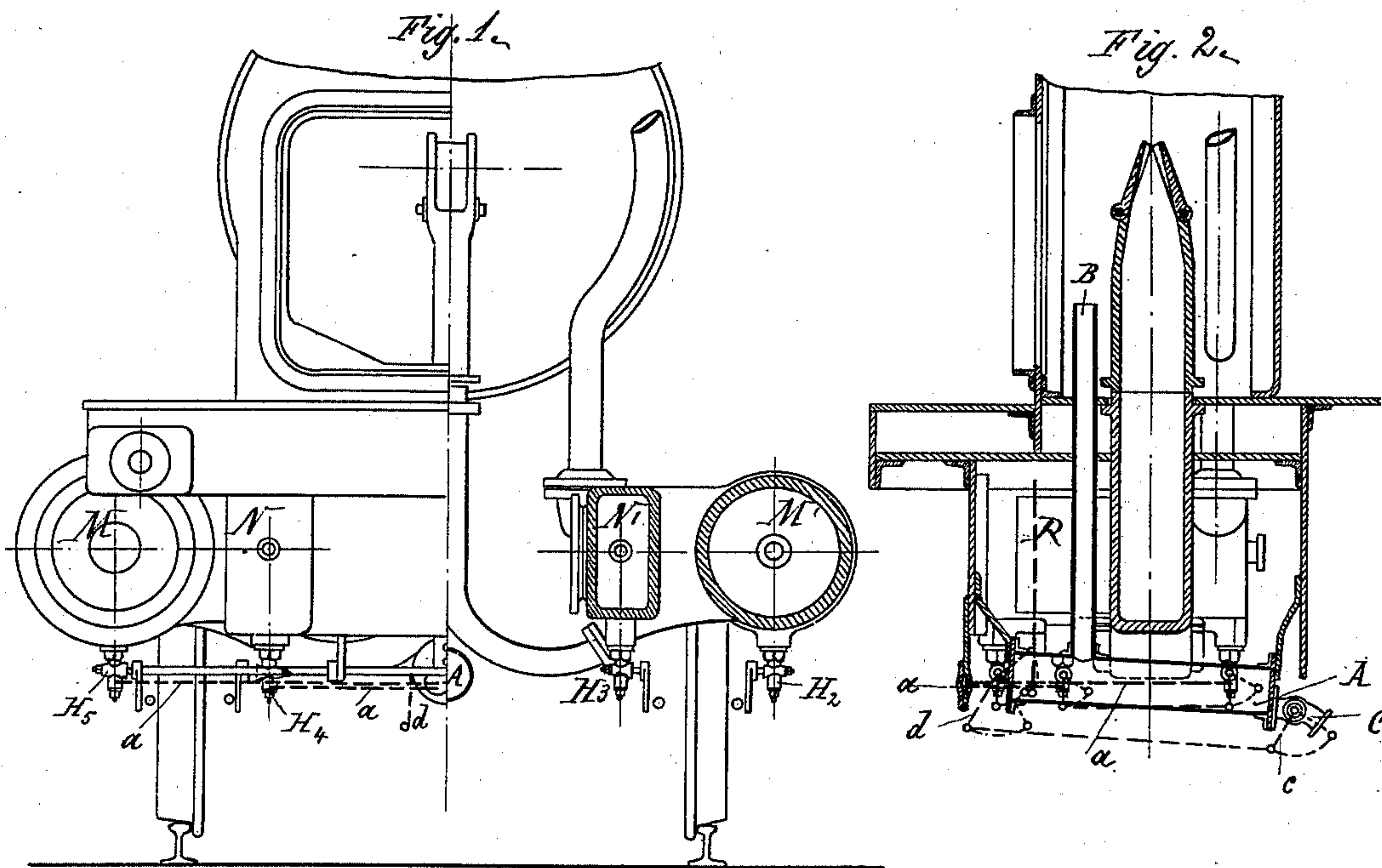


G. OLFENIUS.
Blow-off Apparatus for Locomotives, &c.
No. 223,604. Patented Jan. 13, 1880.



Witnesses:
Julien Meyer
Albert C. Janssen

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per Ernst Rühlmann
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UNITED STATES PATENT OFFICE.

GUSTAV OLFENIUS, OF CASTEL, NEAR MENTZ, GERMANY.

BLOW-OFF APPARATUS FOR LOCOMOTIVES, &c.

SPECIFICATION forming part of Letters Patent No. 223,604, dated January 13, 1880.

Application filed November 22, 1879. Patented in Germany, February 17, 1879.

To all whom it may concern :

Be it known that I, GUSTAV OLFENIUS, of the town of Castel, in the German Empire, have invented a new and useful Improvement in Blow-Off Apparatus for Locomotive-Cylinders and Valve-Chests, of which the following is a specification.

This invention relates to means for discharging the condensed water from the cylinders and valve-chests in such a manner that the inconveniences resulting from the escape of steam through the blow-off cocks as heretofore arranged shall be avoided.

In the accompanying drawings, in which similar letters of reference indicate like parts, Figure 1 is an end view and half cross-section of a locomotive provided with my invention. Fig. 2 is a longitudinal section. Fig. 3 is a plan of the principal parts of my invention. Figs. 4, 5, and 6 show the different positions of the cocks.

A metal vessel, A, is placed between the steam-cylinders M M'. This vessel forms the recipient for the water and steam from the cylinders M M' and steam-chests N N', the blow-off cocks H' H² H³ H⁴ H⁵ H⁶ on the cylinders and steam-chests being connected with the vessel A by means of pipes a a a.

H' H² are the blow-off cocks for the two ends of one of the cylinders. H³ is the blow-off cock for the steam-chest of the same cylinder. H⁵ and H⁴ are the blow-off cocks for the other steam-cylinder and steam-chest.

The vessel A, by means of a tube, B, communicates with the locomotive-chimney, so that the steam in the vessel A can escape freely through the chimney.

The blow-off cocks H' and H⁵, as represented in the drawings, Figs. 1 and 5, are situated in the direction of the axis of the shaft or bar D, and are directly operated by said bar, which swings in fixed bearings. Arms d' d' on the shaft D, links b, and arms d d on the blow-off cocks are the means for opening and closing the blow-off cocks by turning the shaft D in its bearings. Another arm, c', on the shaft D, together with the link e, forms the means for operating a water-cock, C, which is placed at or near the bottom of one end of the vessel A. The arms or levers d and c are of unequal

length, so that for equal swing of the shaft D the cock C will have a greater angular motion than the cocks H' H² H³ H⁴ H⁵ H⁶, for the purpose hereinafter explained.

The shaft D is turned from the rear end of the locomotive by any of the known means for transmitting motion, such as an arm on the shaft D, a vertical rod (shown in dotted lines in Fig. 2) connecting with a bell-crank lever secured on top of the boiler, and a horizontal rod sliding in one or more guides, with a handle within reach of the engineer.

Figs. 4, 5, and 6 are diagrams illustrating the different relative positions of the stop-cocks. H represents therein the blow-off cocks H' H² H³ H⁴ H⁵ H⁶ on the steam-cylinders and steam-chests; d, the arms or levers by which they are turned. C is, as above, the water-cock of the vessel A, having the shorter arm c. The two arms, connected, as in Figs. 4, 5, and 6, by a link, take the relative motion as by the apparatus in Figs. 1, 2, 3.

Fig. 4 shows the blow-off cocks H open, while the water-cock C on the vessel A is closed by the extreme position of the arms toward the right.

Fig. 5 shows both cocks H and C closed by the medium position of the arms.

Fig. 6 shows the water-cock C on the vessel A open and the valves H closed, by the extreme position of the arms to the left.

Thus, with one rod or handle the engineer is enabled to turn all the cocks on the steam-cylinders and steam-chests, so as to discharge water and steam into the vessel A, allowing the steam to escape through the chimney without squirting water or steam sidewise or on the track. By further movement he can shut off all the cocks, and by still further movement he can discharge the water from the vessel A through the cock C. By this arrangement all the noise caused by the opening of the blow-off cocks is prevented.

In starting with a very full boiler the cylinders and valve-chests are easily kept free from water, and the engineer may discharge the water from the vessel A at any place that may be convenient, without being compelled to do so whenever he opens the blow-off cocks on the cylinders and valve-chests.

What I claim is—

1. In a locomotive, the vessel A, arranged between and parallel with the steam-cylinders M M' and steam-chests N N', and provided with a pipe extending from said vessel upward into the smoke-stack, in combination with pipes *a a*, connecting the steam-cylinders and chests with the end of the said vessel, and automatically operating blow-off cocks for the said cylinders and chests, all arranged for operation substantially as described.

2. In a locomotive, a vessel connected with the blow-off cock or cocks and with the chim-

ney, and provided with a cock for emptying the same, in combination with means for operating the cocks in such a manner that by the extreme and medium positions of the operating-handle the blow-off cocks alone may be opened, or the water-cock on the vessel alone may be opened, or both the blow-off cocks and the water-cock may be closed, substantially as shown and described.

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Witnesses:

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