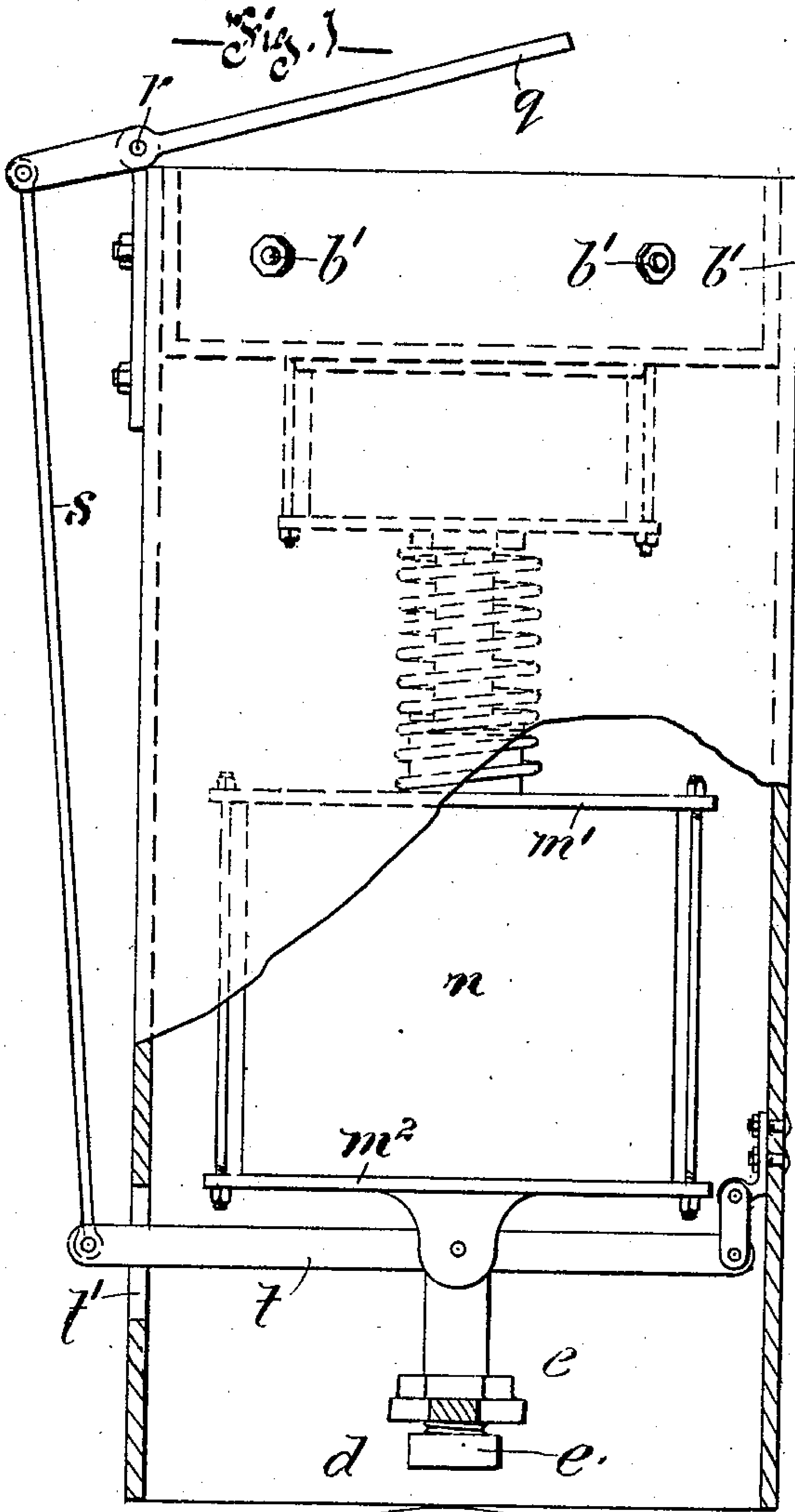
(No Model.)

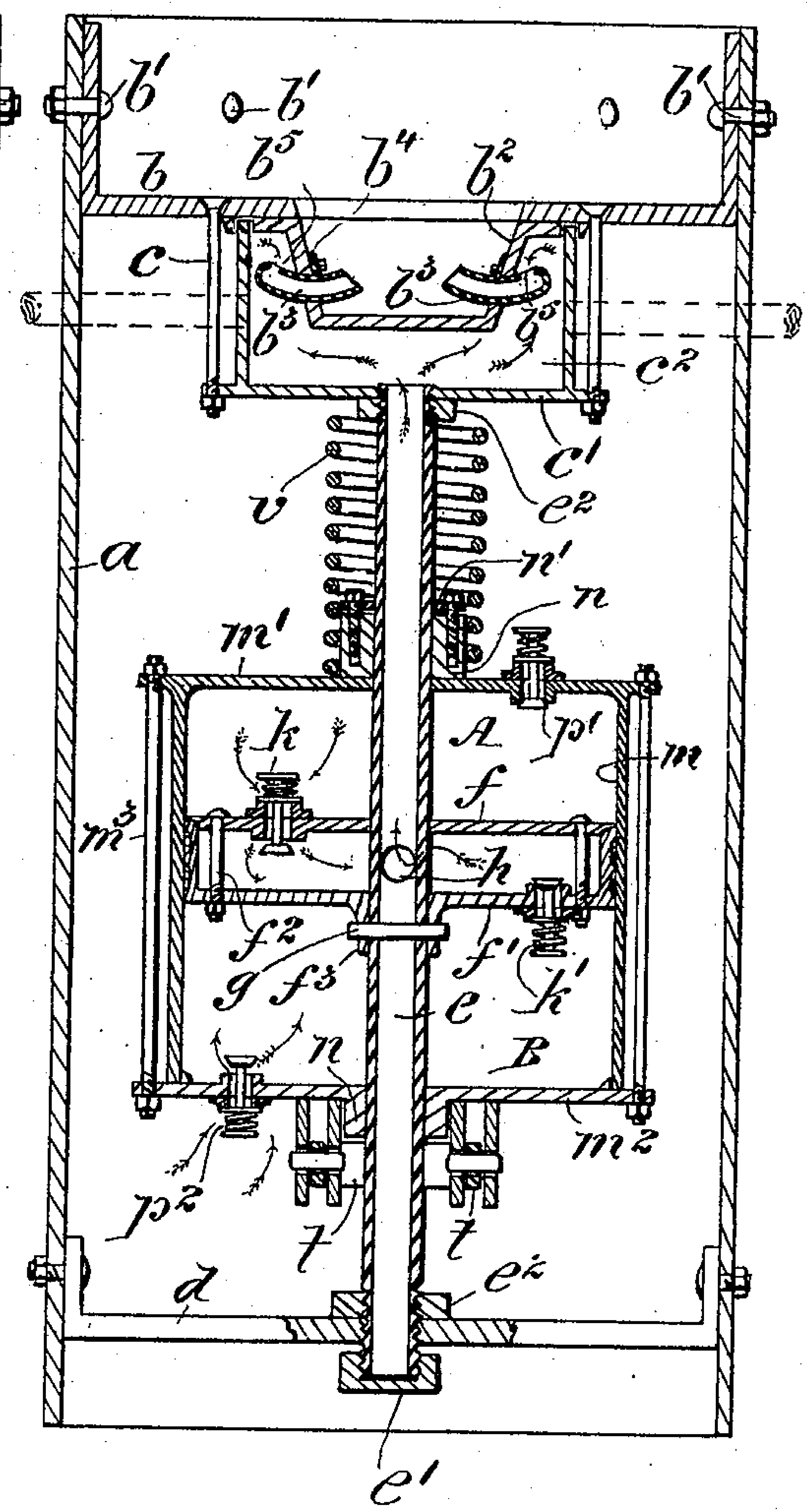
W. ROSS.
FORGE.

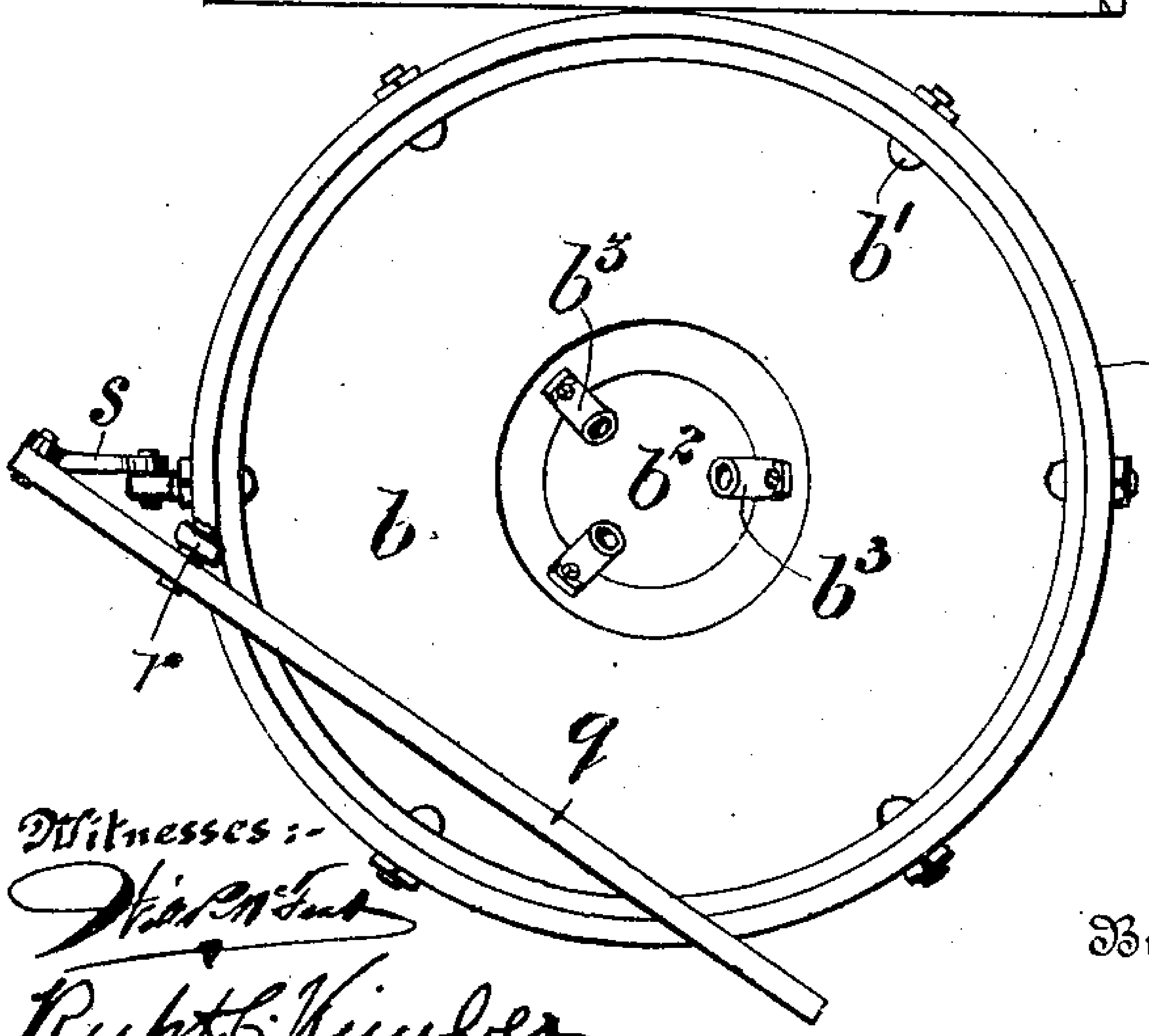
No. 576,794. Patented Feb. 9, 1897.

—Fig. 1—



—Fig. 2—





—Fig. 3—

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UNITED STATES PATENT OFFICE.

WILLIAM ROSS, OF MONTREAL, CANADA.

FORGE.

SPECIFICATION forming part of Letters Patent No. 576,794, dated February 9, 1897.

Application filed June 5, 1895. Serial No. 551,791. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM ROSS, of the city of Montreal, in the district of Montreal and Province of Quebec, Canada, have invented certain new and useful Improvements in Forges; and I do hereby declare that the following is a full, clear, and exact description of the same.

This invention has for its object to produce a blacksmith's forge of simple and durable construction and one that will be much more effective than those at present in use, and portable.

To such ends the invention consists in the matters hereinafter set forth, and pointed out in the appended claims.

In the accompanying drawings, which illustrate one practicable and desirable form in which my invention may be embodied, Figure 1 is a side elevation, partly broken away, of a forge constructed according to my invention; Fig. 2, a vertical section of same, and Fig. 3 a plan view thereof.

As a body, frame, or support I prefer to use an open-ended metal cylinder length a, which stands on end and carries at its upper end the fire-pot or receptacle for the fuel, the bottom of which is also preferably constructed of a flanged ring b, secured by bolts b' to the cylinder-frame, and a flanged fire-pot section proper, b^2, held against the under side of the ring b by means of bolts c, serving to secure a boxing c' in place, so as to inclose the fire-pot section b^2 and provide a hot-air chamber c^2 about same, the edges of the boxing fitting against the flanges of the section and thus holding the latter in place.

The side of the fire-pot section b^2 is perforated to allow of a number of removable twyers b^3 being located therein and secured in place by screw b^4, passing through eyes in lugs thereon, the twyers being in the form of short tubular sections horizontally and radially placed, as shown, and preferably bowed, so that their ends are turned upward. The outer ends of the twyers are stopped and inlets b^5 provided in their upper sides for the entrance of air, while the inner ends direct the air at the desired angle centrally of the fire, the bowed or curved form of the twyers serving to arrest any dust that might enter and allow of its being blown out, thus preventing its entrance to the pumping mechanism.

Extending between this boxing c' and a transverse bar or support d, carried by the frame near the bottom thereof and perforated to receive it, is a tubular guide e, located centrally of the apparatus and with its upper end passing through an aperture in the boxing c', so as to be in open communication with the hot-air chamber c^2 and its lower end closed by a cap e', which latter, with jam-nuts e^2 e^2, serves to retain it in place.

The tubular guide e carries about centrally of its length a stationary hollow piston preferably formed of two disks f f', secured together by bolts f^2, and the one f flanged and having a hub portion f^3, through which it is secured to the guide e by a pin g, passing through both hub and guide. The tubular guide is perforated at h to communicate with the interior of the piston, and the disks f f' of the latter are each perforated and provided with a check-valve k k', respectively, which valves are both normally closed when the forge is not in use, but each alternately opened and closed during operation, as will be described farther on.

A movable air-pumping cylinder is fitted over the hollow piston, being mounted to slide up and down the tubular guide e and operated by means to be presently described. The cylinder is preferably formed of end pieces or heads m' m^2 and a cylindrical side or body piece m, formed integral with the end piece m', and the whole held firmly together by means of bolts m^3, each end piece being formed with a hub portion n and, if desired, provided with a stuffing-box, as shown at n', and also perforated and having a check-valve p' p^2, respectively, adapted to operate as will be presently described.

The pumping-cylinder is operated, preferably, by means of a hand-lever q, fulcrumed at r to a bracket at the top of the frame a and connected by a rod s with the outer end of a second lever t, projecting through a slot t' in the frame a and having its inner end pivotally connected, as at u, with the interior of the frame, the pumping-cylinder being pivotally connected with the central portion of the lever, which is looped to encircle the tubular guide e.

As an auxiliary device, for the purpose of starting the cylinder in its downward movement, a coiled spring encircling the guide between the boxing c' and the top of the pumping-cylinder, as shown at v, may be employed.

In operation the up-and-down movement of the pumping-cylinder will cause air to alternately enter the cylinder-chambers A B on either side of the piston, the check-valve p' being open as the cylinder ascends and closed as it descends, and the valve p^2 being closed as the cylinder ascends and open as it descends, while the valve k in the piston is closed as the cylinder ascends and open as it descends, and the valve k open as the cylinder ascends and closed as it descends, the drawings illustrating the operation of the various valves as the cylinder descends. It will thus be seen that in ascending the chamber A of the pumping-cylinder receives and becomes filled with air, while the air in chamber B is forced through the valve k' into the hollow piston and thence through the tubular guide e to the chamber c^2, surrounding the fire-pot proper, where it can be heated before passing through the twyers to the fuel, while in descending the same action is repeated reversely, fresh air entering chamber B and the air in chamber A being forced to the twyers.

If desired a large number of fire-pots could be blown from a single pumping mechanism of the construction shown, and preferably operated by steam or other power, as it would only be necessary to connect the several air-chambers c^2 by conductors, as indicated by dotted lines in Fig. 2.

What I claim is as follows:

1. In a forge, the combination of a frame or support, a fuel-receptacle or fire-pot, an air-conductor in communication with said receptacle or fire-pot, an intact stationary hollow piston of inclosing rigid cylindrical form, carried by said conductor communicating therewith, and provided with an inlet in each end thereof and a separate and independently-operating valve for each inlet, a movable cylinder encircling and inclosing such piston, provided with valve-controlled inlets and adapted to receive and force air into said piston and means for actuating such cylinder for the purpose set forth.

2. In a forge, the combination of a frame or support, a fuel-receptacle or fire-pot, an air-conductor extending vertically beneath said receptacle or fire-pot and communicating with same, an intact stationary hollow piston of inclosing rigid cylindrical form carried by said air-conductor with its inner space in communication with the inner space of such conductor and provided with an inlet in each end thereof and a separate and independently-operating valve for each inlet and a movable cylinder encircling and inclosing such piston, provided with valve-controlled inlets and adapted to receive and force air into said piston with means for actuating such cylinder, for the purpose set forth.

3. In a forge, the combination of a frame or support, a fuel-receptacle or fire-pot, an air-conductor in communication with said receptacle or fire-pot, an intact stationary hollow piston of inclosing rigid cylindrical form, carried by said conductor communicating therewith, and provided with an inlet in each end thereof and a separate and independently operating valve for each inlet, a movable cylinder encircling and inclosing such piston, provided with valve-controlled inlets.

4. In a forge, a fuel-receptacle or fire-pot having twyers extending through its sides, the twyers being curved and placed with their convex sides undermost, for the purpose set forth.

5. In a forge, a fuel-receptacle or fire-pot having twyers extending through its sides, the twyers being curved and placed with their convex side undermost their inner ends open and their outer ends closed and inlets in the uppermost side of same near the closed ends for the purpose set forth.

6. The twyer of curved form and with open and closed ends and an inlet in the concave side thereof near the closed end, for the purpose set forth.

7. In a forge, the combination with a fuel-receptacle or fire-pot, of a hot-air chamber encircling same, an air-inlet to the chamber and inlets from the chamber to the fire-pot in the form of curved twyers placed with their convex side undermost extending transversely through the sides of the fire-pot, for the purpose set forth.

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