

No. 662,448.

Patented Nov. 27, 1900.

M. LEITCH.
DRYING APPARATUS.
(Application filed Nov. 6, 1897.)

(No Model.)

FIG. 1.

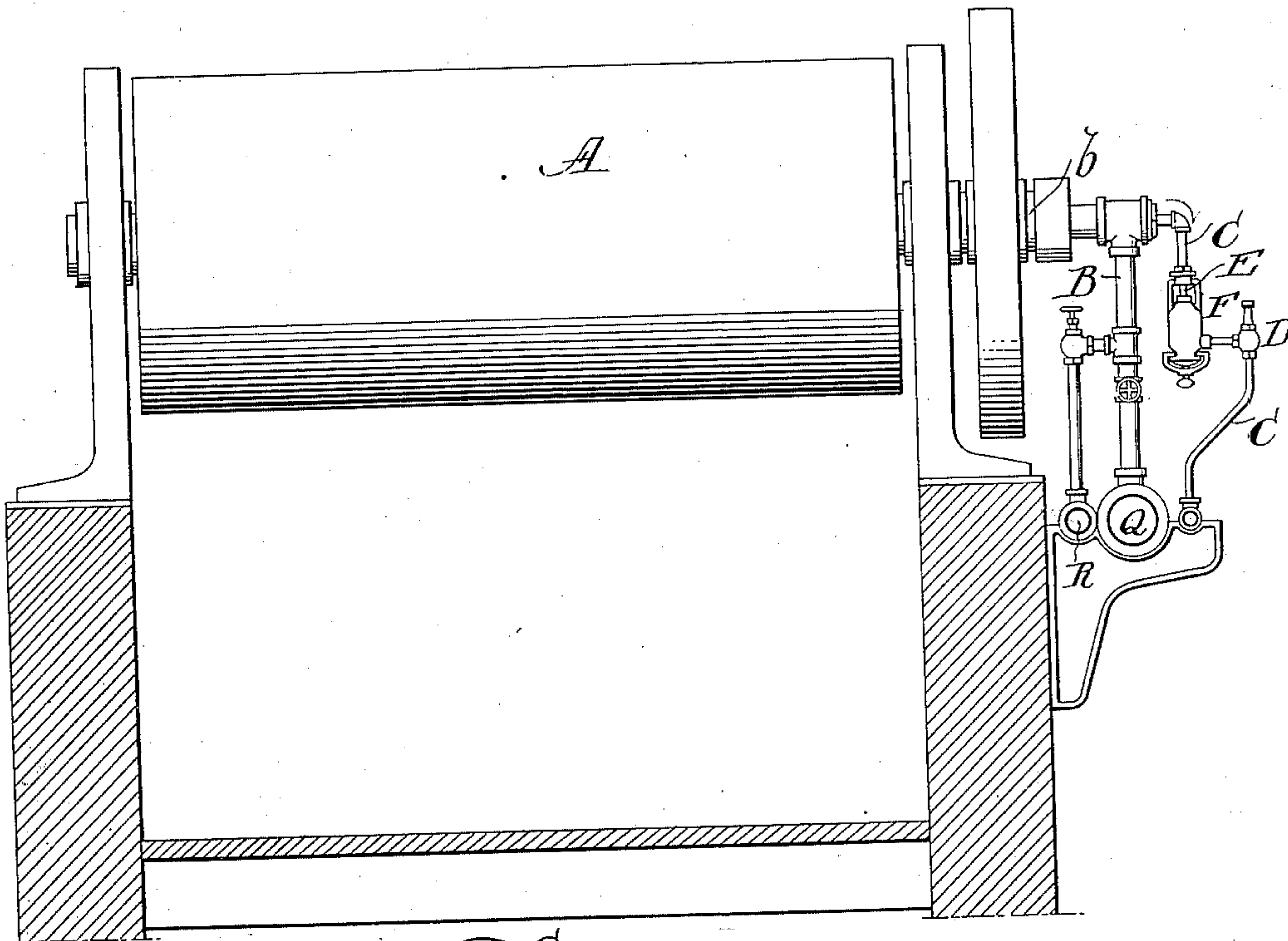


FIG. 2.

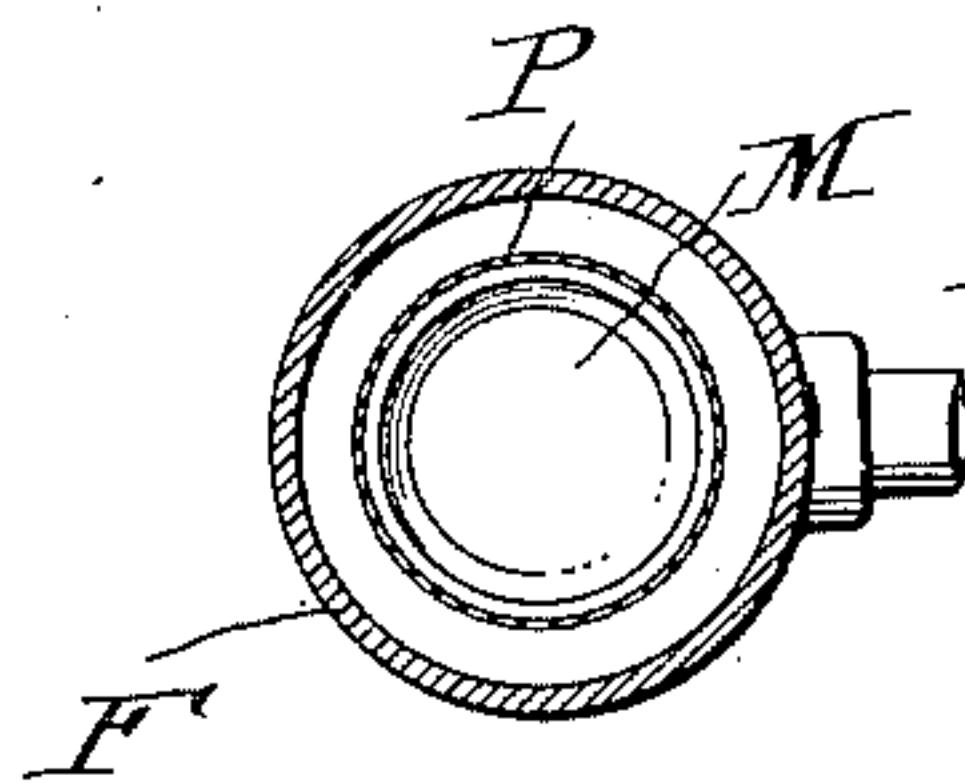
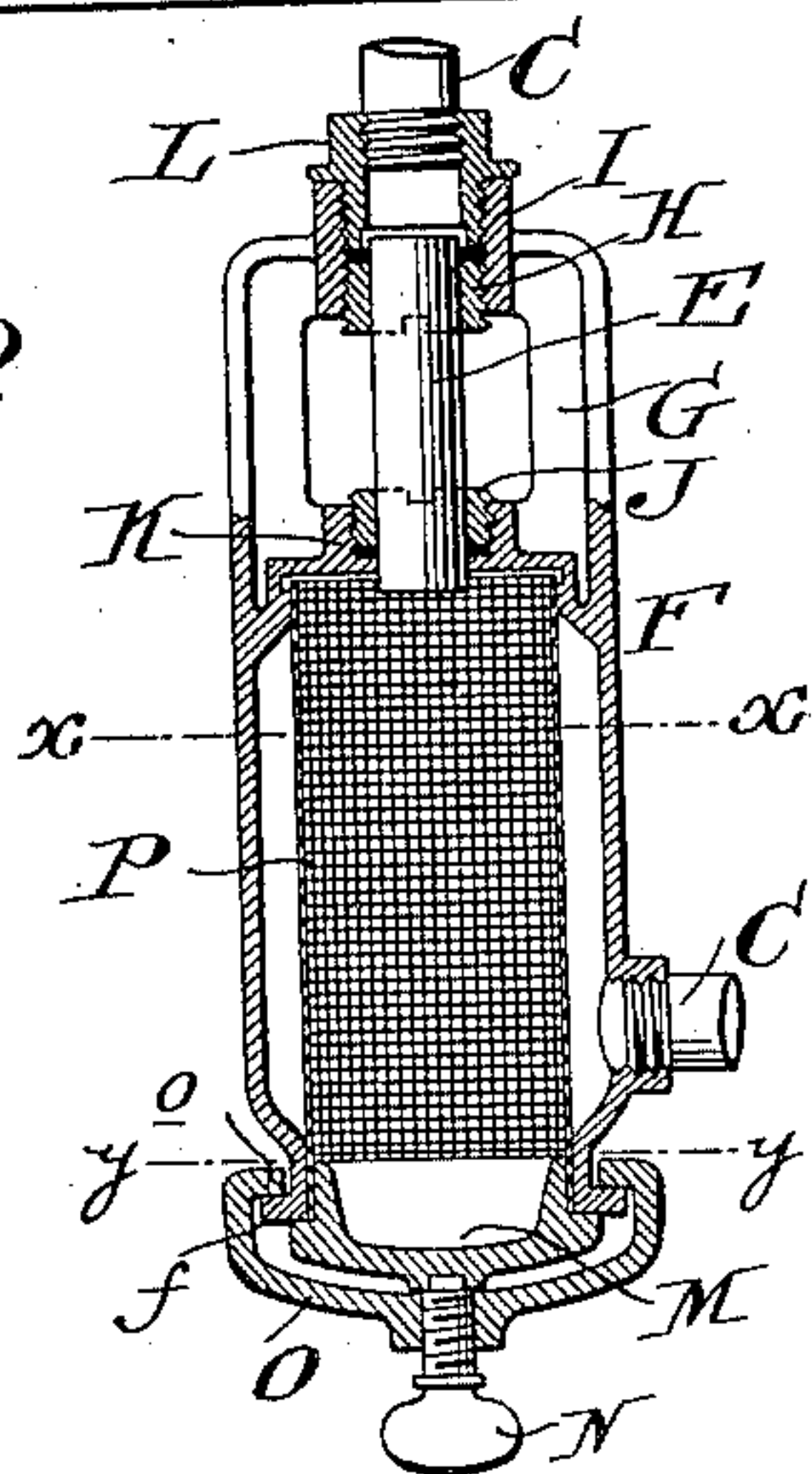


FIG. 3.

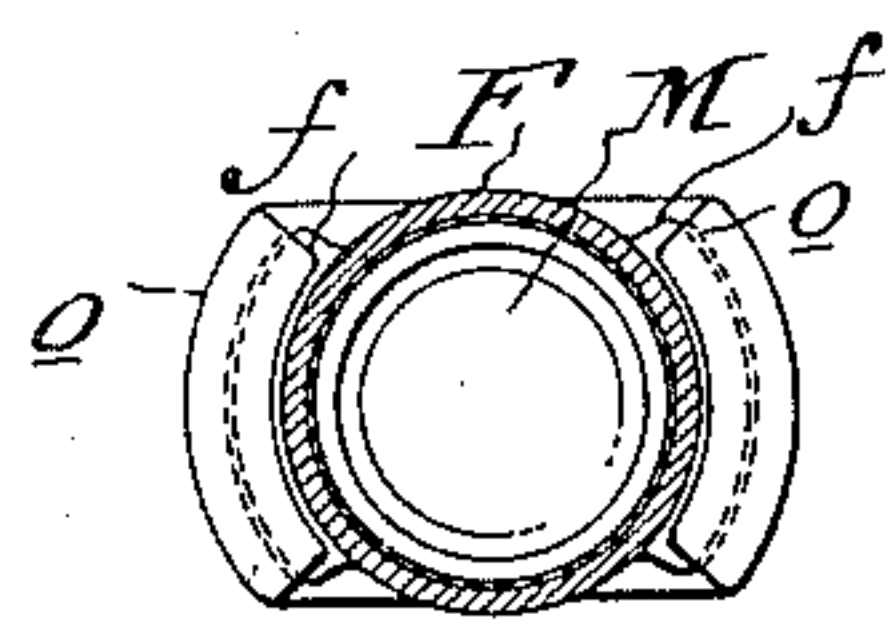


FIG. 4.

WITNESSES:

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By his atty

[Signature]

UNITED STATES PATENT OFFICE.

MEREDITH LEITCH, OF MERCHANTVILLE, NEW JERSEY, ASSIGNOR TO THE
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DRYING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 662,448, dated November 27, 1900.

Application filed November 6, 1897. Serial No. 657,600. (No model.)

To all whom it may concern:

Be it known that I, MEREDITH LEITCH, of Merchantville, Camden county, State of New Jersey, have invented an Improvement in Drying Apparatus, of which the following is a specification.

My invention relates to drying apparatus; and it consists of the improvements which are fully set forth in the following specification and are shown in the accompanying drawings.

In drying apparatus employing internally-heated rotary drums, cylinders, or cans—such as paper-dryers, slashers, &c.—difficulty is experienced in properly effecting the discharge of the water of condensation of the steam used as the heating medium from the interior of the cylinders through the siphons, buckets, or other water-discharging means employed.

In some cases the discharge of the water of condensation and air is effected by the maintenance of a partial vacuum in the return or discharge pipe or a lower pressure therein than exists in the cylinder or drum. The proper operation of the apparatus requires the careful adjustment and regulation of the valves in the discharge-pipe and of the vacuum-pump or exhausting devices to regulate the partial vacuum or difference in pressure when the discharge is effected by a partial vacuum or difference in pressure in the return or discharge pipe. In apparatus as heretofore constructed this necessary adjustment and regulation to suit changes in the conditions of operation has been attended with considerable difficulty, and it is one of the objects of my invention to enable the apparatus to be regulated with facility and accuracy.

My invention also relates to the employment of a dirt-trap and to the construction and arrangement thereof to arrest the sediment and particles of dirt that may be present in the water of condensation discharged from the cylinders and prevent them passing through to the regulating-valve, which is particularly objectionable in those cases where a thermostatic or automatic regulating-valve is employed.

In the accompanying drawings I have shown my invention applied to a single drying cylinder or drum; but it will be understood that in practice it may be applied to a series there-

of, such as is usually employed in drying-machines, each being connected with the supply and discharge mains and having my improvements applied to the return or discharge pipe of each cylinder leading to the return-main.

Figure 1 is a front elevation of a drying apparatus embodying my invention. Fig. 2 is a vertical sectional view, enlarged, of the detached gage and dirt-trap; and Figs. 3 and 4 are horizontal sectional views of the same on the line *x x* and *y y*, respectively.

A is a rotary drying cylinder or drum of any character—such, *e. g.*, as is used in paper-drying machines or slashers—to the interior of which steam is supplied by a supply-pipe B through the hollow journal *b* and from which the water of condensation, air, and vapors are discharged, by means of siphons or buckets, in the manner well known through the usual discharge-pipe C, in which a partial vacuum or pressure below that of the cylinder may be maintained. I have shown the supply-pipe B connected with the exhaust-steam main Q and also with a reduced live-steam main R, by which live steam may be supplied when a temperature greater than that of exhaust-steam is required.

D is a valve of any convenient construction located in the discharge-pipe C, by which the passage of water of condensation, air, and steam in the pipe C may be controlled. I prefer to use a thermostatic valve of any suitable construction, which opens to permit the escape of water of condensation, air, and uncondensed vapors, but closes to the passage of steam, whereby the cylinder may be kept free from the accumulation of water and air, but the escape and waste of steam may be prevented.

The details of construction of the thermostatic valve D are not shown; but a valve especially adapted for the purposes is described in Letters Patent to Serrell & Leitch, No. 600,653, dated March 15, 1898.

E is a transparent gage-tube, of glass or other suitable material, interposed in the discharge-pipe C between the outlet from the cylinder and the valve D, through which the escaping water of condensation passes before reaching the valve D.

F is a dirt-trap also interposed in the pipe C between the outlet from the cylinder and the valve D, by which sediment and particles of matter in the water of condensation may be arrested and prevented from passing to the valve D. As shown, this dirt-trap consists of a small hollow receptacle communicating at the top with the portion of the discharge-pipe C, leading from the cylinder A, and at the bottom with the portion of the discharge-pipe which leads to the valve D.

I have shown the upper portion of the trap formed with an open frame or cage G, in which the sight-tube or glass gage E is located, which is shown carried at its upper end in a nut H, screwed into the annular collar I of the cage G, and at its lower end in a nut J, screwed into a collar K in the top of the receptacle F.

L is a coupling-nut receiving the end of the upper portion of the discharge-pipe C and screwed into the collar I above the nut H. The sight tube or gage E thus forms a substantial continuation of the upper portion of the discharge-pipe C into the trap or receptacle F.

M is the removable bottom of the trap F, which is supported by a set-screw N, carried by a cap O, having flanges o, which engage flanges f on the bottom of the trap F. By turning the cap O so as to disengage the flanges o thereof from the flanges f the cap O and with it the bottom M may be removed to discharge the dirt.

P is a dirt-screen, such as gauze-wire, within the trap F, shown as secured at its lower edge between the removable bottom M and the orifice in the base of the trap F, to catch the sediment and small particles of matter and prevent them passing into the pipe C beyond the trap.

The water of condensation, air, and uncondensed vapors pass from the outlet of the cylinder through the discharge-pipe C and through the sight or gage tube E to the valve. Any dirt or sediment is arrested by the screen P and caught in the dirt-trap F, from which it may be discharged by removing the bottom M.

The passage of the water of condensation being visible in the sight-tube E will show at a glance the operation of the apparatus, so that the valve D or suction-creating device may be regulated accordingly if the apparatus is not operating properly. If an excess of water passes through the tube E, it indicates that the water of condensation is permitted to accumulate in the cylinder, in which case the valve D, in the case of an ordinary hand-valve, should be opened wider or the suction in the return-line C, in the case of a vacuum system, should be increased. In this way the operation of the system may be regulated and kept uniform, notwithstanding changes in the conditions of operation.

The details of construction which have been shown may be varied without departing from my invention.

What I claim as new, and desire to secure by Letters Patent, is as follows:

1. The combination with the discharge-pipe for the water of condensation, of the valve for controlling the flow of said water of condensation, and a dirt-trap interposed between the outlet to said discharge-pipe and the valve, consisting of a body F provided with a frame G for connection with the discharge-pipe, and a sight or gage tube E carried by the frame G and extending into the body F.

2. The combination with the discharge-pipe for the water of condensation, of the valve for controlling the flow of said water of condensation, and a dirt-trap interposed between the outlet to said discharge-pipe and the valve, consisting of a body F provided with a frame G for connection with the discharge-pipe, and a sight or gage tube E carried by the frame G and extending into the body F and connected with the frame G and body F by nuts H, J, respectively.

In testimony of which invention I hereunto set my hand.

MEREDITH LEITCH.

Witnesses:

ERNEST HOWARD HUNTER,
J. W. KENWORTHY.