

No. 721,139.

PATENTED FEB. 24, 1903.

J. BERG.
CINDER HOPPER.

APPLICATION FILED SEPT. 18, 1902.

2 SHEETS—SHEET 1.

NO MODEL.

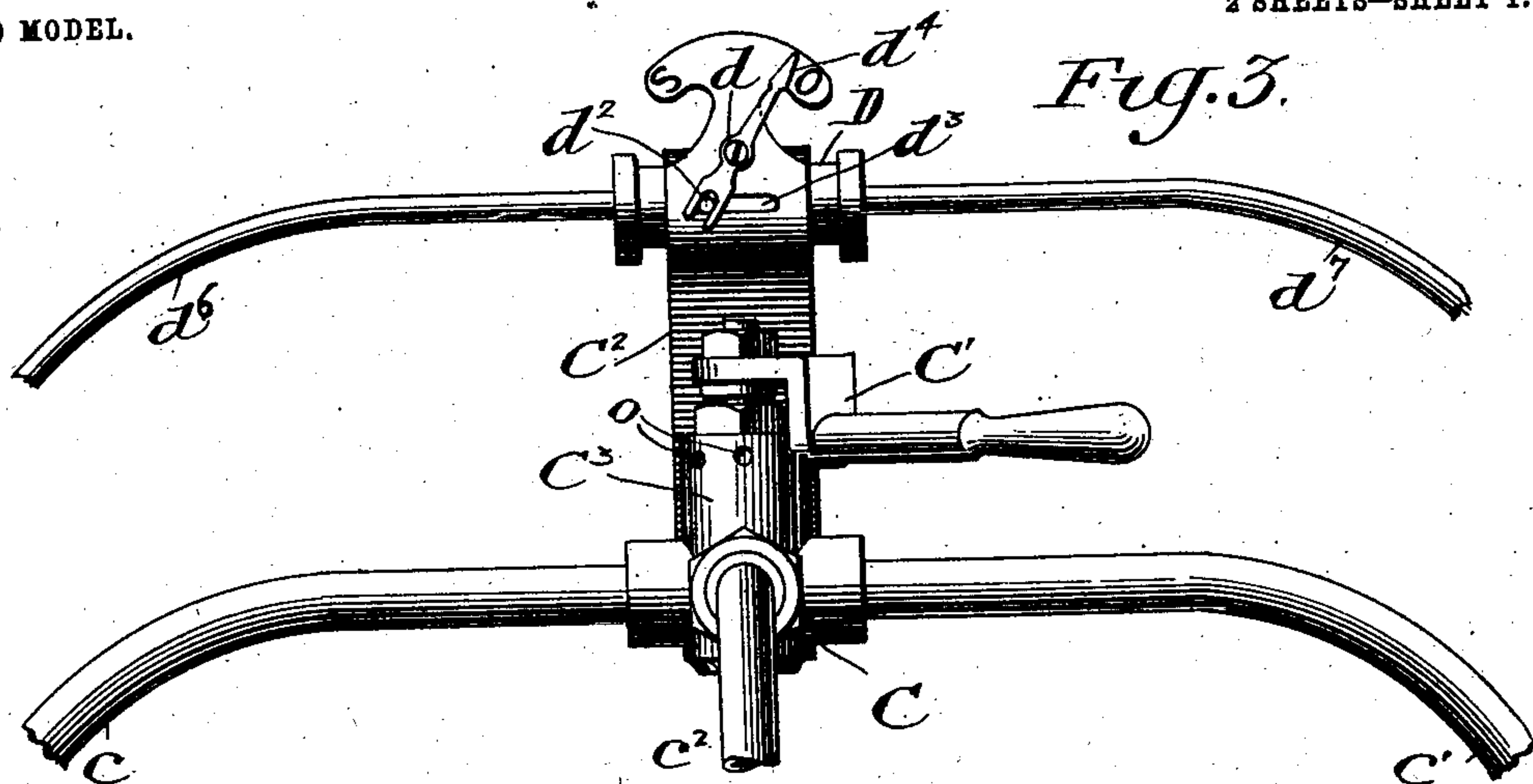


Fig. 1

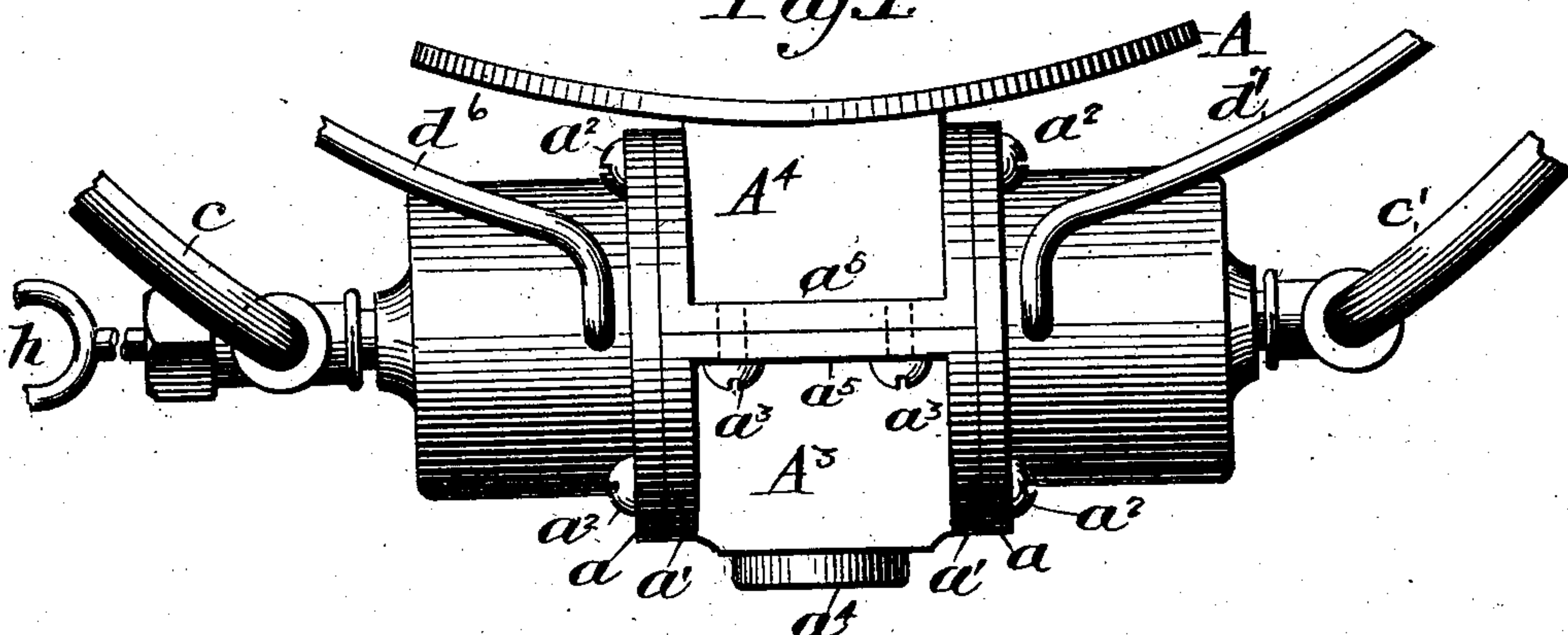
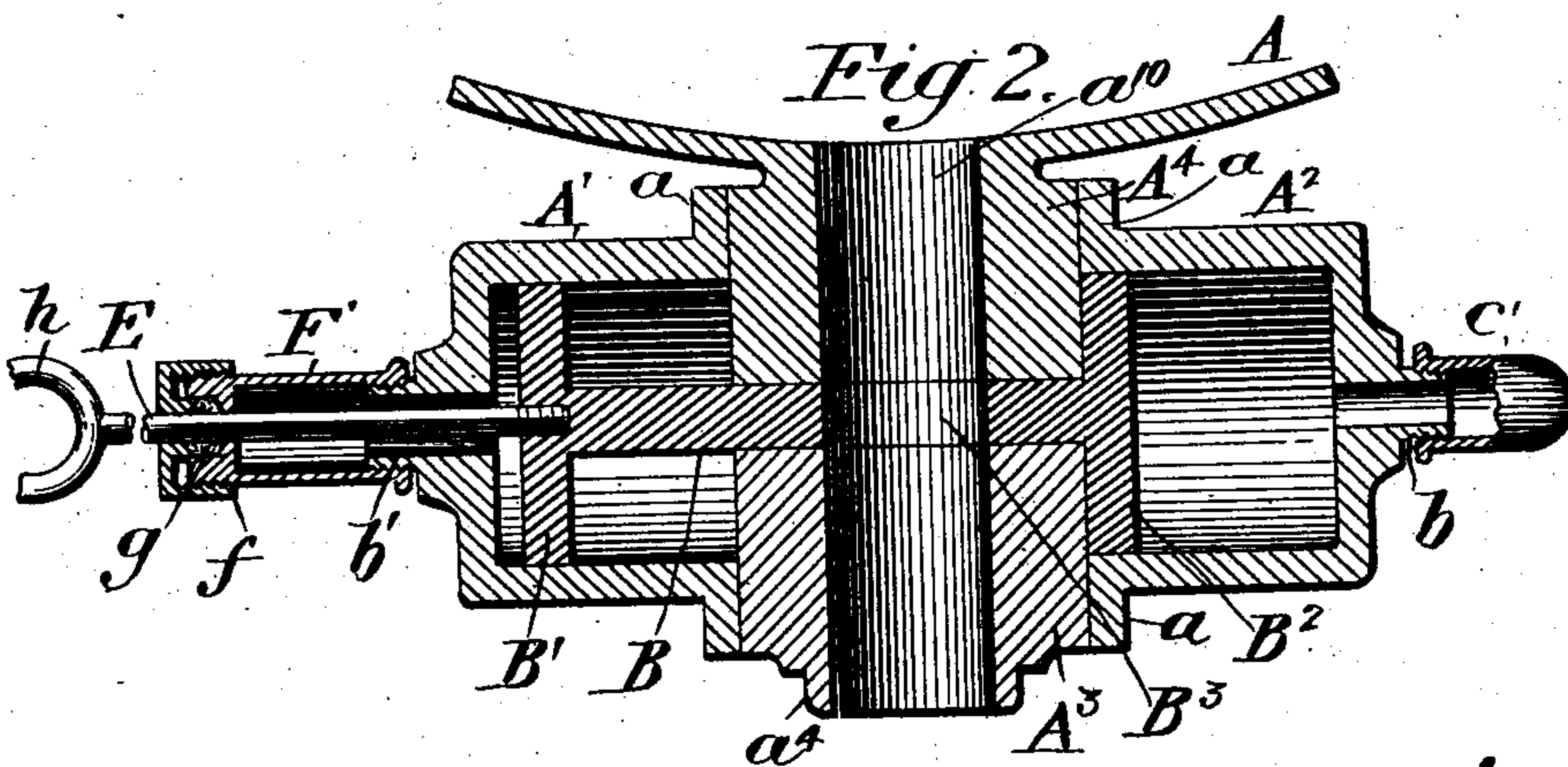


Fig. 2.



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No. 721,139.

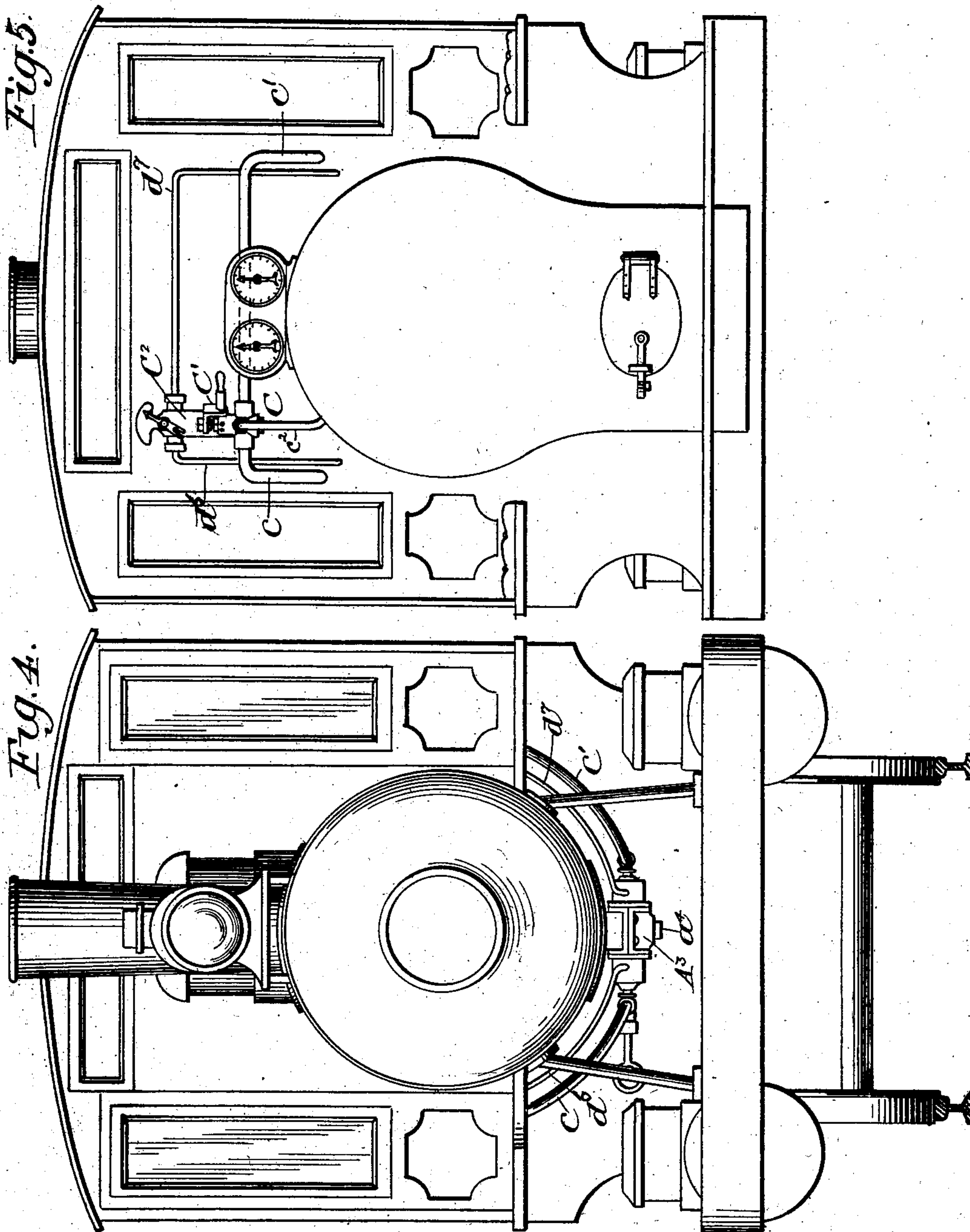
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NO MODEL.

2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

JOSEPH BERG, OF LITTLE ROCK, ARKANSAS, ASSIGNOR OF THREE-FOURTHS
TO JOHN E. COATES, THOMAS E. GLYNN, AND MATHIAS LAUX, OF LITTLE
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CINDER-HOPPER.

SPECIFICATION forming part of Letters Patent No. 721,139, dated February 24, 1903.

Application filed September 18, 1902. Serial No. 123,937. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH BERG, a citizen of the United States, residing at Little Rock, in the county of Pulaski and State of Arkansas, have invented certain new and useful Improvements in Cinder-Hoppers, of which the following is a specification, reference being had to the accompanying drawings.

The invention to be hereinafter described relates to cinder-hoppers, and more particularly to the means employed for operating the cut-off or hopper-plug to discharge the accumulation of cinders from the extension front end of a locomotive, and it is designed especially as an improvement over the form of such devices as disclosed in the patents to Laux, No. 679,083, of 1901, and No. 703,603, of 1902. It is a generally well-known fact that in the ordinary type of locomotive the cinders passing through the flues of the boiler and not carried directly out of the smoke-stack fall back and accumulate in the extension front end of the locomotive, and unless this accumulation is kept to a minimum quantity the draft becomes more direct and acts with increasing intensity upon the fire, tearing it up and, in fact, drawing an increased number or quantity of cinders through the flues, the effect of which is a drop in steam-pressure, which the fireman endeavors to counteract by an increased consumption of fuel. Means have heretofore been devised, as shown by the Laux patents referred to, to overcome these difficulties and to provide the extension front end with a discharge-hopper which might from time to time let the cinders and other accumulated matter fall from the extension front end to the ground between the tracks. Such forms of prior cinder-hoppers have been open to the charge of complication, either in the general construction thereof or the means for operating them.

It is therefore one of the objects of my invention, as generally stated, to provide a cinder-hopper of an improved construction whereby the parts shall be simplified and mechanically perfected to enable the operation of the hopper to be performed easily and without liability of clogging, and I also, as one of the objects of my invention, so construct the

cinder-hopper as that it may be readily taken apart and reassembled when desired or necessary to enable repairs or cleaning to be effected.

In the drawings, Figure 1 is a detached view of my cinder-hopper with the piping leading to the cab of the locomotive broken away. Fig. 2 is a vertical section of the parts shown in Fig. 1 centrally through the same. Fig. 3 is a front view of the arrangement of piping and valves and indicator within the cab. Fig. 4 is a front view of a locomotive with my invention applied thereto, and Fig. 5 is a view looking into the cab of the locomotive.

I have not deemed it necessary in the drawings to illustrate the entire locomotive, its cab, and other accessories, as these are and may be all of the same general type as shown in the patents to Laux, hereinbefore mentioned and to which reference may be had, although to define more clearly in the drawings of this case the application of my invention I have shown a front view and a view into the cab of a locomotive.

The discharge chute or plug through which the cinders are expelled from the extension front end comprises the two-part portion $A^3 A^4$, the latter of which has a flange or plate either formed integral therewith or attached thereto in any approved manner. The two portions $A^3 A^4$ of the discharge-chute are preferably provided with suitable flanges at their connecting ends, as $a^5 a^5$, whereby they are detachably secured together by suitable screw-bolts or otherwise a^3 . Extending circumferentially at each end of each portion $A^3 A^4$ is a flange a' , to which by another suitably-formed flange a on the adjacent faces thereof are two cylinders $A' A^2$, connected to the discharge-chute and the portions $A^3 A^4$ by means of suitable screw-bolts or otherwise a^2 . When the parts $A^3 A^4$ of the discharge-chute are secured together, the openings a^{10} in each of said parts will be in prolongation of each other and serve to form an opening the entire length of the discharge-chute or portions $A^3 A^4$ for the discharge of the cinders. Formed on the lower portion of the piece A^3 is a flange a^4 , suitably shaped to receive and have secured upon it any ordinary form of piping

or otherwise to carry the cinders below the locomotive to the space between the tracks.

The cylinders $A' A^2$ are provided each with its piston $B' B^2$, adapted to reciprocate in said cylinders, as will be obvious, and these cylinders are connected by a perforated plate B, the perforation of which plate is to one side of the central portion thereof. Corresponding to the size of the plate B and adapted to contain said plate during its reciprocating movement a suitable aperture is formed between the portions $A^3 A^4$ of the discharge chute or plug, the plate itself passing through said aperture and connected at its ends with the pistons $B' B^2$.

Projecting from the ends of the cylinders $A' A^2$ are suitable pipe-connecting devices $b b'$. To the pipe-connecting device b on cylinder A^2 is connected the fluid-pressure pipe c' , which leads to the cab of the locomotive, as will hereinafter appear.

To the pipe-connecting device b' from the cylinder A' is connected a coupling F' , to which is jointed in any suitable manner the pressure-pipe c , leading likewise from the cab of the locomotive. Passing axially through the coupling F' is a rod E' , screw-threaded at one end to engage, as shown, one end of the plate-connected pistons $B' B^2$, and having on its other end a suitable hand-operating ring h , the end of the coupling F' being provided with suitable screw-threads f to be engaged by a packing-nut g , as usual in steam-fitting devices.

From the construction thus far described, it will be evident that if fluid-pressure is admitted to the cylinder A^2 through the piping c' , the plate-connected pistons $B' B^2$ will both be moved to the left to bring the aperture B^3 in the plate B into coincidence with the openings a^{10} in the portions $A^3 A^4$ of the discharge chute or plug, and in this position the cinders will be discharged. It is likewise obvious that if now fluid-pressure be admitted to the piston B' to the left through the fluid-pressure pipe c the action thereof upon the piston B' will cause the plate-connected pistons to move to the right, thus taking the opening B^3 of the plate B out of coincidence with the openings a^{10} in the plug and closing the passage through the plug or discharge-chute. If for any reason it is desired to operate the device manually, it is only necessary, as will be evident, to pull upon or pull the rod E by means of the ring or knob h .

Referring to Figs. 3 and 5, which disclose sufficient of the device to show the arrangement thereof in the cab of the locomotive, the pressure device $c c'$, leading to a three-way cock C, has a supply-pipe c^2 , leading to the boiler of the locomotive or to a compressed-air supply. By manipulation of the handle C' of the three-way cock, which may be of any usual construction, not necessary herein to further illustrate or describe, the

pressure-fluid through the pipe c^2 may be transmitted to the cylinders $A' A^2$ at will.

In order that the engineer may be always informed as to the position of the plate-connected pistons $B' B^2$, and consequently know whether the chute is open or closed, there is disposed in the cab a suitable indicator d^4 , pivoted at d and having a slotted end which engages a pin d^2 on the piston, contained within a suitable cylinder of small size, as D, the pin during the movement of the piston working back and forth in the slot d^3 , as will be evident. Connected to the opposite ends of the cylinder D are the pipes $d^6 d^7$, which lead, respectively, to the cylinders $A' A^2$, and consequently when fluid-pressure is admitted to either one or the other of said cylinders the piston and cylinder B will be correspondingly operated and the indicator d^4 thrown to the right or left between the letters S and O on the plate of the indicator, which signify that the discharge-chute is open or shut.

It will be understood, of course, that the fitting of the plate B between the portions $A^3 A^4$ of the discharge-chute is such that when the openings a^{10} are closed by the plate air cannot enter the extension front end.

I may, if I desire, of course provide the three-way-cock casing C^3 with openings or depressions o , which may be engaged by suitable spring-pressed pins carried by the inner portion of the handle C' of the three-way cock; but this is also of the usual construction and need not be further elucidated. In order that the indicator d^4 and the three-way cock may be in close proximity, I have preferably connected them by an intermediate support C^2 .

The described construction presents, as will be evident, a very small, inexpensive, and effectually-operative device of the character described, and it may be varied in its particular features of structure within limits without departing from the spirit of my invention, which contemplates a central plug or discharge-chute having on either side of it a cylinder, each containing a piston connected by a suitable plate and movable in the aperture in said plug or plate to open or close the discharge-chute.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. The combination of a locomotive-barrel, a cinder-hopper secured thereto and comprising a plug having a discharge-opening there-through, a cylinder on each side of said plug, a piston in each of said cylinders, and a plate connecting said pistons, said plate having a perforation for opening or closing said discharge-opening.

2. The combination of a locomotive-barrel, of a cinder-hopper secured thereto, comprising a discharge chute or plug having an opening therethrough for the discharge of cinders

from the locomotive-barrel, and transversely slotted or perforated, a cylinder on each side of said discharge chute or plug, each containing a piston, and a perforated plate movable
 5 within the transverse slot of the discharge chute or plug for opening or closing the discharge-opening.

3. The combination of a locomotive-barrel, of a cinder-hopper secured thereto comprising
 10 a discharge chute or plug formed of two parts secured together and having a discharge-opening extending through said two parts, and a space separating said parts, a cylinder on each side of said discharge chute or plug,
 15 a piston in each of said cylinders, and a plate movable in the space between said parts of the discharge chute or plug and having an opening for controlling the discharge of cinders through the chute or plug.

20 4. The combination of a locomotive-barrel, a cinder-hopper secured thereto comprising a discharge chute or plug having a discharge-opening therethrough, and a transverse slot, a cylinder on each side of said discharge chute
 25 or plug, a piston in each cylinder, a perforated plate joining said pistons and movable in said slot, a fluid-supply device connected to the cylinders for supplying fluid-pressure thereto.

30 5. The combination of a locomotive-barrel, a cinder-hopper secured thereto comprising a discharge chute or plug having a discharge-opening therethrough, and a transverse slot, a cylinder on each side of said discharge chute
 35 or plug, a piston in each cylinder, a perforated plate joining said pistons and movable

in said slot, a fluid-supply device connected to the cylinders for supplying fluid-pressure thereto, and an indicator located within the
 40 cab of the locomotive, and piping connecting said indicator with each cylinder to show the position of the pistons and plate.

6. The combination of a locomotive-barrel, a cinder-hopper secured thereto and comprising an upper and a lower portion, detachable
 45 means for connecting said upper and lower portions, said portions having a discharge-opening through each, the adjacent ends of said two portions being separated to form a
 50 space, a cylinder on each side of said opening, a piston in each cylinder, and a perforated plate joining said pistons, and means for moving said plate transversely of the discharge plug or chute.

7. The combination of a locomotive-barrel, 55 a cinder-hopper secured thereto and comprising a discharge chute or plug having a discharge-opening therethrough and a transverse slot, a cylinder on opposite sides of said
 60 discharge chute or plug, a piston in each of said cylinders, a perforated plate movable in the slot transverse of said discharge chute or plug, fluid-pressure pipes leading from each of said cylinders to the cab of the locomotive,
 65 an indicator and suitable piping connecting said indicator with each of said cylinders to show the position of the pistons in said cylinders.

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Witnesses:

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