

(No Model.)

2 Sheets—Sheet 1.

H. L. LEACH.
AUTOMATIC TRACK SANDING APPARATUS.

No. 572,428.

Patented Dec. 1, 1896.

Fig. 1.

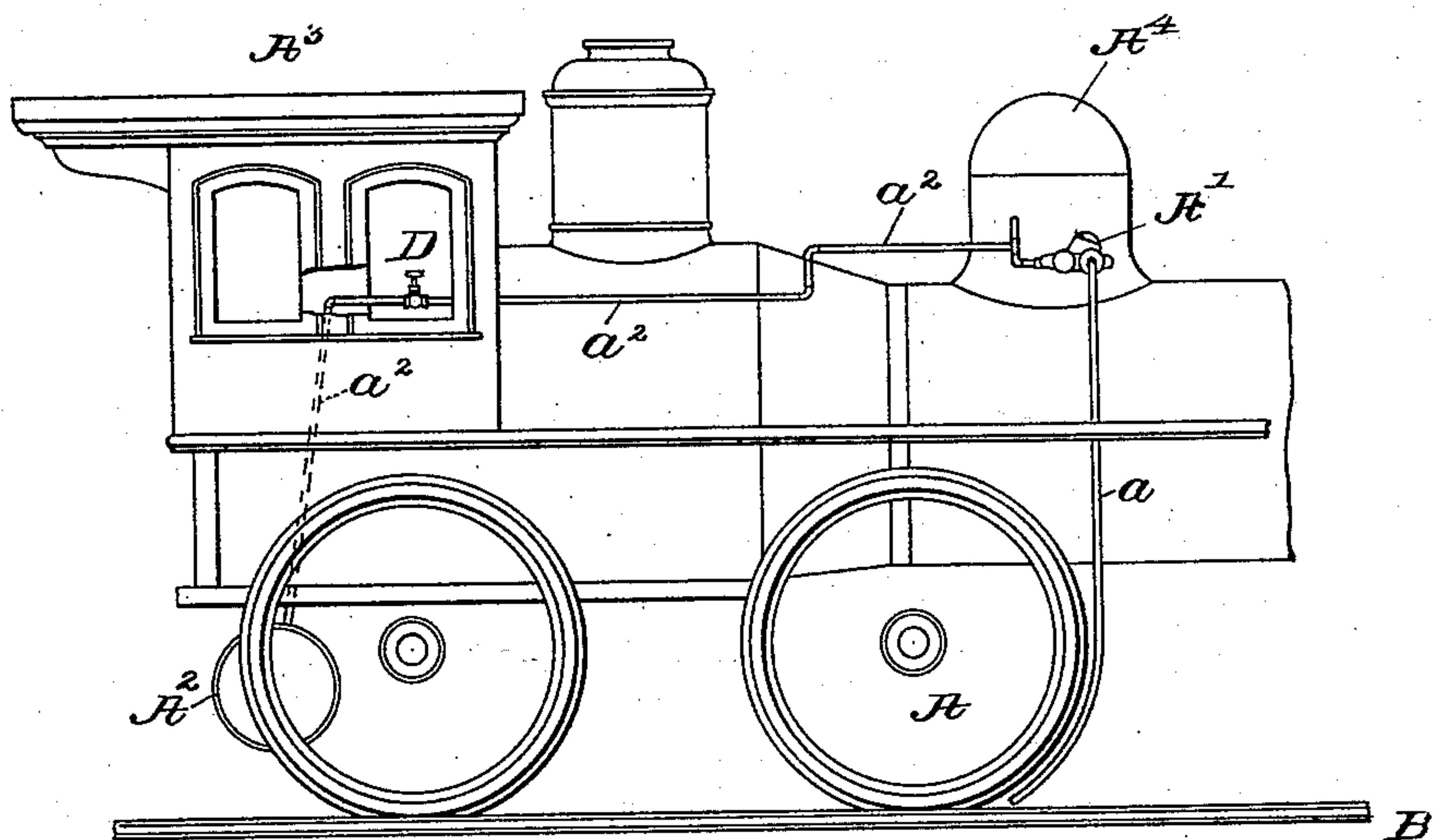
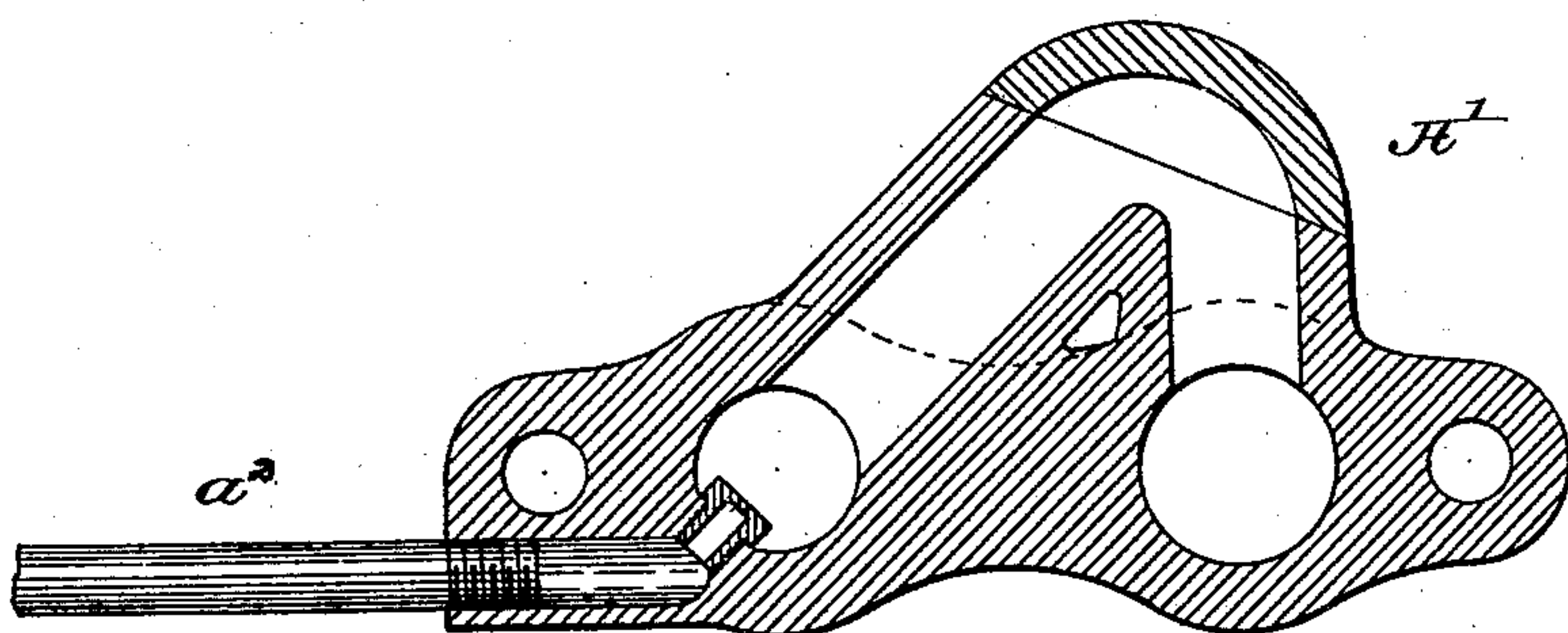


Fig. 2.



WITNESSES.

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Henry L. Leach
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Edwards S. Beach.

(No Model.)

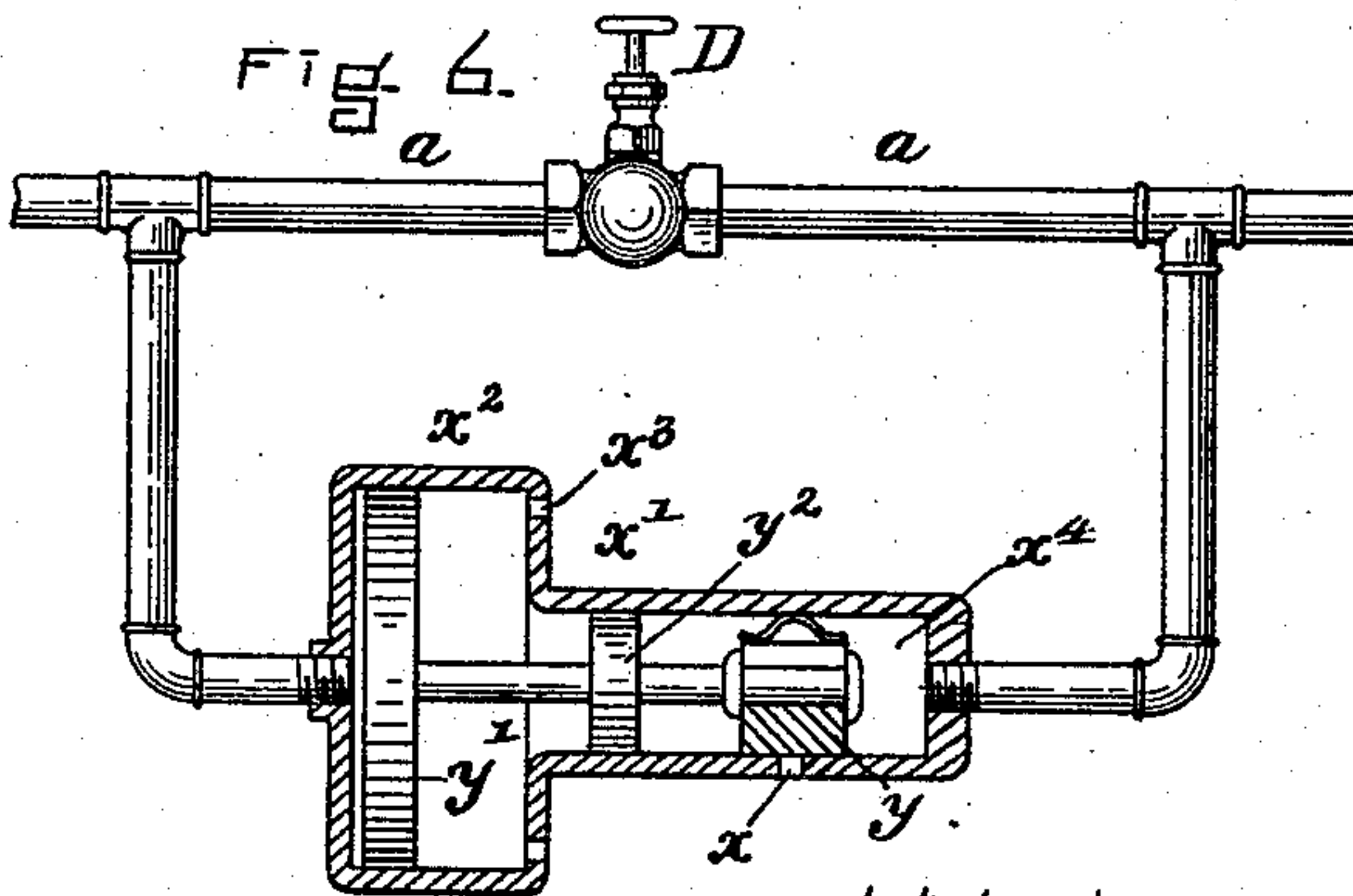
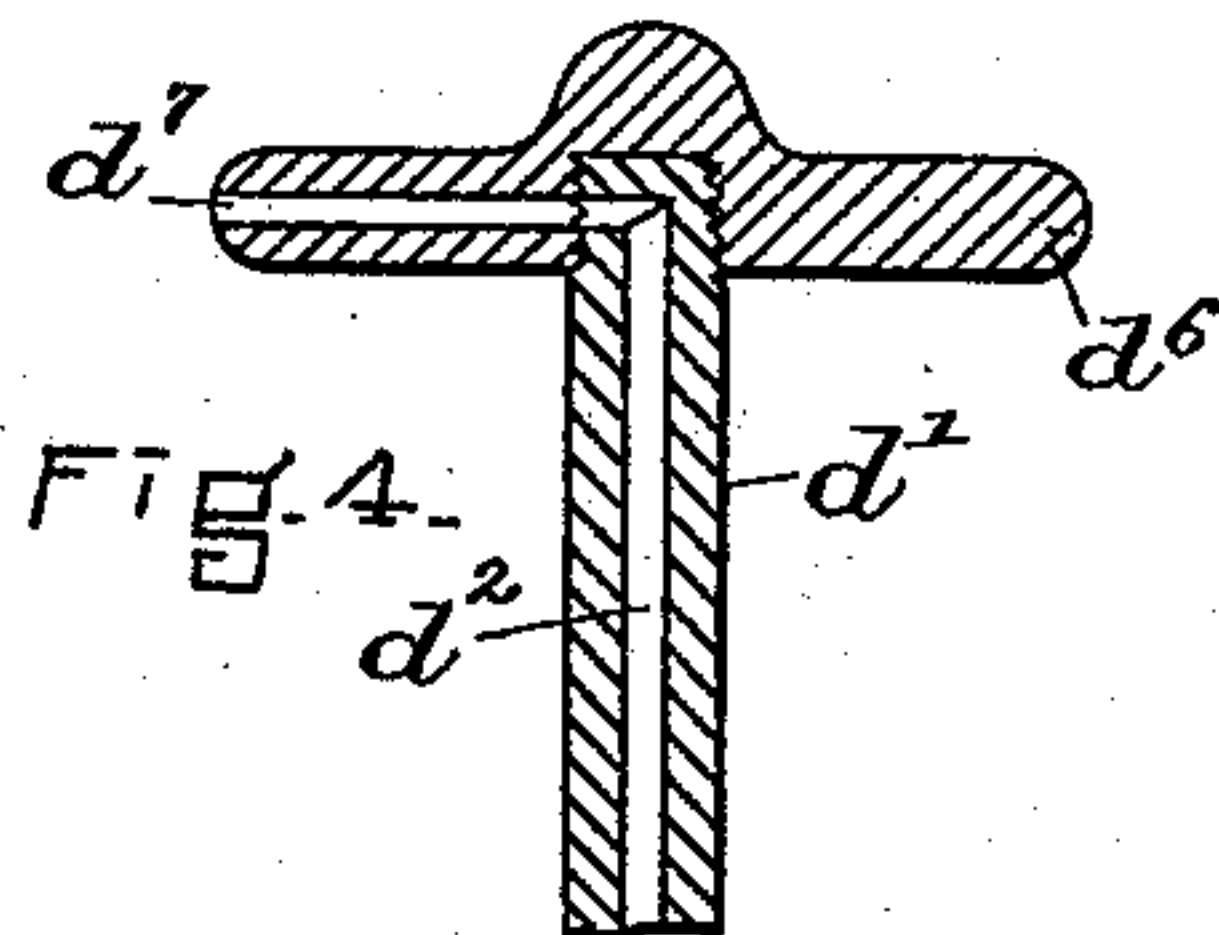
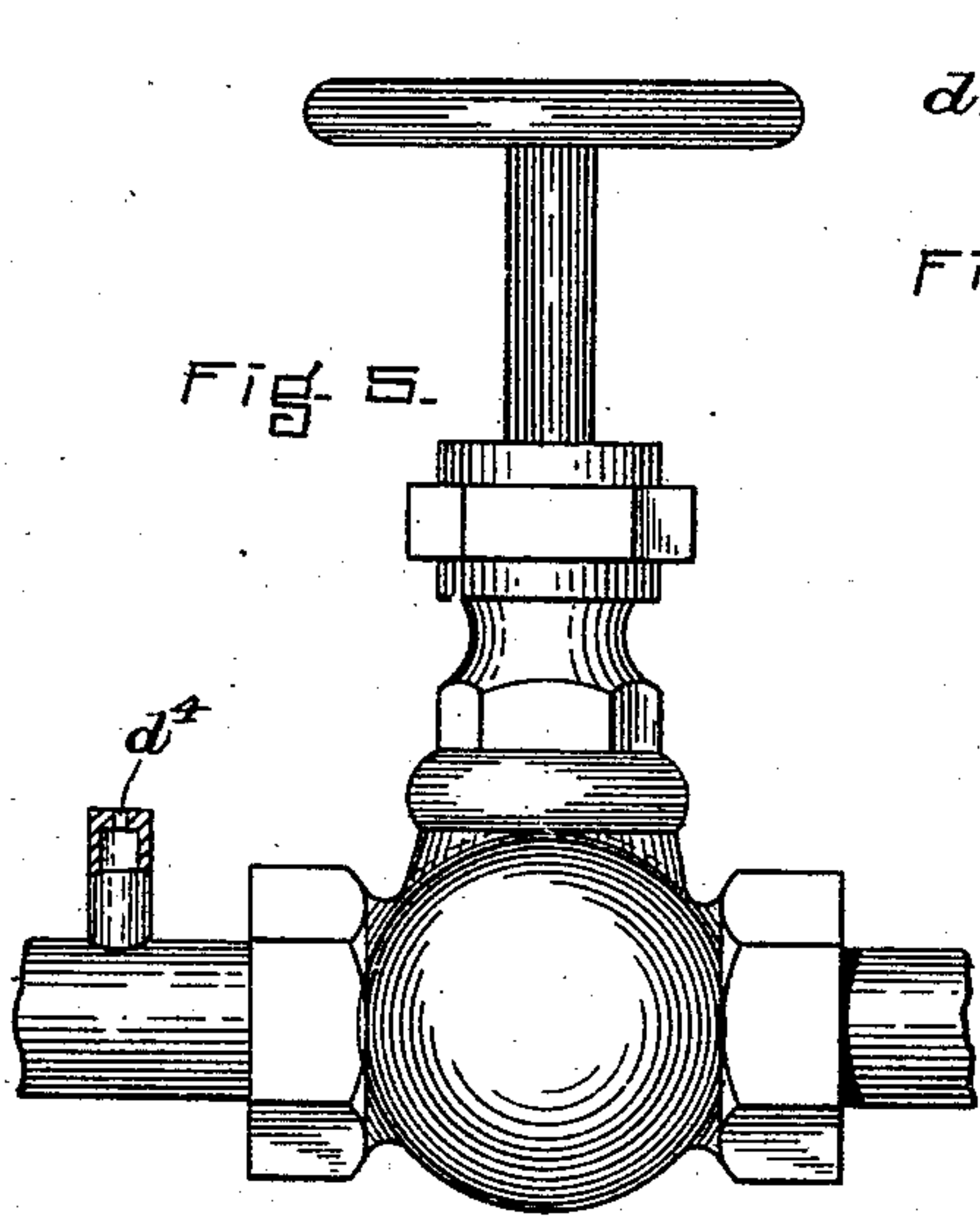
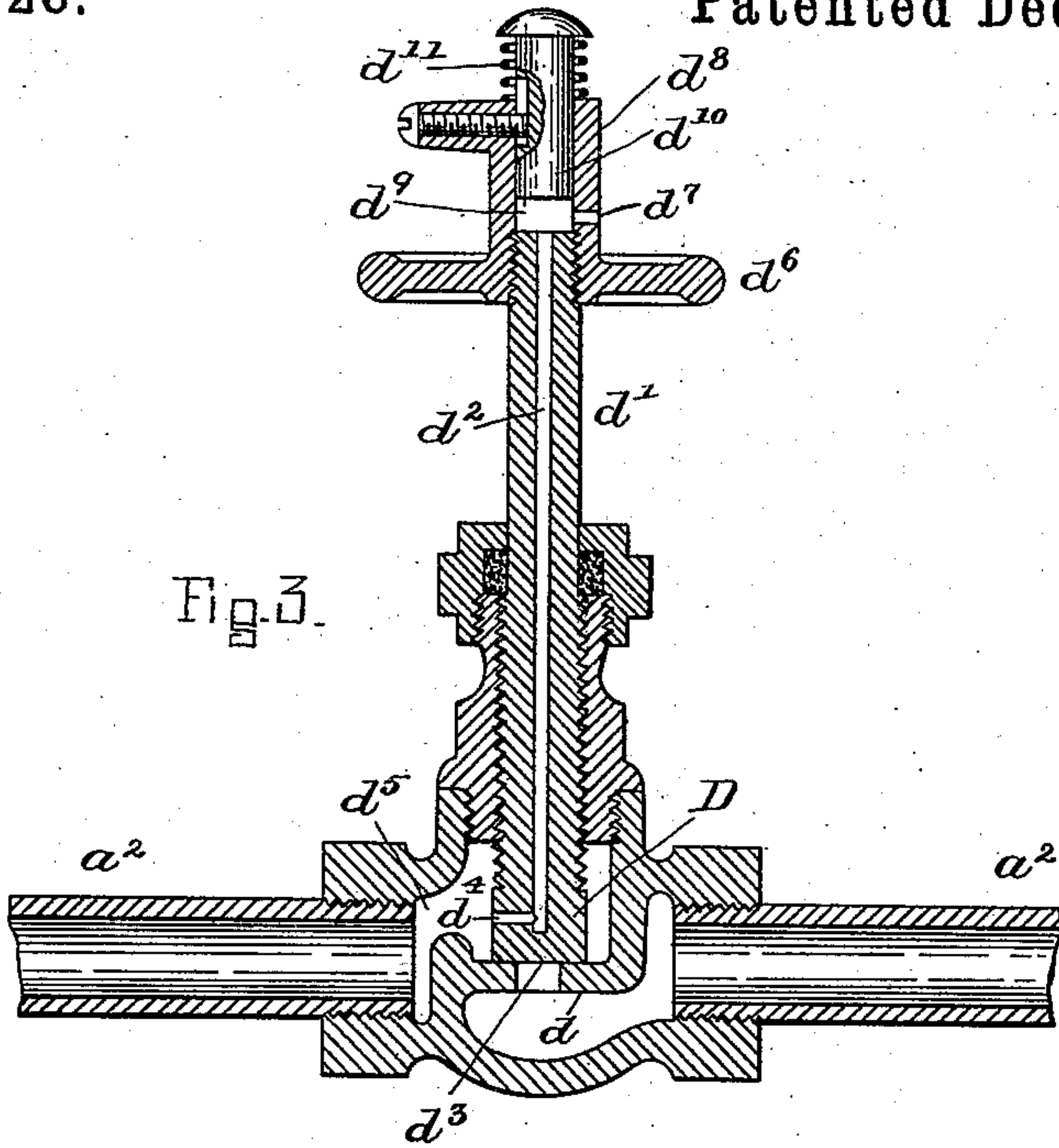
2 Sheets—Sheet 6

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WITNESSES.

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UNITED STATES PATENT OFFICE.

HENRY L. LEACH, OF CAMBRIDGE, MASSACHUSETTS.

AUTOMATIC TRACK-SANDING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 572,428, dated December 1, 1896.

Application filed March 30, 1896. Serial No. 585,370. (No model.)

To all whom it may concern:

Be it known that I, HENRY L. LEACH, of Cambridge, in the county of Middlesex and State of Massachusetts, have invented a new and useful Improvement in Automatic Track-Sanding Apparatus, of which the following is a specification.

Referring to the accompanying drawings, Figure 1 is a side view of a portion of a locomotive-engine provided with one form of track-sanding device embodying my invention. Fig. 2 is a sectional view of a trap which forms part of the particular construction of sand-feeding apparatus in which my present invention is shown embodied. Fig. 3 is a central sectional view of a regulating-valve in the conduit from the compressed-fluid-supply to the sand-supply apparatus, this valve containing a warning-port. Figs. 4, 5, and 6 show modifications.

It is of great importance that no more sand than is necessary to prevent slipping of locomotive driving-wheels should be fed to the tracks, because of the wear which sand causes the tracks and wheels and of the resistance which it offers to the progress of the train. For economical reasons it is therefore a desideratum in this art that as little sand as possible should be used and that its flow to the tracks should be promptly stopped when sand is not required to prevent slipping. Heretofore in all track-sanding apparatus it has frequently happened that the feed-valve has been left open longer than necessary by reason of the forgetfulness of the engineer, whose attention has been directed to other duties while the device has been in operation. Waste of air and sand and unnecessary wear and tear of tires and rails have been the result. To overcome this I have combined with the air-supply reservoir and sand-discharge apparatus an automatically-acting signal which sounds a warning whenever the feed-valve is open and the engineer's hand is removed from it for other duties. The engineer is thereby kept informed that sand is flowing and warned against continuation of the flow when the slipping has ceased.

In the drawings I show my invention embodied in the well-known Leach track-sanding apparatus for locomotives, although it

may be embodied, if desired, in track-sanding apparatus of different construction.

A is a locomotive driving-wheel, and *a* the track-sanding pipe discharging on the rail B. Pipe *a* is connected with any suitable sand-supply apparatus A' of any desired kind that is provided with means for feeding sand to the track therefrom, which means comprise any fluid-motor for the sand (air or steam, for example) flowing to the sand-supply apparatus and controlled by a feed or regulating valve under the engineer's control.

In the present embodiment of my invention the fluid-motor, that is, the agency which forces sand to pipe *a*, flows to the sanding apparatus A' through a pipe or conduit *a*² from any compressed-fluid supply, such as reservoir A², which may be and preferably is the main reservoir of the air-brake system. Pipe *a*² passes, preferably, through cab A³ and is provided with a feed or regulating valve D, which is under the engineer's or other attendant's control, being preferably within the cab and under hand control.

When valve D is off its seat *d*, compressed air flows from reservoir A² through pipe *a*² to sand-supply apparatus A' and moves sand to pipe *a*, by means of which sand is fed. There are a considerable number of track-sanding devices other than the Leach in which my present invention may be embodied; but in this case conduit *a*² leads into a trap or sand-chamber supplied from a main sand-box A⁴, and pipe *a* leads from the trap, as more fully set forth in my Letters Patent No. 433,686, dated August 5, 1890, and No. 512,833, dated January 16, 1894.

To accomplish the object of my invention, I provide an escape for the compressed fluid which moves the sand in apparatus A', the escape being operative or potentially operative when the valve is off its seat and inoperative when the valve is on its seat, the noise of the escaping fluid sounding the warning that sand is flowing.

The preferred mode of applying the principle of my invention is to provide valve-stem *d'* with a central passage *d*², that has a solid bottom *d*³, and an opening *d*⁴ on its side within the lower-pressure side *d*⁵ of the valve-casing. Valve-stem *d'* is provided with a

handle d^6 , by which the valve-stem is moved inwardly or outwardly, as desired. Passage d^2 has an opening d^7 without the valve-casing, and this opening d^7 is preferably formed in a cap d^8 , attached to the outer end of valve-stem d^7 , cap d^8 having a chamber d^9 , in which is mounted a slide-valve d^{10} , kept normally by a spring d^{11} out of contact with the wall of the chamber around the outlet or opening d^7 .

10 When the valve proper (which is the inner end of stem d^7) is on seat d , flow from compressed-fluid reservoir A^2 to sand apparatus A' is impossible. If sand is needed on the track, valve-stem d^7 is turned to carry the

15 valve off its seat, and the compressed fluid from the reservoir A' flows through the valve-casing to actuate the sand. Compressed fluid flowing past the valve toward the sanding apparatus enters passage d^2 through opening

20 d^4 and escapes through d^7 with a whistling noise. So long as the attendant keeps his hand on handle d^6 and then presses valve d^{10} inwardly to close escape-opening d^7 no sound is heard. If, however, the attendant's hand

25 is removed for any reason without closing valve D , the warning sounds at escape d^4 , for the valve d^{10} is then carried away from opening d^4 by the spring d^{11} , if one be used, or by the force of the compressed fluid trying to es-

30 cape through passage d^2 . It is not necessary, of course, to provide any valve for escape d^7 ; but I prefer to use one for the sake of better economizing the escaping fluid that sounds the warning.

35 In Fig. 4, showing a modification, the warning-port or escape d^7 is closed by the hand that grasps the handle d^6 .

In Fig. 5, showing another modification, the warning-port d^4 is an orifice in the low-

40 pressure portion of the pipe in which the regulating or feed valve is placed.

In Fig. 6, showing another modification, the warning-port x is on the high-pressure side of the feed or regulating valve and in this in-

45 stance is an opening in an auxiliary casing x' , provided with a piston-valve y , having larger and smaller piston-heads. Casing x' is piped to the conduit a at each side of the regulating-valve D . Casing x' is enlarged at

50 x^2 to receive the larger piston y' of the piston-valve y , this enlarged section of the casing having an escape x^3 . Piston-valve y also has an intermediate smaller piston y^2 , which is a sliding fit in the smaller chamber x^4 of casing

55 x' . When regulating-valve D is on its seat, the compressed fluid in conduit a exerts its force wholly on the high-pressure side of the

smaller piston y^2 , and so keeps piston-valve y over the warning-port, thereby closing it. When the regulating-valve is off its seat, pressure is exerted on the low-pressure side of the larger piston y' and the piston-valve thereby moved off the warning-port, which continues to sound until the regulating-valve is seated.

What I claim is—

1. In track-sanding apparatus, the combination of a compressed-fluid apparatus; a sand-supply apparatus having a sand-discharge pipe; a conduit from the compressed-fluid apparatus to the said supply apparatus; a valve-casing interiorly divided into two chambers by a valve-seat, and mounted in said conduit with the conduit connected, on one side, with the chamber above the valve-seat, and on the other side with the chamber below the valve-seat; a regulating-valve mounted in said casing and having a handle projecting therefrom; and a sounding device which is between said fluid apparatus and sanding apparatus and is in communication with the conduit from the compressed-fluid apparatus to the sand-supply apparatus, and operative when said valve is off its seat and inoperative when the valve is on its seat; the sand-discharge pipe being in communication, through the sand-supply apparatus, with the said conduit.

2. The combination of a valve-casing having a valve-seat with a high-pressure port below the valve-seat and a low-pressure port above the valve-seat with a valve having a chambered stem, the chamber thereof having a constantly-open passage into the low-pressure chamber and an opening outside the casing.

3. The combination of a valve-casing having a valve-seat; a high-pressure port below the valve-seat and a low-pressure port above the valve-seat, with a valve having a chambered stem, the chamber thereof having a constantly-open passage into the low-pressure chamber and an opening outside the casing; and a valve for said opening outside the casing.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, on this 17th day of March, A. D. 1896.

HENRY L. LEACH.

Witnesses:

EDWARD S. BEACH,
E. A. ALLEN.