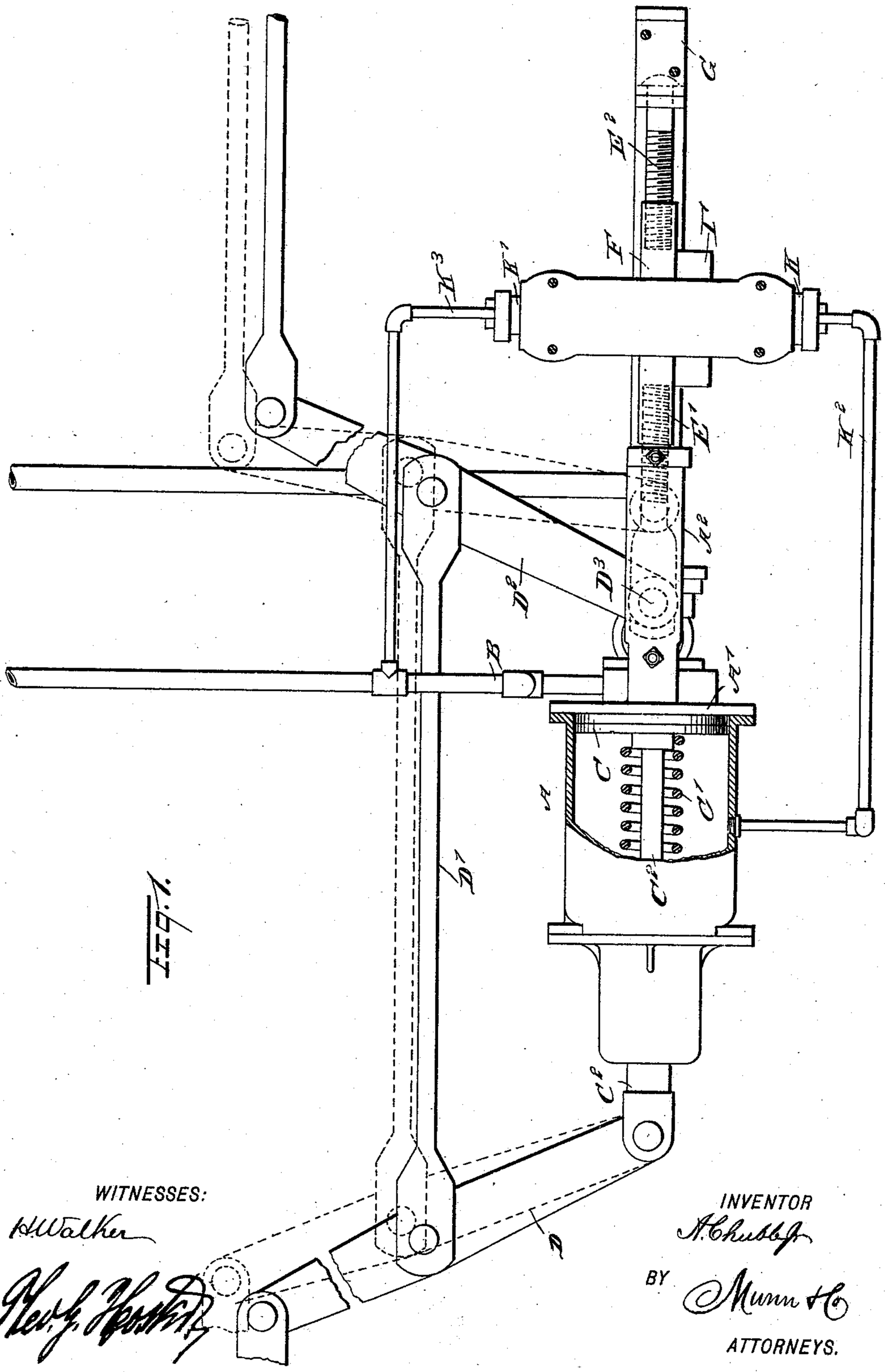
(No Model.) 3 Sheets—Sheet 1.

A. CHUBB, Jr.

SLACK ADJUSTER.

No. 543,294. Patented July 23, 1895.



WITNESSES:

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ATTORNEYS.

(No Model.)

3 Sheets—Sheet 2.

A. CHUBB, Jr.

SLACK ADJUSTER.

No. 543,294. Patented July 23, 1895.

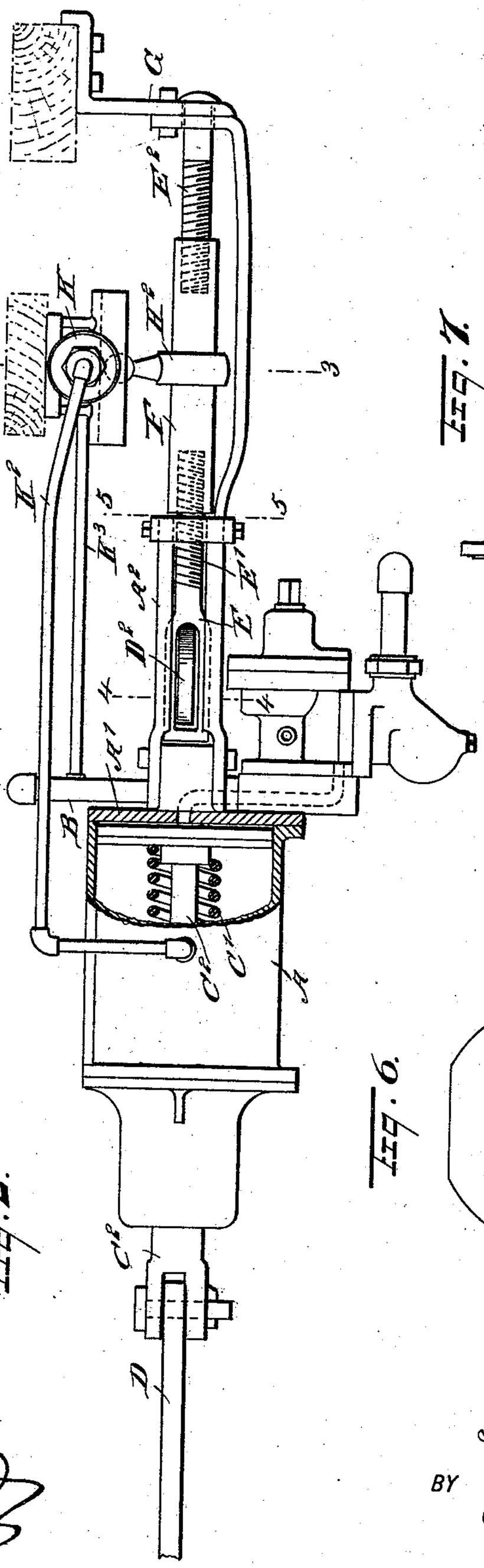


Fig. 1.

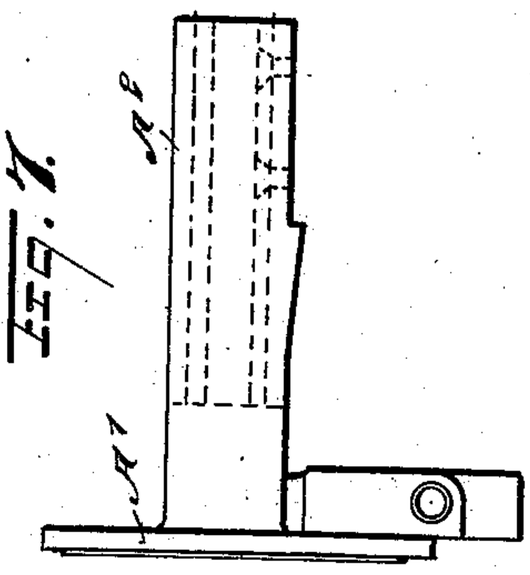


Fig. 5.

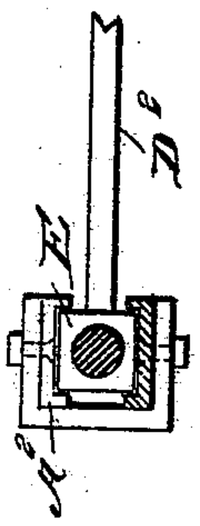
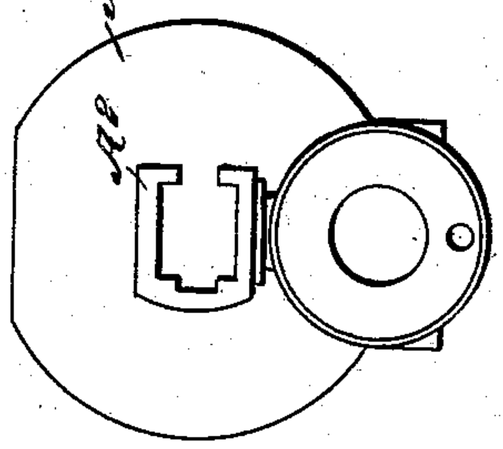


Fig. 4.

Fig. 6.



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(No Model.) 3 Sheets—Sheet 3.

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SLACK ADJUSTER.

No. 543,294. Patented July 23, 1895.

Fig. 3.

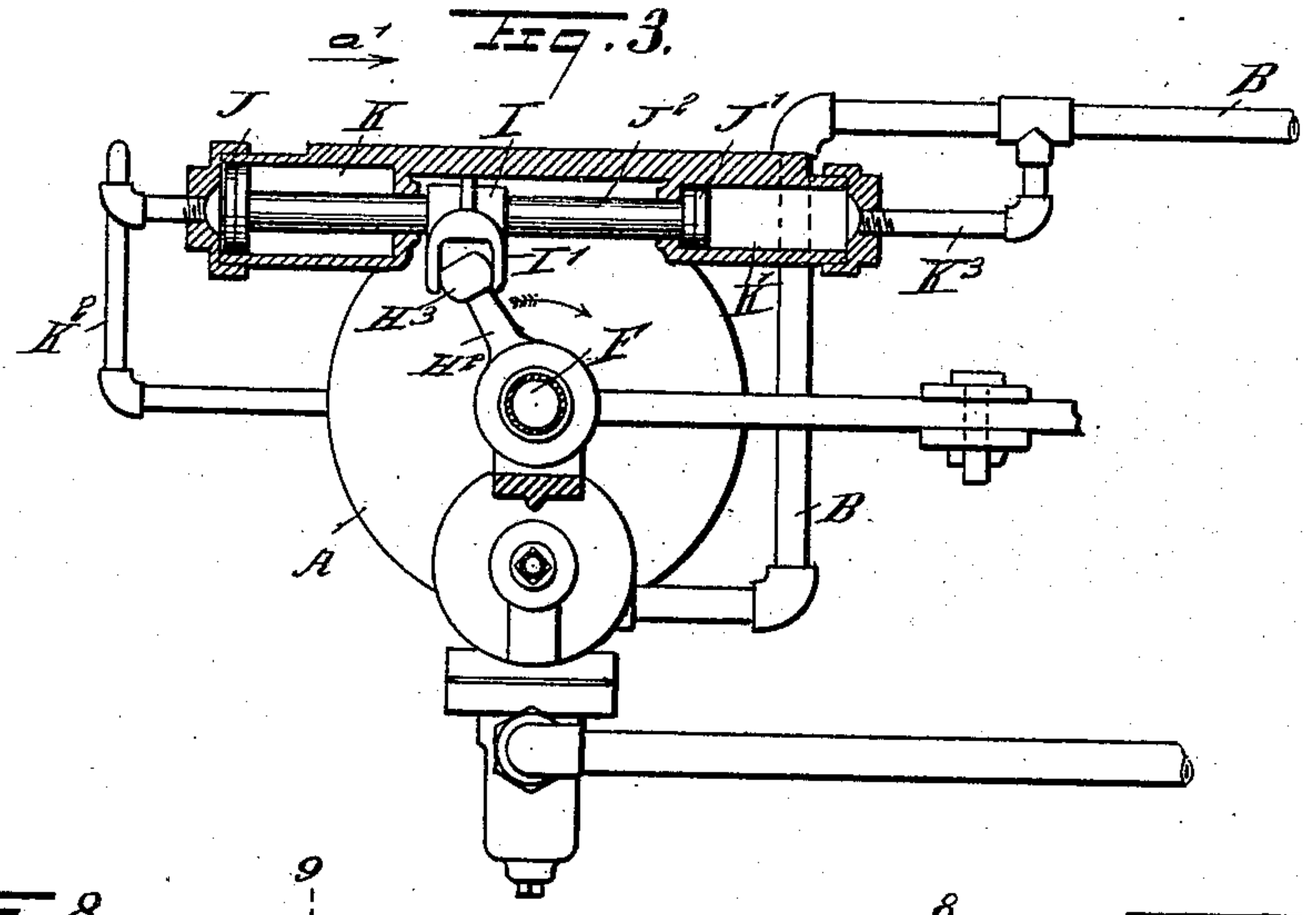


Fig. 8.

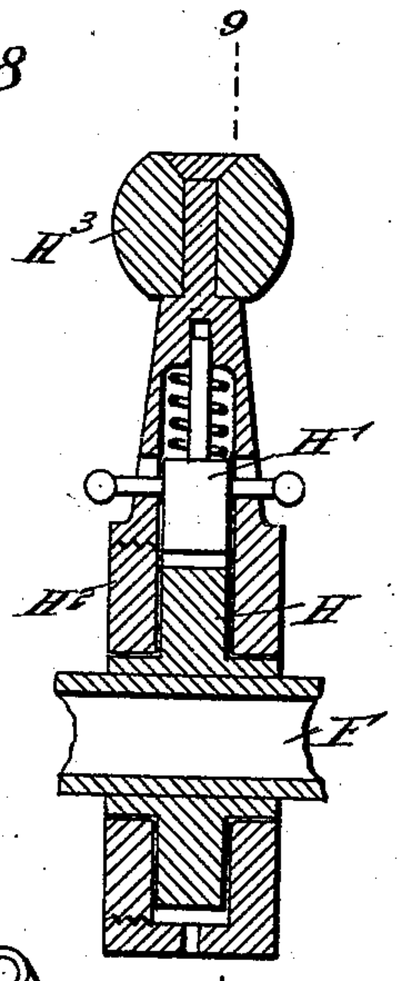


Fig. 9.

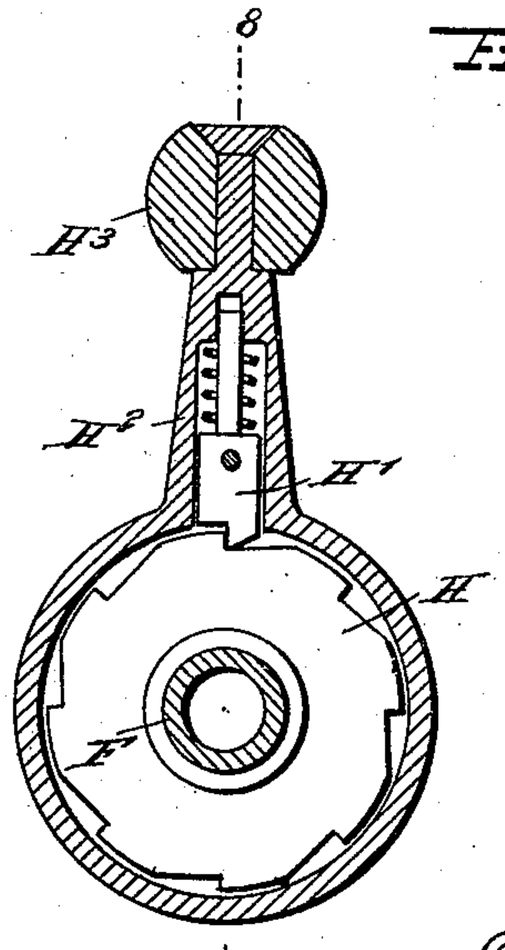
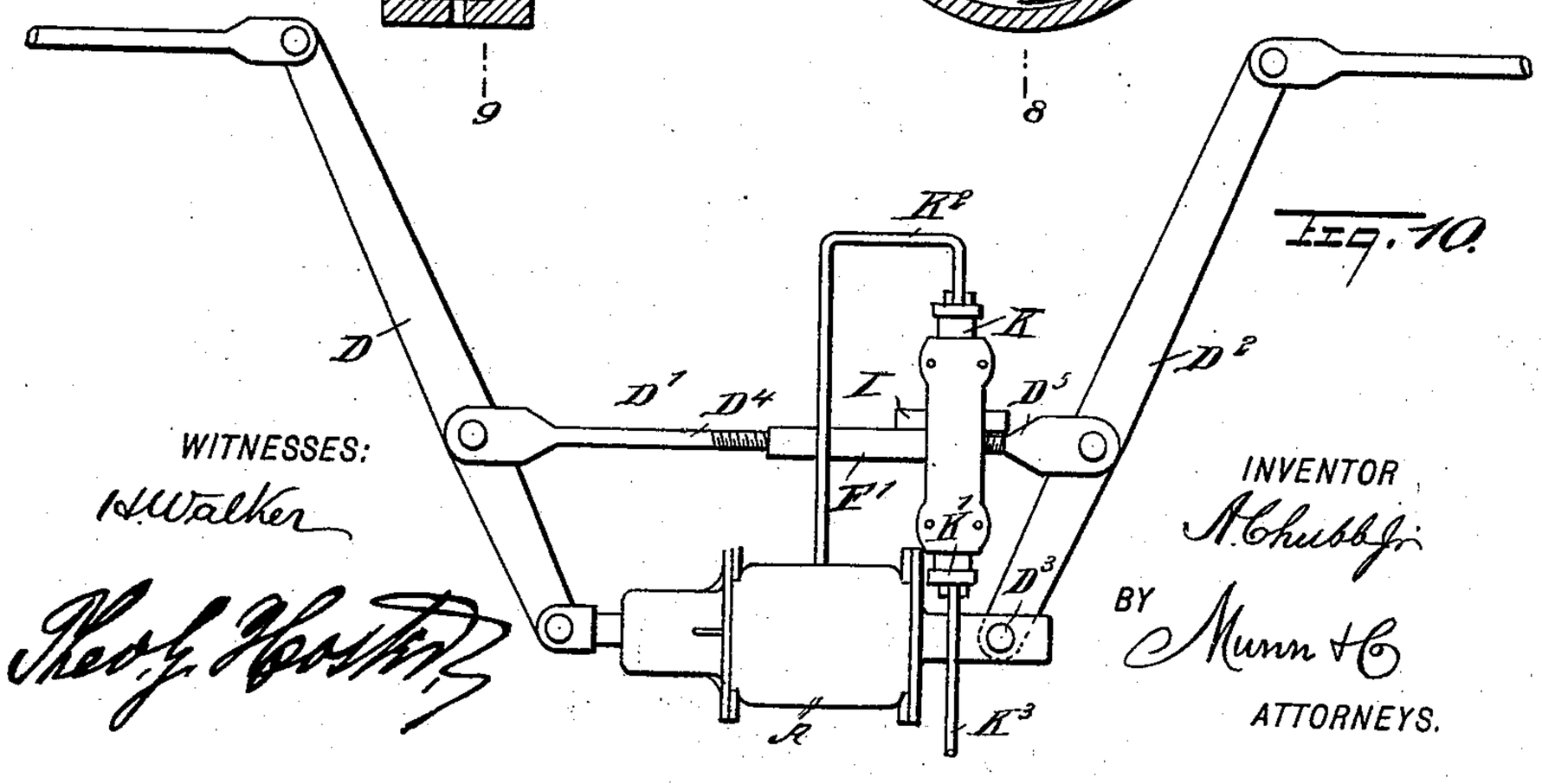


Fig. 10.



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UNITED STATES PATENT OFFICE.

ALONZO CHUBB, JR., OF LA CROSSE, WISCONSIN.

SLACK-ADJUSTER.

SPECIFICATION forming part of Letters Patent No. 543,294, dated July 23, 1895.

Application filed January 28, 1895. Serial No. 536,422. (No model.)

To all whom it may concern:

Be it known that I, ALONZO CHUBB, Jr., of La Crosse, in the county of La Crosse and State of Wisconsin, have invented a new and Improved Device for Taking Up Slack in Brake-Rigging, of which the following is a full, clear, and exact description.

The invention relates to fluid-pressure brakes; and its object is to provide a new and improved device for automatically taking up the slack in the brake-rigging caused by wear of brake shoes, bolt connections, and other causes.

The invention consists principally of a device for automatically controlling the travel of the piston in the brake-cylinder, the said device being controlled by fluid-pressure from the brake-cylinder and auxiliary reservoir.

The invention further consists of two connected pistons of different area and connected with a part of the brake-rigging, the larger piston being controlled by fluid-pressure from the brake-cylinder, and the other by fluid-pressure from the auxiliary reservoir.

The invention also consists of certain parts and details and combinations of the same, as will be fully described hereinafter, and then pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a plan view of the improvement, with parts in section. Fig. 2 is a side elevation of the same, with parts in section. Fig. 3 is a cross-section of the same on the line 3 3 of Fig. 2. Fig. 4 is a similar view of part of the improvement on the line 4 4 of Fig. 2. Fig. 5 is a like view of the same on the line 5 5 of Fig. 2. Fig 6 is an end view of the brake-cylinder head and guideway. Fig. 7 is a side elevation of the same. Fig. 8 is an enlarged side elevation of the ratchet and its lever, the section being taken on the line 8 8 of Fig. 9. Fig. 9 is a cross-section of the same on the line 9 9 of Fig. 8; and Fig. 10 is a reduced plan view of the improvement as applied on the connecting-link for the brake-levers.

The brake-cylinder A is connected at its head A′ in the usual manner, with a pipe B, connected with the auxiliary reservoir. In the brake-cylinder A is fitted to slide the piston C, pressed on by a spring C′, and having its piston-rod C^2 connected at its outer end with the front brake-lever D, forming part of the brake-rigging for one end of the car. The lever D is pivotally connected by the link D′ with the other brake-lever D^2, forming part of the brake-rigging for the other end of the car. Now, this brake-lever D^2 has its fulcrum D^3 in a slide E, mounted to slide longitudinally in guideways A^2, secured to or forming part of the cylinder-head A′, as is plainly illustrated in the drawings, with special reference to Figs. 6 and 7.

The slide E is formed at its forward end with a thread E′, screwing in a turnbuckle F, screwing at its outer end on a screw-rod E^2, fitted to slide in suitable bearings G, attached to a beam of the car and connected with the outer end of the guideway A^2. (See Fig. 2.) On the turnbuckle F, and at or near the middle thereof, is secured a ratchet-wheel H, engaged by a spring-pressed pawl H′ fitted to slide in a ratchet-lever H^2, fulcrumed on the turnbuckle and forming a casing for the ratchet-wheel H, as will be readily understood by reference to Figs. 8 and 9. The free end of this ratchet-lever H^2 is provided with a ball H^3, mounted to turn on the outer end of the lever and engaging a longitudinally-extending guideway I′, formed in a cross-head I, secured on the piston-rod J^2, common to both pistons J and J′, secured on the ends of the said piston-rod and mounted to travel in the cylinders K and K′, secured to a suitable beam of the car and arranged transversely, as indicated in the drawings.

The pistons J and J′ are of different diameters—that is, the piston J is somewhat larger than the piston J′—and the outer end of the cylinder K, containing the larger piston J, is connected by a pipe K^2 with the brake-cylinder A at a point predetermined as the desired distance of travel for the piston C. The outer end of the smaller cylinder K′ is connected by a pipe K^3 with the pipe B, leading to the auxiliary reservoir.

Now, it will be seen that air-pressure from the auxiliary reservoir passing through the

pipe B to actuate the piston C to apply the brakes in the usual manner, can also pass through the pipe K^3 into the cylinder K′ to hold the piston J′ at the inner end of the cylinder and the piston J at the outer end of its cylinder K, owing to the piston-rod J^2 connecting the two cylinders with each other. As the pipe K^2 opens into the forward end of the cylinder A, no, or very little, pressure is exerted against the outer face of the piston J. Now, when the piston C, owing to the slack in the brake-rigging, is forced beyond that point in the cylinder A at which the pipe K^2 enters the cylinder, then the air under pressure from the cylinder A can pass through the pipe K^2 into the outer end of the cylinder K, to act on the larger piston J to force the latter transversely in the direction of the arrow a', as indicated in Fig. 3, whereby the cross-head I, in moving transversely, carries the ratchet-wheel H^2 along, so that the pawl H′ glides over the teeth of the ratchet-wheel H, the lever then assuming the position indicated in dotted lines in Fig. 1.

As soon as the brakes are released by permitting the air to escape from the cylinder A in the usual manner, then the spring C′ forces the piston C back to its normal position, (shown in Fig. 2,) and the piston in moving to this position connects the pipe K^2 again with the forward end of the cylinder A, and consequently with the outer air, to release the air from the cylinder K and to permit the air acting on the piston J′ from the auxiliary reservoir to force the said piston J′ back to its former position—that is, in the inverse direction of the arrow a', as shown in Fig. 3.

The piston-rod J^2, in moving in the inverse direction of the arrow a', causes the cross-head I to swing the ratchet-lever H^2 back to its former position, and in doing so the spring-pressed pawl H′ turns the ratchet-wheel H, and consequently the turn-buckle F, so that the latter screws on the thread E′ and the rod E^2, whereby the slide E is shifted to shift the fulcrum of the lever D^2, so that all slack in the brake-rigging is taken up. Now, when the brakes are again applied, the piston C will only travel to the point predetermined, as the desired distance of travel for the piston—that is, to the entrance of the pipe K^2 into the cylinder A.

It is understood that whenever any slack again occurs in the brake-rigging, owing to wear on the brake-shoes, bolt, connections, or other causes, then the piston C, in traveling beyond the predetermined amount of travel, again connects the pipe K^2 with the air under pressure in the cylinder A, to cause the shifting of the pistons J and J′ and cross-head I, in the manner previously described, to cause the pawl H′ to move into a position ready to turn the ratchet-wheel H. As soon as the brakes are released again the pressure from the auxiliary reservoir passing through the pipe K^3 into the cylinder K′ can act on the piston J′ to return the latter to its normal position.

I do not limit myself to applying this automatic regulating device for taking up the slack in the rigging to the lever D^2, as the said device can be applied to any other part of the rigging—for instance, as illustrated in Fig. 10—in which the connecting-link D′ is made in two parts D^4 and D^5, connected with each other by a sleeve F′, similar to the sleeve F, and engaged by a pawl and ratchet of the character above described.

As shown in the drawings, the device is applied to passenger-car brakes; but it is evident that it can equally well be applied on freight-car brakes, it being understood that in the latter case suitable arrangements of rods and levers are added to suit particular classes of cars and the point at which it is desired to take up the slack.

It is further understood that the device shown will operate if the pipe K^3 from the cylinder K is connected to the main train-pipe in place of the auxiliary reservoir.

Having thus fully described my invention, I claim as new and desire to secure by Letters Patent—

1. A fluid pressure air brake, provided with a device for automatically controlling the travel of the piston in the brake cylinder, the said device being controlled by fluid pressure from the brake cylinder and auxiliary reservoir, acting alternately substantially as shown and described.

2. In a device of the class described, the combination with a ratchet take up mechanism, of means for operating the ratchet of the take up mechanism in its forward movement by fluid pressure from the auxiliary reservoir when the brakes are released, substantially as described.

3. In a device of the class described, the combination with a take up mechanism, of two cylinders, one in communication with the brake cylinder and the other with the auxiliary reservoir, and pistons in the cylinders and operating the take up mechanism, substantially as described.

4. In a device of the class described, the combination with a ratchet take up mechanism of two cylinders, one in communication with the brake cylinder and the other with the auxiliary reservoir, and pistons in the cylinders connected together and engaged by the ratchet lever, substantially as described.

5. A device of the class described, comprising two connected pistons of different area and connected with a part of the brake rigging, one of the said pistons being controlled by fluid pressure from the brake cylinder, and the other by fluid pressure from the auxiliary reservoir, substantially as shown and described.

6. A device of the class described, comprising a turn-buckle for taking up the slack in the brake rigging, a pawl and ratchet mech-

anism for turning the said turn-buckle, a cross-head engaging the lever of the said pawl and ratchet mechanism, and connected pistons of different area and carrying on their piston rod the said cross head, the larger piston being controlled by fluid pressure from the brake cylinder, and the other, smaller piston by fluid pressure from the auxiliary reservoir, substantially as shown and described.

ALONZO CHUBB, JR.

Witnesses:
LOUIS ZAISER,
W. L. COOPER.