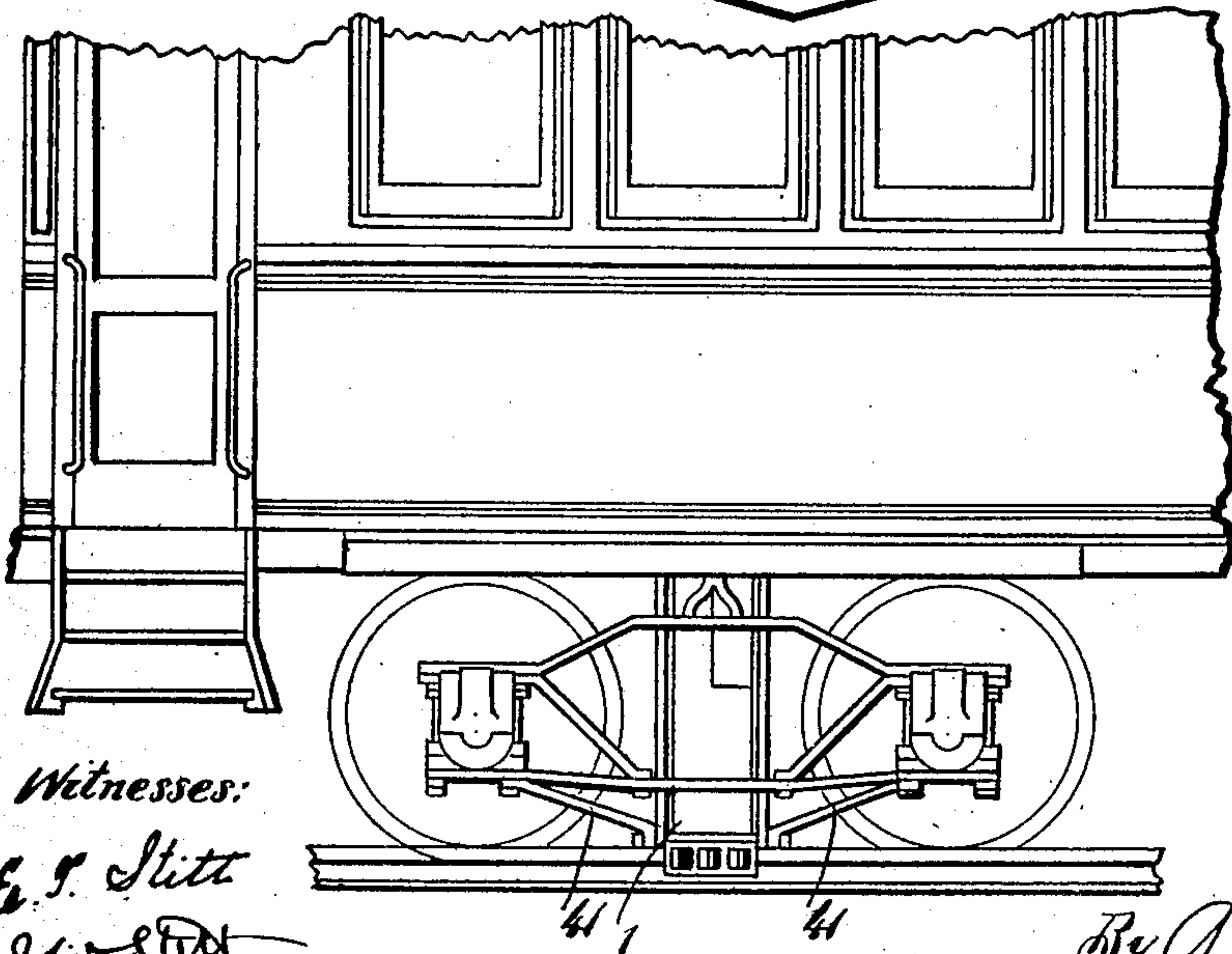
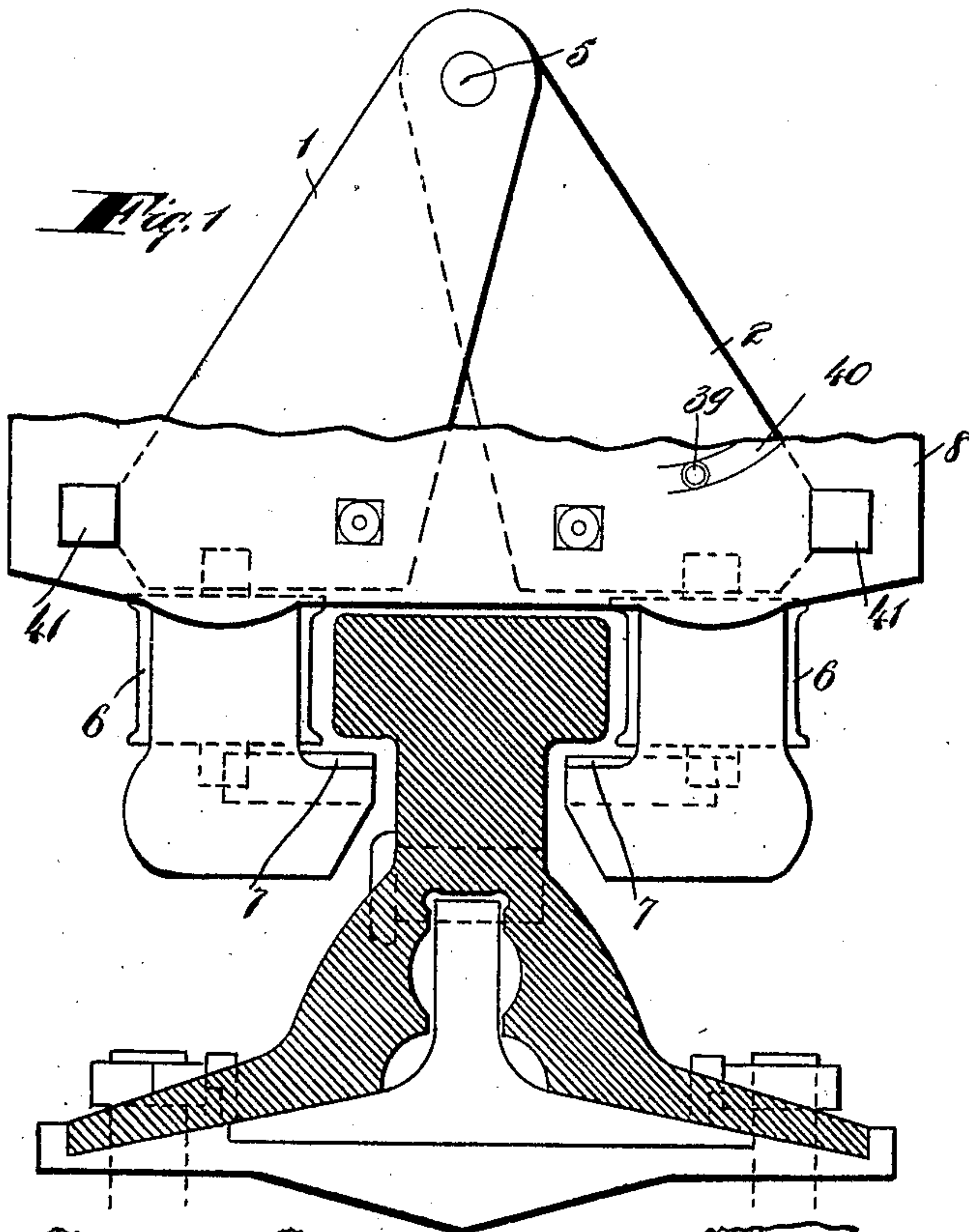


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PNEUMATIC RAIL BRAKE.  
APPLICATION FILED AUG. 18, 1908.

916,644.

Patented Mar. 30, 1909.

3 SHEETS—SHEET 1.



Witnesses:

E. J. Stitt  
J. W. Stitt

Inventor,  
P. O. Adams.

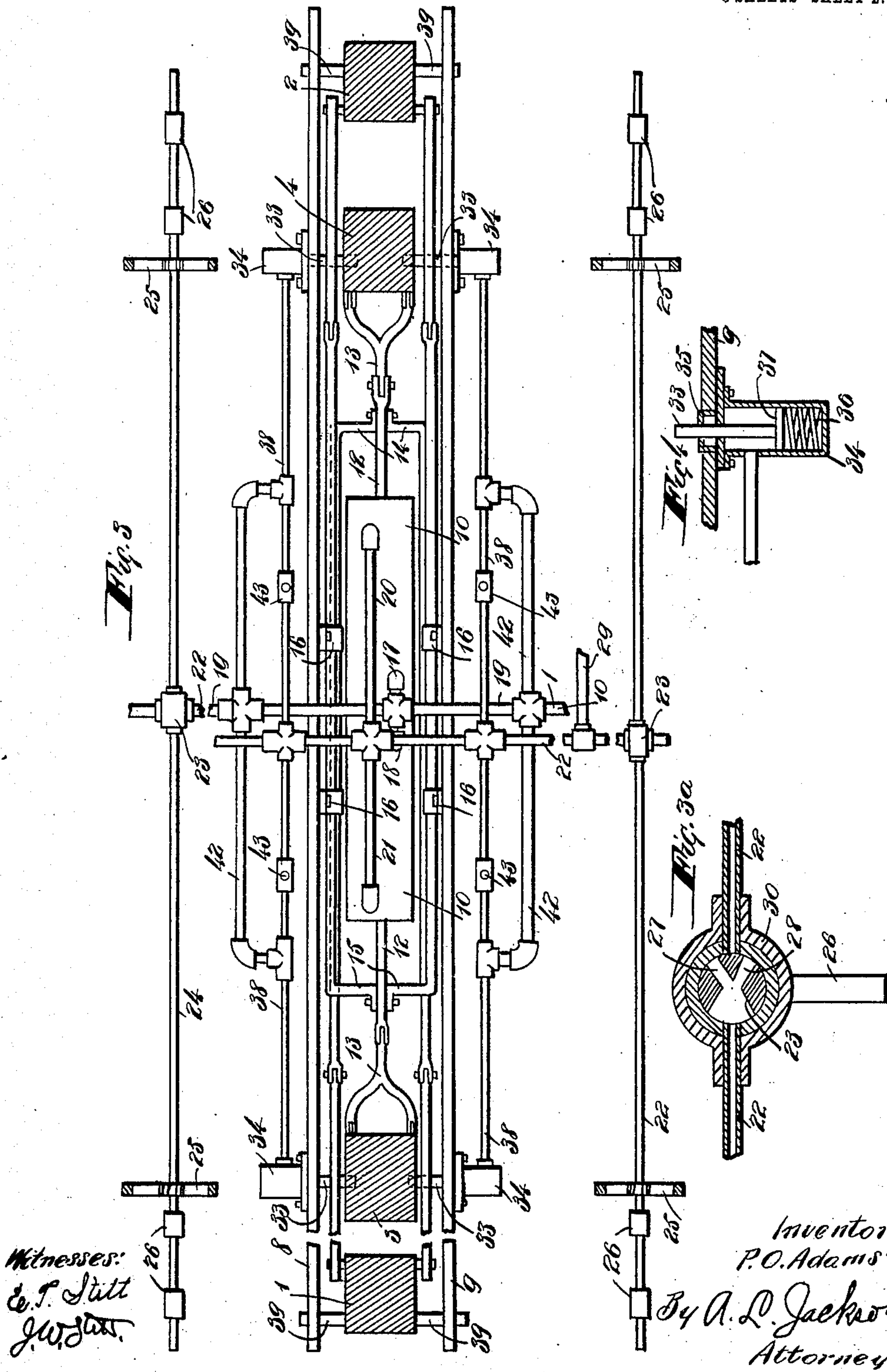
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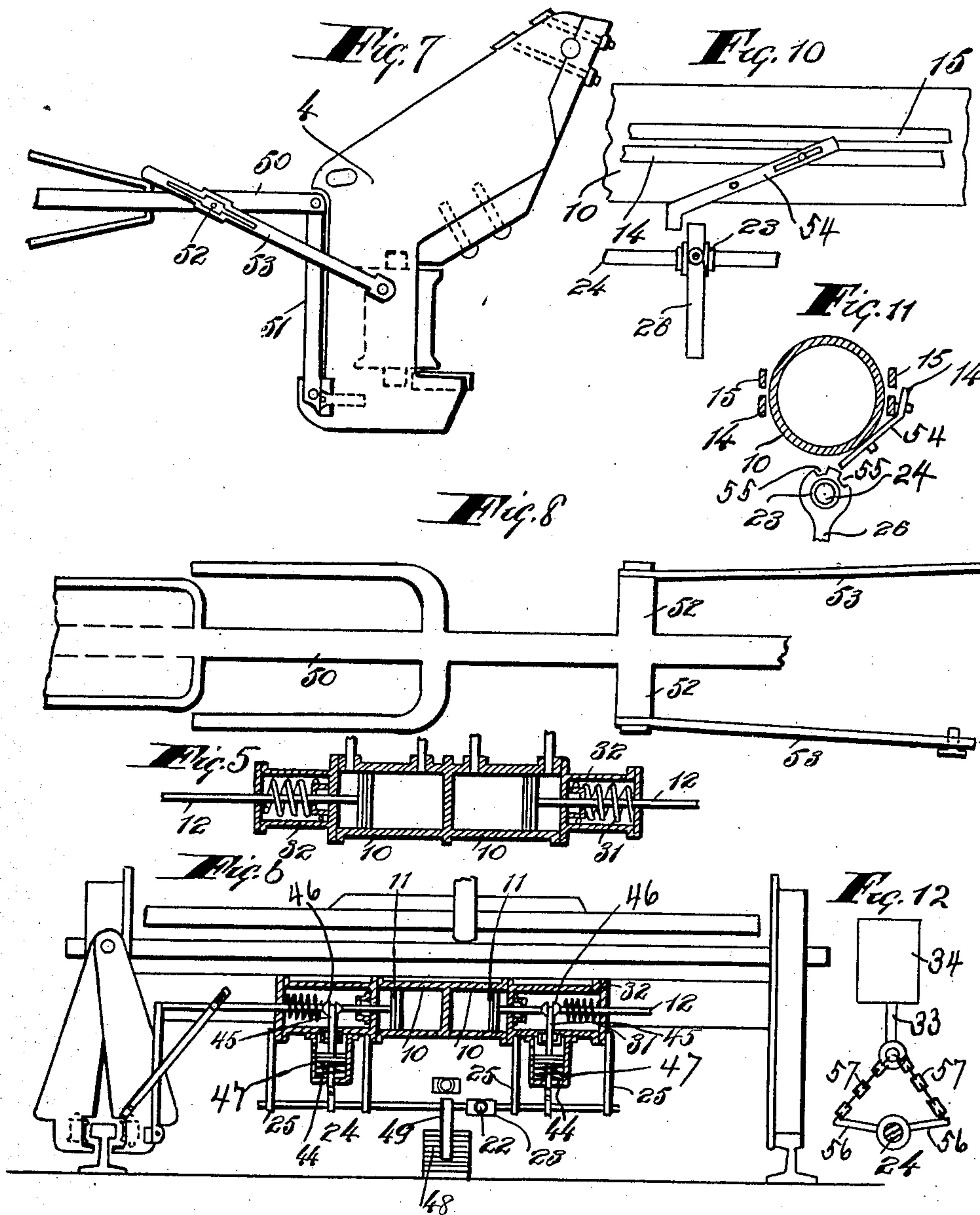
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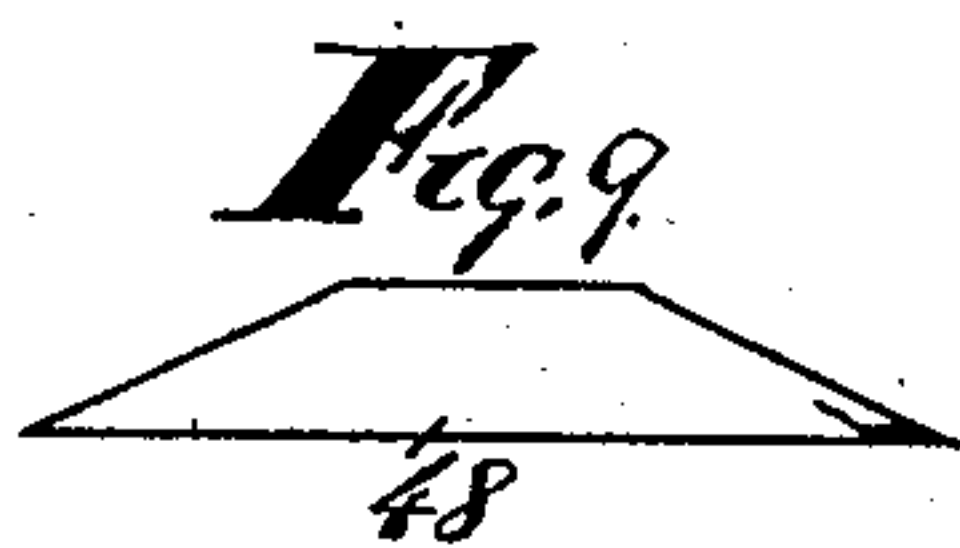
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3 SHEETS—SHEET 3.



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# UNITED STATES PATENT OFFICE.

POWELL ORGAIN ADAMS, OF CAMERON, TEXAS.

## PNEUMATIC RAIL-BRAKE.

No. 916,644.

Specification of Letters Patent.

Patented March 30, 1909.

Application filed August 18, 1908. Serial No. 449,133.

*To all whom it may concern:*

Be it known that I, POWELL ORGAIN ADAMS, a citizen of the United States, residing at Cameron, county of Milam, and State of Texas, have invented certain new and useful Improvements in Pneumatic Rail-Brakes, of which the following is a specification.

My invention relates to brakes for railway trains and more particularly to rail brakes, and the object is to provide brakes which will be automatically operated to prevent trains from leaving the tracks and which will prevent wrecks.

The improved brakes are applicable to cars propelled by steam and by electricity and the brakes are particularly designed for use on such rails as are set forth in the Letters Patent granted to me on January 21, 1908, No. 877,279, for rail joints.

Other objects and advantages will be fully explained in the following description and the invention will be more particularly pointed out in the claims.

Reference is had to the accompanying drawings which form a part of this application and specification.

Figure 1 is an elevation of a pair of brakes embodying my invention. Fig. 2 is an elevation of a portion of a car, showing how the brakes are mounted on the trucks of the car. Fig. 3 is a plan view or diagrammatic view of the air system for operating the brakes, showing the clamps (which form the brakes) in horizontal section. Fig. 3<sup>a</sup> is a vertical section of a three-way valve for automatically elevating the brakes. Fig. 4 is a longitudinal section of a cylinder, showing a piston for drawing the guard pin from a clamp. Fig. 5 is a longitudinal section of the double air cylinder. Fig. 6 illustrates a variation in the application of the air for operating the brakes and for locking the brakes in their normal positions, the air-brake cylinders being shown in vertical section. Fig. 7 is a side elevation of one of the clamps, showing a variation in the manner of connecting the pistons to the brake clamps. Fig. 8 is a plan view of the piston connecting means shown in Fig. 7. Fig. 9 illustrates a sloping block which is used in cooperation with the tripping devices carried by the cars for automatically raising the brakes to pass over switches, frogs, and other fixtures about railway rails. Fig. 10 is a broken detail view, showing devices for

locking the tripping bars in elevated positions. Fig. 11 is a cross-section of one of the air cylinders, showing the relative positions of the tripping bars and the arms of the yokes for operating the brakes and showing the means for locking the tripping bars in elevated positions. Fig. 12 shows an additional means of unlocking the piston rods of the air cylinders so that the pistons can operate the brakes.

Similar characters of reference are used to indicate the same parts throughout the several views.

The present invention is an improvement on the patent granted to me on January 16, 1906, No. 810,316. In that patent brakes were hung above the rails to be lowered to grasp the rails in case of emergency. In the present invention the brakes are hung to move adjacent to the rails. The brakes 1 and 2 and 3 and 4 are similar to the patent, having a fulcrum 5 and rollers 6 and 7 to prevent the brakes binding on the rails. The brakes are mounted between guides 8 and 9 which extend transversely under the car in front and behind the brakes and the double air cylinders 10 may be suspended between the guides 8 and 9. Each air cylinder is provided with a piston 11 and a piston rod 12.

The brake shoes 1, 2, 3, and 4 are controlled by the piston rods, each piston rod controlling two brake shoes. As the brake shoes swing on fulcrums 5 the piston rods 12 must be jointed as shown, the jointed part 13 on each side engaging the interior brake shoe. The jointed parts 13 are formed with two arms which are pivotally connected with the brake shoe. Yokes 14 are bolted to the piston rod 12 and are bent backward and are extended to the shoe 1 and are pivotally connected therewith. Yokes 15 are bolted to the piston 12 and bent backward and extended to the brake shoe 2 and pivotally connected therewith. From this arrangement it will be seen that when the pistons are moved all the brake shoes will be moved. Guides 16 are provided for the yokes 14 and 15 and are attached to the guide plates or bars 8 and 9. For braking purposes air is admitted to the cylinders 10 by pipes 17 and 18 which are connected to the common pipe 19, which comes from the supply source and is under the control of the engineer. The engineer can cause the brakes to engage the rails at will.



Means are provided for elevating the brake shoes for passage of switches, frogs, and other devices connected with railway rails. For the purpose of elevating the brake shoes, air is admitted to the cylinders 10 by pipes 20 and 21 which are connected to the common pipe 22 which may extend to a supply source of air. Means are provided for turning air into the pipe 22 and consequently pipes 20 and 21 automatically. A three-way valve 23 is made rigid with a rod or rocker-shaft 24 which is mounted in suitable hangers 25 and operatively connected with the pipe 22. Tripping bars 26 are rigid with the rod or rocker shaft 24 and hang by the rails in front and to the rear of the brake shoes. The object in having the tripping bars both in front and in the rear of the brake shoes is apparent because the train or car might go in either direction. The tripping bars must be a reasonable distance from the brake shoes so that the mechanism will have sufficient time to operate the brake shoes. When the tripping bars or any one of the tripping bars strikes a switch or frog or other object the bar or rocker-shaft 24 will be rocked and one of the ways 27 or 28 will be brought into line with pipe 22 and thus let air into the cylinders 10 to move the piston rods 12 and their connections by means of the pistons 11. The brake shoes will be thus automatically and instantaneously elevated, swinging on the fulcrums 5. If, for any reason, the engineer should have to elevate the brake shoes, he can do so by means of a pipe 29. It will be apparent that the valve 23 will be normally closed against the admission of air to the air cylinders. Spiral springs 31 may be used to cooperate with the air-pressure to operate the piston rods to elevate the brake shoes. The springs 31 are attached to the pistons 12 and rest against the cylinder heads for seats and stand normally compressed. The springs will cause instantaneous movement of the piston rods. A casing 32 is provided for each spring 31. The spring is thus provided with a seat and attached to the piston rod 12.

To prevent accidental misplacement or displacement of the brake shoes and to cause the same to remain in their normal positions when not in use, spring-actuated lugs 33 project through the guide plates 8 and 9 and slightly into the brake-shoes. These lugs or pins are mounted in cylinders 34 which are rigidly attached to the guides 8 and 9 and the pins project through packing glands 35. The cylinders 34 are air cylinders for the purpose hereinafter explained.

When the brake shoes are to be elevated, the locking pins 33 must be automatically and instantaneously withdrawn from the brake shoes. Means are provided for accomplishing this withdrawal. The pins are

held normally in the brake shoes by springs 36 which press against pistons 37. Air pipes 38 are connected with the cylinders 34 and with the air pipe 22. Consequently, when the valve 23 is automatically opened by the tripping bars 26, the pistons 37 will withdraw the pins 33 from the brake shoes instantaneously. It is necessary to withdraw these pins so that the piston rods 12 can begin to move at practically the same time, and it is necessary that all the pins be withdrawn at the same time. In addition to the automatic means for thus withdrawing the locking pins, means must be provided by which the engineer can withdraw these pins at will. This can be done by connecting the engineer's pipe 19 with the pipes 38 which lead to the locking cylinders 34. Pipes 42 are connected with pipes 19 and 38. It will be necessary to put check valves 43 in the pipes 38 between the air cylinders and the connection of the pipes 42 to prevent the air from the engineer's pipe 19 from interfering with the working of the pipes 20 and 21. The locking pins 33 must be withdrawn from the brake clamps by the engineer before he can apply the brakes. Thus he can, with the connections shown, withdraw the pins 33 and apply the brakes at one turn of his lever. It is pointed out above how the engineer can withdraw the pins 33 and raise the clamps to keep them from striking frogs and switches. A special pipe 29 connects with the compressed air pipe 22.

Instead of locking the clamps or brake shoes themselves against movement, the piston rods may be locked against movement. The manner of locking the piston rods against movement is illustrated in Fig. 7. Cylinders 44 similar to cylinders 34 are connected with the casing 32 and provided with a plunger 45 which acts in the same way as the pins 33. Beveled collars 46 are mounted on the piston rods 12 and 13 and made rigid thereon. The plunger 45 projects normally between the collars 46 and locks the piston rod against movement, and thus the brake clamps cannot move. The plungers 45 may be withdrawn and operated with the same compressed air pipes and valves heretofore described. The said collars 46 are beveled so that the plunger 45, should it come back to the piston rod on the outside of either collar, slide up the bevel of the collar and drop between the collars 46. The springs 47 in the cylinders 44 will permit the plungers 45 to yield enough to pass up the bevel of either collar 46. With this arrangement, one set of the pipe connections shown in Fig. 3 can be dispensed with.

A variation in the tripping means is shown. A sloping block 48 is to be placed in the center of the space between the railway rails. But one tripping bar 49 will be



necessary on the rocker shaft 24. This tripping bar 49 will rock the shaft 24 in either direction to operate the compressed air connections as before described. One of the blocks 48 is to be placed on each side of the frogs or switches which make it necessary to raise the brake clamps.

A variation is shown in the manner of attaching the piston rods inside clamps 3 and 4. The piston rod 50 is pivotally connected with a link 51 which is pivotally connected to the lower part of the brake clamp 4. The piston rod 50 has side lugs 52. Slotted link bars 53 are pivotally connected with the lugs 52 and also pivotally connected with the outside of the clamp 4.

Means are provided for locking the tripping bars 26 or 49 in elevated positions. A lock 54 is pivotally mounted on the side of the cylinder 10 or a lock on both cylinders 10 and is actuated by one arm of the yoke 14. The lock 54 has a slot therein and a pin is mounted in the arm 14 and projects through the slot in the bar 54. The locking arm 54 will be moved whenever the arm 14 is moved. In moving one way the arm 14 will swing the lock downward and in moving the other way the arm 14 will swing the locking arm 54 upward. When the tripping bar swings or is moved one way or the other the locking arm 54 will catch in one of the notches 55 and thus hold the tripping bar in an elevated position until the arm 14 is moved.

In addition to the means already described for operating the pins 33 in cylinders 34 and the locking pins in cylinders 44, means which will cooperate with the compressed air are shown in Fig. 12 for operating these pins to release the brake shoes, or clamps. Arms 56 are rigidly mounted on the rocker-shaft and chains 57 connect the arms 56 to the pins 33 so that the rocking of the rocker shaft will cause the chains 57 to draw the pins and thus release the brake clamps so that the clamps may be operated.

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

1. A pneumatic rail brake comprising pairs of brake shoes or clamps, one member of each pair of clamps hanging on each side of a rail, pneumatically operated piston rods operatively connected with said clamps for operating the same, means for locking said clamps out of engagement with said rails consisting of spring-actuated plungers, and means for releasing said clamps prior to the movement of said clamps by said pistons.

2. A pneumatic rail brake comprising pairs of clamps, one member of each pair of clamps hanging on each side of a rail, air-brake cylinders provided with pistons and horizontally disposed between said pairs

of clamps, and piston rods actuated by said pistons and operatively connected with said clamps.

3. A pneumatic rail brake comprising pairs of clamps provided with fulcrums, one member of each pair of clamps hanging on each side of a rail, air cylinders horizontally disposed between each pair of clamps, pistons operating in said cylinders, piston rods for said pistons, said piston rods being connected with the interior members of said clamps, and yokes operatively connected with said piston rods and with the exterior members of said clamps.

4. A pneumatic rail brake comprising pairs of clamps, one member of each pair of clamps hanging on each side of a rail, air cylinders provided with pistons and piston rods operatively connected to said clamps, one system of air pipes connected to said cylinders for elevating said clamps, and another system of air pipes for causing said clamps to engage the rails.

5. A pneumatic rail brake comprising pairs of clamps disposed to engage the rails of a railway track, means for locking said clamps against accidental engagement with the rails of a railway track, air cylinders having pistons provided with piston rods operatively connected with said clamps, and air pipes for supplying air to said cylinders to release said locking means and to elevate said clamps.

6. A pneumatic rail brake comprising pairs of clamps disposed to engage the rails of a railway track, means for locking said clamps against accidental engagement with the rails of a railway track, means for releasing said locking means when said clamps are to be elevated or to engage said rails, and air cylinders provided with pistons and piston rods operatively connected with said clamps.

7. A pneumatic rail brake comprising pairs of clamps disposed to engage the rails of a railway track, air cylinders provided with pistons and piston rods operatively connected with said clamps, means for elevating said clamps above obstructions consisting of air pipes connected with said cylinders and valves for said pipes, rocker-shafts operatively connected with said valves, and tripping bars suspended from said shafts for opening said valves.

8. A pneumatic rail brake comprising clamps disposed to engage the rails of a railway track, air cylinders having pistons provided with piston rods operatively connected with said clamps, pins normally locking said clamps against engagement with said rails, air cylinders provided with pistons connected to said pins, and air pipes connected to both sets of said air cylinders for unlocking said clamps and simultaneously starting the elevation of said clamps.



9. A pneumatic rail brake comprising clamps disposed to engage the rails of a railway track, air cylinders having pistons provided with piston rods operatively connected  
5 with said clamps, pins normally locking said clamps against engagement with said rails, air cylinders provided with pistons connected to said pins, and air pipes connected to both sets of said cylinders for unlocking said clamps and immediately thereafter  
10 elevating said clamps.

10. A pneumatic rail brake comprising clamps disposed to engage the rails of a railway track, air cylinders having pistons provided with piston rods operatively connected  
15 with said clamps, pins normally locking said clamps against engagement with said rails, air cylinders provided with pistons connected to said pins, air pipes connected to both sets of said cylinders for unlocking  
20 said clamps and immediately thereafter elevating said clamps, and tripping devices to be actuated by obstructions on said track for opening said pipes to supply said cylinders  
25 with air.

11. A pneumatic rail brake comprising clamps disposed to engage the rails of a railway track, air cylinders having pistons operatively connected with said clamps, pins  
30 normally locking said clamps against engagement with said rails, air cylinders having pistons connected with said pins, and air pipes connected to both sets of said cylinders for unlocking said clamps and immediately thereafter causing said clamps to  
35 engage said rails.

12. A pneumatic rail brake comprising clamps disposed to engage the rails of a railway track, air cylinders having pistons operatively connected with said clamps, pins  
40 normally locking said clamps against engagement with said rails, air cylinders having pistons connected with said pins, one

system of air pipes connected with both sets of said cylinders for unlocking said pins and  
45 elevating said clamps, and another system of pipes connected to both sets of said cylinders for unlocking said pins and causing said clamps to engage said rails.

13. A pneumatic rail brake comprising  
50 clamps disposed to engage the rails of a railway track, air cylinders having pistons operatively connected with said clamps, pins normally locking said clamps against engagement with said rails, air cylinders having  
55 pistons connected with said pins, one system of air pipes connected with both sets of said cylinders for unlocking said pins and elevating said clamps, another system of pipes connected with said first named  
60 cylinders and connected with said first named pipes for unlocking said pins and causing said clamps to engage said rails, and check valves in said first named system of pipes to prevent interference of operation  
65 by said second named pipes.

14. A pneumatic rail brake comprising clamps disposed to engage the rails of a railway track, air cylinders having pistons operatively connected with said clamps, a system  
70 of pipes provided with valves and connected with said cylinders, rocker-shafts connected with said valves, tripping bars rigidly connected with said shafts to be actuated by obstructions on the railway track  
75 to open said valves, and locking devices for locking said tripping bars to hold said valves open.

In testimony whereof, I set my hand in the presence of two witnesses, this 22nd day  
80 of July, 1908.

POWELL ORGAIN ADAMS.

Witnesses:

S. D. TYSON,  
MYRTLE AVRIETT.