

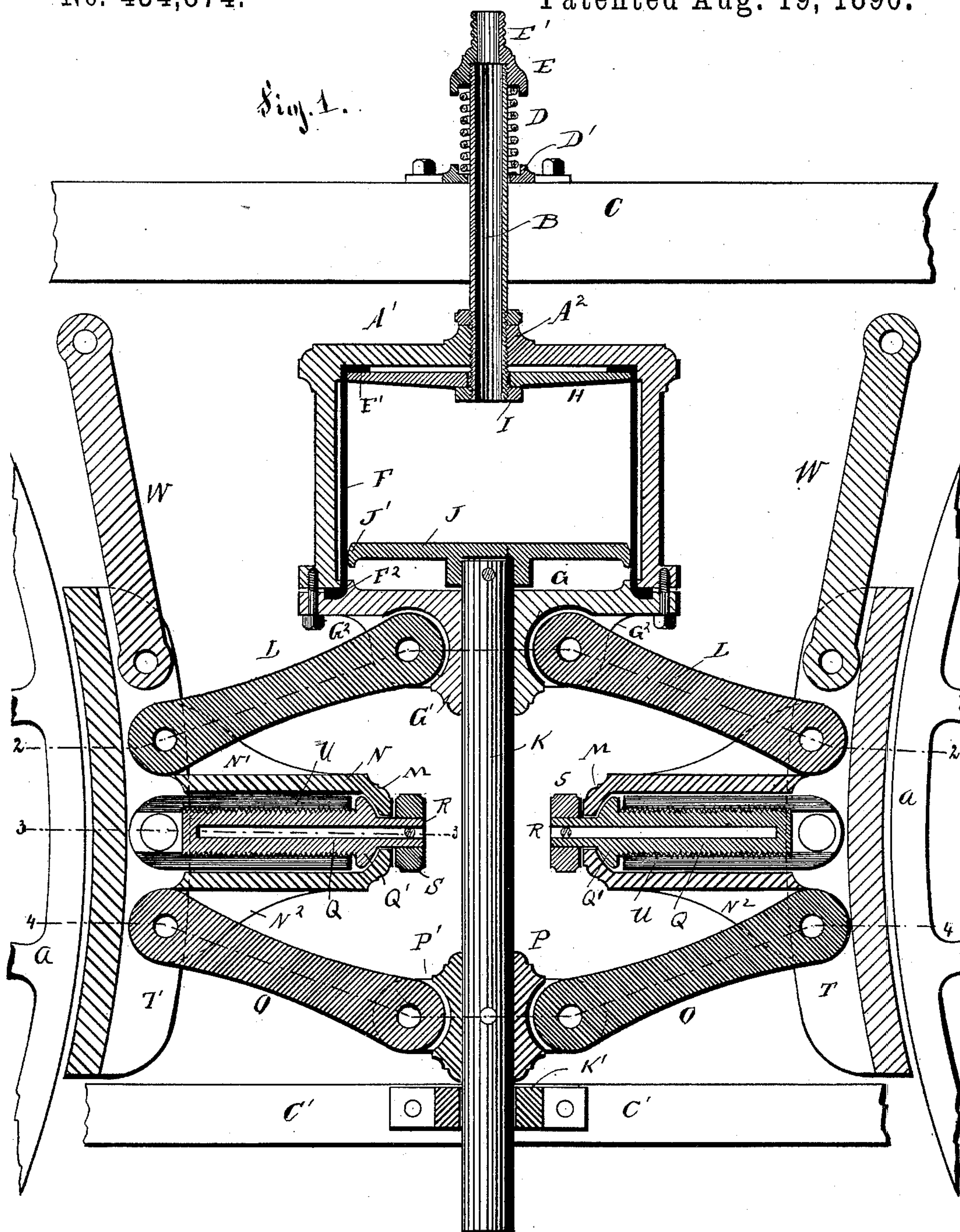
(No Model.)

2 Sheets—Sheet 1.

L. P. LAWRENCE.  
SPREAD BRAKE.

No. 434,874.

Patented Aug. 19, 1890.



**WITNESSES:**

Harry Huber  
Weinberg

**INVENTOR:**

INVENTOR:  
Louis P. Lawrence

BY

BY *George F. Ruggier*  
ATTORNEYS.

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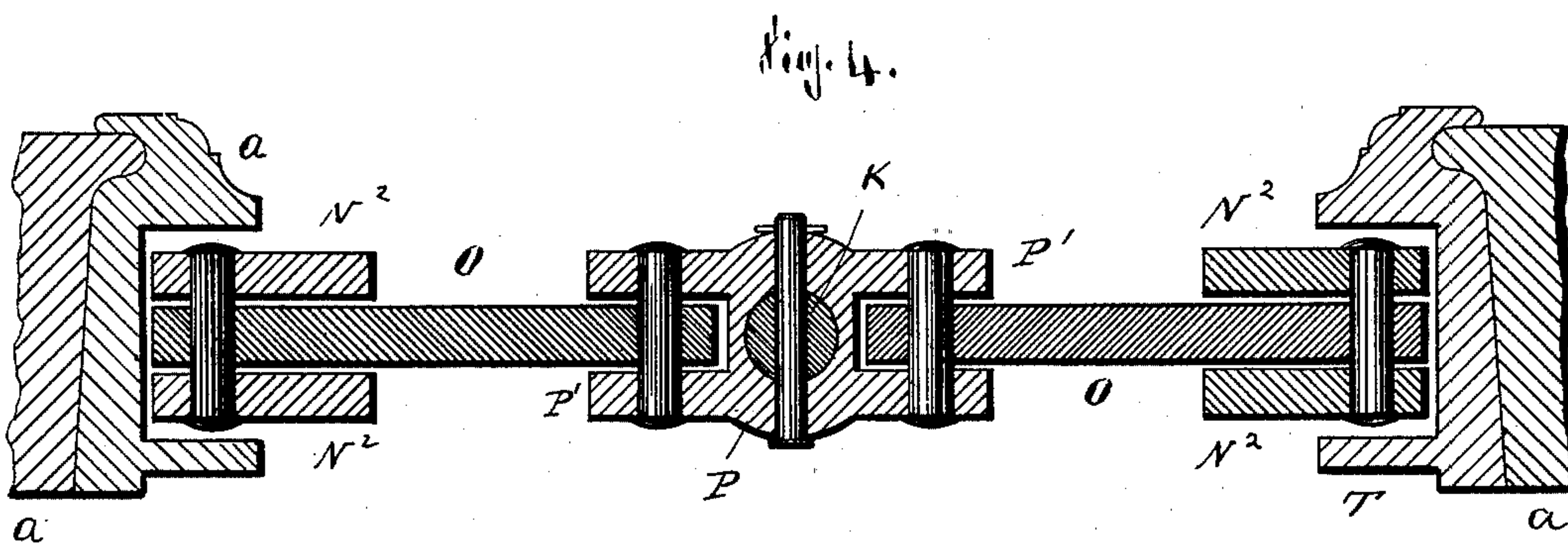
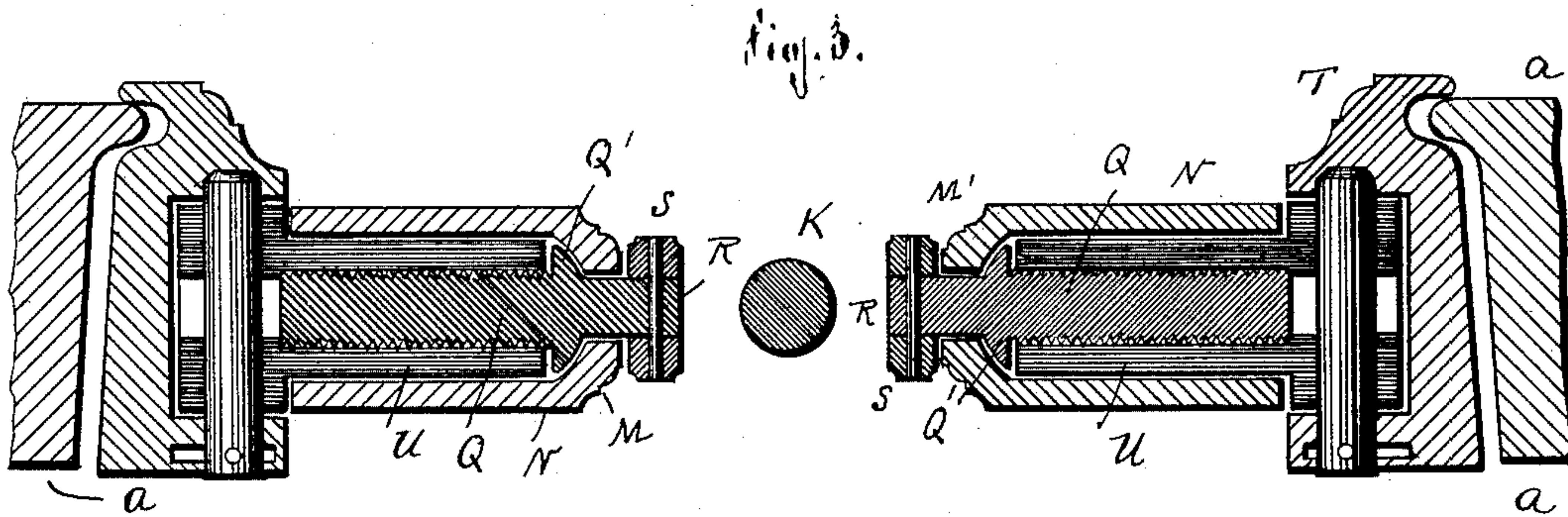
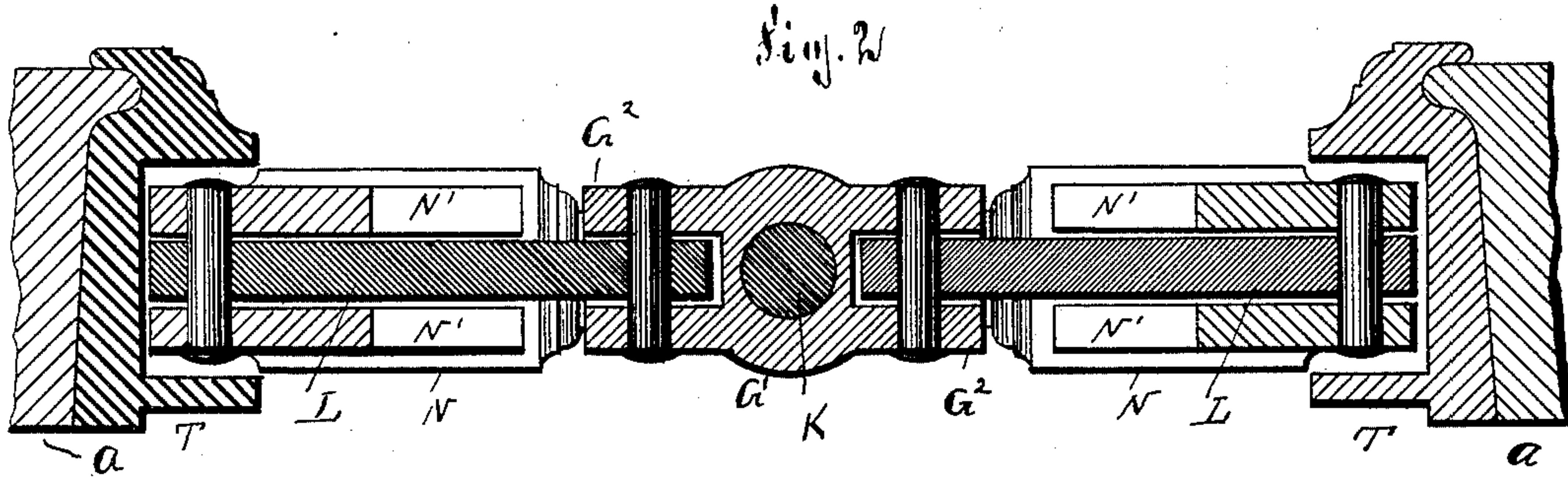
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# UNITED STATES PATENT OFFICE.

LOUIS P. LAWRENCE, OF PASSAIC, NEW JERSEY.

## SPREAD-BRAKE.

SPECIFICATION forming part of Letters Patent No. 434,874, dated August 19, 1890.

Application filed April 14, 1890. Serial No. 347,928. (No model.)

*To all whom it may concern:*

Be it known that I, LOUIS P. LAWRENCE, of Passaic, county of Passaic, and State of New Jersey, a citizen of the United States, have invented certain new and useful Improvements in Spread-Brakes, of which the following is a specification.

This invention relates to improvements in spread-brakes—such as are used between the driving-wheels of locomotive-engines—and which brakes are operated by vacuum, compressed air, steam, or any other suitable motive power.

The object of my invention is to provide a brake of this kind which is simple and rapid in operation, simple in construction, and very powerful and durable.

The invention consists in the construction and combination of parts and details, as will be fully described and set forth hereinafter, and then pointed out in the claims.

In the accompanying drawings, Figure 1 is a vertical longitudinal sectional view of my improved spread-brake. Figs. 2, 3, and 4 are horizontal sectional views of the same on the lines 2 2, 3 3, and 4 4, respectively, of Fig. 1.

Similar letters of reference indicate corresponding parts.

The cylinder A is cast integral with its top head A', which is provided with a central neck A<sup>2</sup>, into which the air-exhaust tube B is screwed, the lower end of said tube projecting a short distance from the under side of said head A', and said projecting part being screw-threaded.

The upper part of the tube B projects through a suitable aperture in the running-board C or frame of the locomotive, and is surrounded above said running-board C by a spiral spring D, the lower end of which rests on a suitable socket-plate D' on the top of the running-board, the upper end of the spring resting against the under side of a nut E, screwed on the upper end of the tube B. Said nut E has a longitudinal bore and is provided on its upper end with a neck E', on which a tube can be applied for connecting the nut and tube B with an air-exhaust device or with a supply of compressed air, steam, or other motive fluid. By this con-

struction the cylinder is suspended from the running-board in such a manner that it can move downward a greater or less distance.

Within the cylinder A a tubular diaphragm or packing F, made of rubber or analogous material, is placed, which is provided at its upper end with an inwardly-projecting flange F' and at its lower end with an outwardly-projecting flange F<sup>2</sup>, which latter is clamped between the bottom edge of the cylinder and the bottom head G of the cylinder. The upper flange F' of the tubular packing-diaphragm F is clamped between the underside of the top head A' and a circular plate H, which is pressed up against the under side of the said upper flange F' by a nut I, screwed on the lower screw-threaded and projecting end of the tube B. The tubular diaphragm F is thus held securely at the top and bottom, and its outer cylindrical surface is held a short distance from the inner walls of the cylinder. The piston J, which has a diameter slightly greater than the inner diameter of the tubular diaphragm F, is provided on its edge with the downwardly-projecting flange J', the outer face of which is slightly rounded. The piston-rod K is secured to the piston J and projects through the central neck G' of the bottom head G of the cylinder, and is guided at its lower end by the guide-piece K' on the locomotive-frame C'. To lugs G<sup>2</sup> on the sides of the neck G' the two links L are pivoted, the opposite ends of which are pivoted to the top wings N' of two casings N, also provided with bottom wings N<sup>2</sup>, to which the two links O are pivoted, the opposite ends of said links O being pivoted to the opposite lugs P' of a collar P, fixed on the piston-rod K near the lower end of the same. Each casing N contains a screw Q, provided near its outer end with a flange Q', resting against a shoulder M, formed on the inner surfaces of the casing N, at the outer end of the same, and beyond said flange each screw Q is provided with a stem R, which projects from an aperture in the outer end of the casing, and on said stem a head S is fixed, which is used for turning the screw. Each screw Q is screwed in the internally-screw-threaded bore of a sleeve U, pivoted to the brake-shoe T at



or near the center of the same. The shoes T are suspended and hung by means of links W in the usual manner.

The operation is as follows: When the air  
 5 is exhausted from the upper part of the cylinder A, the piston J is forced upward by the pressure of the air, and the outer ends of the links O are forced from each other in the manner of a toggle-lever, and the brake-shoes are  
 10 pressed against the rims *a* of the wheels. As the air is still further exhausted from the top part of the cylinder, and as the piston cannot be forced up any farther, the entire cylinder moves downward under the action of the air,  
 15 and the outer ends of the links L are forced from each other also in the same manner as in a toggle-lever, and thus more pressure is exerted on the shoes. The links L and O do not act directly on the shoes, but press the  
 20 casing N laterally. Said casing presses the screws Q laterally, and as the screws are in the sleeves U, and said sleeves are pivoted to the shoes, it follows that the shoes are pressed against the wheel-rims. As the shoes and  
 25 the wheel-rims wear off, the screws Q are turned, so as to lengthen the distance between the pivots of the sleeves U and shoes, and the outer ends of the screws *a*—that is to say, the effective length of the sleeve—is increased  
 30 accordingly as the shoe wears off. When the air is exhausted from the cylinder, the pressure of the air in the narrow space between the outer surface of the tubular diaphragm F and the inner walls of the cylinder forces  
 35 the said tubular diaphragm inward and against the edges of the piston J, thereby packing the piston and preventing any leak.

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

1. In a brake, the combination of a cylinder mounted to move toward a movable piston in the same, a piston-rod on said piston, brake-shoes suitably suspended and hung,  
 45 sleeves connected with the brake-shoes, casings surrounding said sleeves, links connecting said casings with a cylinder, and other links connecting the said casings with the piston-rod, substantially as set forth.

50 2. The combination, with a cylinder, piston,

and a piston-rod, said cylinder being mounted to move toward its movable piston, of brake-shoes suitably suspended and hung, sleeves pivoted to the brake-shoes, screws screwed into said sleeves, casings surrounding the  
 55 sleeves and resting against the screws, links connecting said casings with the cylinder, and other links connecting said casings with the piston-rod, substantially as set forth.

3. The combination, with a cylinder, piston, 60 and piston-rod, of brake-shoes suitably suspended and hung, sleeves pivoted to the brake-shoes, screws screwed into said sleeves and provided at their outer end with flanges, casings surrounding the sleeves and having the  
 65 outer ends rested against the flanges of the screws, heads for turning said screws, links connecting said casings with the cylinder, and other links connecting the casings with the piston-rod, substantially as set forth. 70

4. The combination, with the cylinder, of a tubular diaphragm made of rubber or analogous material and secured in the cylinder at both ends, and a piston mounted to move in the direction of the length of the cylinder  
 75 within said tubular diaphragm, substantially as set forth.

5. The combination, with a cylinder, of a tubular diaphragm provided with flanges resting against the top of the cylinder, a plate  
 80 resting against said flanges, and means for pressing said plate against the flanges, substantially as set forth.

6. The combination, with a cylinder, of an air-exhaust tube in the top of the same and  
 85 projecting some distance below the head, a tubular diaphragm placed in the cylinder and having a top flange resting against the under side of the top head, a plate resting against said flange, and a nut screwed on the project-  
 90 ing end of the exhaust-tube and serving to press the said plate against the flange of the diaphragm, substantially as set forth.

In testimony that I claim the foregoing as my invention I have signed my name in pres-  
 95 ence of two subscribing witnesses.

LOUIS P. LAWRENCE.

Witnesses:

JULIUS JENSEN,  
 WM. F. GASTON.