

(No Model.)

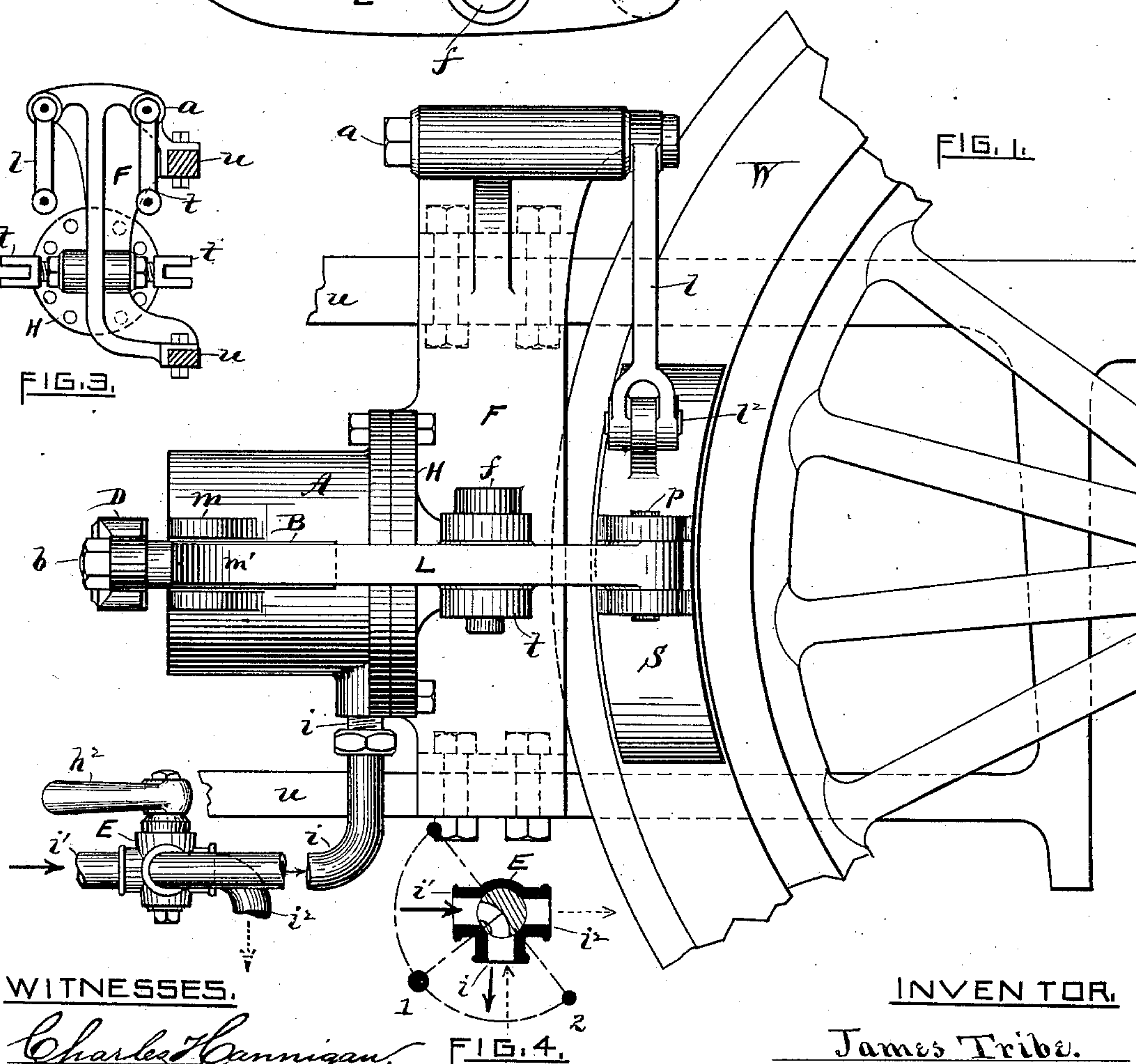
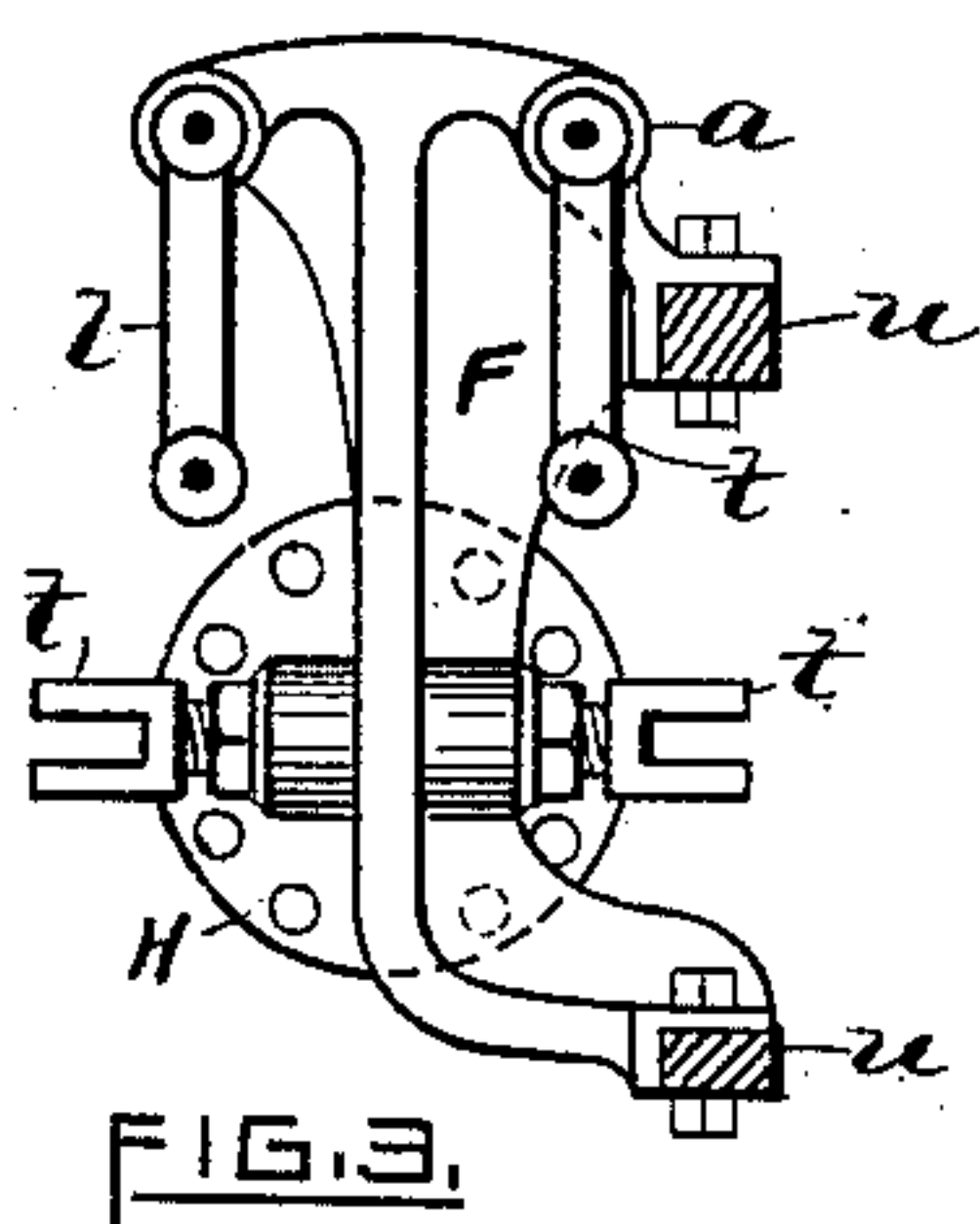
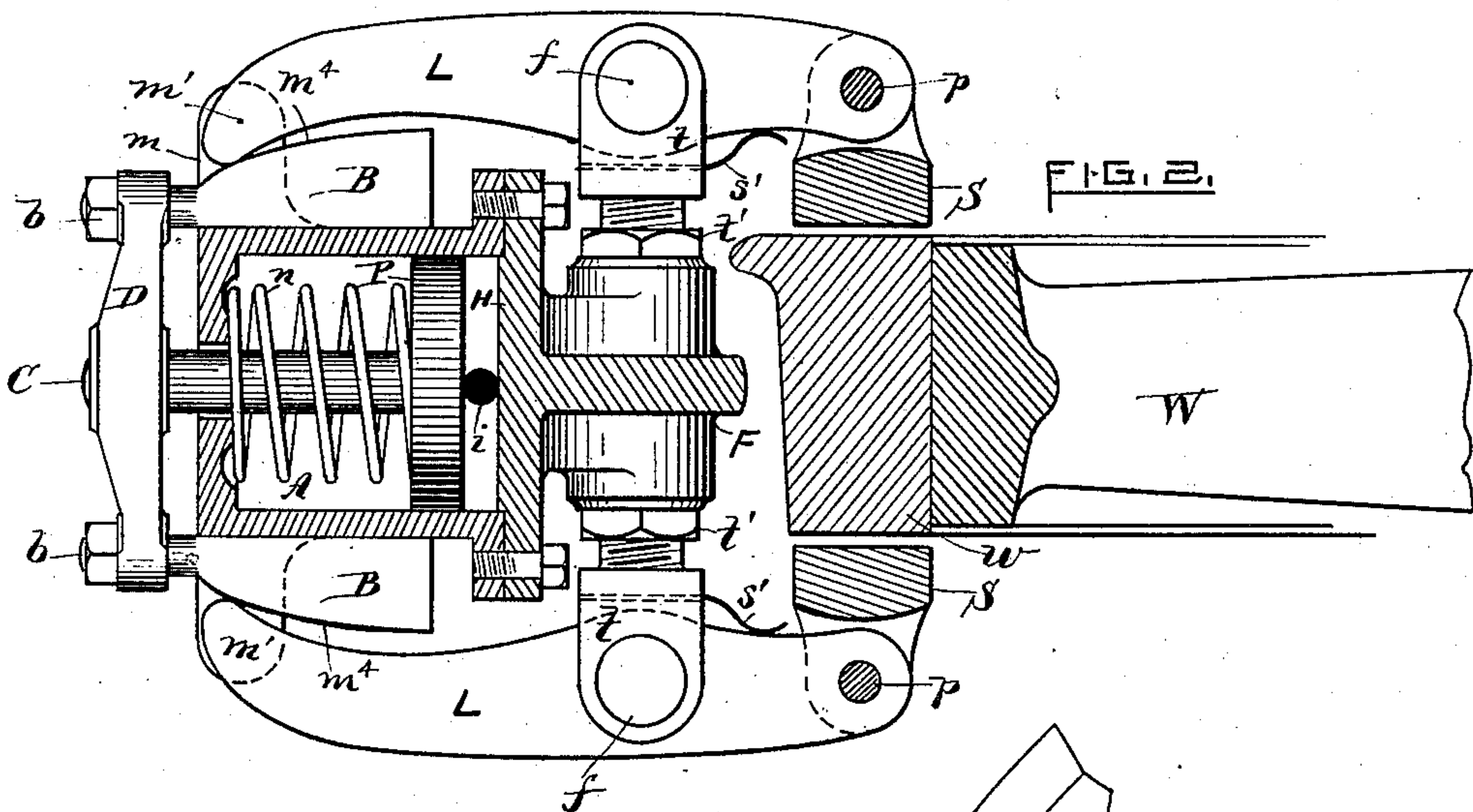
3 Sheets—Sheet 1.

J. TRIBE.

LOCOMOTIVE AND CAR BRAKE.

No. 343,680.

Patented June 15, 1886.



WITNESSES.

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FIG. 6.

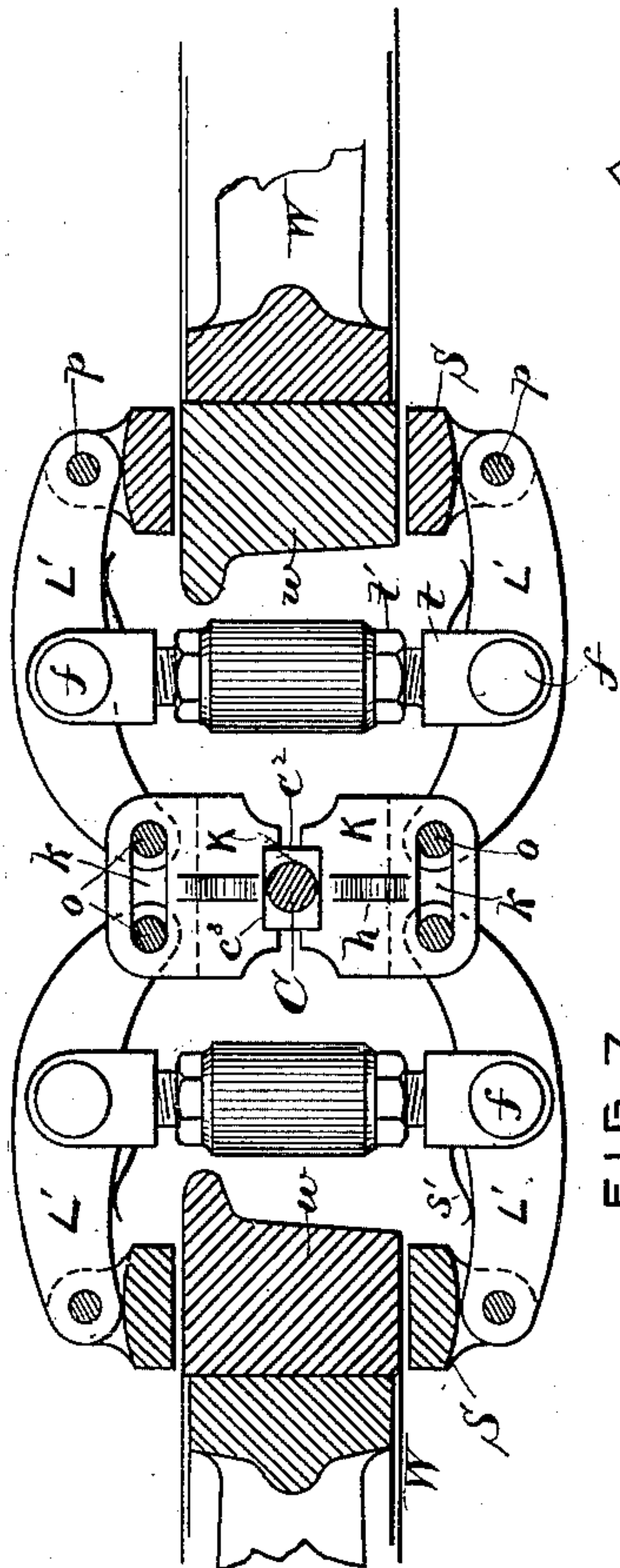
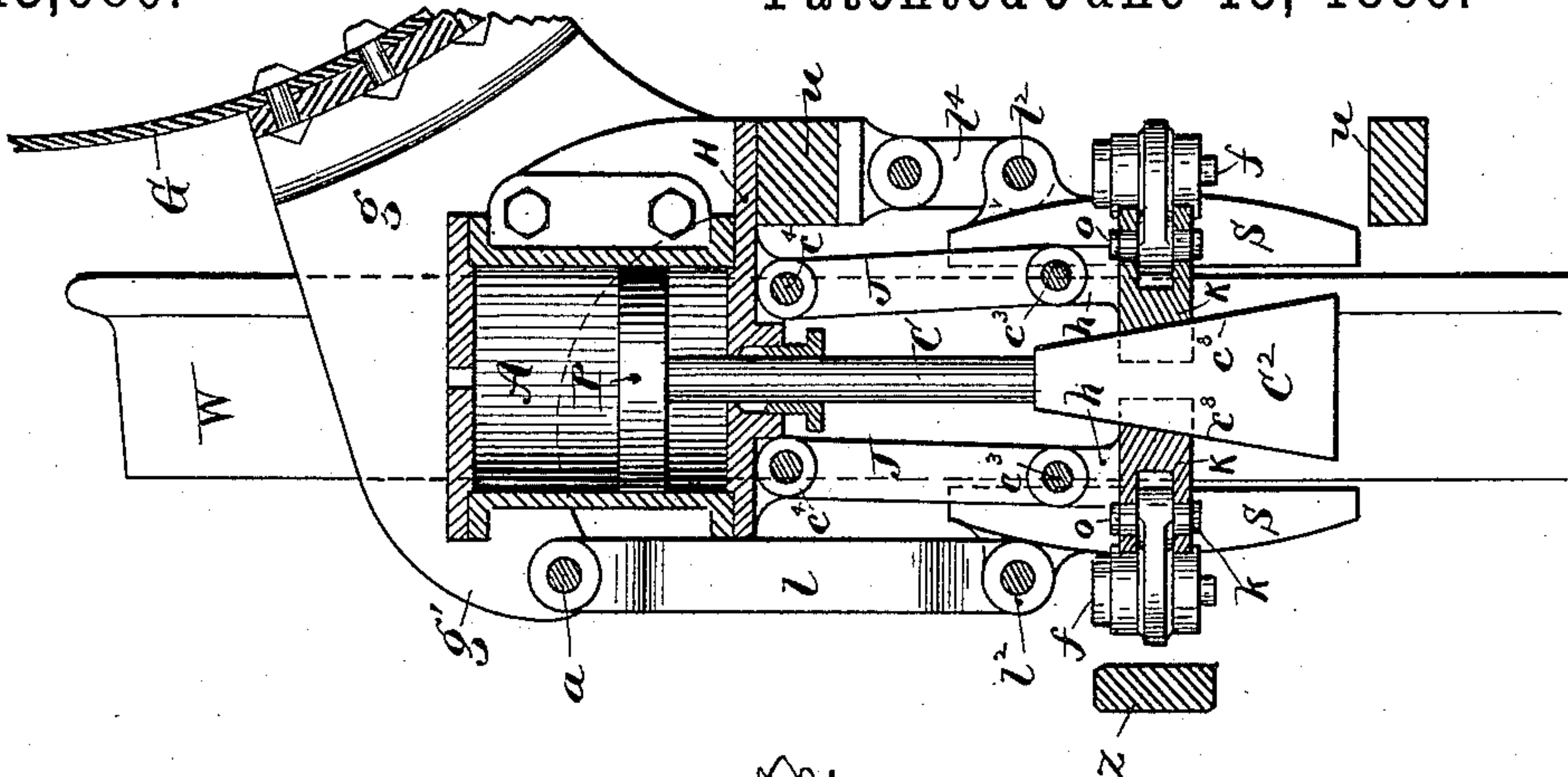


FIG. 7.

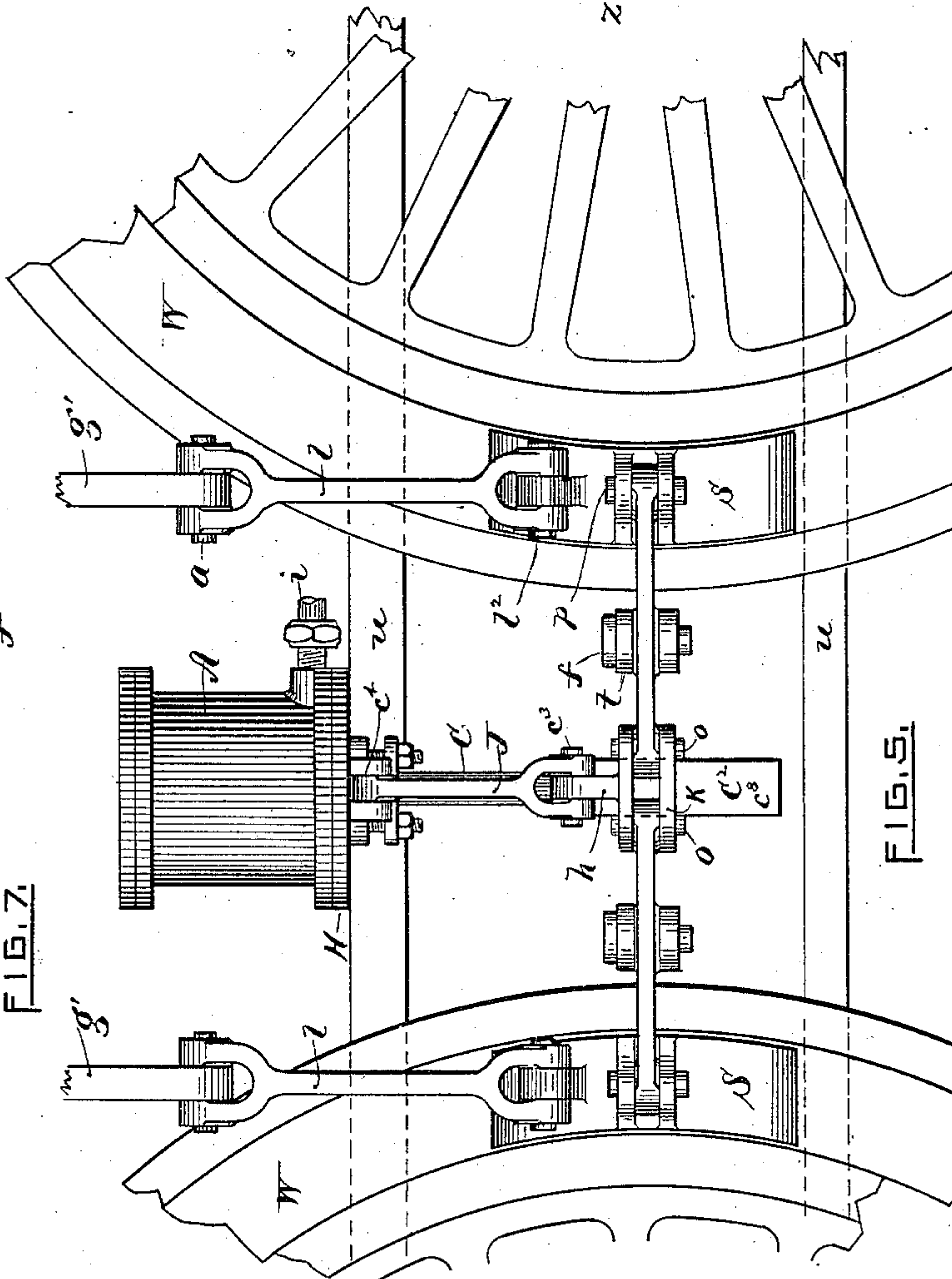


FIG. 8.

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(No Model.)

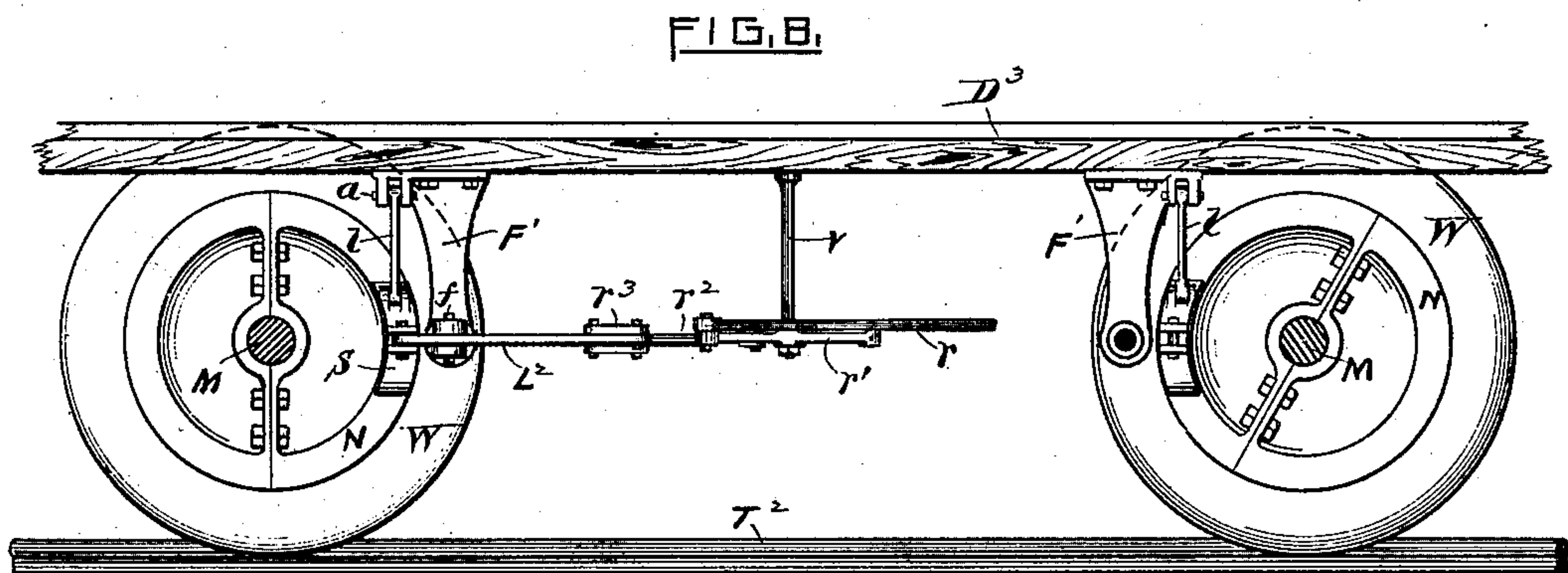
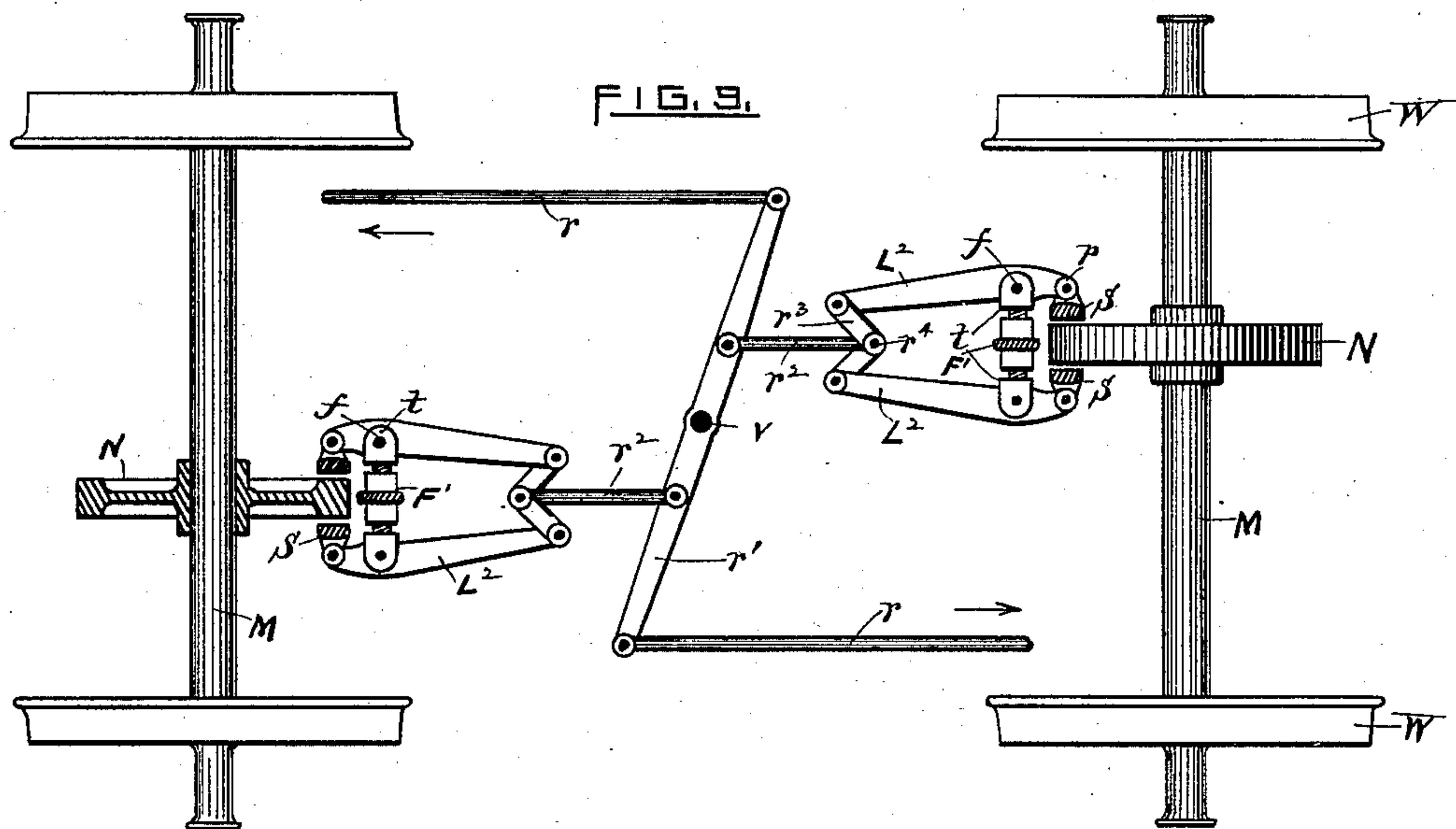
3 Sheets—Sheet 3.

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UNITED STATES PATENT OFFICE.

JAMES TRIBE, OF PROVIDENCE, RHODE ISLAND.

LOCOMOTIVE AND CAR BRAKE.

SPECIFICATION forming part of Letters Patent No. 343,680, dated June 15, 1886.

Application filed January 27, 1886. Serial No. 189,916. (No model.)

To all whom it may concern:

Be it known that I, JAMES TRIBE, a subject of the Queen of Great Britain, residing at Providence, in the county of Providence and State of Rhode Island, have invented certain new and useful Improvements in Locomotive and Car Brakes; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

My invention relates to friction-brakes adapted more particularly for use with locomotive and car wheels; and it consists, essentially, in the novel construction and arrangement of the brake-shoes, combined with mechanism for effecting the frictional engagement of said shoes with the two lateral faces of the rim of the wheel.

It consists in the combination, with a pair of driving-wheels and a duplex set of brake-shoes adapted to bear against the lateral faces of said wheels, of a wedge-shaped block connected with the piston-rod of a steam or air pressure cylinder, whereby the piston thereof in its movement causes the wedge-block to actuate the brake-shoes simultaneously, all as will be more fully hereinafter set forth and claimed.

Heretofore, so far as I am aware, the brake-shoes have been applied directly to the outer peripheral surface or "tread" of the driving and truck wheels when used in retarding the momentum of a moving train, thereby losing nearly one-half of the force or pressure applied to the brakes, the same being borne by the lubricated surface of the journals. Such construction also produces excessive wear upon the wheels, as well as in the bearings and journals of the axles on which said wheels are secured.

The object of my invention is to overcome the disadvantages just named, and also to permit the train to be stopped in a more expeditious and less annoying manner.

By means of my improvement the pressure applied to one shoe in forcing it against a side or edge of the wheel is equally borne by the other

shoe, which bears against the opposite side of the wheel, thus obtaining the advantage of the reactive force, and enabling me to use smaller cylinders, &c., as compared with the old system.

In the accompanying three sheets of drawings which I have prepared to illustrate my invention, Figure 1, Sheet 1, represents a partial front view in elevation, showing the arrangement of the device as applied to the main driving-wheels of a locomotive. Fig. 2 is a horizontal sectional view of the same, showing the brake-shoes detached or disconnected from the wheel and corresponding to the normal position, the shoes each being connected to an arm or lever having its free end bearing against a parabola-shaped wedge or key, which latter in turn is connected to and moves in unison with the piston of the pressure-cylinder. Fig. 3 is a reduced transverse sectional view showing the manner of supporting the device, the shoes, however, being removed. Fig. 4 is a horizontal sectional view through the valve or cock, which is adapted both to admit steam (or air) into the cylinder and to exhaust it therefrom. Fig. 5, Sheet 2, is a front or longitudinal view in elevation, showing the device as arranged to form a double brake, the same being applied to two adjacent driving-wheels of a locomotive. Fig. 6 is a vertical transverse sectional view of the same. Fig. 7 is a horizontal sectional view through the wheels, brake-shoes, and piston-rod. Fig. 8, Sheet 3, is a transverse sectional view through the axles of a car-truck, showing a supplemental wheel secured to each axle, and having my improved brakes connected therewith, the shoes being operated by means of jointed levers and links actuated by a lever common to both sets of shoes; and Fig. 9 is a plan view of the same, the supports for the device being removed.

The following is a more detailed description of the invention, including the manner of its construction and operation.

W, again referring to the drawings, designates the driving-wheels of a locomotive, or the truck-wheels of a car, as the case may be, the same being constructed and mounted as common.

S S indicate the brake-shoes, each having a

flat face or surface adapted to frictionally engage the lateral sides or edges of the rim of the wheel, as clearly shown in Figs. 2, &c. At or near the center of the back of each shoe 5 are formed ears or lugs, to which the lever L is pivoted, as at *p*. A lug is also formed on the shoe for the purpose of receiving a pin, *l*², which passes through a suspension-link, *l*, the latter in turn being supported by a pin, *a*, 10 mounted in the stationary frame F, secured to the main frame *u*, as shown in Fig. 1. The frame F is provided with a transverse hub, which is tapped to receive the oppositely-arranged screw-threaded fulcrums *t*, Fig. 2, the 15 latter being adjustably secured in position by means of check-nuts *t*¹.

L L indicate levers, which connect with and operate the brake-shoes S, said levers being fulcrumed at *f* to the threaded pieces *t*, before 20 described. *s*¹ indicates light springs, which bear against the levers L, for the purpose of keeping the shoes in the normal position—i. e., disengaged from the wheel W.

A designates a cylinder adapted to receive 25 air or steam under pressure, the same being provided with a piston, P, and its rod C, as common, H being the front head of the cylinder, and, as drawn, forming a part of the stationary frame F. A spring, *n*, located be- 30 tween the back head and the piston, serves to return the latter to its normal position as the pressure in front of the piston is released.

i indicates an inlet-passage leading from the steam or air reservoir to the cylinder, by 35 means of which the steam or air is admitted into the cylinder and against the front side of the piston also, as usual. To the outer end of the piston-rod C is secured the cross head or arm D, the latter having a key or block-wedge, 40 B, secured to each end thereof, said keys each being guided by means of ears *m*, formed on opposite sides of the cylinder A, as shown. The outer edge, *m*¹, of said keys is made convex, and conforming closely to the form of a 45 parabola, the same having the free end *m*² of the levers L resting thereon. By means of this construction it is obvious that as the piston moves rearwardly, so also at the same time are the keys B forcibly drawn in the same di- 50 rection, the ears *m* retaining the keys in lateral position. Now, it is further evident that as the said keys are thus moved the curved edges *m*¹ thereof cause the free ends of the levers L to separate or diverge from each other, 55 thus forcing the flat surface of the brake-shoes against the opposite edges of the wheel W.

E, Figs. 1 and 4, indicates a three-way cock connected with the cylinder A, *i*¹ being a tube 60 or pipe connecting said cock with the steam or air supply. The handle *h*² of the cock, when in the position 1, Fig. 4, permits the steam to pass from the pipe *i*¹ through the cock, and into the pipe *i*, leading to the cylinder, the direction being indicated by means of 65 the full-line arrows. The release or exhaust

is effected by carrying the handle to the position 2, the steam then passing from the cylinder back through the pipe *i* and cock, and thence out at the pipe *i*², as indicated by dotted- 70 line arrows.

In Sheet 2 of the drawings I have represented the device as applied to the opposite sides or faces of a pair of locomotive driving- 75 wheels, thereby forming a double or duplex brake, the four shoes of which are adapted to be simultaneously operated by means of the moving piston P of the cylinder A, the piston-rod C thereof having a wedge-shaped block, C², secured thereto at its lower end, as 80 clearly shown in Fig. 6. The oppositely-inclined surfaces *c*² of said wedge engage each a block, K, having an ear, *h*, and slotted opening *k*.

J indicates a link, (one for each block K,) 85 pivoted at *c*¹ to the frame or head H, the lower end of said link connecting with and suspending the block K by means of a pin, *c*³, passing through it and the ear *h*. The front shoes S are suspended by means of the links 90 *l*, connected therewith, as before stated, the upper portion of said links, however, being pivoted at *a* to an arm, *g*¹, of the frame *g*, secured to the boiler G, the rear shoes at the same time being suspended by the short links 95 *l*¹, all as clearly shown in Fig. 6.

L' L' indicate the levers for operating the shoes, the same being pivoted at *f* in fulcrums *t*, substantially as hereinbefore described. The inner end of each of said levers is provided 100 with a pin, *o*, which is fitted to slide in the slotted opening *k* of the forked block K.

u u indicate the engine-frame, as before, and *z* designates a cross-sectional view of the out- 105 side connecting-rod.

The device may be so constructed that the shoes S shall engage the sides of a brake-wheel, N, secured to the axle M, intermediate of the driving or truck wheels W, as shown in Figs. 8 and 9. In this case the mechanism com- 110 posing the brake arrangement is supported by means of a frame, F', secured to the under side of the car, links *l*, depending therefrom, connecting with the brake-shoes S, as before described. 115

In lieu of the cylinder A, the levers L² may connect with links *r*³ and rod *r*², which in turn connects with a lever, *r*¹, supported by the vertical rod V. A rod, *r*, is pivoted to the free end of said lever *r*¹, and adapted to be 120 connected with the platform brake-levers, &c., for operating the same, as common. The rod *r* may be connected directly with the air-cylinder now generally employed in the "air-brake" system without departing from the 125 spirit of the invention.

The device now being first constructed, arranged, and mounted substantially as shown and hereinbefore described, the operation would be as follows: Steam or air is admitted 130 into the cylinder A, thus forcing the piston P and its connections in a rearward direction.

During the first part of this movement the curved portion of the keys B, Fig. 2, causes the levers L resting thereon to move rather rapidly; but as the flattened or less-inclined portion of the blocks comes in contact with the levers, so, relatively, is the pressure or leverage upon the shoes S, bearing against the opposite sides of the wheel, increased. The pressure is quickly released from the cylinder by simply moving the handle h^2 of the cock E to the position 2, Fig. 4, the air or steam then passing from the pipe i through the valve or cock and out at the pipe i^2 , as indicated by the dotted-line arrows, the springs n and s' at the same time causing the several parts to assume their normal or free position, the same being substantially true of the devices represented in Sheets 2 and 3 of the drawings. By means of this arrangement I am enabled to overcome and reduce to a minimum all the lateral thrust or pressure upon the journals and their bearings, which heretofore has been unavoidable when the shoes or brakes were applied directly to the peripheral surfaces of the wheels. This advantageous result is obtained by means of the novel arrangement of the brake-shoes with relation to the wheels, wherein the pressure is the same upon each side of the wheel. The wear or abrasion thus produced does not materially affect the efficiency or durability of the wheel, as would be the case if the shoes were made to bear directly upon the tread of the wheel, as commonly arranged.

By means of the split wheels N, secured to the car-axles, Figs. 8 and 9, old cars may be readily provided with the improved apparatus, the latter occupying less space, and being more accessible as compared with the common method in general use.

It is obvious that one shoe only may be used, although, practically, I prefer the employment of two or more, as indicated throughout the drawings.

I do not limit myself to the exact form and arrangement of the parts herein shown and described, as the device would necessarily require minor changes or modifications therein in order to adapt it to the various locomotives or cars to which it may be attached.

I am aware that it is not new with me to secure a brake-wheel upon the axle intermediate of the truck-wheels, as such combination has been made and patented prior to my present invention. Therefore I do not claim such, broadly.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent of the United States, is—

1. The herein-described improved brake for locomotives, consisting of brake-shoes S, arranged on opposite vertical sides or faces of

one of the driving-wheels, means for supporting and suspending the shoes in position with relation to the wheel, and means, substantially as shown and described, for effecting the frictional engagement of the shoes with the wheel, the whole arranged and operating substantially as set forth.

2. The combination, with a locomotive or car-wheel, brake-shoes S, arranged on opposite parallel sides or faces thereof, and levers L, adjustably mounted in a frame or support, of a pressure-cylinder, means for admitting steam into said cylinder and exhausting it therefrom, a piston moving in the cylinder, a cross-head secured to the piston-rod, and oppositely-arranged curved blocks or keys connected to and moving with said cross-head, each engaging the free end of a brake-shoe lever, the whole constructed and arranged whereby the piston in its rearward movement causes the brake-shoes to simultaneously frictionally engage the opposite sides or edges of the wheel, substantially as shown and hereinbefore set forth.

3. The duplex brake for locomotive driving-wheels, substantially as hereinbefore described and shown, consisting of the four shoes S, levers L', connecting said shoes, adjustably-mounted fulcrums t , in which the levers are pivoted, slotted blocks K, each connected with and operating two of the said levers L', suspension-links l^u and J J for the shoes and blocks K, respectively, a wedge, C', engaging both blocks K, a piston and rod for operating said wedge, and means whereby steam or air is admitted into and released from the cylinder, the whole arranged and operating substantially as set forth.

4. The combination, with the locomotive driving-wheel W, of brake-shoes S S, arranged on opposite sides of the vertical parallel faces of said wheel, a frame and links for sustaining the brake-shoes, and mechanism for frictionally engaging the faces of said brake-shoes with the vertical faces of the wheel W, substantially as shown and hereinbefore described.

5. The combination, with a wheel, W, shoes S, levers L, and adjustable supports for said levers, of a pressure-cylinder, a piston adapted to work therein, piston-rod carrying a cross-head, D, and wedge-blocks B, secured to said cross-head, whereby the piston causes the blocks B to move in unison therewith, substantially as shown, and for the purpose hereinbefore set forth.

In testimony whereof I have affixed my signature in presence of two witnesses.

JAMES TRIBE.

Witnesses:

HERBERT WILFORD,
GEO. H. REMINGTON.