

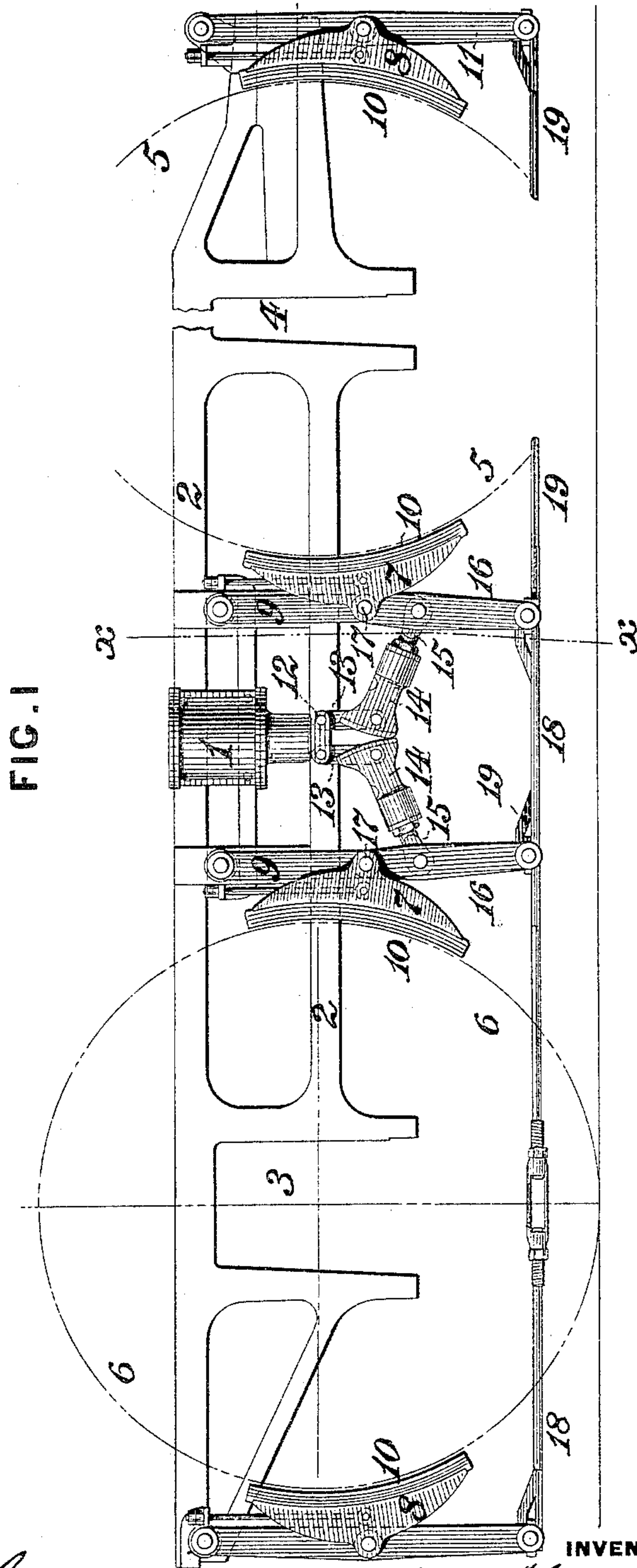
(No Model.)

2 Sheets—Sheet 1.

H. H. WELSH.  
LOCOMOTIVE DRIVER BRAKE.

No. 432,960.

Patented July 22, 1890.



WITNESSES:

*R. A. Whittlesey*  
*F. E. Gaither*

INVENTOR,

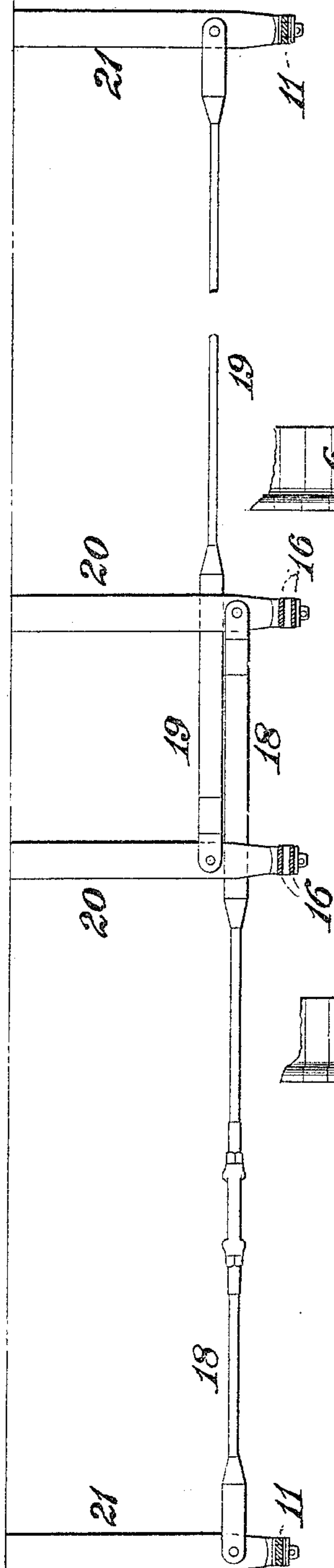
*Harry H. Welsh,*  
*by J. Snowden Bell,*  
Att'y.

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FIG. 2.



WITNESSES:

*R. H. Whittesey*  
*F. E. Gaither*

FIG. 4.

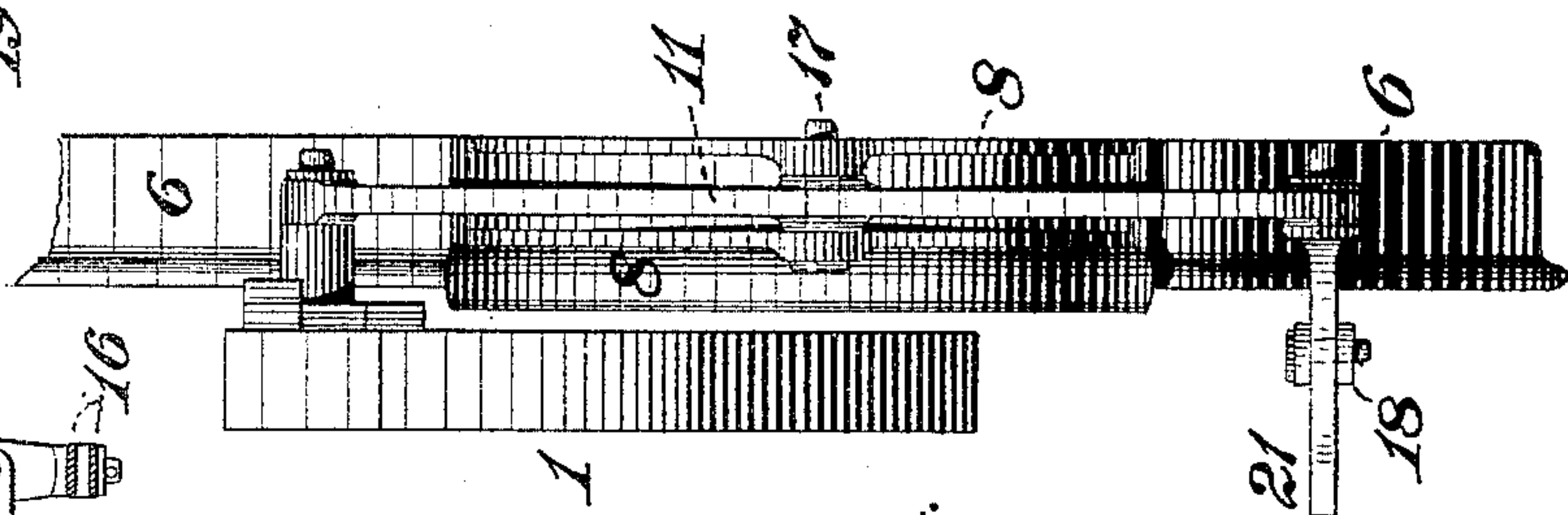
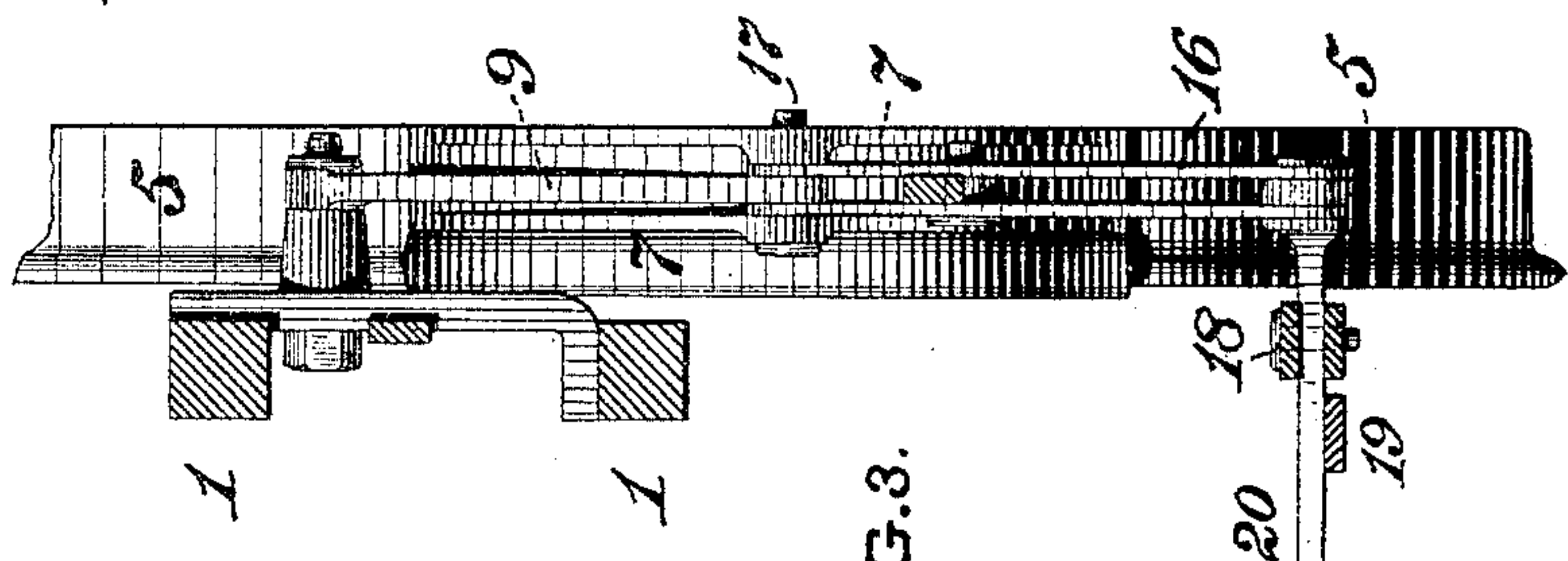


FIG. 3.



INVENTOR,

*Harvey H. Welsh,*  
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# UNITED STATES PATENT OFFICE.

HARVEY H. WELSH, OF KILBUCK, ASSIGNOR TO THE WESTINGHOUSE AIR BRAKE COMPANY, OF PITTSBURG, PENNSYLVANIA.

## LOCOMOTIVE-DRIVER BRAKE.

SPECIFICATION forming part of Letters Patent No. 432,960, dated July 22, 1890.

Application filed February 15, 1890. Serial No. 340,563. (No model.)

*To all whom it may concern:*

Be it known that I, HARVEY H. WELSH, a citizen of the United States, residing at Kilbuck township, in the county of Allegheny and State of Pennsylvania, have invented or discovered a certain new and useful Improvement in Locomotive-Driver Brakes, of which improvement the following is a specification.

My invention relates to fluid-pressure brakes for the driving-wheels of locomotive-engines, and its object is to enable the advantages of the squeeze-brake system, or that in which in the brake-shoes are applied on opposite sides of the wheels, in connection with those due to the application of the braking-pressure through segment-levers, to be attained in a simple and effective manner and by a construction readily applicable to engines of the ordinary standard patterns.

To this end my invention, generally stated, consists in the combination of two pairs of brake-heads, the members of each pair being suspended on opposite sides of a locomotive driving-wheel, a fluid-pressure cylinder fixed between the driving-wheels, live-levers coupled to the two inner or adjacent brake-heads, segment or cam levers coupled to said live-levers and to the piston-rod of the cylinder, dead-levers coupled to the two outer brake-heads, and oppositely-extending pull-rods connecting each live-lever with a dead-lever on the side of the cylinder opposite thereto.

The improvement claimed is hereinafter fully set forth.

In the accompanying drawings, Figure 1 is a side view in elevation of a driver-brake mechanism embodying my invention; Fig. 2, a half plan of the pull-rods and brake-beams; Fig. 3, a vertical transverse section, on an enlarged scale, through the engine-frame at the line  $xx$  of Fig. 1, looking forward, and Fig. 4 a rear view in elevation and on a similar scale.

In the practice of my invention I provide a fluid-pressure cylinder 1, which is secured vertically to the frame 2 of a locomotive-engine centrally between the jaws or pedestals 4 and 3, in which are fitted the journal-boxes of the driving-wheels 5 and 6. Two brake-heads 7 and 8, provided with suitable shoes 10, are suspended from the frame on opposite sides of

each of the driving-wheels, the inner brake-heads 7 of each pair, or those nearest the cylinder, being carried by hangers 9, which are pivoted at their upper ends to the frame and at their lower ends by pins 17 to the brake-heads, and the outer brake-heads 8, or those farthest from the cylinder, being coupled to dead-levers 11, which are pivoted at their upper ends to the frame.

The cylinder 1 is fitted with a suitable piston adapted to be actuated in the usual manner by compressed air, steam, or hydraulic pressure applied above it, or atmospheric pressure acting as the result of a partial vacuum being effected below it, and its piston-rod is provided at its outer end with a transverse head 12, which is coupled by links 13 to a pair of segment or eccentric-faced levers 14, having their faces abutting in the axial line of the cylinder 1, these segment-levers being substantially similar in operation to those set forth in the patent of George Westinghouse, jr., No. 147,212, dated February 3, 1874. The opposite ends of the segment-levers 14 are coupled by adjustable screw-connections 15 to live-levers 16, the upper ends of which are coupled to the pins 17, which connect the hangers 9 and brake-heads 7. The lower end of the live-lever 16 of the inner brake-head 7 of the front driving-wheel 5 is coupled by a rearwardly-extending pull-rod 18 to the dead-lever 11 of the outer brake-shoe 8 of the rear driving-wheel 6, and the lower end of the live-lever 16 of the inner brake-head 7 of the rear driving-wheel 6 is coupled by a forwardly-extending pull-rod 19 to the dead-lever 11 of the outer brake-shoe 8 of the front driving-wheel 5. The live-levers of the wheels on opposite sides of the engine are also coupled to and connected at their lower ends by transverse brake beams or ties 20, and the dead-levers of the opposite wheels are correspondingly coupled and connected by similar brake beams or ties 21.

In operation downward movement of the piston of the cylinder 1 by pressure applied thereto forces the upper portions of the eccentric faces of the segment-levers 14 together, thereby forcing the live-levers 16 outwardly from the center line of the cylinder and through said levers, which act in the manner of toggles in



changing the direction of the pressure of the shoes 10 of the inner brake-heads 7 to the driving-wheels 5 and 6, the application of pressure being effected without the variation of leverage incident to the action of toggle-levers. The outward movement of the forward and rear live-levers 16 being transmitted through the oppositely-extending pull-rods 18 and 19 to the rear and forward dead-levers 11, respectively, effects a corresponding inward movement of said levers, and thereby coincidently applies the shoes of the outer brake-heads 8 to the driving-wheels. It will thus be seen that the simultaneous application of brake-shoes to opposite sides of the wheels, as in the squeeze-brake constructions heretofore known, is effected by a very simple series of connections, and the application of power therefor is made with the attainment of the advantages which have been demonstrated in practice as resultant from toggle-lever action, the segment-levers, through which the braking-power is transmitted, presenting the further advantage of maintaining uniform leverage throughout the stroke of the piston 1.

I claim as my invention and desire to secure by Letters Patent—

1. In a locomotive-driver brake, the combination of brake-heads suspended in pairs on the opposite sides of two driving-wheels, a fluid-pressure cylinder fixed between said wheels, eccentric-faced segment-levers coupled to the piston-rod of said cylinder, and connections for transmitting the power applied through said segment-levers to each pair of brake-heads, substantially as set forth.

2. In a locomotive-driver brake, the combination of brake-heads suspended in pairs on the opposite sides of two driving-wheels, a fluid-pressure cylinder fixed between the driving-wheels, live-levers coupled to the inner brake-heads, segment-levers coupled to said live-levers and to the piston-rod of the cylinder, dead-levers coupled to the outer brake-heads, and pull-rods coupling the live-lever of the inner brake-head of each driving-wheel with the dead-lever of the outer brake-head of the other driving-wheel, substantially as set forth.

3. In a locomotive-driver brake, the combination of brake-heads located in position to bear against the inner or adjacent sides of two driving-wheels, hangers suspending said brake-heads from fixed supports, brake-heads located in position to bear against the opposite or outer sides of said driving-wheels, dead-levers coupled to fixed supports and to said outer brake-heads, live-levers coupled to the inner brake-heads, a fluid-pressure cylinder fixed between the driving-wheels, segment-levers coupled to the live-levers and to the piston-rod of the fluid-pressure cylinder, a pull-rod coupling the forward dead-lever with the rear live-lever, and a pull-rod coupling the forward live-lever with the rear dead-lever, substantially as set forth.

In testimony whereof I have hereunto set my hand.

HARVEY H. WELSH.

Witnesses:

J. SNOWDEN BELL,  
FRANCIS X. BARR.