

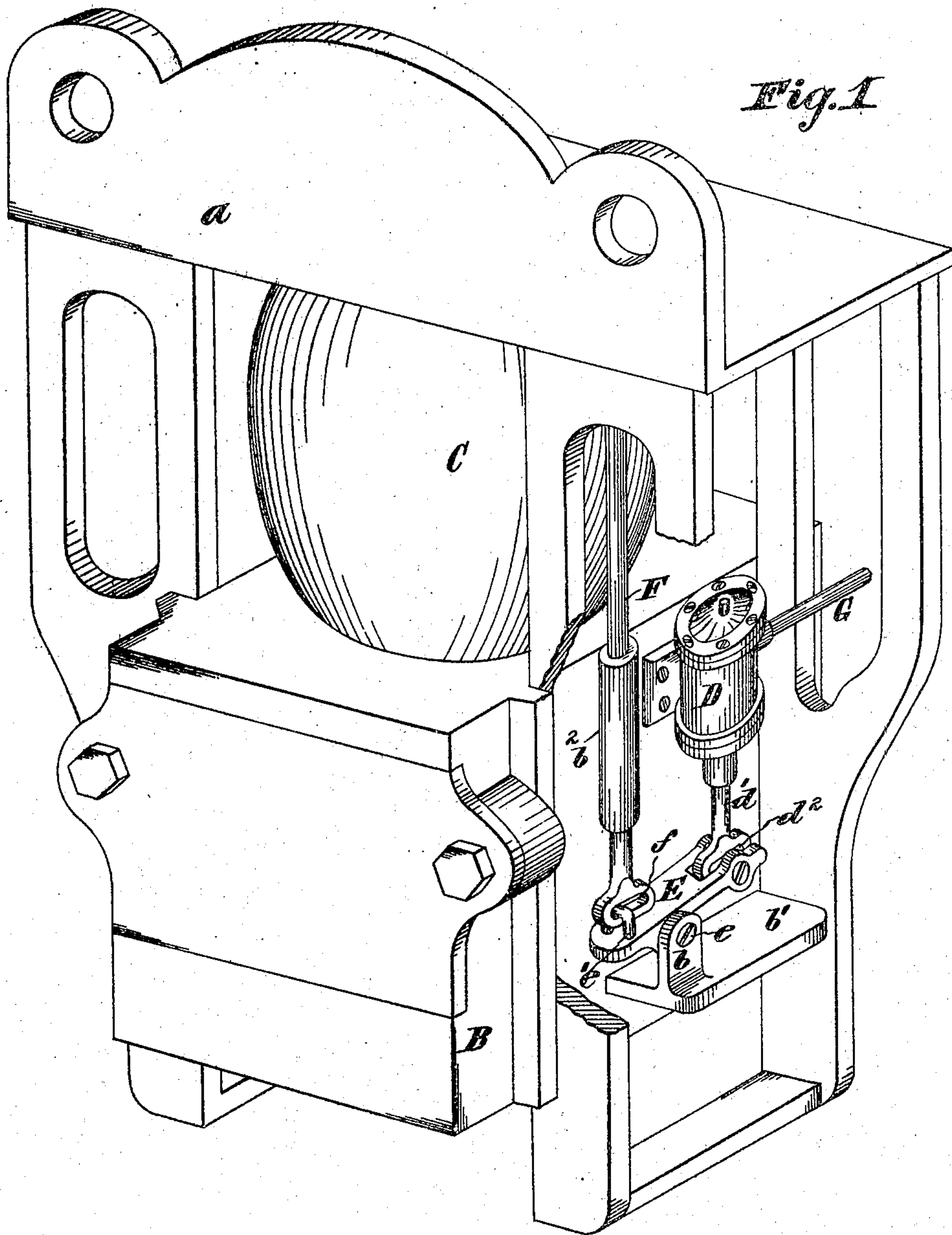
(No Model.)

3 Sheets—Sheet 1.

I. P. WENDELL.  
Atmospheric Car Brake.

No. 233,957.

Patented Nov. 2, 1880.



WITNESSES:  
Albert Lupton.  
Richd. Jones.

INVENTOR,  
Isaac P. Wendell.

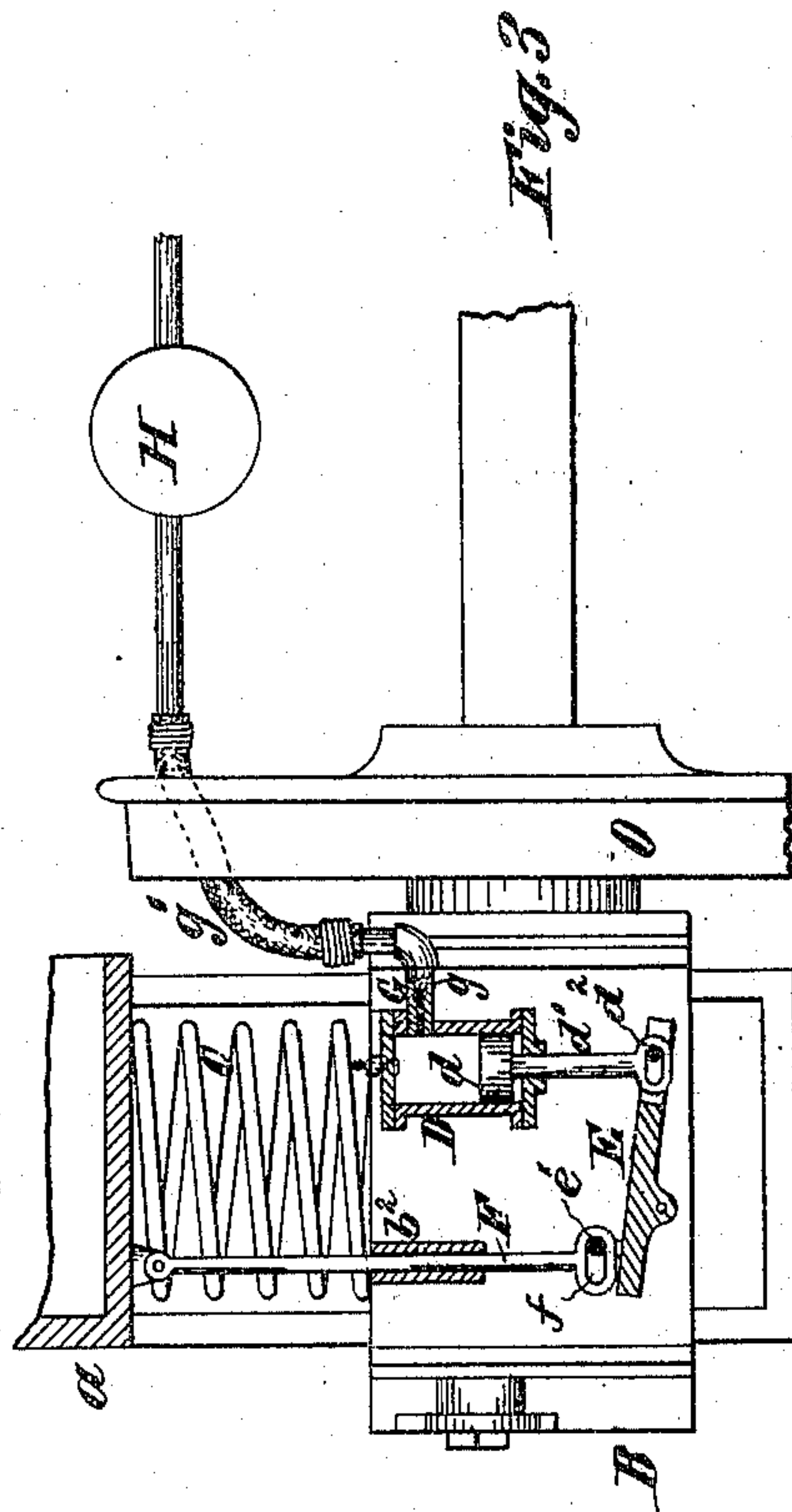
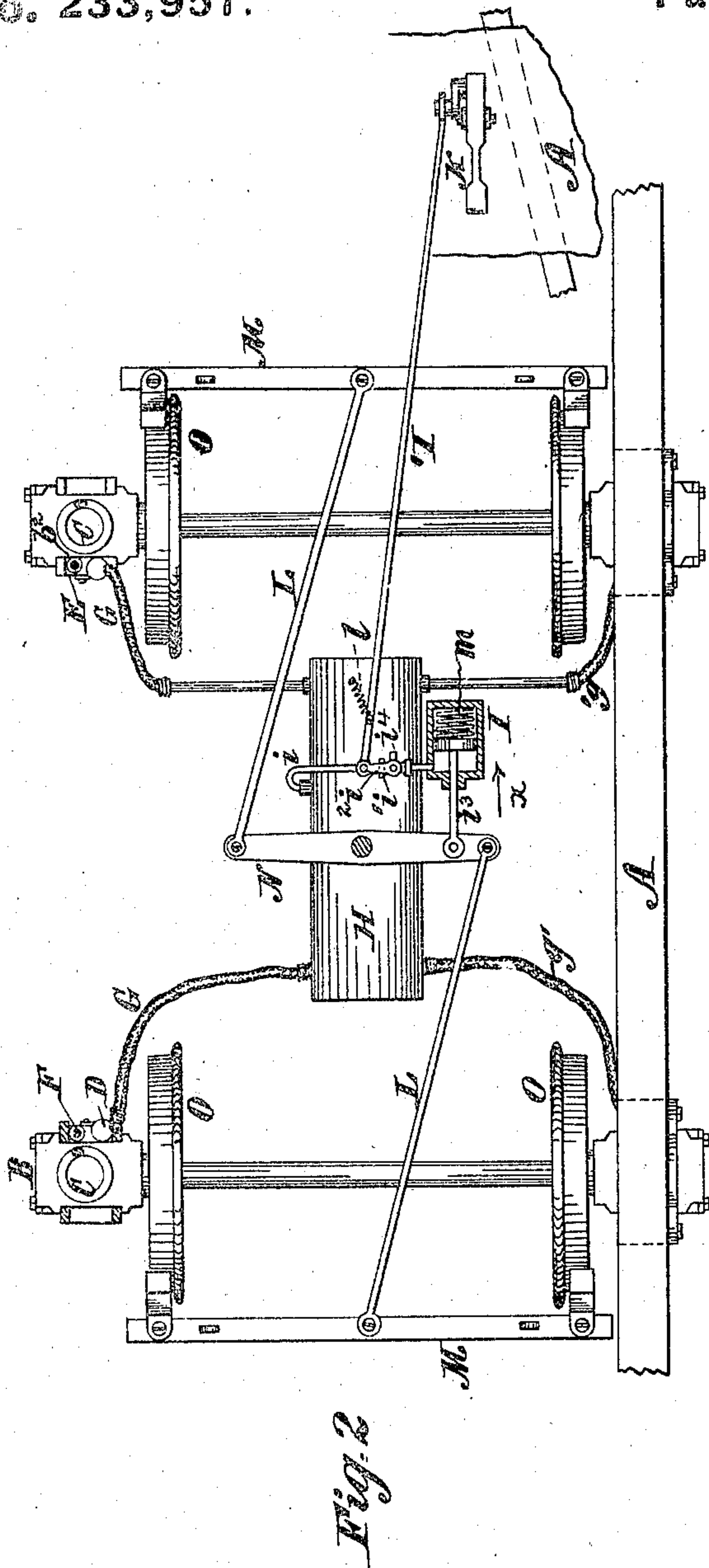
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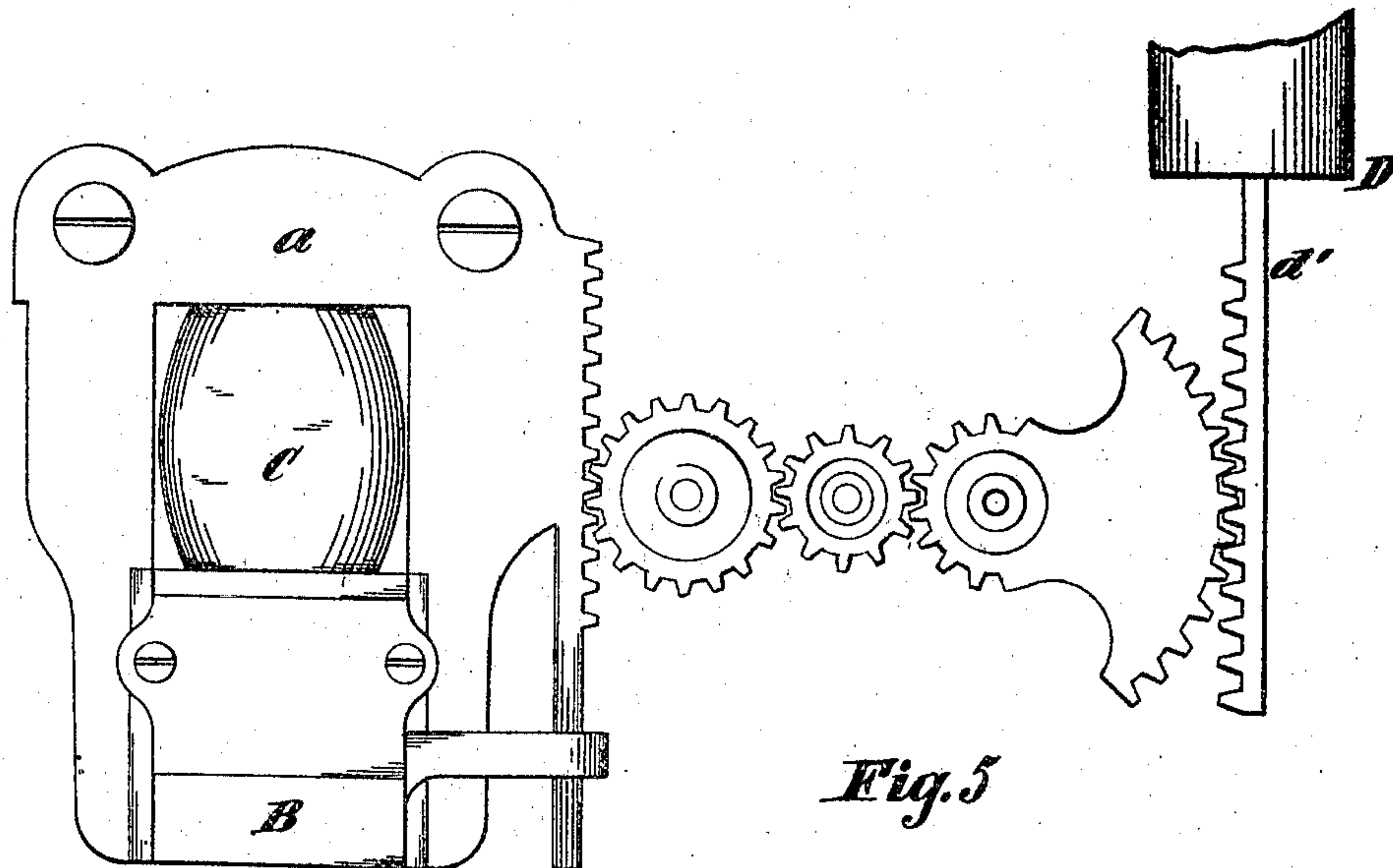
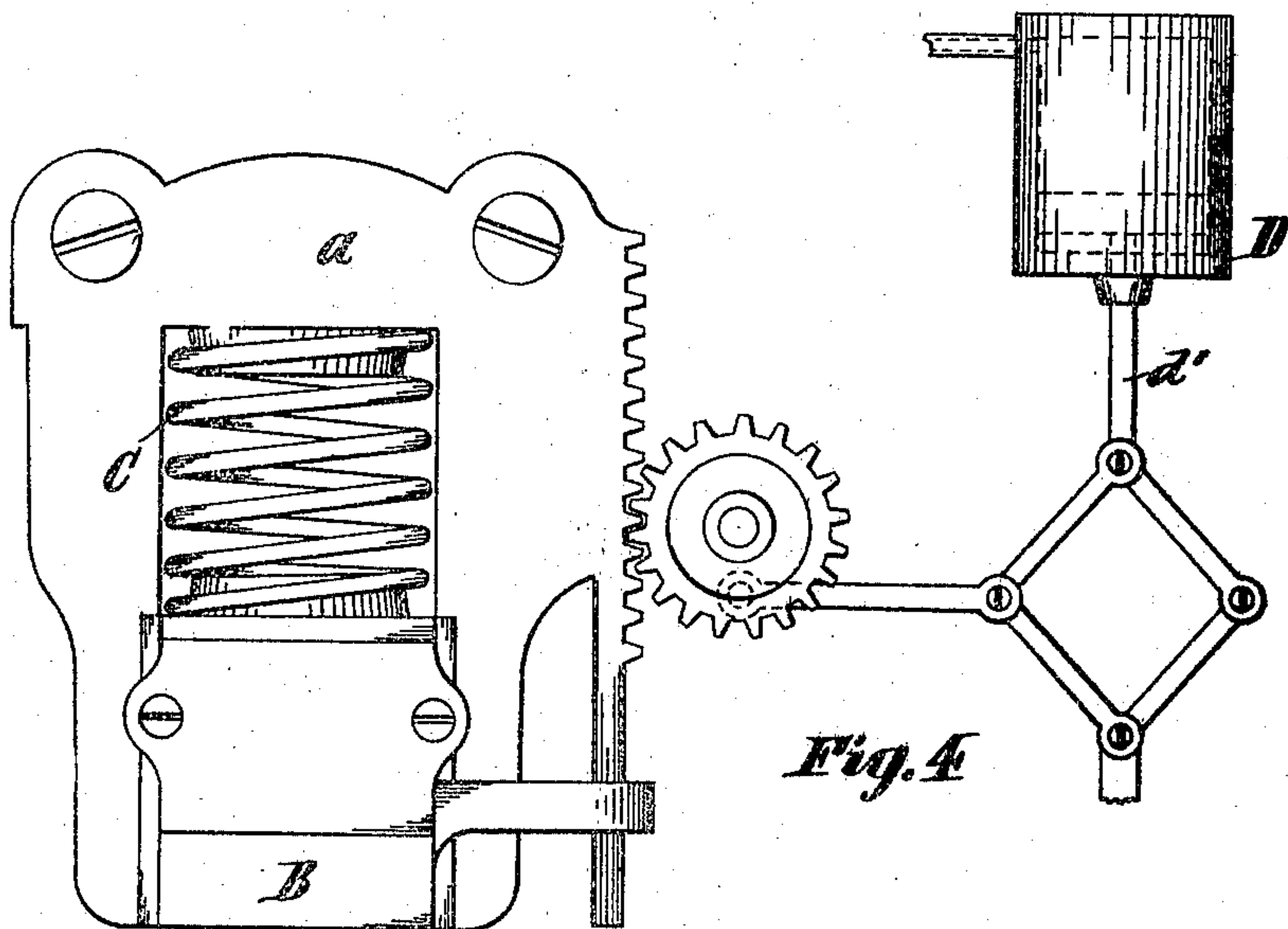
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# UNITED STATES PATENT OFFICE.

ISAAC P. WENDELL, OF PHILADELPHIA, PENNSYLVANIA.

## ATMOSPHERIC CAR-BRAKE

SPECIFICATION forming part of Letters Patent No. 233,957, dated November 2, 1880.

Application filed April 17, 1880. (No model.)

To all whom it may concern:

Be it known that I, ISAAC P. WENDELL, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented new and useful Improvements in Atmospheric Car-Brakes, of which the following is a specification, reference being had to the accompanying drawings, wherein—

10 Figure 1 is a perspective of a spring-supported car-pedestal and axle-box having my improvements applied thereto. Fig. 2 is a plan, partly in section, of the running-gear of a car with my improvements applied thereto. 15 Fig. 3 is a detail vertical section of the air-compressing devices, and Figs. 4 and 5 are side elevations of modifications of the same.

My invention has for its object to utilize the vertical vibratory movement of a spring-supported car body or truck, to condense air and force it into a tank or reservoir, to be then used as a motive power for operating the car-brakes, my invention being peculiarly adapted for street-railway cars.

25 My invention accordingly consists in the provision of a pump or compressor secured to the axle-box or other immovable part of the car; of operating mechanism for said pump, attached to the pedestals or yielding car-body; 30 of a reservoir or tank affixed to the body of the car; of a braking or operating cylinder connected to the braking-levers and operating or controlling mechanisms, whereby the brakes are forced upon the wheels by an air-pressure 35 produced by the vertical vibratory movement of the car.

Referring to the accompanying drawings, A represents a portion of the frame of the car-body provided with pedestals *a a* of the usual 40 or any appropriate construction. B B are the axle-boxes, and C C the springs between said pedestals and boxes. D D are air pumps or compressors secured to the sides of the said axle-boxes, as shown, their pistons *d* having 45 rods *d'* formed with slotted ends *d''*, through which passes a pin or bar connecting said rods to the levers E. The latter are pivoted at *e* to the axle-boxes and to bearings *b*, projecting from the brackets *b'*, formed on said axle-boxes. 50 F F are rods secured to and depending from the pedestals *a a*. They pass through bear-

ings *b''*, formed on the axle-boxes, and are provided with slotted ends *f f*, through which pass the links or pins *e'*, connecting said rods to the levers E.

The effect of the foregoing construction is as follows: As the car-body vertically vibrates the rods F F reciprocate in their bearings *b''* and oscillate the levers E E to reciprocate the pistons *d d* in the pumps D D, to condense 60 or compress air therein, which air is forced through the valves *g* in the pipes G to the tank H, secured to the bottom of the car-body. The valves *g* open toward the tank H, and as the pistons *d d* descend said valves close to 65 cut off any back flow or pressure from said tank. As the car vibrates all the pumps are operated, and their combined results soon fill tank H with air condensed to several atmospheres, which can be used as a motive power 70 for operating the car-brakes of steam or street-railway cars.

The mechanism employed for operating the brakes differs but little from that heretofore used. In Fig. 2, I have shown the same as applied to a street-car, wherein I is the braking-cylinder connected to tank H by pipe *i*, having a two-way cock, *i'*, provided with a crank, *i''*, which is attached, by a rod, *I'*, to a foot-treadle, K, or brake-wheel controlled by the driver of 80 the car.

L L are the brake-levers, secured at one of their ends to the brake-rods M M, and at their other ends to the pivoted bar N, to which is also attached one end of the brake-cylinder 85 piston-rod *i''*, as shown.

To operate the brakes the treadle K is depressed, which, through medium of rod *I'*, moves crank *i''* of valve *i'* to the position shown, thereby turning valve *i'* to open communication from tank H to cylinder I, the air pressure therefrom moving the piston of said cylinder in the direction of arrow *x* to move the bar N and levers L L, to cause the brake-shoes 90 to impinge upon the wheels O O. Said shoes are held in such position as long as valve *i'* remains open, as described. 95

On releasing the power or foot from treadle K the crank *i''*, under the influence of the reacting-spring *l*, is returned to its normal position, thereby turning the valve *i'* to shut off the air-supply from tank H, and opening a 100



passage through the exhaust-port  $i^4$  to the brake-cylinder for the escape of the contained air-pressure previously used for operating the brakes, the spring  $m$  returning the piston to the opposite end of cylinder I, and thereby reversely moving the rod N to release the brake-shoes from the wheels.

The pipes G G have flexible connections  $g'$  with the tank H, to accommodate said pipes to the vibration of the car as said tank is secured to said car and moves therewith.

Figs. 4 and 5 show modifications of my invention, wherein the pumps are not designed to be attached directly to the axle-boxes, but to bars or rods springing therefrom, and are operated by means of the racks formed on the pedestals or hanging from the car-body and meshing with intermediate gear mechanism, to either operate said pump-pistons by means of the toggle-levers, as shown in Fig. 4, or by the segmental gear and rack, as shown in Fig. 5.

The advantages of these modifications are that a more powerful compressor or pump may be used, and by the employment of multiplying-levers a greater length of stroke may be obtained to condense a larger amount of air with a given vibration of the car-body.

It is obvious that the detailed arrangement of the pumps or compressors and their operating mechanisms may be greatly varied within the spirit of my invention, and in applying my improvements to steam railroad-cars the pumps may, if desired, be secured to the equalizing-bars and the operating mechanisms to the truck-timbers, the result in either case being the same.

I do not wish to be understood as claiming, broadly, operating car-brakes by atmospheric pressure; but my invention consists in utilizing the vertical vibratory movement of a car-body to produce such pressure by means of suitably-interposed mechanism, and, in combination therewith, of braking mechanism.

What I claim as my invention is—

1. In combination with a spring-supported car-body, an air compressor or pump operated by the vertical vibratory movement of said car-body to condense or compress air, substantially as and for the purpose set forth.

2. In combination with a car-body having spring-supports, an air compressor or pump operated by the vertical vibratory movement of said car-body to compress air and force it into a reservoir or tank, substantially as shown and set forth.

3. In combination with a car-body having spring-supported pedestals, the axle-boxes having attached air pumping or compressing devices, and interposed mechanism whereby said pumps are operated by the vertical vibratory movement of said car-body, substantially as shown and described.

4. In combination with a spring-supported car body or truck, the air compressing or pumping devices, and operating mechanism whereby said pumping devices are worked by the vertical vibratory movement of said car-body, and the reservoir or tank and brake mechanism, substantially as shown and described.

5. The combination of spring-supported pedestals  $a a$ , axle-boxes B B, pumps D D, and interposed mechanism whereby said pumps are operated by the vibratory movement of the pedestals, substantially as shown and described.

6. The combination of pedestals  $a a$ , axle-boxes B B, pumps D D, and interposed mechanism for operating said pumps, substantially as shown and described, the reservoir H, brake-cylinder I, and braking mechanism, substantially as and for the purpose set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 14th day of April, A. D. 1880.

ISAAC. P. WENDELL.

Witnesses:

C. B. ROBERTS,  
ALBERT LUPTON.