

(No Model.)

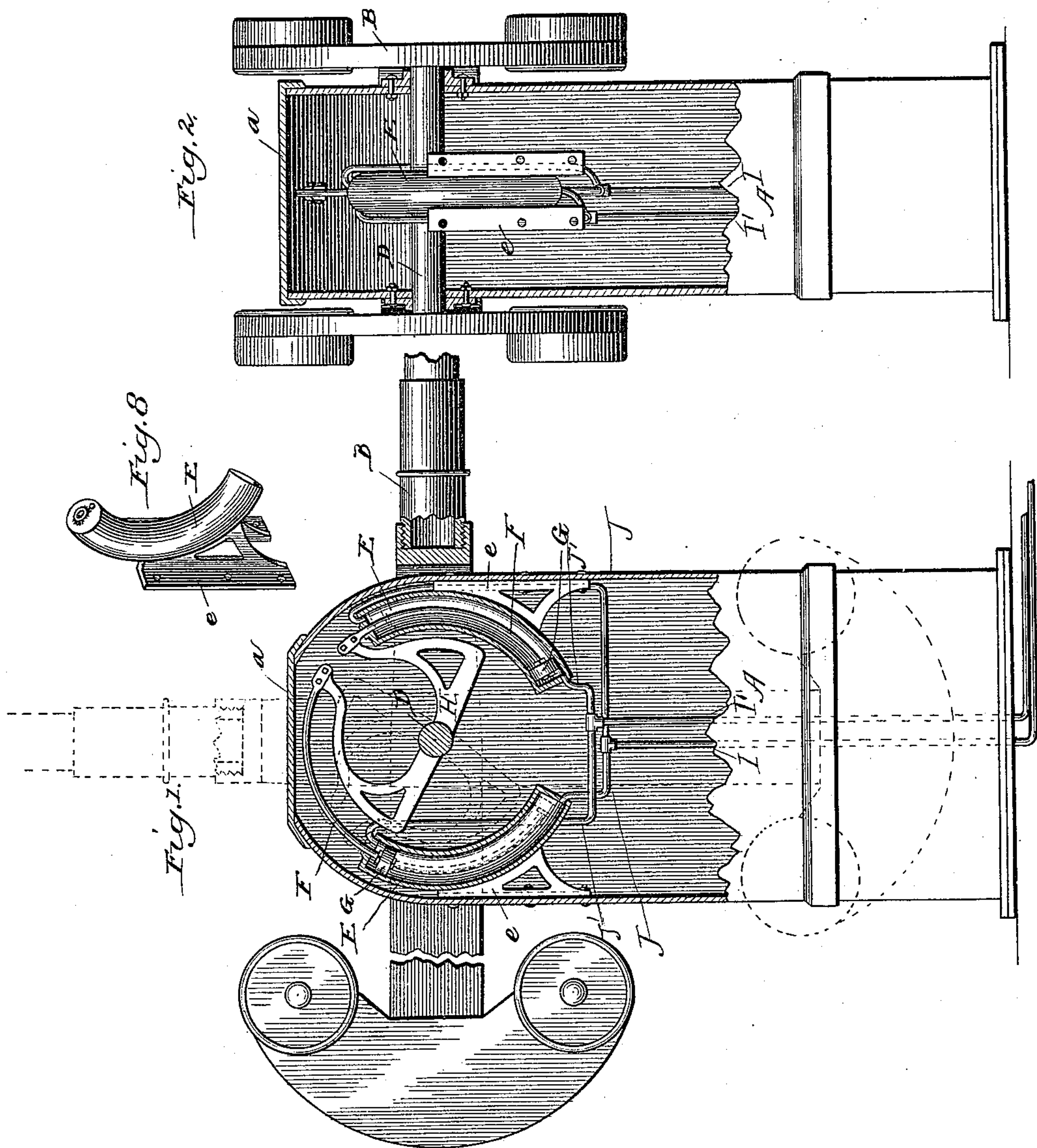
2 Sheets—Sheet 1.

A. J. McDONALD & R. B. BRENT.

MOTOR FOR RAILWAY GATES.

No. 447,079.

Patented Feb. 24, 1891.



Witnesses

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(No Model.)

2 Sheets—Sheet 2.

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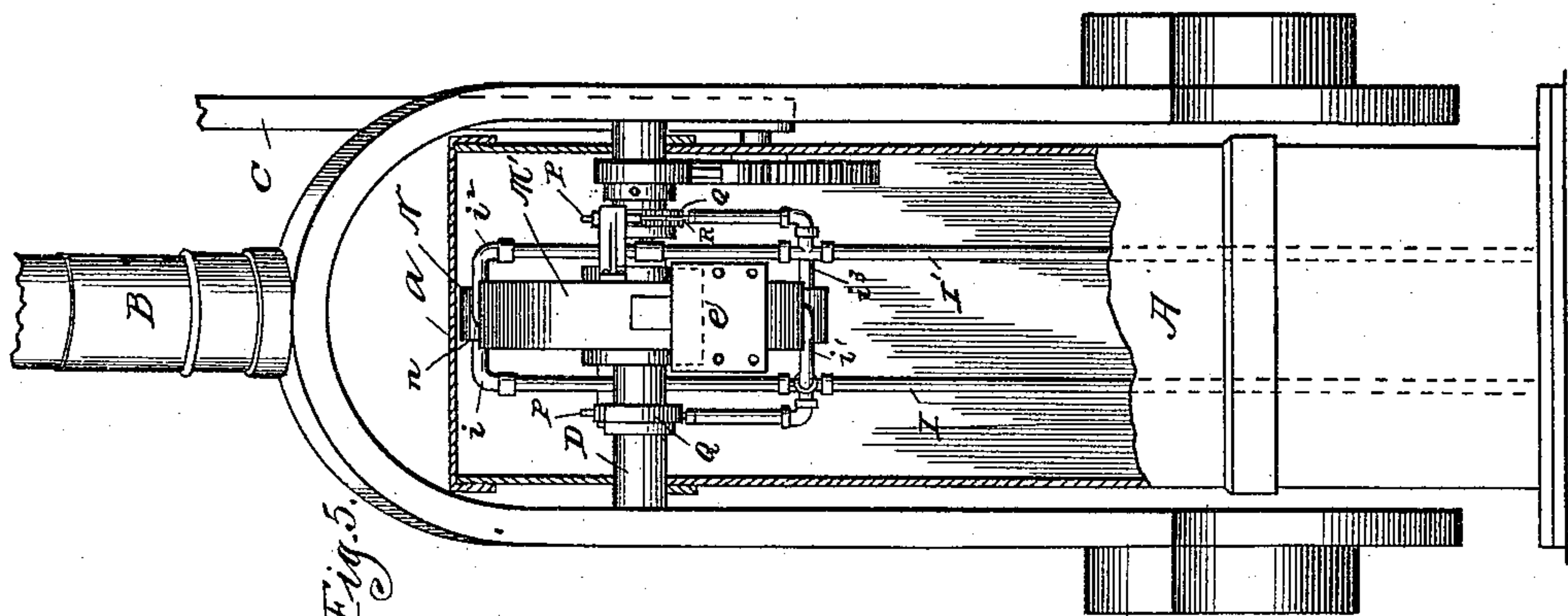


Fig. 5.

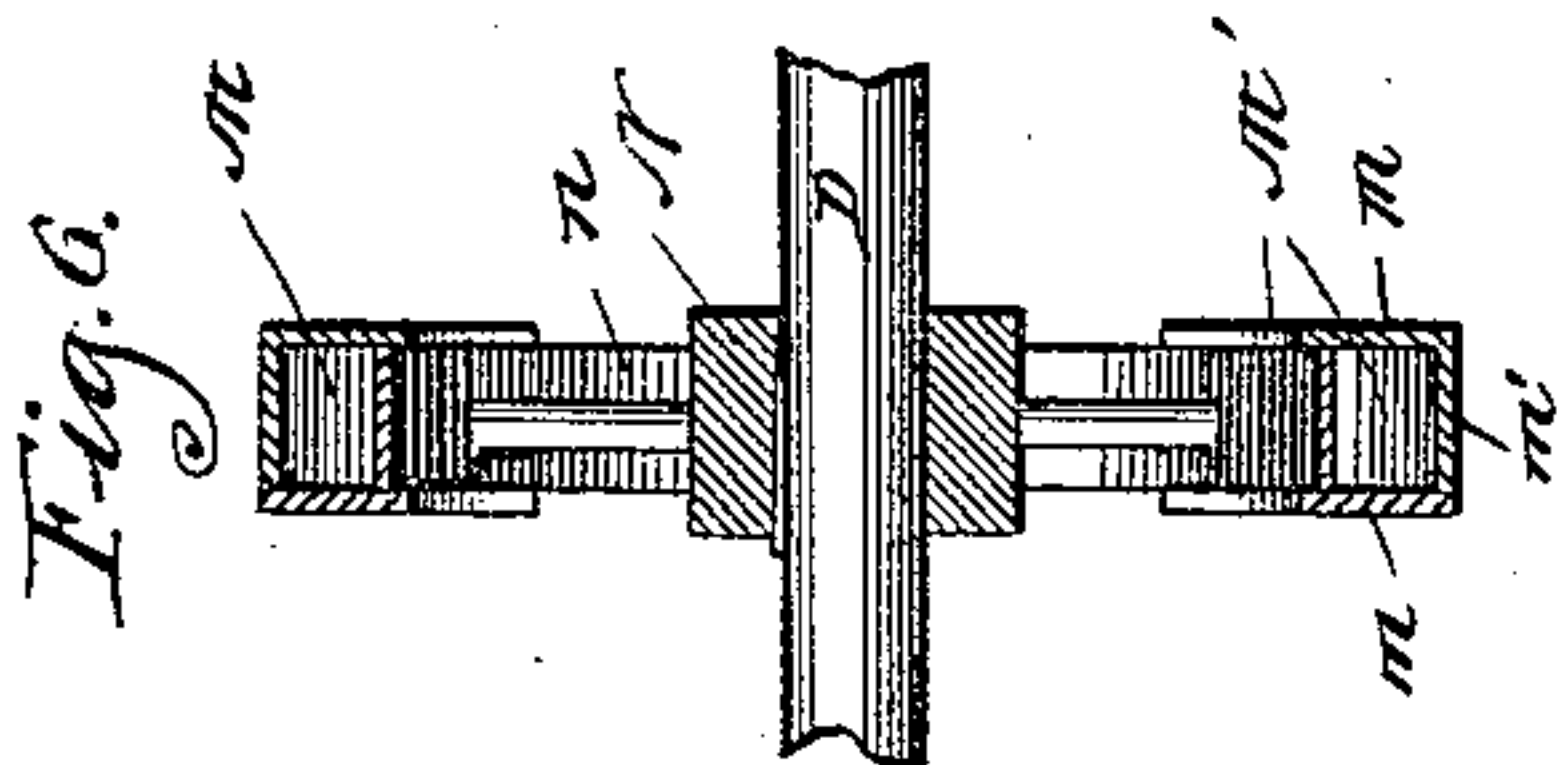


Fig. 6.

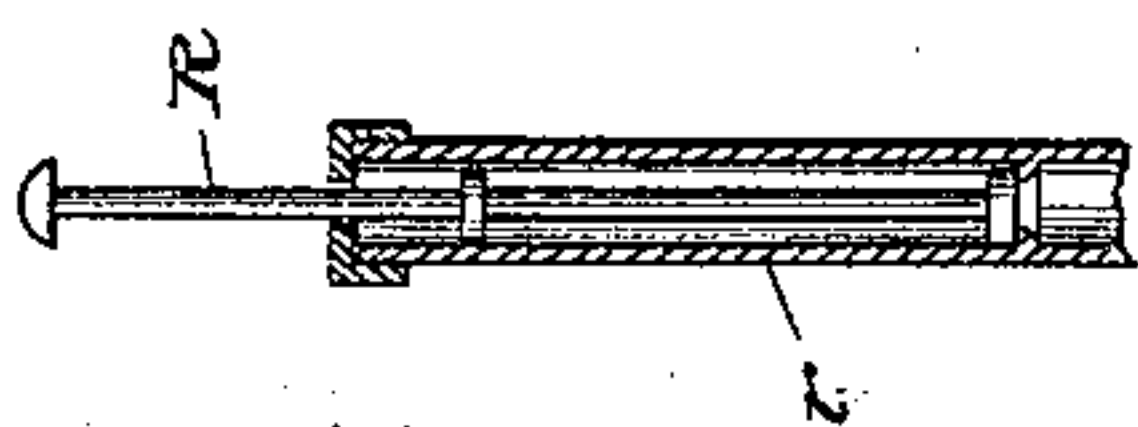


Fig. 7.

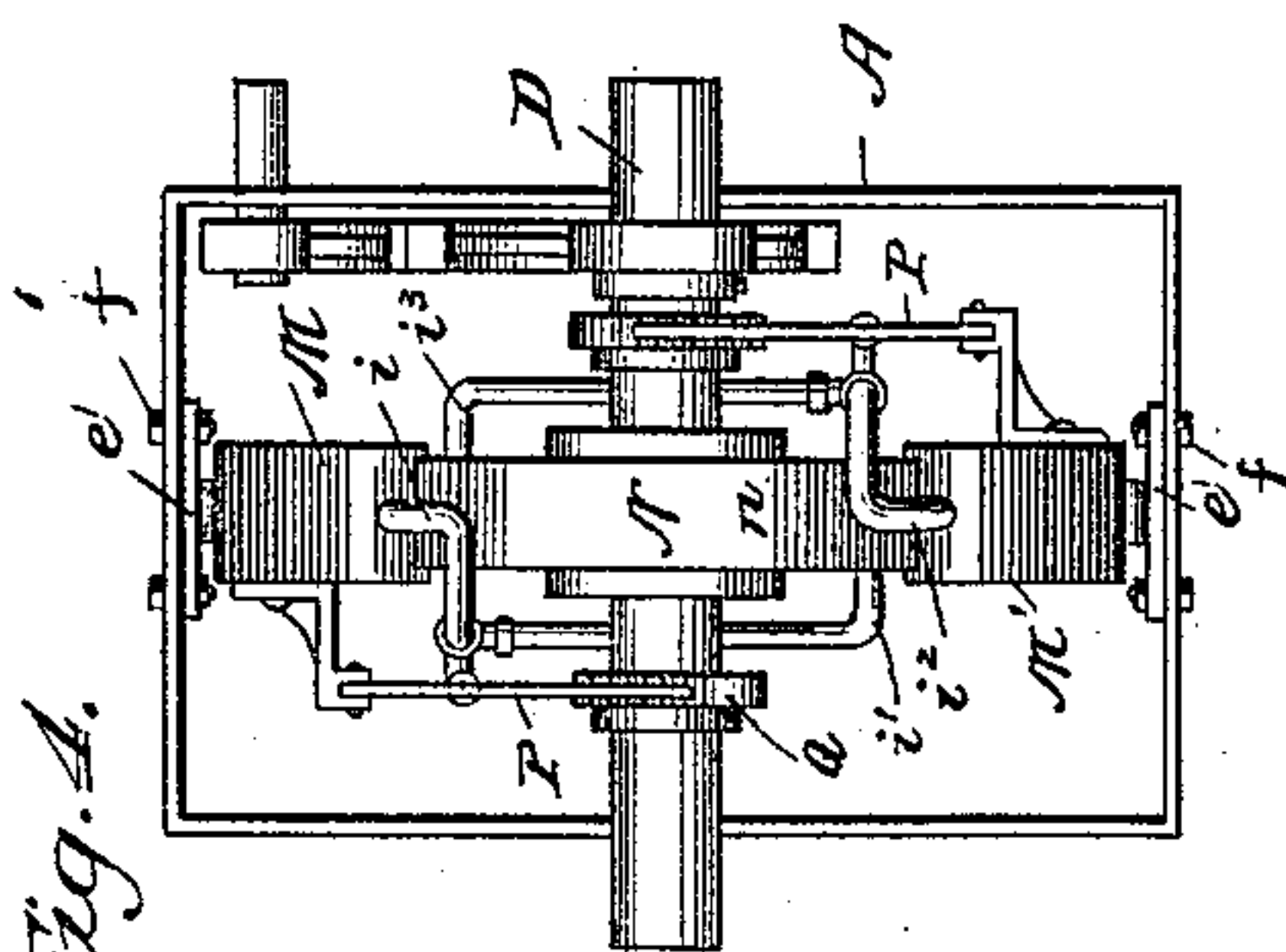


Fig. 4.

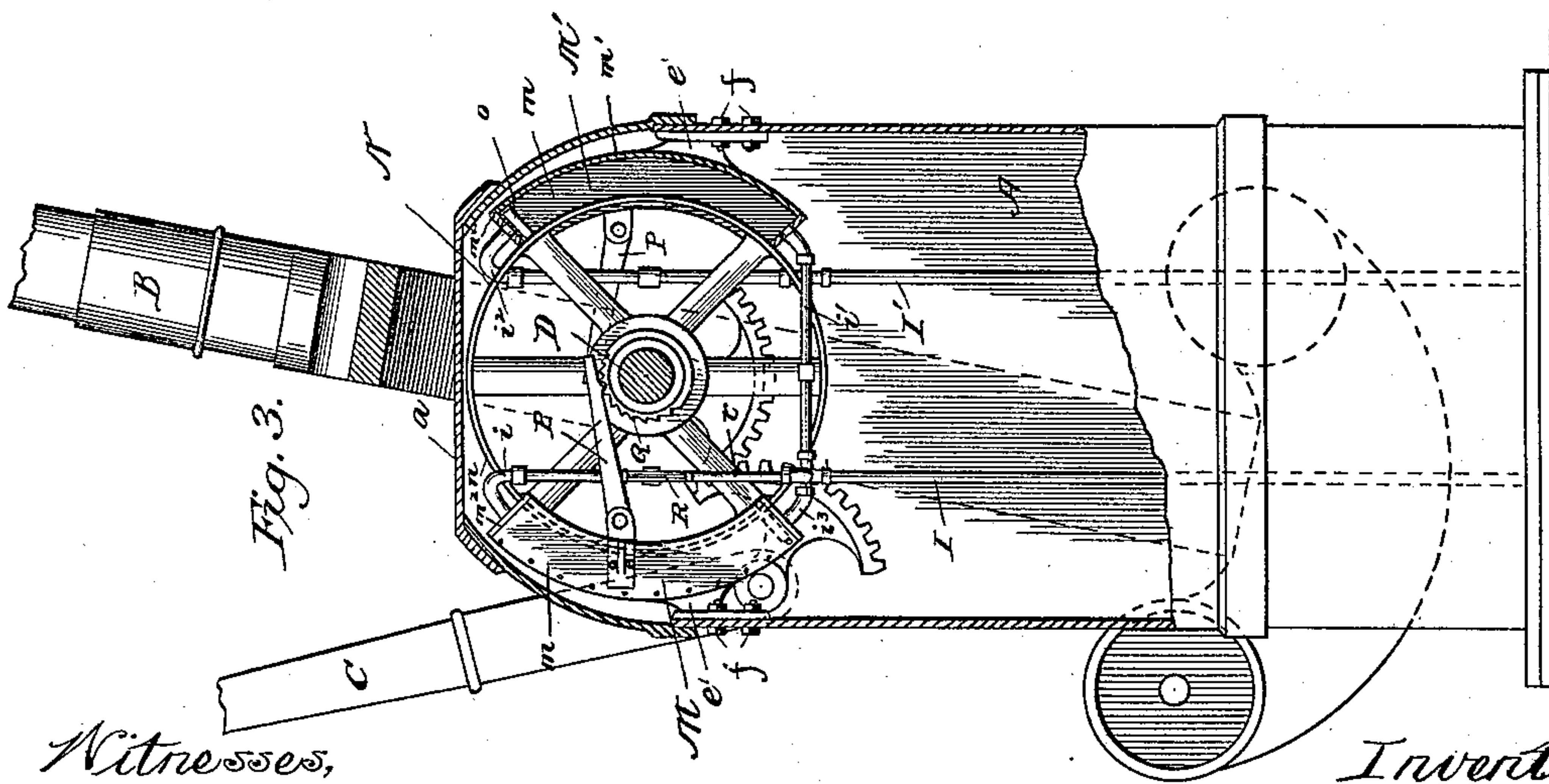


Fig. 3.

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UNITED STATES PATENT OFFICE.

ALEXANDER J. McDONALD AND ROBERT B. BRENT, OF CHICAGO, ILLINOIS,
ASSIGNORS TO THE PNEUMATIC POWER AND RAILROAD GATE COM-
PANY, OF SAME PLACE.

MOTOR FOR RAILWAY-GATES.

SPECIFICATION forming part of Letters Patent No. 447,079, dated February 24, 1891.

Application filed October 27, 1888. Serial No. 289,323. (No model.)

To all whom it may concern:

Be it known that we, ALEXANDER J. McDONALD and ROBERT B. BRENT, of Chicago, Illinois, have invented certain new and useful Improvements in Motors for Railway-Gates, &c., of which the following is a specification.

Our invention has for its object to provide a fluid-motor by which reciprocating rocking motion may be imparted to a shaft—as, for example, the rock-shaft upon which the arm of a railway-gate is secured.

In the accompanying drawings we have shown the preferred form of using our invention and several modifications of said preferred construction.

In said drawings, Figure 1 is a side elevation, partly in section, of a railway-gate post, showing the base of the gate-arm and its rock-shaft with our motor applied thereto. Fig. 2 is an end elevation of the post, partly in section, and showing the motor also in end elevation applied to the rock-shaft. Fig. 3 is a side elevation, partly in section, showing another construction of the cylinder, piston, and connecting parts of the motor. Fig. 4 is a plan view of the same; Fig. 5, an end elevation; and Figs. 6, 7, and 8 are details.

In said drawings, A represents the post, which will have preferably a removable cap *a*.

B is the main arm, and C an auxiliary arm operated thereby.

D is the rock-shaft, on which the main arm is secured, said shaft having bearings in opposite sides of the post.

The preferred form of motor, which is shown in Figs. 1 and 2, comprises two curved cylinders E, which may be made of pipe bent to suitable form and secured by brackets *e e* to the end walls of the gate-post. The upper ends of these cylinders are fitted to receive curved piston-rods F, bearing pistons G within the cylinders. The outer ends of these piston-rods are secured to the arms of a sector H, which latter is rigidly secured to the rock-shaft D. Pipes I I' convey a fluid under pressure from a suitable force-pump to the inside of the gate-post, where said pipes branch and deliver by branches J J', respectively,

into the upper end of one cylinder and the lower end of the other. Air or other fluid under pressure, being admitted through one of the pipes I I', will be discharged into the upper end of one of the cylinders and into the lower end of the other, and will operate with equal pressure upon the front side of one of the pistons and upon the back side of the other piston, thereby causing the said pistons to reciprocate within the curved cylinders, moving the sector, rocking the shaft, and raising or lowering the gate-arm, as the case may be.

The form of motor shown in Figs. 3 to 6, inclusive, comprises two curved pressure chambers or cylinders M M', two sides of which are formed by inclosing walls *m*, and another by a curved plate *m'*, which may have flanges *e'*, whereby to secure the device to the post by means of bolts *f*. A wheel N is secured upon the shaft D, the rim *n* of which is concentric with the curved plate *m'* and adapted to close the open side of the chambers M M'. The ends of said chambers are closed by plates *m²*, and through these end plates air or other fluid under pressure is admitted to each end of both chambers by means of air-pipes *i i'* and *i² i³*. The pipe *i* is a continuation of a main air-pipe I and communicates with the top of chamber M. The pipe *i'* is a branch of pipe I and enters at the bottom of chamber M'. Pipe *i²* is a continuation of a main pipe I' and enters the top of chamber M', and pipe *i³* is a branch of pipe I and enters the bottom of chamber M. It will thus be seen that air or other fluid forced into pipe I will enter the top of chamber M and the bottom of chamber M', and that air or other fluid forced into pipe I' will enter the top of chamber M' and the bottom of chamber M. Now to render this pressure effective, we provide a piston *o*, secured to the face of the rim of wheel N for each chamber, and effect tight joints in the walls by suitable packing.

It is obvious that if air or other fluid under pressure be admitted to either of the pipes the expansion of the same within the chambers, acting upon the pistons, will cause

the partial rotation of the wheel, and thus rock the shaft and move the arms. To lower the arm, air would be admitted to pipe I', and to raise it to pipe I. It will be observed that in the construction above described both pressure-chambers are utilized to effect the movement of the arm in either direction; but it is obvious that one may be used to lower it and the other to raise it. As the arm is required to move over a quadrant, the chambers in the example extend in length through a quarter of a circle, and a greater movement may be secured by lengthening the air-chambers, thus giving the piston a greater stroke.

15 We have provided locks for the gate-arms, each comprising a dog P, pivotally secured to a stationary portion of the structure and having its free end adapted to engage the teeth of a ratchet Q, secured on the side of the wheel N. The dog P is operated by means of a piston-rod R, secured to travel within a branch r of the main air-pipe. These locks are so arranged that one will lock the gate-arms in their raised and the other in their lowered position. The air, being admitted to one of the main pipes, will fill the branch r, and thus the piston-rod R of that branch will be forced upward, releasing the dog and permitting the partial rotation of the wheel.

30 When the air is exhausted, the dog will fall and engage the ratchet, thus locking the gate-arm.

We claim—

1. The herein-described means for operat-

ing the swinging arms of railway-gates by compressed air; comprising, in combination with the gate-arm secured to a rock-shaft having a sector secured thereon, curved power-cylinders located within the gate-post concentrically to the rock-shaft and having ports at their respective ends for the admission of air, pistons reciprocating within the cylinders, curved piston-rods connected, respectively, to the pistons of the cylinders and to the ends of the sector, an air-pump exterior to the gate-post, and pipes communicating with the pump and with the ports of the cylinders, whereby the pistons of both cylinders are made simultaneously effective to move the gate in either direction, substantially as described.

2. In combination with a motor for railway-gates, &c., a lock therefor, comprising a cylinder to which a fluid under pressure is admitted, a piston-rod reciprocating therein, a pivoted dog or latch adapted to be actuated by the piston-rod, and a ratchet secured to the rock-shaft, substantially as described.

3. The combination, with the arm of a railway-crossing gate, of a pulley on its shaft, and a dog normally engaging with said pulley to lock the arm in its raised position.

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