

(No Model.)

2 Sheets—Sheet 1.

B. F. TEAL.
GATE FOR RAILWAY CROSSINGS.

No. 464,048.

Patented Dec. 1, 1891.

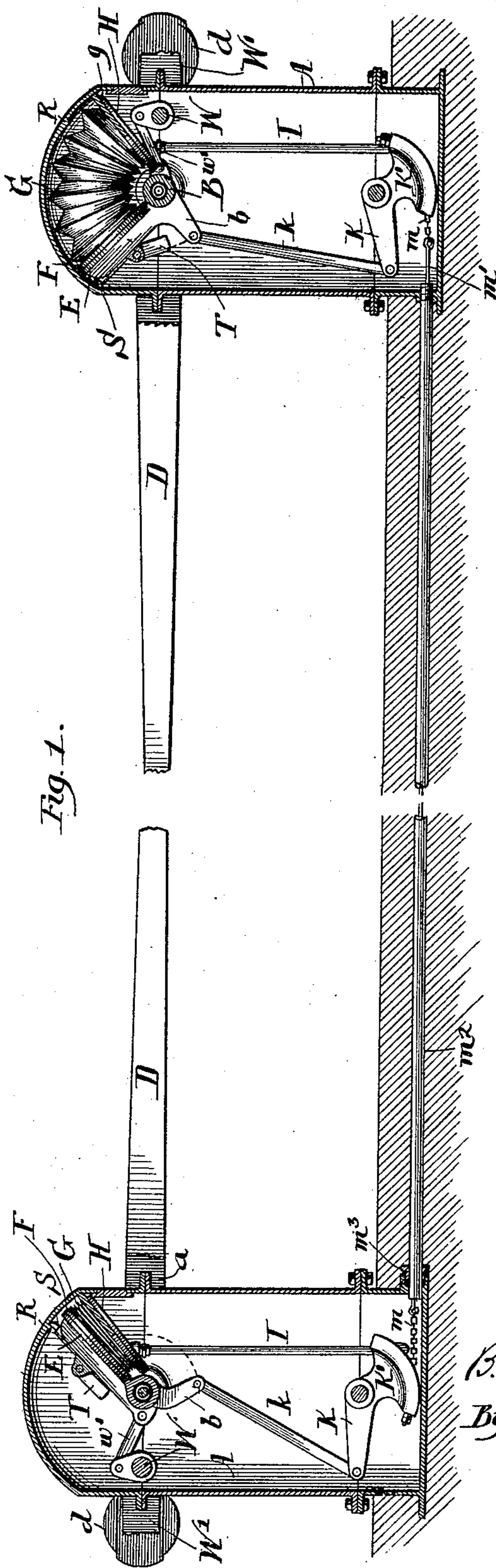


Fig. 1.

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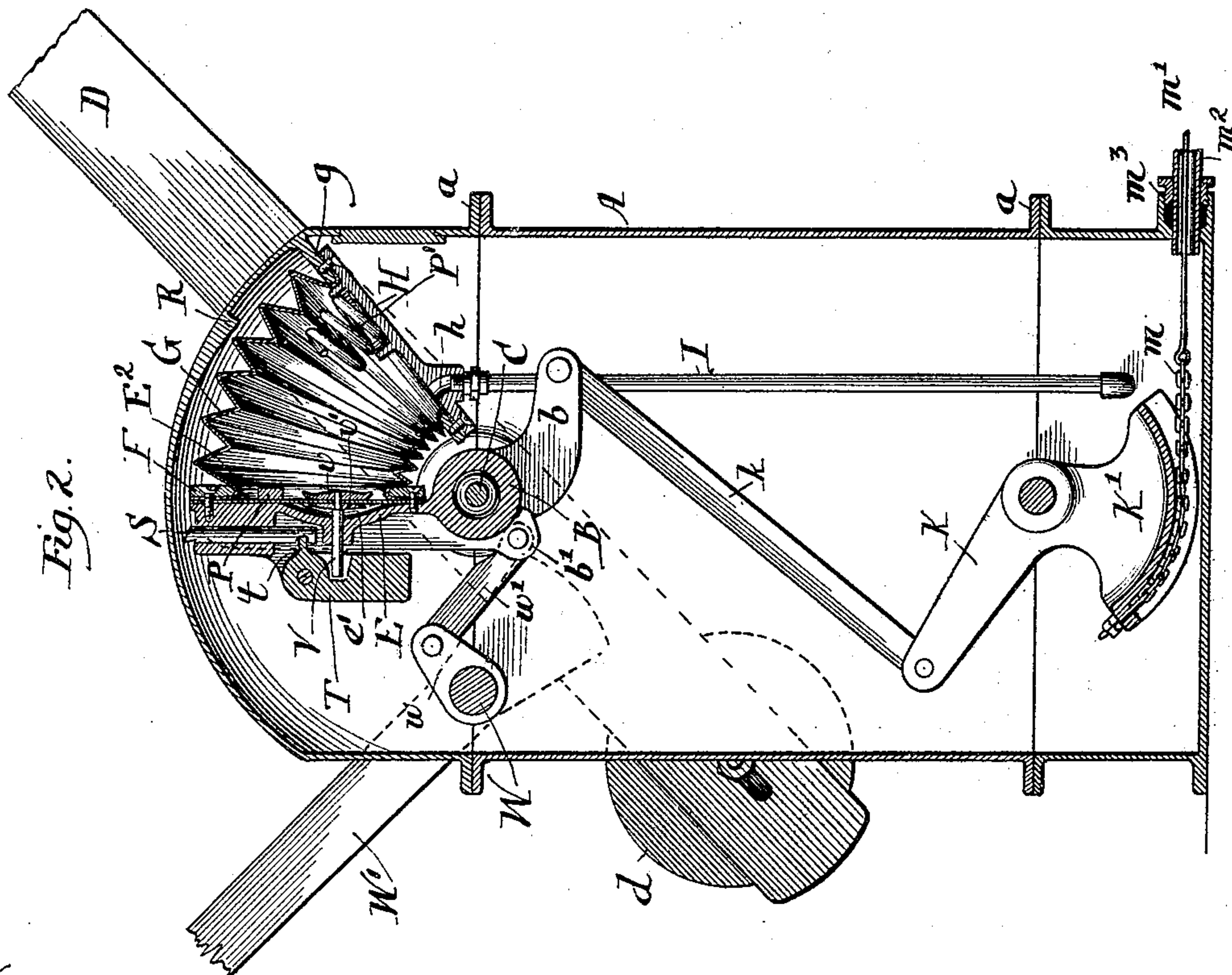
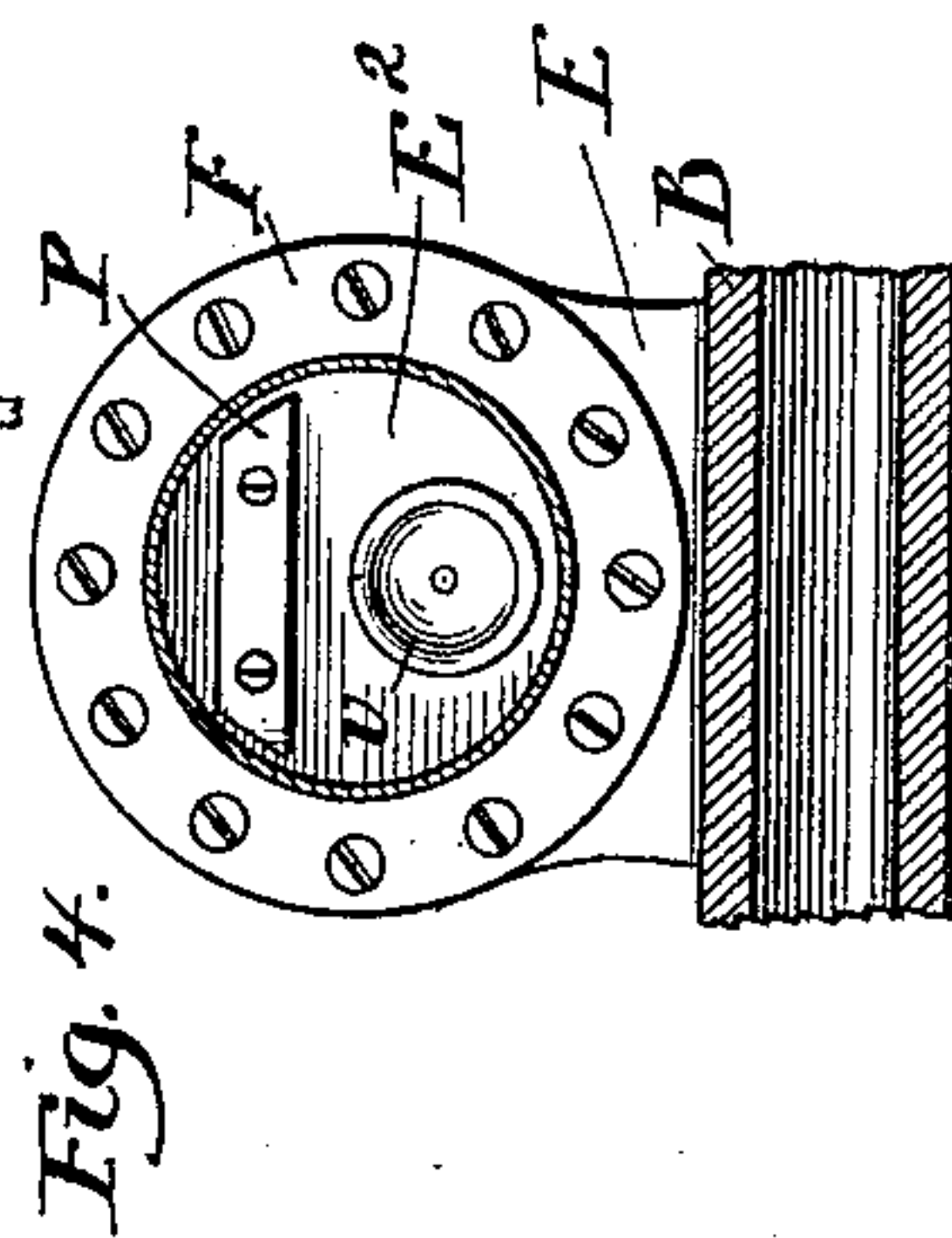
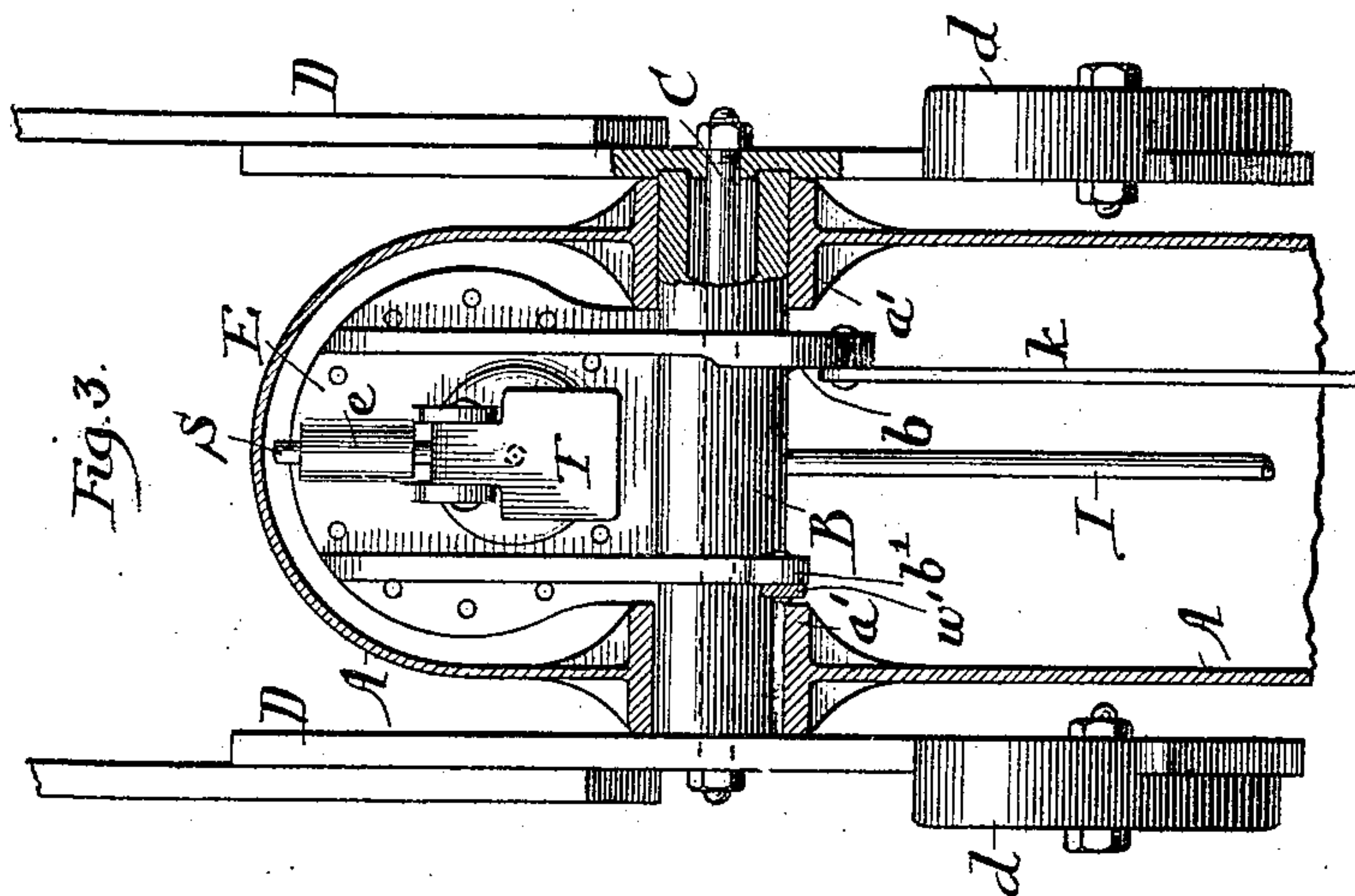
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UNITED STATES PATENT OFFICE.

BENJAMIN FRANKLIN TEAL, OF CHICAGO, ILLINOIS.

GATE FOR RAILWAY-CROSSINGS.

SPECIFICATION forming part of Letters Patent No. 464,048, dated December 1, 1891.

Application filed April 30, 1891. Serial No. 391,087. (No model.)

To all whom it may concern:

Be it known that I, BENJAMIN FRANKLIN TEAL, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Gates for Railway-Crossings and Like Purposes, of which I do declare the following to be a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

My present invention has relation to the improvement of gates of that class designed more especially for the crossings of railways, wherein the gates are operated by means of compressed air or other fluid; and the invention consists in various novel features of construction hereinafter described, illustrated in the accompanying drawings, and particularly pointed out in the claims at the end of this specification.

Figure 1 is a view in vertical section, parts being shown in side elevation, through a "double gate" embodying my invention. Fig. 2 is a view in vertical section through one of the gate-posts and the mechanism therein, parts being shown in elevation. Fig. 3 is an end view of the mechanism within the upper part of the gate-post, the casing of the post being shown in vertical transverse section. Fig. 4 is a detail view of the shifting-plate and the diaphragm carried thereby.

A designates the casing of the gate-post, this casing being preferably formed of the base, body, and cap sections, as shown, these sections being suitably flanged, as at *a*, to permit them to be conveniently bolted together.

Within the upper part of the casing A is journaled the gate-shaft B, this shaft being sustained by suitable hubs or bearings *a'*, formed upon the casing of the post. The shaft B is preferably formed hollow, and through it is extended a tie-rod C, whereby the arms of the safety-gate D are bolted to the ends of the shaft. These arms D of the safety-gate are provided with suitable counterbalance-weights *d* in well-known manner.

Fixed upon the shaft B, and preferably cast integral therewith, is the shifting-plate E, which plate forms part of the air-chamber, into which the compressed air or other fluid will be forced in order to effect the move-

ment of the gate. To the inner face of the shifting-plate E is attached by a suitable ring F one end of the flexible and extensible air-chamber or bellows G, the opposite end of this bellows being connected to a plate H, that also constitutes a part of the air-chamber, and is bolted to a ring *g*, that projects inward from the cap of the post. The bellows G will be clamped between the plate H and the ring *g*. In the plate H is formed an opening *h*, through which air will be delivered by a suitable delivery-pipe I, that will lead to the central station in manner well understood in the art.

From the construction of parts as thus far defined it will be seen that if the air-chamber or bellows be in collapsed position, (illustrated in Fig. 1 of the drawings,) and it is desired to raise the gates, air will be admitted under pressure through the pipe I, thereby forcing the shifting-plate E to and beyond the position seen in Fig. 2, causing the shaft B to turn and thereby raise the safety arm or gate D carried by this shaft.

To the shaft B is fixed an arm *b*, that connects by a link *k* with a rocking arm K, that is journaled upon a shaft L, extending across the base of the post. This rocking arm K has its opposite portion preferably formed in the shape of a segment-plate K', over which extends a chain *m*, connected by a rod *m'* to a corresponding chain *n* of the rocking arm K at the opposite post. The rod *m'* may extend through a suitable pipe *m²* to protect it and insure its easy movement. The pipe *m²* is connected with one of the posts A by means of a water-tight slip-joint *m³*, this slip-joint permitting the expansion and contraction of the pipe due to the changes of temperature, while at the same time serving to exclude water from the post. The slip-joint *m³* may be a stuffing-box of any suitable construction.

The air-chambers in the posts A are identical in construction, but the arrangement of the connections between the gate-shafts and the rocking arms K, journaled at the base of the gate-posts, is different, in order to secure the unison movement of the safety-arms D of the gate. Thus it will be seen by reference to Fig. 1 of the drawings that the arms *b* of the gate-shafts B extend in opposite directions—that is to say, toward each other—while

the rocking arms K extend in the same direction. The object of this arrangement is to enable the opening or raising of the gates to be accomplished by one of the air-chambers 5 and the lowering or closing of the gates to be effected by the opposite air-chamber, the connecting mechanism being so disposed as to secure the unison movement of the gates.

In order to hold the gates in locked position 10 when opened or closed, I prefer to provide the inner face of each of the caps of the gate-posts with an incline R, terminating in an abrupt shoulder adapted to engage the end of a locking-bolt S, that is sustained in a manner free to slide in a suitable seat or extension 15 e on the back of the shifting-plate E, this bolt having a beveled end to permit it to ride freely over the face of the incline R. The opposite end of the bolt S is provided with a suitable notch or seat to receive an offset t , 20 projecting from the releasing-arm or gravity-arm T, journaled between lugs on the back of the shifting-plate E. The shifting-plate E is preferably formed with a depressed or concave portion e' , over which extends a diaphragm E^2 , and to this diaphragm E^2 is suitably connected, as by the plates v and v' , the inner end of a rod or stem V, that extends 25 into proximity to the releasing-arm T and serves to shift this arm, as will presently more fully appear. Upon the inner face of the diaphragm E^2 is preferably bolted a plate P, that will come in contact with the coiled buffer-spring P', suitably held within the air-chamber 30 upon the inner face of the fixed plate H.

From the foregoing description it will be seen that when air is admitted into the air-chamber of one of the posts, in order to effect the lowering of the safety-gates, the lock-bolt 40 S, that is connected to the shifting-plate E of the chamber of the opposite post, will ride upon the incline R until it passes over the abrupt shoulder r thereof, and will then engage with such shoulder so as to prevent the raising of the gates until air is admitted for 45 such purpose into the proper air-chamber. As soon, however, as air is admitted into the appropriate air-chamber for raising the gates the initial pressure of the compressed air will cause an outward movement of the diaphragm 50 E^2 , and the stem or rod V by this outward movement of the diaphragm will cause the swinging of the releasing-plate T, thereby retracting the locking-bolt S. Hence as compressed air continues to enter this air-chamber 55 the shifting-plate E will be caused to revolve, carrying with it the shaft B and the safety arm or gate connected to this shaft. By reason of the connections between the gate-shafts B of each of the posts, it is manifest 60 that when air is admitted to one of the air-chambers for effecting the raising of the gate-arms the connection between these shafts will insure the unison movement of both 65 safety arms or gates, and so, also, when air is admitted to the opposite air-chamber to effect the lowering of the arms a like release will

occur of the lock mechanism that serves to hold the gate-arms in elevated position, and a like unison closing action of the gate-arms 70 will be effected. It is manifest that as the gate-arms are lowered or raised the buffer-springs P' will serve to avoid any shock incident to the too rapid descent of the arms.

As it is frequently desirable to provide a 75 "sidewalk-arm" operated in unison with the "street-arm" of the gate, I journal within the upper portion of the casing A a shaft W, whereon is mounted the sidewalk-arm W', this shaft having fixed thereto a suitable 80 crank-arm w , that connects by a link W' with a short arm or extension b' , formed upon the gate-shaft B. Hence it will be seen that when the safety arms or gates D are raised and lowered a corresponding movement of the 85 sidewalk-arm will occur, and it is plain, also, that the same lock mechanism which serves to control the street-arm will securely hold the sidewalk-arm as well.

By my improved mechanism simple and effective provision is made for delivering the 90 force of the air directly upon the shifting-plate and the arms connected to the shaft to which such plate is fixed, and the employment of an air-chamber formed of a bellows, 95 the end of which is formed by the shifting-arm itself, tends greatly to simplify and cheapen the construction.

It will be readily understood that certain features of my invention may be employed 100 without its adoption as an entirety, and that the precise details of construction above set out may be modified by the skilled mechanic without departing from the spirit of my invention. So, also, it is manifest that instead 105 of the gate-arms or safety-arms D (which for convenience of description I term in the claims the "gate proper") any other suitable form of gate may be employed.

Having thus described my invention, what 110 I claim as new, and desire to secure by Letters Patent, is—

1. A railway or like gate comprising a suitable post, a shaft journaled within said post, a gate proper operated by said shaft, a movable 115 shifting-plate fixed upon said shaft, and an air-chamber of which said shifting-plate forms one end, and a suitable pipe for the admission of air or other fluid to the chamber, whereby it will act directly upon said shifting-plate to effect the movement of the gate-arm, substantially as described. 120

2. A railway or like gate comprising a hollow post, a gate-shaft journaled in said post, a gate proper fixed to said shaft, a movable 125 shifting-plate fixed upon said shaft, an air-chamber within said post having an extensible body connected to said shifting-plate, and a suitable pipe for admitting air or other fluid to said chamber, substantially as described. 130

3. A railway or like gate comprising a hollow post, a gate-shaft journaled within said post, a gate proper connected to said shaft, a movable shifting-plate fixed upon said shaft,

and an air-chamber within said post, said air-chamber consisting of a flexible and extensible body, one end of which is attached to said shifting-plate and the other end of which is attached to a fixed head, and a suitable pipe for admitting air to said air-chamber, substantially as described.

4. A railway or like gate comprising a hollow post, a gate-shaft journaled within said post, a gate proper connected to said shaft, a movable shifting-plate fixed upon said shaft, an extensible air-chamber connected to said shifting-plate at one end and provided at its opposite end with a fixed head and a buffer within the air-chamber, and a suitable pipe for admitting air to said air-chamber, substantially as described.

5. A railway or like gate comprising a gate proper and an air-chamber having a movable side for operating said gate proper, a lock for holding said gate in position, and a diaphragm connected with and sustained by said air-chamber and adapted to operate said lock, whereby when air or other fluid is admitted to said air-chamber the release of said lock will occur, substantially as described.

6. A railway or like gate comprising a gate proper and an air-chamber having a movable side for operating said gate, of a lock for holding said gate in position, a diaphragm sustained by and in free communication with said air-chamber, and a suitable stem connected to said diaphragm and extending into position

to operate the lock mechanism, substantially as described.

7. A railway or like gate comprising a hollow post, a gate-shaft journaled within said post, a gate proper connected to said shaft, a movable shifting-plate fixed upon said shaft, and an air-chamber of which said shifting-plate is a side, said shifting-plate having attached thereto a diaphragm in free communication with the air-chamber, and carrying also lock mechanism for holding the gate in position, and suitable means extending between said diaphragm and said lock mechanism, whereby when air is admitted to the air-chamber to shift the plate a release of the lock mechanism will be effected, substantially as described.

8. A railway or like gate comprising a hollow post, a gate-shaft journaled within said hollow post, a gate proper connected to said shaft, a movable shifting-plate fixed upon said shaft, an air-chamber suitably connected with said shifting-plate, and lock mechanism for holding said gate-arm in position, comprising a bolt, a gravity-arm for shifting said bolt, and a diaphragm carried by the air-chamber and having an extension adapted to actuate said arm to shift the same when the bolt is to be released, substantially as described.

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