

(No Model.)

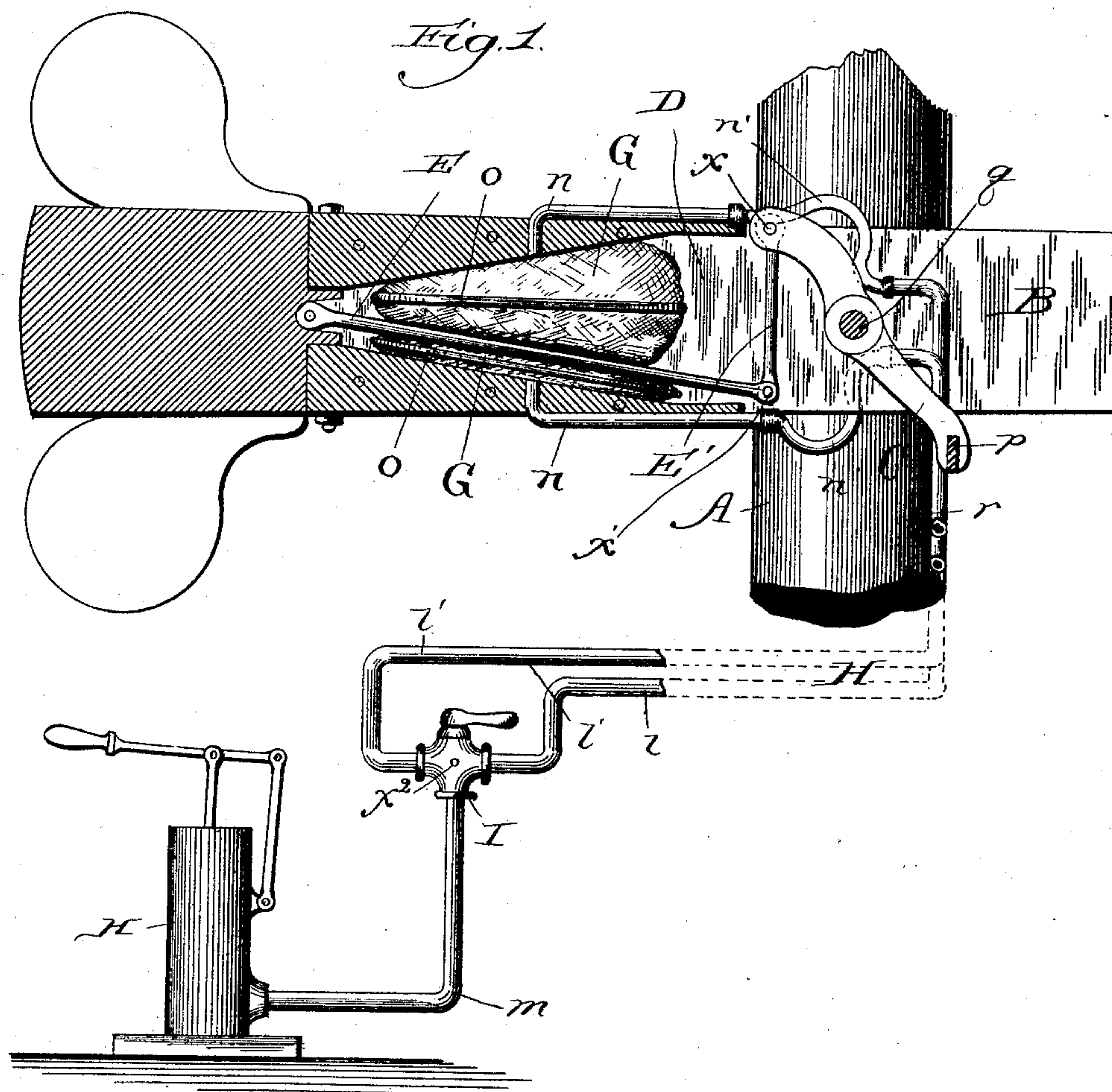
2 Sheets—Sheet 1.

M. B. MILLS.

MECHANICAL MOVEMENT FOR OPERATING GATE BARS, SWITCHES,
SIGNALS, AND THE LIKE.

No. 348,856.

Patented Sept. 7, 1886.



Witnesses:
Chas. E. Gaylord.
J. H. Dyrenforth

Inventor:
Mortimer B. Mills
By Dyrenforth and Dyrenforth
Attys

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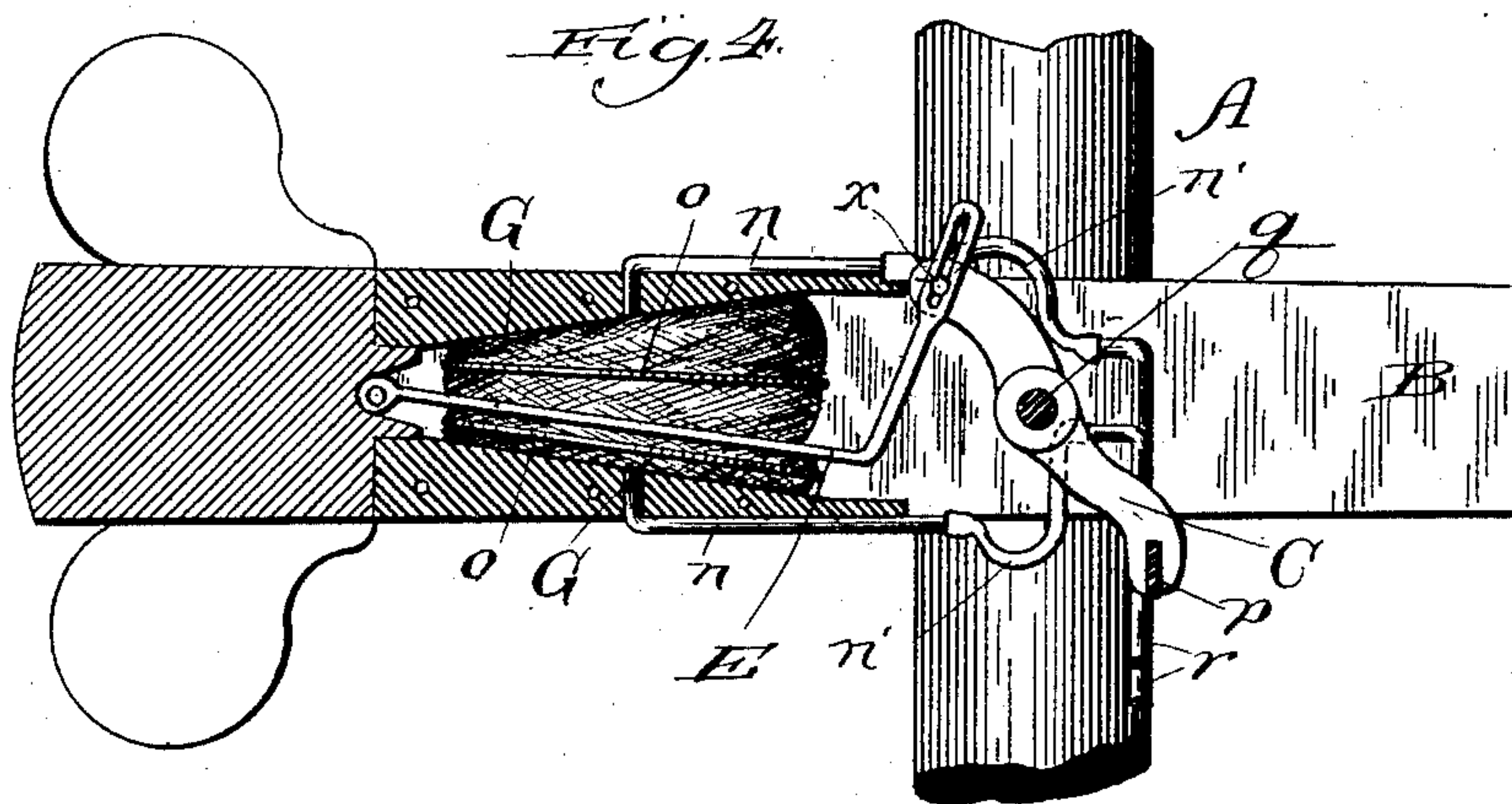
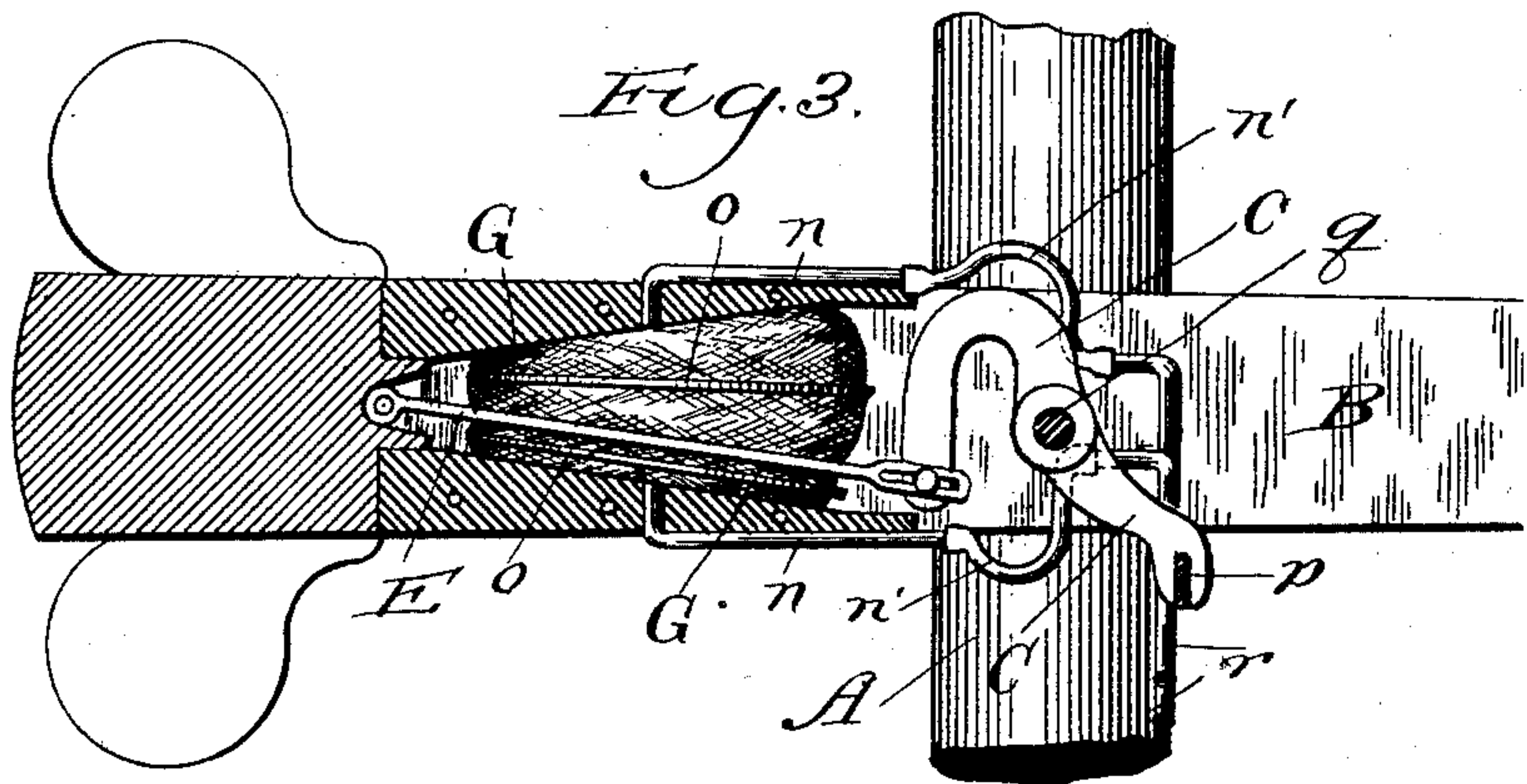
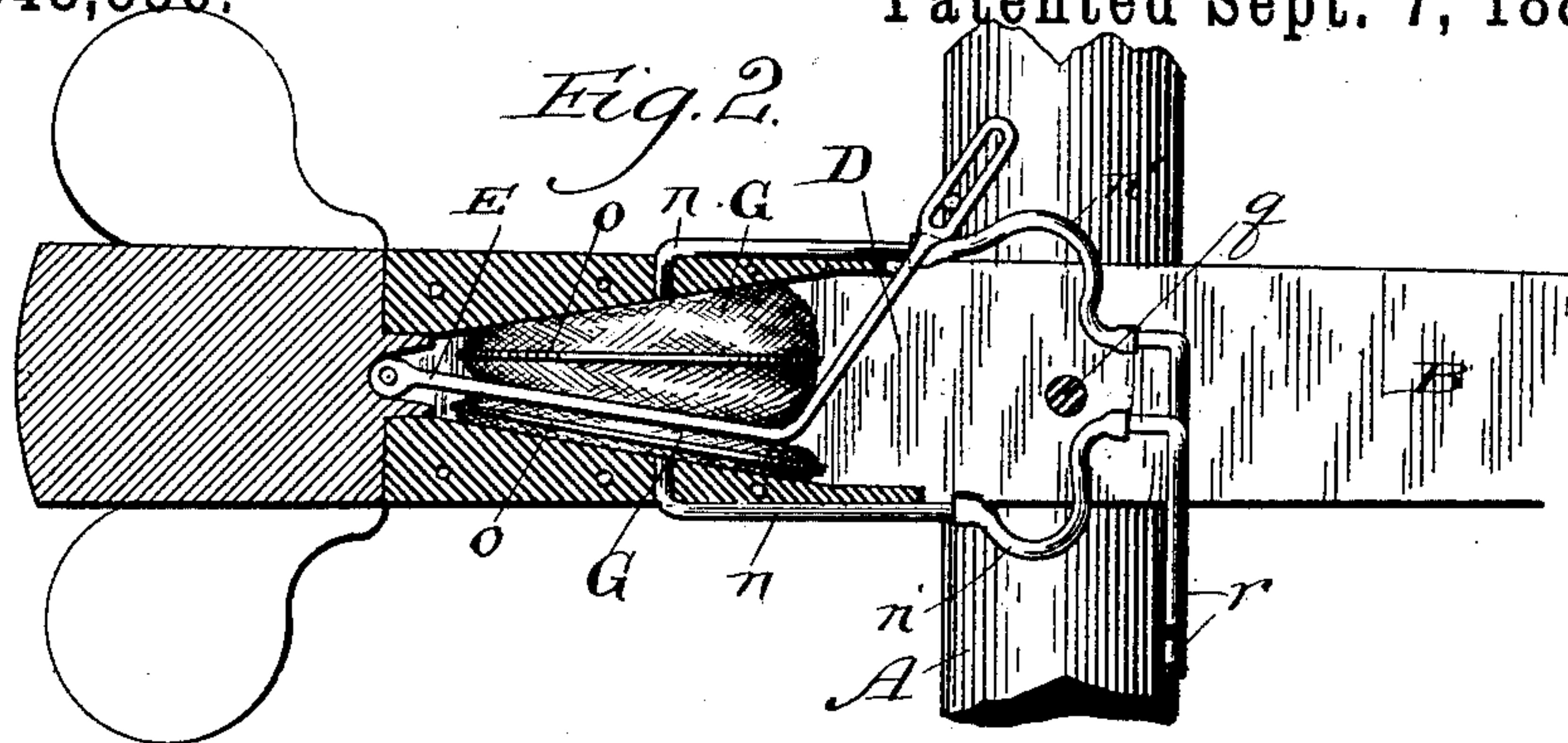
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By Dymenforth & Dymenforth,

Att'ys.

UNITED STATES PATENT OFFICE.

MORTIMER B. MILLS, OF CHICAGO, ILLINOIS.

MECHANICAL MOVEMENT FOR OPERATING GATE-BARS, SWITCHES, SIGNALS, AND THE LIKE.

SPECIFICATION forming part of Letters Patent No. 348,856, dated September 7, 1886.

Application filed May 3, 1886. Serial No. 200,934. (No model.)

To all whom it may concern:

Be it known that I, MORTIMER B. MILLS, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Mechanical Movement for Operating Gate-Bars, Switches, Signals, and the Like; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to a device useful applications of which are, as at present known to me, for operating the vertically-swinging bars of gates for railway-crossings, railroad switches, and signals.

My invention consists, broadly, in a stationary support, a pivotal arm connected therewith by means of a lever fulcrumed toward one end to the pivotal arm, and pivoted toward its opposite end to the stationary support, and a collapsible fluid-receiver connected with a fluid-supply and compressible between the pivotal arm and the lever.

My invention further consists in the general construction of my improved device; and it also consists in certain details of construction and combinations of parts, all as hereinafter more fully set forth.

For the sake of convenience in enabling my invention to be readily understood, the following description explains its application to the swinging gate of a railroad-crossing, and it is shown in such connection in the accompanying drawings, in which—

Figure 1 represents a sectional side elevation of part of a vertically-swinging gate-bar pivotally supported upon a post, or between two posts, as indicated, one side only of the support being shown as broken away toward opposite ends; and Figs. 2, 3, and 4 show modifications of the construction, as represented in Fig. 1.

A is a gate-post. I prefer to form this in two parallel parts, one of which, *r*, only is shown, owing to the nature of the view selected to illustrate the gate, between which the gate bar or arm B is pivoted upon a rod, *g*, to swing vertically. The rod *g* may be either rigid in its bearings or movable, to turn with the gate-bar.

C is a bar, preferably of the form shown in connection with a gate, secured or supported toward its center upon the rod or bearing *g*,

which passes through it, and fixed toward one end to the post A upon a cross-bar, *p*, extending from one part, *r*, to the other, when the part is formed as indicated and hereinbefore described. From the cross-bar *p* the bar C extends obliquely in an upward direction across the support or post A.

The arm or gate-bar B is supported on the post by the rod *g*, which extends through it either at a point to counterbalance it, as represented, or not, the matter of hanging the gate-bar being hereinafter more fully referred to. The gate-bar B is hollow toward its base, to afford a chamber or receptable, D, preferably of the form shown, tapering toward its rear end, and containing a lever, E, in the present instance having the form of an oblong flat piece, either of wood or metal, fulcrumed toward its rear end near the rear end of the gate-bar and pivoted toward its opposite end to the lower end of a link, E', the upper end of which is pivotally connected to the free end of the bar C.

As represented in the drawings, the gate-bar is counterbalanced. When the gate is thus counterbalanced, two collapsible fluid-receivers, G, are required to operate it. These comprise, preferably, bags of air-tight material—such as bellows cloth or rubber—of tapering form, as shown, to fit into the chamber D, having longitudinal strengthening-ribs *o*, and located on opposite sides of the lever E, between the same and the adjacent walls of the chamber D, the latter being sufficiently large to receive both receivers G only when one is collapsed and the other expanded. Both receivers G communicate by means of pipes *n* and rubber-hose connections *n'* with a fluid-pump, H, of common construction, the connection being made in a manner to cause the pump by operating it to exhaust the contents of one receiver G, and thus produce its collapse while it fills with fluid, and thus expands the other receiver. Air is the preferred fluid for use in operating my device, though I do not confine myself to its use.

The effect of exhausting the contents of the receiver G (shown as the lower one and collapsed in the drawings) and at the same time expanding the other receiver is to lower the gate-bar to the position represented. This result is produced by the movement of the le-

ver E, caused by the expansion of the upper receiver, G, which movement exerts a downward strain from the point x where the link E' is connected with the bar C, (which, as it is to be noted, is independent of the gate-bar, except for its connection therewith by means of the link E' and lever E,) and consequently causes the lever E at its pivotal end x' to pull upward the rear end of the gate-bar, thereby "lowering" the same. To raise the bar B, air is exhausted from the expanded receiver G and pumped into the collapsed one, which exerts the strain in an upward direction at the point x , thereby causing the rear end of the gate-bar to lower, thus raising the end forward of the bearing g , the lever E being caused to assume a vertical position.

It is not absolutely necessary that the part E' shall be in the form of a pivotal link, though the construction shown is the preferred one; but it might form a rigid part of the bar C, as shown in Fig. 3, with the lever E pivoted toward its lower end, or the angular part of the lever E, as shown in Fig. 4, pivoted at the point x ; also, the bar C might be dispensed with and the lever suitably connected with the post A, as shown in Fig. 2.

In any one of the modified constructions it is, for obvious reasons, necessary to provide a slot, as shown, in the part to which the pivot at the forward end of the lever E is connected, since otherwise by the lever being fulcrumed to the pivoted arm and pivotally connected to the stationary support the three points of connection—namely, those at which the arm is pivoted to the support, the lever to the arm, and the lever to the support—would constitute a triangle, each side of which would have a fixed length, and that between the two points on the stationary support being also fixed in position no movement could occur.

When two receivers, G, are employed, I prefer to make the connection thereof with the air-pump H, as shown, by means of a pipe, m , provided with an ordinary three-way cock, I, having an exhaust-opening, x^2 , in its shell, and branches l and l' , the opposite ends of which connect, respectively, with the rubber tubes n' . Thus, when the cock is set by hand to open communication between the pump and a receiver, G, the air from the other receiver may exhaust through the opening x^2 .

If the gate-bar B is heaviest at either end, it is obvious that only one receiver G is required to raise or lower it, depending upon which end is the heavier, which of course determines the side of the lever E upon which to place the receiver.

It is advisable in non-counterbalanced gates to have the rear end the heavier, so that the receptacle G in such cases is placed upon the upper or outer surface of the lever E.

What I claim as new, and desire to secure by Letters Patent, is—

1. The combination of a stationary support, a pivotal arm, a lever fulcrumed toward one

end to the pivotal arm and pivotally connected toward its opposite end to the stationary support, and a collapsible fluid-receiver confined between the said lever and pivotal arm and communicating with a suitable fluid-pump, the whole forming a new mechanical movement, substantially as described.

2. The combination of a stationary support, a bar rigidly secured thereon, a pivotal arm, a lever fulcrumed toward one end to the pivotal arm and pivotally connected toward its opposite end with the said bar, and a collapsible fluid-receiver confined between the said lever and pivotal arm and communicating with a suitable fluid-pump, the whole forming a new mechanical movement, substantially as described.

3. The combination of a stationary support, a bar rigidly secured thereon, a link connected toward one end with the bar, a pivotal arm, a lever fulcrumed toward one end to the pivotal arm and pivotally connected with the said link toward its opposite end, and a collapsible fluid-receiver confined between the said lever and pivotal arm and communicating with a suitable fluid-pump, the whole forming a new mechanical movement, substantially as described.

4. The combination of a stationary support, A, a bar, C, rigidly secured toward one end to the support A and extending obliquely across the same, a link, E', connected toward one end with the free end of the bar C, an arm, B, supported to swing upon the support A by a bearing, g , which passes through the bar C toward its center, a chamber, D, in the arm B, a lever, E, fulcrumed toward one end to the said arm and lying within the said chamber and pivotally connected with the link E' toward its opposite end, and a collapsible fluid-receiver, G, confined between the lever E and adjacent surface of the chamber D and communicating with a suitable fluid-pump, substantially as and for the purpose set forth.

5. The combination of a stationary support, A, a bar, C, rigidly secured toward one end to the support A and extending obliquely across the same, a link, E', connected toward one end with the free end of the bar C, an arm, B, supported to swing upon the support A by a bearing, g , which passes through the bar C toward its center, a chamber, D, in the arm B, a lever, E, fulcrumed toward one end to the arm at one side of the bearing g and lying within the said chamber, and pivotally connected with the link E' toward its opposite end, and collapsible fluid-receivers G, confined one on each side of the lever C within the chamber D, and controllably communicating with a suitable fluid-pump, H, the whole being constructed and arranged to operate substantially as and for the purpose set forth.

MORTIMER B. MILLS.

In presence of—

HENRY HUDSON,
J. W. DYRENFORTH.