

(No Model.)

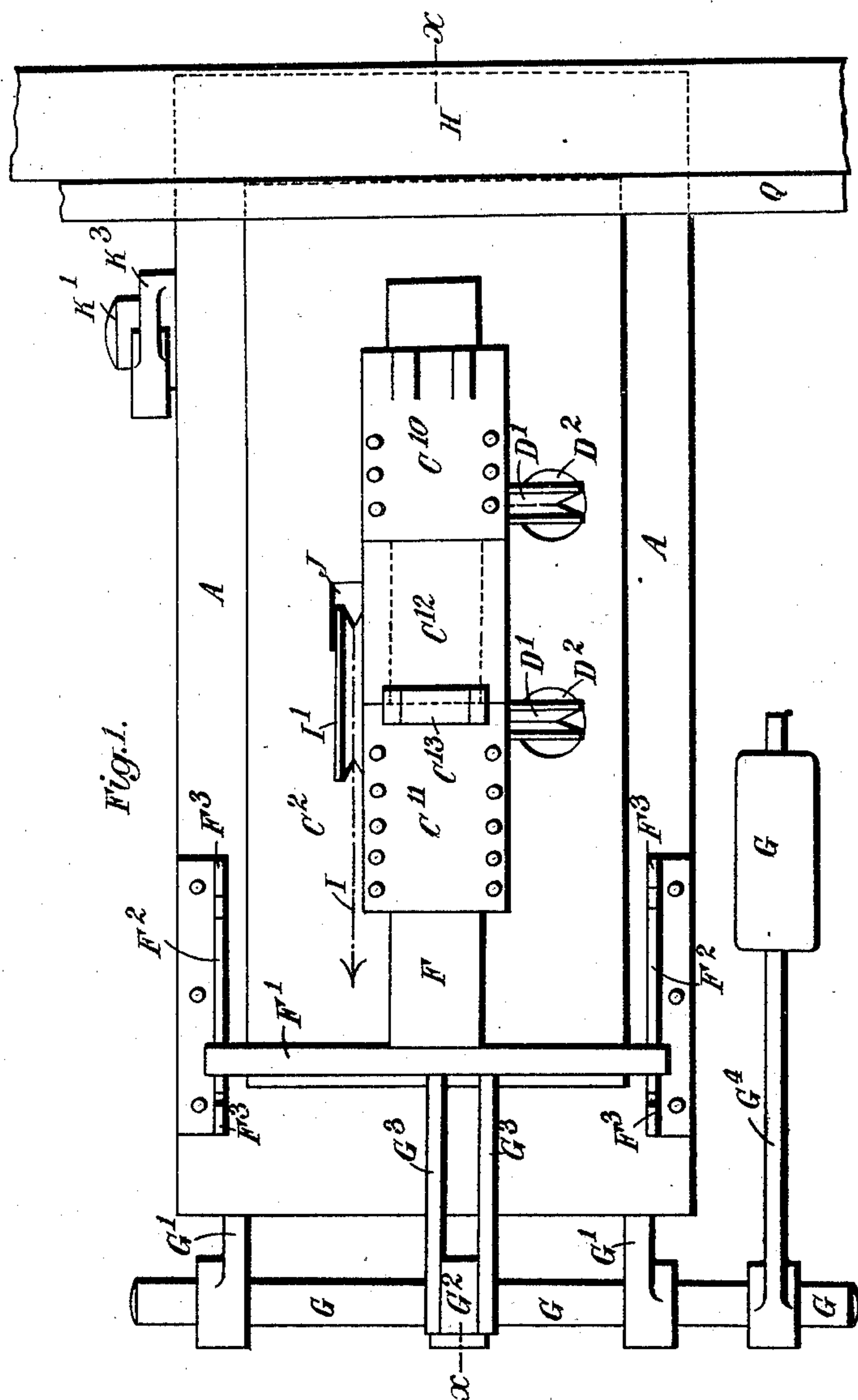
4 Sheets—Sheet 1.

J. G. DIXON.

AUTOMATIC FOG SIGNAL APPARATUS FOR RAILWAYS.

No. 509,796.

Patented Nov. 28, 1893.



Witnesses:
G. H. Rea,
J. A. Saul.

Inventor:
John G. Dixon,
By James L. Norris,
Atty.

(No Model.)

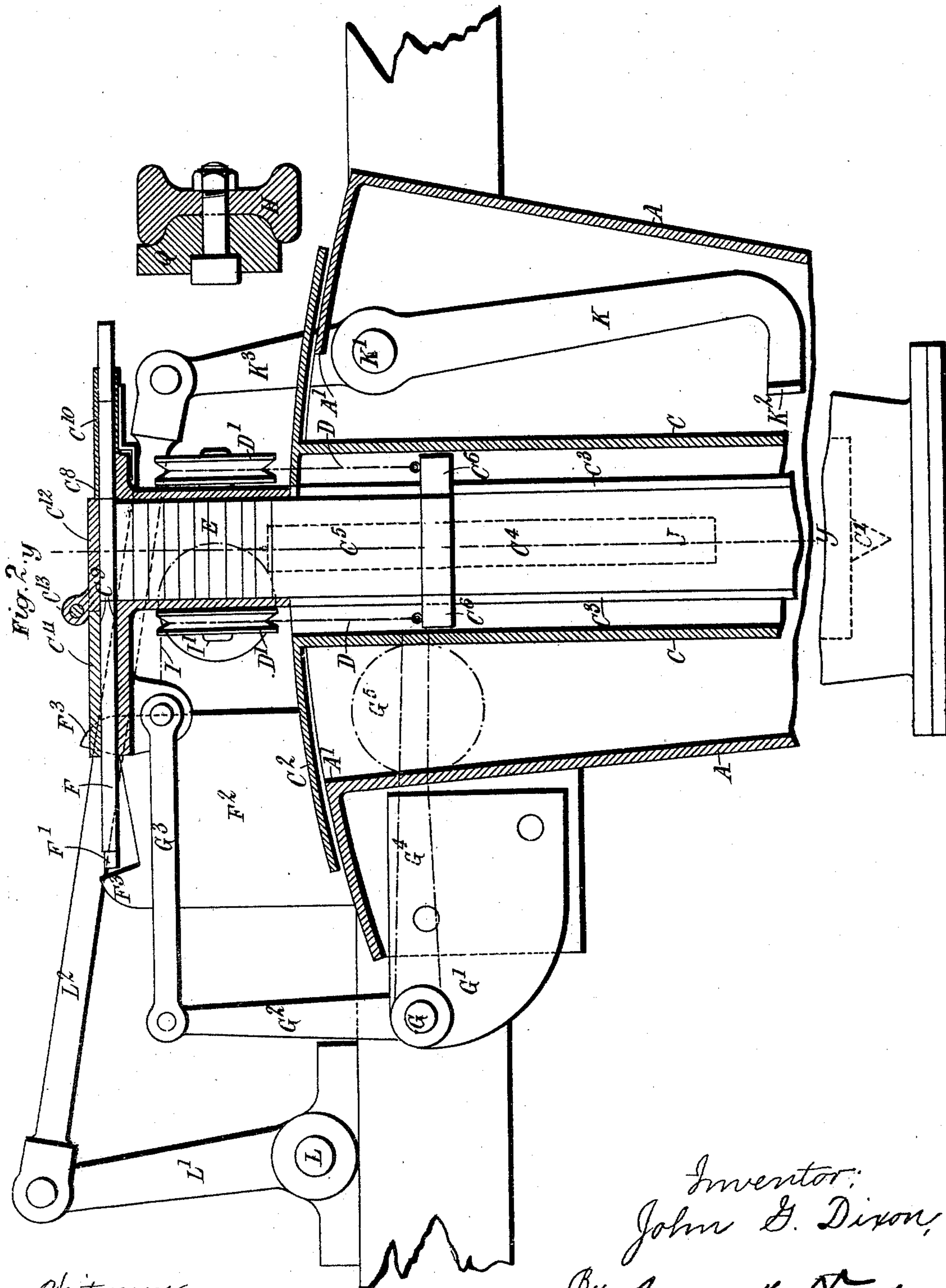
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4 Sheets—Sheet 3.

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Fig. 3.

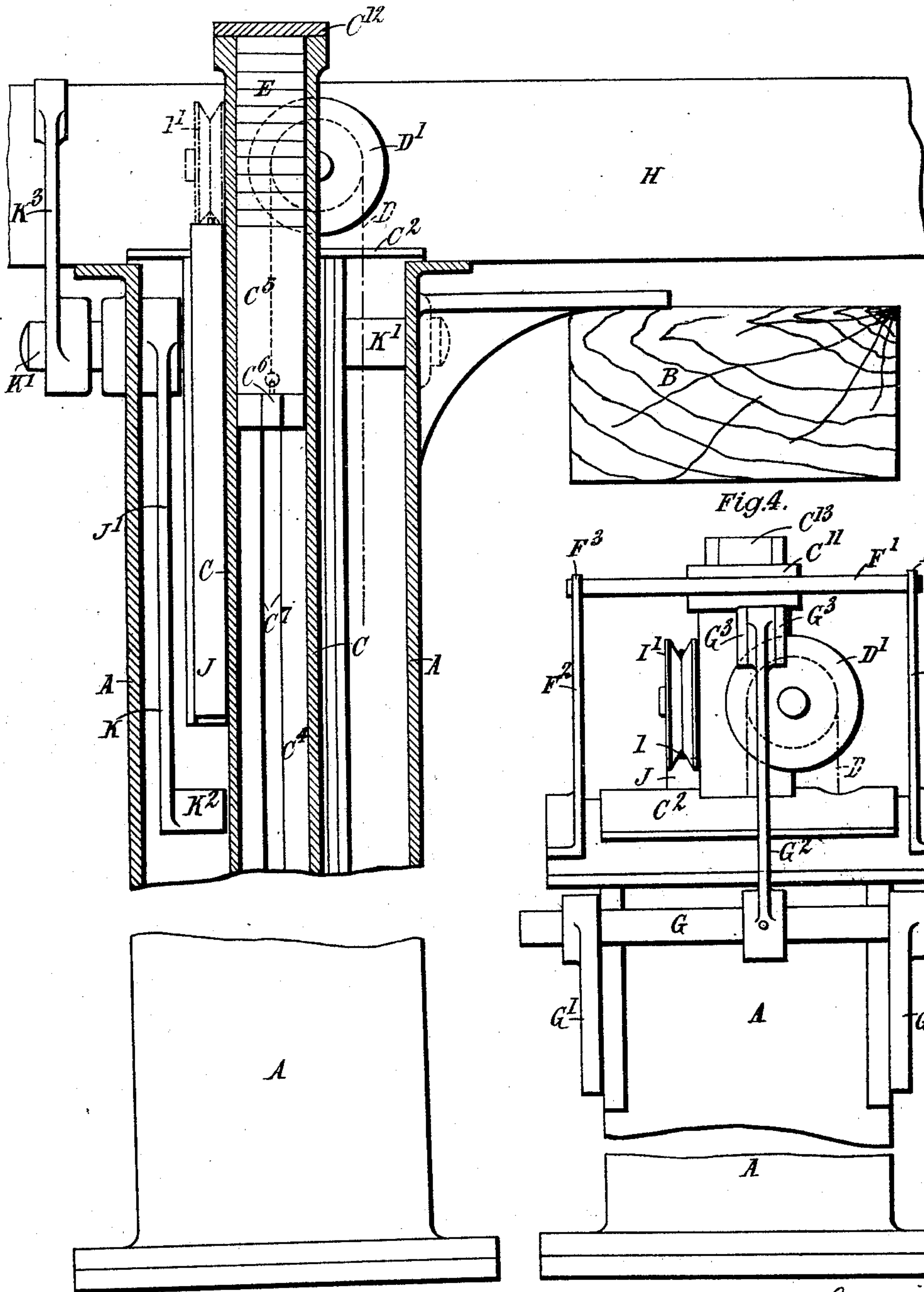
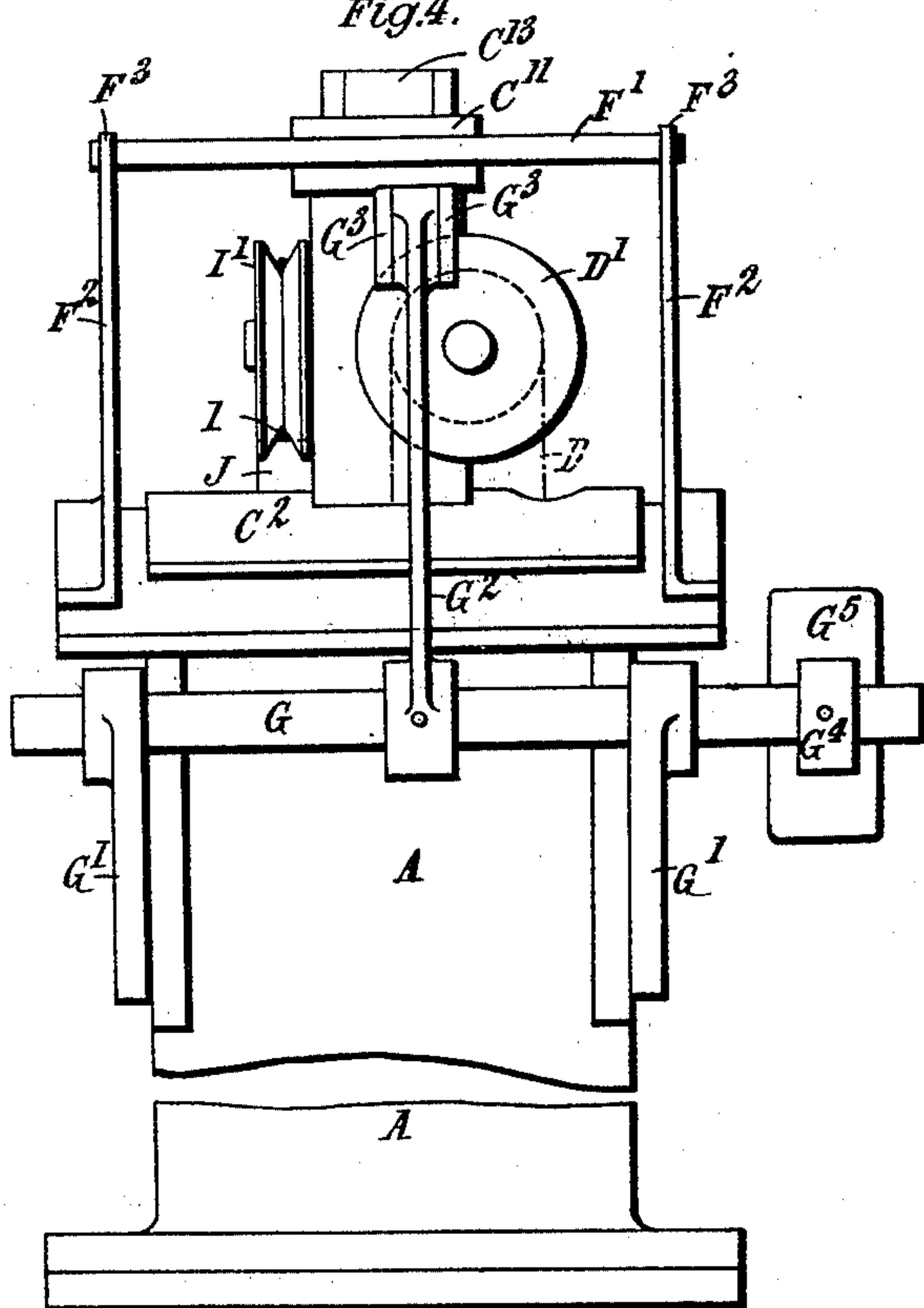


Fig. 4.



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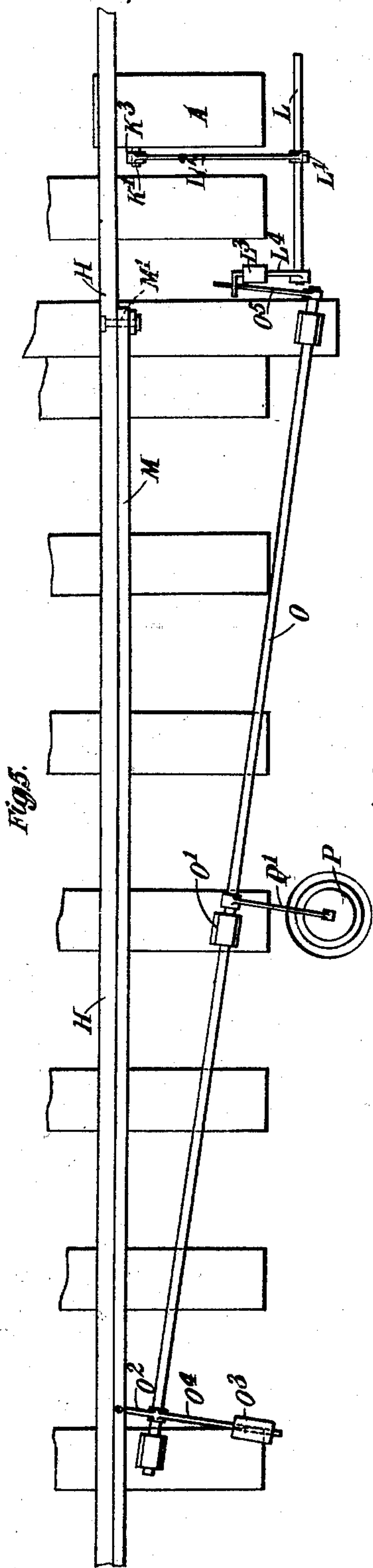


Fig. 6.

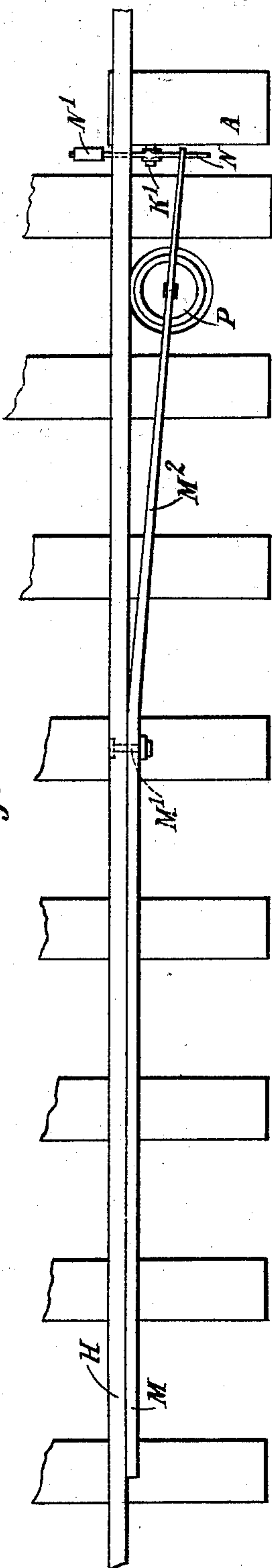
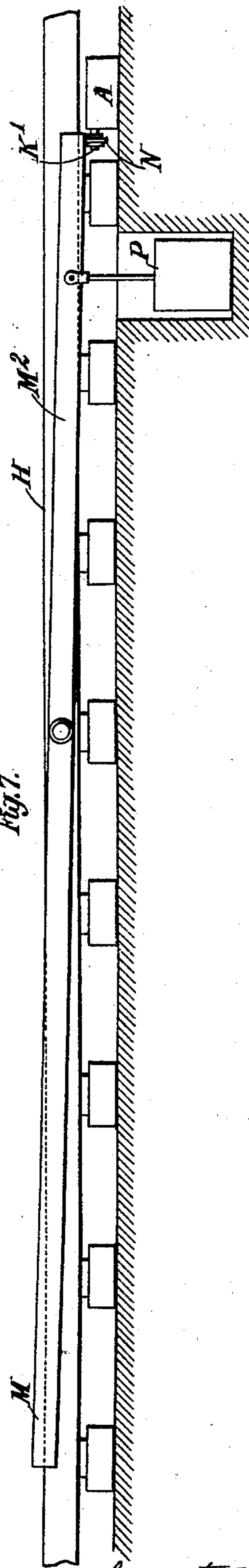


Fig. 7.



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Inventor:
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UNITED STATES PATENT OFFICE.

JOHN GEORGE DIXON, OF HUDDERSFIELD, ENGLAND.

AUTOMATIC FOG-SIGNAL APPARATUS FOR RAILWAYS.

SPECIFICATION forming part of Letters Patent No. 509,796, dated November 28, 1893.

Application filed May 25, 1893. Serial No. 475,469. (No model.)

To all whom it may concern:

Be it known that I, JOHN GEORGE DIXON, a subject of the Queen of Great Britain, and a resident of Huddersfield, England, have invented certain new and useful Improvements in Apparatus Employed in Fog-Signaling on Railways, of which the following is a specification, reference being had to the accompanying drawings.

10 This invention relates to apparatus for placing detonating cartridges or fog signals on railway metals in foggy weather. It is automatic in its action, and operates to remove the cartridge which has been exploded
15 by a passing train and replace the same by a fresh cartridge which is held on the line in readiness for the next train so long as the ordinary line signal is at danger. The said apparatus is controlled by the ordinary line
20 signal wire or point rod and is placed in the operative or inoperative position by the signalman in the cabin or elsewhere simultaneously with the operation of the said line signal. The said apparatus remains in the op-
25 erative position so long as the line signal is "on" and in that position it is operated by each passing train in such a manner as to throw out the exploded cartridge and replace the same with a fresh cartridge. The car-
30 tridges are contained in a suitable trunk or box which can be turned about a pivot toward and away from the rail. The normal position of the box is vertical corresponding with the "off" position of the line signal.
35 The movement of the box from the normal position toward the rail effects the placing of a cartridge on the rail, and the movement in the opposite direction from the vertical position, that is to say, away from the rail, re-
40 places the spent cartridge with a fresh one. The movement toward the rail is effected by the signalman, and that away from the rail is effected by the engine or train.

45 In the accompanying drawings I have shown how my invention may be conveniently and advantageously carried into practice.

Figure 1 is a plan of the apparatus for placing the detonating fog signals or cartridges on the rail. Fig. 2 is a vertical section of the
50 same taken on the line x, x Fig. 1. Fig. 3 is a vertical central section taken on the line y, y Fig. 2. Fig. 4 is a rear end elevation of the

same. Fig. 5 is a plan drawn to a smaller scale of one form of mechanism for operating the box shown in Figs. 1 to 4 to displace
55 the spent cartridges and replace the same with fresh cartridges. Fig. 6 is a plan, and Fig. 7 is an elevation of a slightly modified form of this operating mechanism.

Like letters of reference denote correspond-
60 ing parts in all the figures.

Referring now to Figs. 1 to 4, A is a stationary box or casing which is sunk in a hole in the permanent way by the side of the rail at the place where the cartridges are required
65 to be placed on the line, and is firmly stayed as for example by a beam B or otherwise, so as to prevent rocking.

Inside the casing A is a long rectangular trunk or box C which is provided with a pivot
70 C' Fig. 2 at its lower end resting in a suitable bearing formed in the casing, or is otherwise suitably supported to admit of a to-and-fro rocking movement of the said box. The up-
75 per end of the casing A is made sufficiently wide in the plane of the movement of the box C to allow of said rocking movement, the extent of which is limited by the ends of the opening A' in the top of the casing.

C² is a cover attached to the box C which
80 cover extends over the opening A' and serves to keep out the rain.

C³ C³ Fig. 2 are partition walls extending the whole length of the box C and which form an inner compartment C⁴ for the cartridges
85 or detonating fog signals. C⁵ is a platform for supporting the said cartridges. Said platform is furnished with ears C⁶ C⁶ which project through vertical slots C⁷ Fig. 3 in the partition walls C³ and are attached by chains
90 D, D that pass over guide pulleys D', D' to balance weights D², D² Fig. 1.

E indicates the cartridges packed in the compartment C⁴ above the platform C⁵. The uppermost cartridge is pressed against the
95 top of the compartment which is constituted by a door C¹². The said door is provided to admit of refilling the box with fresh cartridges when required. It is hinged at C¹³
100 and can be held shut by a catch or otherwise. An aperture C⁸ is formed in the front wall of the chamber C⁴ sufficiently large to allow of the passage therethrough of one cartridge at a time, and a corresponding opening C⁹ is

provided in the back wall to receive a sliding piece F which effects the feeding as hereinafter described. Front and rear tubular extensions C^{10} , C^{11} of rectangular section are formed on the walls of the chamber C^4 for a purpose hereinafter explained. The sliding piece F which projects from the part C^{11} is furnished with a cross bar F' at its rear end which bar works between two ears F^3 , F^3 formed on brackets F^2 placed one on each side of the apparatus for a purpose hereinafter explained.

G is a shaft supported in bearings in a bracket G' fixed to the casing A. Said shaft is coupled by an arm G^2 and links G^3 G^3 to the upper end or head of the box C, and is loaded by a weight G^5 on the end of an arm G^4 so as to cause it to tend continually to push the box C toward the rail H. This tendency however is restrained by the pull of the wire I of the ordinary line signal which when the ordinary signal is "off" maintains the box C in the upright position shown in Fig. 2 but allows the said box to fall forward toward the rail when the signal is "on." The wire I is not attached directly to the box C but passes over a guide pulley I' and is secured to a long bar or weight J which is suspended in a channeled part J' Fig. 3 formed outside the box C. In the position shown in Fig. 2 the upper end of the weight J is in contact with the guide pulley I' , over which the wire I passes, and is thus prevented from being drawn out of its channel guide any farther. Any other stop may be provided for this purpose. When the wire I is slackened and the line signal thus allowed to go "on," the box C tilts toward the rail as far as it can go. The whole of the slack in the wire I is however not taken up by this movement of the box C and consequently the bar or weight J is allowed to descend in its channel guide. When the line signal is pulled "off" by the signalman, the weight J is first drawn up as far as it will go, and then the box C is pulled back to its upright position. In the lowest position of the weight J its lower end projects through the bottom of its channel guide J' as, and for a purpose hereinafter specified.

K is an arm fixed on a short shaft K' that passes through the casing A. The arm K is inside the casing and its lower end is formed with a part K^2 Figs. 2 and 3 which when the arm K is oscillated is adapted to strike the lower end of the weight J when the latter is in its lowest position, but which will miss the said weight when the latter is raised.

K^3 is an arm fixed on the outer end of the shaft K' and connected by a link L^2 to an arm L' fixed on a shaft L, see Figs. 2 and 5, which shaft is loaded by a balance weight L^3 mounted on an arm L^4 fixed to the said shaft. By oscillating the shaft L the lever K is caused to swing to and fro and to strike the weight J when the latter is in its lowest position as above described. The balance weight L^3 is sufficiently heavy to overcome when released

the balance weight G^5 so that when the said weight L^3 is freed from restraint and the weight J is depressed, it will operate to push back the box C away from the rail as far as it will go.

Referring now to Fig. 5 M is a bar preferably about twenty feet long pivoted at M' preferably on the outside of the rail H. O is a shaft supported in suitable bearings O' and having an arm O^2 at one end that extends underneath the bar M and to which is pivoted a pin that projects into a small hole in the under side of said bar; the bar M may be otherwise supported by an arm of the shaft O. O^3 is a balance weight mounted on an arm O^4 secured to the shaft O, and which balances the bar M, and maintains said bar in an inclined position, so that its higher end projects about one and one-half inches more or less above the level of the rail. The pivoted end of the bar is depressed slightly below the rail. O^5 is another arm secured on the shaft O and passing underneath and supporting a cranked part of the balance arm L^4 of the shaft L; the said arm L^4 is thereby prevented from descending until the arm O^5 is first depressed by the passing of a train along the line. P is a dashpot the movable piston of which is connected with the shaft O by an arm P' secured on said shaft and coupled to the said piston. The object of the said dashpot is to prevent the too rapid rising of the arm O^5 after it has been depressed.

Q Figs. 1 and 2 is a metal bar secured to the side of the rail at the place where the cartridges are placed thereon and which serves to form a level support for said cartridges.

The operation of this apparatus is as follows, that is to say, assuming the line signal is "on" and the box C is therefore inclined toward the line so as to hold a fog signal thereon, then when an engine or train passes over the rails at the place where this apparatus is fixed it first fires the detonating cartridge and then depresses the inclined bar M and thereby partially turns the shaft O and lowers the arm O^5 . The weight L^3 being thus no longer supported, descends and partially turns the shaft L and through the arm L' , link L^2 and arm K^3 operates to turn the arm K and cause the lower end thereof to press against the weight J which is then in its lowest position. The box C is thereby pushed back beyond the upright or central position, and the cross bar F' of the slide F is brought into contact with and arrested by, the rear stops F^3 on the brackets F^2 . The continued rearward movement of the box C then has the effect of pushing out the spent cartridge from the jaw C^{10} and of replacing such cartridge with a fresh one which is held projecting from the said jaw C^{10} as shown in Fig. 2. As soon as the engine or train has passed the bar M the latter begins to rise under the influence of the balance weight O^3 but rises very slowly by reason of the dashpot P and hence time is given for the spent cartridge to be thrown out of the ma-

chine and replaced by another cartridge in the manner above described. When however the bar M has returned to its initial position the arm K will have receded from the weight J and will thus have allowed the box C to return to the rail H and place the new cartridge thereon ready for the next train if the line signal is still at danger, or return to the upright position if in the meantime the line signal has been taken "off." During the forward movement of the box C toward the rail H the plate F is drawn out of the part C¹¹ by the forward stops F³ of the plates F² which stops engage with and arrest the bar F'. Another cartridge is thus permitted to ascend from the box to take the place of that previously at the top. It will be seen that any train which passes the fog signaling apparatus when the line signal is "off" will not operate either to discharge or to replace a cartridge because in the first place the fog signal is not then on the line, and in the second place the weight J being in its raised position the arm K when oscillated misses the said weight and consequently does not push back the box. A cartridge is thus placed on the line only when the line signal is at danger and said cartridge after being discharged is replaced automatically by the passing train.

In the slight modification of the apparatus shown in Figs. 6 and 7 the incline M is provided with a tail piece M² which rests on an arm N fixed on shaft K' of the signal apparatus which shaft is weighted by a weight N' so as to operate the box C, in the manner above described with reference to Fig. 5 when the tail end of the bar M is raised.

P is a dashpot to prevent the too rapid return of the bar M to its initial position after it has been depressed.

The slow movement of the apparatus to and away from the rail is an important feature of my invention inasmuch as the apparatus is thereby caused to work smoothly and efficiently and is not injuriously shaken as would be the case if it were connected positively to the incline and operated suddenly by a passing train or engine.

What I claim is—

1. In an automatic fog signal apparatus for railways, the combination of a cartridge box pivoted so as to be capable of rocking to and away from the rail, an opening with jaws in said box through which the cartridges can pass one at a time, a balanced platform for supporting the cartridges and maintaining the uppermost cartridge opposite said opening, and means comprising a pusher and fixed controlling stops therefor whereby when the box is pushed back away from the rail beyond its normal position the foremost cartridge is thrown out of the jaws and replaced by another one, and when the box is rocked toward the rail the pusher is withdrawn to allow another cartridge to rise into the position of the one previously displaced, substantially as described for the purpose specified.

2. In an automatic fog signal apparatus for railways, the combination of a cartridge box pivoted so as to be capable of rocking to and away from the rail, an opening with jaws in said box through which the cartridges can pass one at a time, a balanced platform for supporting the cartridges and maintaining the uppermost cartridge opposite said opening, means comprising a pusher and fixed controlling stops therefor whereby when the box is pushed back away from the rail beyond its normal position the foremost cartridge is thrown out of the jaws and replaced by another one, and when the box is rocked toward the rail the pusher is withdrawn to allow another cartridge to rise into the position of the one previously displaced, a balance weight which tends to move the box toward the rail, and a connection between the said box and the ordinary line signal whereby when the signal is "off" the box is maintained away from the rail, and when the signal is "on" the box is inclined toward the rail and holds a cartridge thereon, substantially as described.

3. In an automatic fog signal apparatus for railways, the combination of a cartridge box pivoted so as to be capable of rocking to and away from the rail, an opening with jaws in said box through which the cartridges can pass one at a time, a balanced platform for supporting the cartridges and maintaining the uppermost cartridge opposite said opening, means comprising a pusher and fixed controlling stops therefor whereby when the box is pushed back away from the rail beyond its normal position the foremost cartridge is thrown out of the jaws and replaced by another one, and when the box is rocked toward the rail the pusher is withdrawn to allow another cartridge to rise into the position of the one previously displaced, a balance weight which tends to move the box toward the rail, a wire I connected with the ordinary line signal and passing over a guide pulley I', and a weight J suspended from said wire and adapted to slide up and down in a channel J', the upward movement of said weight being limited by the pulley I', substantially as described for the purpose specified.

4. In an automatic fog signal apparatus for railways, the combination of a cartridge box pivoted so as to be capable of rocking to and away from the rail an opening with jaws in said box through which the cartridges can pass one at a time, a balanced platform for supporting the cartridges and maintaining the uppermost cartridge opposite said opening, means comprising a pusher and fixed controlling stops therefor whereby when the box is pushed back away from the rail beyond its normal position the foremost cartridge is thrown out of the jaws and replaced by another one, and when the box is rocked toward the rail the pusher is withdrawn to allow another cartridge to rise into the position of the one previously displaced, an arm K controlled by a balance weight and adapted when re-

leased to engage with the weight J when the latter is lowered and push back the cartridge box from the rail, substantially as described for the purpose specified.

5 5. In an automatic fog signal apparatus for railways, the combination of a cartridge box pivoted so as to be capable of rocking to and away from the rail, an opening with jaws in said box through which the cartridges can
10 pass one at a time, a balanced platform for supporting the cartridges and maintaining the uppermost cartridge opposite said opening, means comprising a pusher and fixed controlling stops therefor whereby when the
15 box is pushed back away from the rail beyond its normal position the foremost cartridge is thrown out of the jaws and replaced by another one, and when the box is rocked toward the rail the pusher is withdrawn to allow another cartridge to rise into the position of the one previously displaced, an inclined bar pivoted to the side of the rail and adapted to be depressed by each passing engine and means connecting said inclined
20 bar to the cartridge box whereby the latter is rocked away from the rail when the bar is depressed, substantially as described, for the purpose specified.

6. In an automatic fog signal apparatus for
30 railways, the combination of a cartridge box pivoted so as to be capable of rocking to and away from the rail, an opening with jaws in said box through which the cartridges can pass one at a time, a balanced platform for supporting the cartridges and maintaining
35 the uppermost cartridge opposite said opening, means comprising a pusher and fixed controlling stops therefor whereby when the box is pushed back away from the rail beyond its normal position the foremost cartridge is
40 thrown out of the jaws and replaced by another one, and when the box is rocked toward the rail the pusher is withdrawn to allow another cartridge to rise into the position of the one previously displaced, a balance weight which tends to move the box toward the rail, a wire I connected with the ordinary line signal and passing over a guide pulley I', a weight J suspended from said wire and adapted
50 to slide up and down in a channel J' being drawn up when the line signal is "off" and lowered when the line signal is "on," the upward movement of the weight being limited by the pulley I', an inclined counterbalanced bar pivoted to the side of the rail in a position to be depressed by each passing engine, and means intermediate of the said bar and the weight J adapted to push laterally against the said weight when the inclined bar
55 is depressed and the weight is lowered, but not to engage with the weight when the latter is raised, thereby forcing back the box when the line signal is "on" but not at any other time, substantially as described for the purpose specified.

7. In an automatic fog signal apparatus for

railways, the combination of a cartridge box pivoted so as to be capable of rocking to and away from the rail, an opening with jaws in said box through which the cartridges can
70 pass one at a time, a balanced platform for supporting the cartridges and maintaining the uppermost cartridge opposite said opening, means comprising a pusher and fixed controlling stops therefor whereby when the box
75 is pushed back away from the rail beyond its normal position the foremost cartridge is thrown out of the jaws and replaced by another one, and when the box is rocked toward the rail the pusher is withdrawn to allow another
80 cartridge to rise into the position of the one previously displaced, an arm K controlled by a balance weight and adapted when released to engage with the weight J when the latter is lowered and push the cartridge box
85 away from the rail and an inclined counterbalanced bar pivoted to the side of the rail in a position to be depressed by each passing engine and forming a support to prevent the movement of the arm K so long as said bar
90 remains raised, substantially as described for the purpose specified.

8. In an automatic fog signal apparatus for
95 railways, the combination of a cartridge box pivoted so as to be capable of rocking to and away from the rail, an opening with jaws in said box through which the cartridges can pass one at a time, a balanced platform for supporting the cartridges and maintaining
100 the uppermost cartridge opposite said opening, means comprising a pusher and fixed controlling stops therefor whereby when the box is pushed back away from the rails beyond its normal position the foremost cartridge is
105 thrown out of the jaws and replaced by another one, and when the box is rocked toward the rail the pusher is withdrawn to allow another cartridge to rise into the position of the one previously displaced, an arm K controlled by a balance weight and adapted when released to press against the weight J when the
110 latter is lowered and push back the cartridge box away from the rail, an inclined counterbalanced bar pivoted to the side of the rail in a position to be depressed by each passing
115 engine, and forming a support to prevent the movement of the arm K so long as the said bar remains raised, and means to prevent the too sudden return of the inclined bar to its normal position, substantially as described
120 for the purpose specified.

9. In an automatic fog signal apparatus for
125 railways, the combination of a cartridge box pivoted so as to be capable of rocking to and away from the rail, an opening with jaws in said box through which the cartridges can pass one at a time, a balanced platform for supporting the cartridges and maintaining
130 the uppermost cartridge opposite said opening, means comprising a pusher and fixed controlling stops therefor whereby when the box is pushed back away from the rail be-

yond its normal position the foremost cartridge is thrown out of the jaws and replaced by another one, and when the box is rocked toward the rail the pusher is withdrawn to
5 allow another cartridge to rise into the position of the one previously displaced, an arm K controlled by a balance weight and adapted when released to press against the weight J
10 when the latter is lowered and push the cartridge box away from the rail, an inclined counter balanced bar pivoted to the side of the rail in a position to be depressed by each
passing engine, a shaft O having an arm O² secured thereon to engage with the bar M and
15 another arm O⁴ carrying a balance weight O³, a dash-pot P connected with the shaft O by an arm P', another arm O⁵ secured on the shaft O for supporting a loaded cranked arm
L⁴ which is connected to the arm K by shaft
20 L, arm L', link L², arm K³ and shaft K', sub-

stantially as described, for the purpose specified.

10. In an automatic fog signal apparatus, the combination of a cartridge box for placing the cartridges on the rail, an inclined bar 25 pivoted in a position to be depressed by the wheels of each passing engine or train, means connecting the said bar to the said cartridge box for actuating the latter when the former is depressed, and means comprising a dash 30 pot whereby the inclined bar is prevented from rising suddenly or rapidly after each depression thereof, substantially as described.

In witness whereof I have hereunto set my hand this 11th day of May, 1893.

JOHN GEORGE DIXON.

Witnesses:

GEO. HARRISON,
ARTHUR A. BERGIN.