(No Model.) 3 Sheets—Sheet 1.

G. S. PFLASTERER.

COMBINED SWITCH AND DISTANT SIGNAL STAND.

No. 577,171. Patented Feb. 16, 1897.

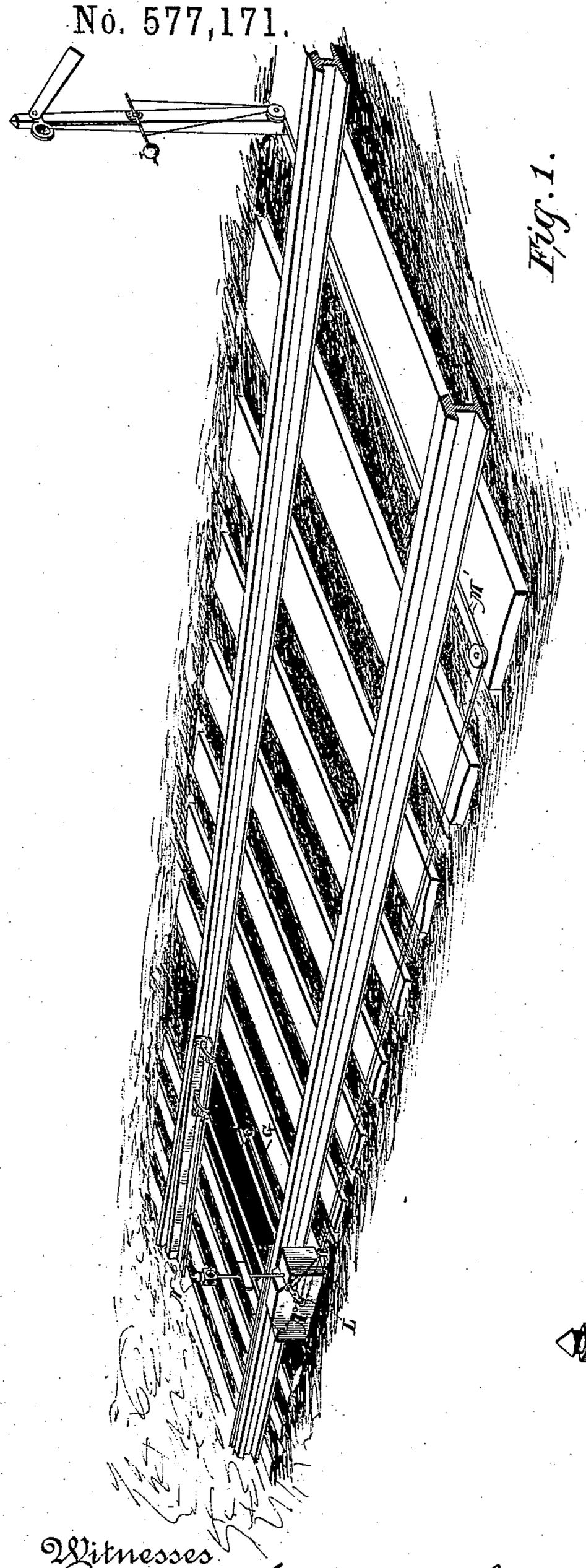

Fig. 1.

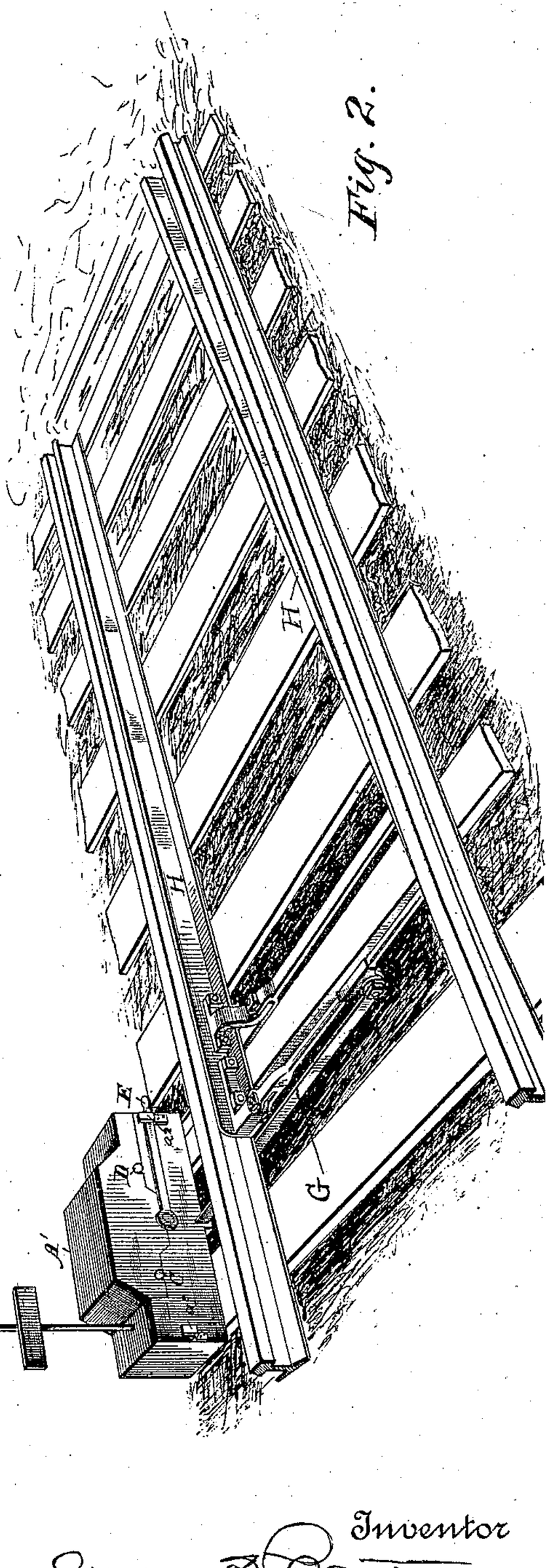

Fig. 2.

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(No Model.) 3 Sheets—Sheet 2.

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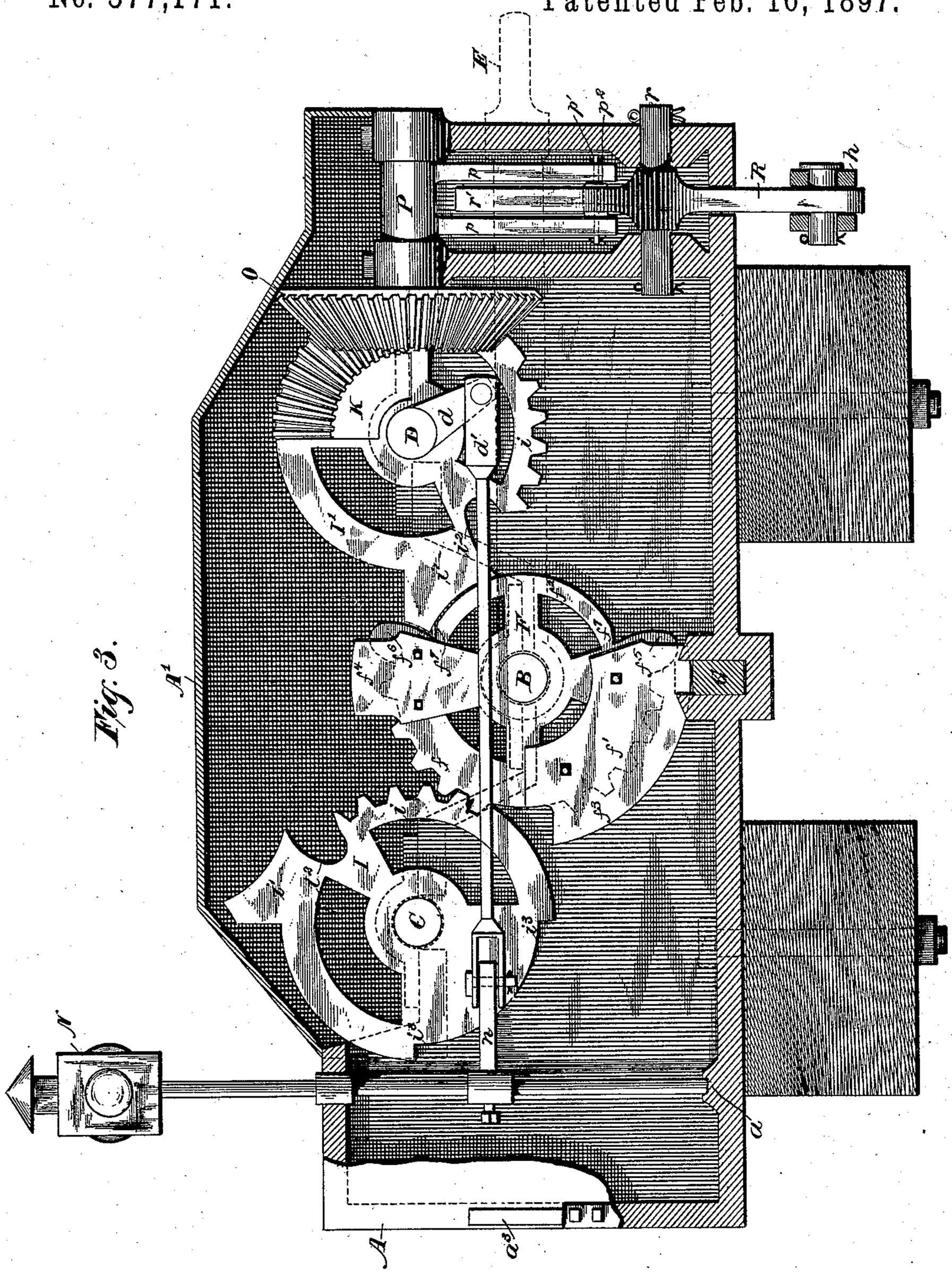

Fig. 3.

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(No Model.) 3 Sheets—Sheet 3.

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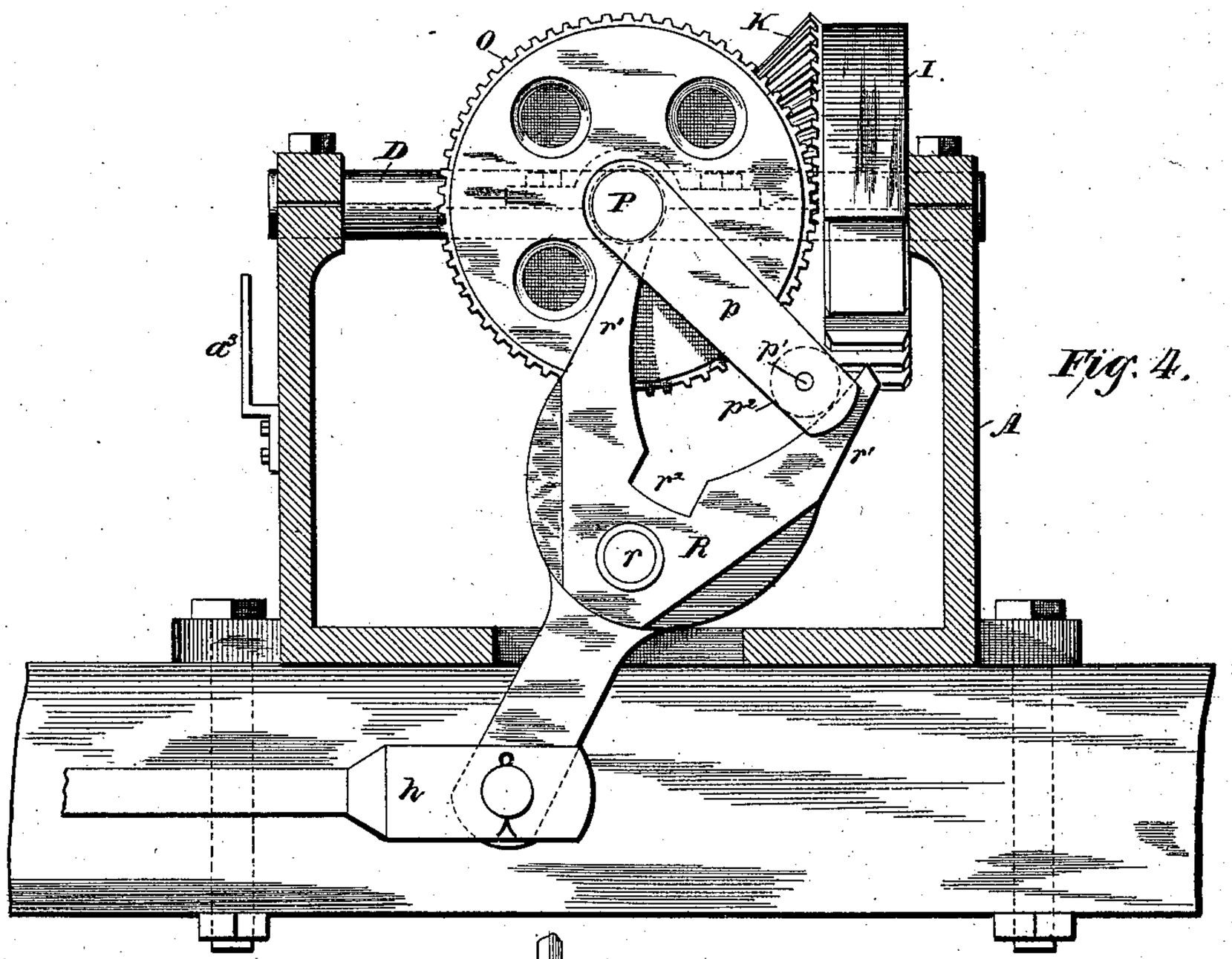

Fig. 4.

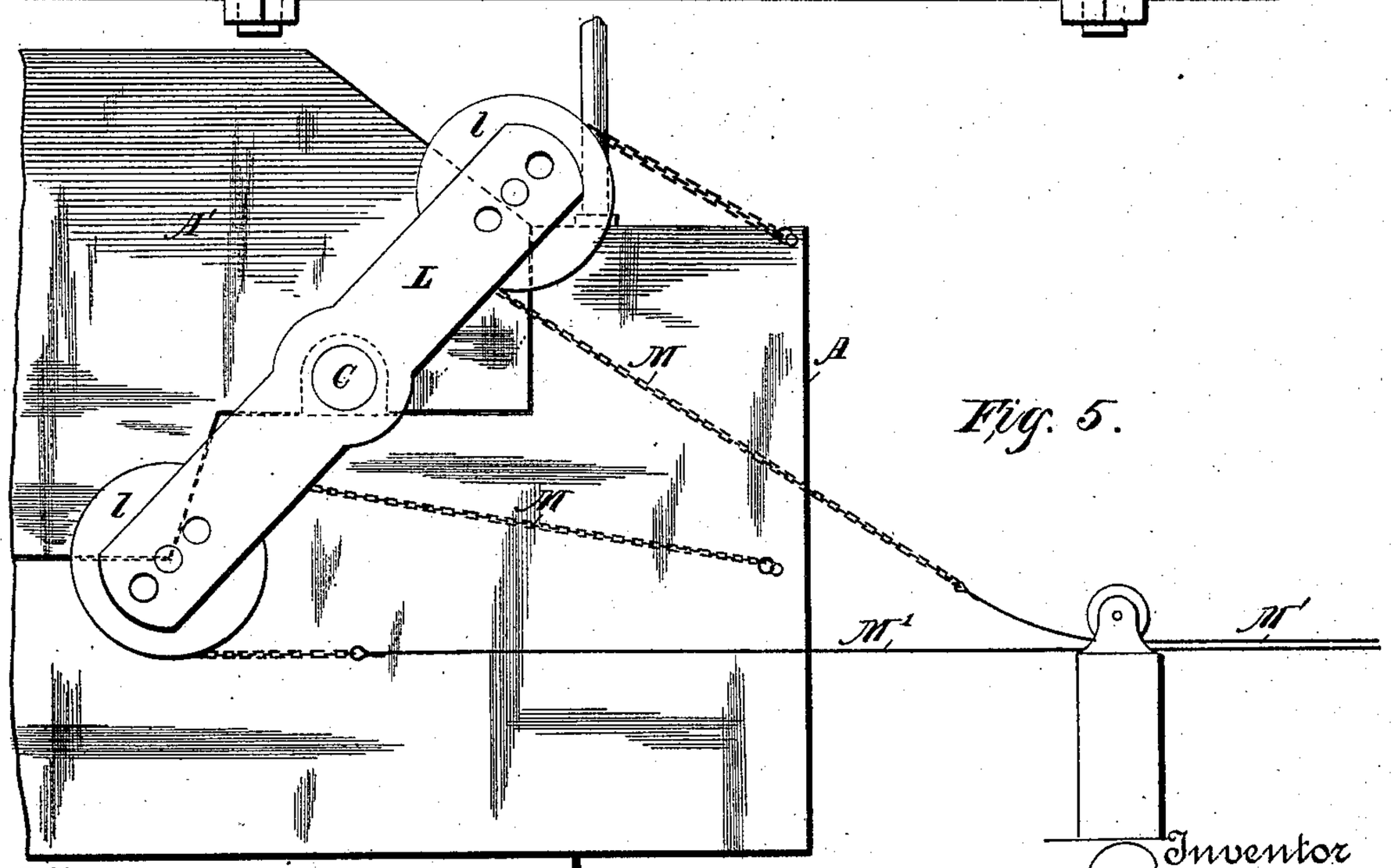

Fig. 5.

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UNITED STATES PATENT OFFICE.

GEORGE SAMUEL PFLASTERER, OF DANVILLE, ILLINOIS.

COMBINED SWITCH AND DISTANT-SIGNAL STAND.

SPECIFICATION forming part of Letters Patent No. 577,171, dated February 16, 1897.

Application filed November 27, 1896. Serial No. 613,602. (No model.)

To all whom it may concern:

Be it known that I, GEORGE SAMUEL PFLASTERER, a citizen of the United States, residing at Danville, in the county of Vermilion and State of Illinois, have invented certain new and useful Improvements in a Combined Switch and Distant-Signal Stand; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

My invention relates to stands for railway switch and signal apparatus. Its object is to insure the operation of the signals and switch in the proper relative order both in opening and closing the switch. It is designed to control a distant signal and is therefore of especial value on curves or at other places where the switch-light cannot be seen or on any facing switch. The mechanism is such that the switch cannot be moved from the main-track position until the signal has been thrown to "danger," and, conversely, the signal cannot be cleared until the switch has been set right for the main line. There is also a lock-rod which securely holds the point of the switch in both its open and closed positions, and also renders it impossible to operate the signal if any obstacle blocks the movement of the switch-point.

The parts are operated by a single lever which is thrown one way to set the signal and open the switch and in the opposite direction to close the switch and clear the signal.

The mechanism is inclosed in a tight metal case which can be placed at any distance from the track. The operating-lever and the signal connection are arranged outside of the case, and can be placed on either side of it at will, according to the location of the device. It is desirable to keep the signal-connection wires as far away from the track as possible, in order to avoid compelling the trackmen and the trainmen to step over them in operating the switch. When placed between the tracks, the wires can be boxed. The lamp-staff can be of any desired height for low or high stands.

In case the signal gets out of order the device can be used as a simple switch-stand by merely removing the signal connections.

The preferred form of my invention is shown in the accompanying drawings, in which—

Figures 1 and 2 are perspective views of a piece of track with my switch-stand in place. Fig. 3 is a side elevation of the mechanism. Fig. 4 is an end elevation of the same; and Fig. 5 is a view of one end of the device, showing the distant-signal connections.

The working parts are inclosed in a casing A, which has a removable cover A′, and is made of some water-tight material, such as metal. Journaled in bearings in the sides of the casing are three shafts B C D. The ends of the main or driving shaft B project through the casing and are squared or otherwise formed to receive an operating-lever E. Secured to the shaft B inside the casing is a driving-wheel F, having two segment-gears $f f'$, each occupying about one-quarter of its periphery, with a short interval between them. The rest of the wheel is smooth, as at f^2. Adjacent to the segment-gear f' is a locking quadrant or rim f^3, whose edge lies out beyond the crests of the gear-teeth. Adjacent to one end of the segment-gear f and diametrically opposite one end of the quadrant f^3 is a short similar locking-rim f^4. At this end of the segment-gear f and at the diametrically opposite end of the gear f' is a rounded tooth f^5 f^6, respectively, which projects radially beyond the teeth of the gear. At the base of each tooth f^5 f^6, where it joins the smooth portion f^2 of the wheel, there is a notch f^7.

The locking-rims f^3 f^4 are secured to the driving-shaft, being preferably bolted to the driving-wheel, and are capable of adjustment thereon. They can be placed on either side of the wheel F, as may be most convenient, and can be shifted from one side to the other, if necessary, when the switch-stand is moved to a new location. The function of the locking-rims is to enter a transverse notch in the lock-rod G, attached to and moving with the switch-point H, in order to positively hold the switch-point open or closed. The rim f^3 locks the switch-point closed and the rim f^4 locks it open.

The shaft C operates the signal and the

shaft D the switch. They are both geared to the shaft B by means of driven wheels I I′, having segment or mutilated gears, so as to be operated in succession instead of simultaneously. These wheels are preferably duplicates, but they are so arranged that one is right-handed and the other left-handed, looking from either side of the casing. They comprise quadrant-gears *i*, projecting lock-segments *i′*, with a deep notch i^2 between the gear and the lock-segment. The quadrant of the periphery opposite this notch is recessed or shouldered at i^3, and the wheel I′ on the shaft D has a quadrant bevel-gear K set in between said shoulders and bolted to the wheel I′. It can be placed on either side of the wheel to suit the necessities of the case.

The ends of the shaft C extend beyond the sides of the casing A to receive on one end or the other the cross-arm L, carrying the pulleys *l*, to actuate the distant signal by means of chains M, fastened to the casing A at one end and running around the pulleys to the ends of the wire connections M′. By giving the shaft C and cross-arm L a quarter-turn the connections will be operated in an obvious and well-known manner.

The shaft D is arranged to actuate the switch-signal N. This may be accomplished by means of a crank *d* on the shaft, connected by means of a rod *d′* with a crank-arm *n* on the staff of the lamp N, so that a quarter-turn of the shaft D will give the lamp a quarter-turn. For convenience the lamp-staff may be stepped in a socket *a* in the casing A and rise through a bearing in the top of the casing. The shaft D also throws the switch, and the mechanism I prefer to employ for this purpose is as follows: Meshing with the quadrant bevel-gear K is a bevel-gear O, secured to a short horizontal shaft P, on which is a crank, preferably a double one, composed of two parallel crank-webs *p*, connected at their ends by a crank-pin *p′*, preferably provided with a roller p^2. This crank is arranged to actuate a rock-lever R, to one arm of which the switch-rod *h* is pivoted. The preferred form of rock-lever is shown clearly in Fig. 3. It is mounted on trunnions *r* and has a bifurcated upper arm receiving between its jaws *r′* the crank-pin *p′*. The inner faces of the jaws *r′* are curved on an arc concentric with the shaft P. At their inner ends there is a central notch r^2, adapted to be engaged by the crank-pin or its roller. At each throw of the crank the rock-arm is carried to one side or the other, as the case may be. At the end of its stroke the rock-arm is securely locked against accidental movement by reason of the curved face *r′* lying normal to the lengthwise axis of the crank.

The operation of my invention is as follows: When the switch is set for the main track and the signal is clear, the lever E lies to the right, as shown in Fig. 3, being retained in this position by a clip a^2 on the casing A. The segment-gear *f* on the driving-wheel meshes with segment-gear *i* on the driven wheel I. The wheel I′ is rigidly locked by reason of its lock-segment *i′* lying against the smooth portion f^2 of the driving-wheel F, the outer edge of the lock-segment being concave on the same curvature as the portion f^2 of the wheel. The locking-rim f^3 is engaged with the notch in the lock-rod G. Now let the lever E be lifted to an upright position, that is, through a quarter-revolution. This causes the driving-wheel I to make a quarter-turn, which throws the distant signal to "danger." The lock-segment *i′* on the wheel I comes down in contact with the smooth portion f^2 of the wheel F, the long tooth f^6 insuring the simultaneous movement of the two wheels until the lock-segment is fairly in contact and the notch f^7 permitting the corner of the lock-segment to pass by. The wheel I is thus locked against any backward movement which might be induced by the tension on the signal connections. The gears *f* and *i* having now become disengaged and the locking-rim f^3 having passed out of the notch in the lock-rod G, the continued movement of the lever E through another quarter-revolution causes the gear *f′* to mesh with the gear *i* on the driven wheel I′ and give said wheel a quarter-revolution. This turns the signal N, and also by rotating the bevel-wheel O a quarter-turn causes the crank *p* to move through ninety degrees, and in so doing to rock the lever R and throw the switch. The locking-rim f^4 then passes into another notch in the lock-rod G (which has necessarily moved with the switch-point) and locks the switch in its open position, lever E being held by a clip a^3.

When the operation is reversed, the first quarter-revolution of the lever E unlocks the switch and closes it and sets the signal N at "safety." The second quarter-revolution of the lever locks the switch-point closed and clears the distant signal.

The shafts B, C, and D are reversible end for end, so that the wheels F, I, and I′ can be placed on the opposite sides of the casing in order to get the proper push or pull for the switch with which it is to be used. The locking-rims f^3 f^4 can also be changed from one side of the wheel F to the other. In case the switch is run through backward when closed or open, thereby forcibly throwing the rods G and *h*, the locking-rims and the crank-pin *p′* will give way and save the rest of the machine.

My invention does not occupy much room and is dirt and snow proof. Its working parts are strong and simple in construction and are easily accessible when repairs are necessary. The device can be connected to any switch or to any signal of the semaphore type.

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

1. In a switch-stand, the combination with a single operating-shaft, of two adjacent shafts, one provided with distant-signal-operating

mechanism, and the other with connections to a switch, and segmental gears on the three shafts whereby the operating-shaft is enabled to actuate the others in succession, substantially as described.

2. In a switch-stand, the combination with a single operating-shaft, of a driving-wheel thereon having two quadrant-gears and a smooth peripheral portion, two adjacent shafts, and a driven wheel on each of said two shafts, each wheel having a quadrant-gear, and a lock-segment adapted to coact with the smooth portion of the driving-wheel, substantially as described.

3. In a switch-stand, the combination with a single operating-shaft, and two adjacent shafts, of coacting segmental gears and lock-segments on said shafts, distant-signal connections adapted to be actuated by one shaft, switch mechanism connected with another shaft, a lock-rod connected with the switch, and locking-rims on the operating-shaft to engage with said rod, substantially as described.

4. In a switch-stand, the combination with a single operating-shaft, of two adjacent shafts, distant-signal-operating mechanism adapted to be actuated by one shaft, and switch mechanism connected with the other shaft, and a switch-signal connected with the switch-operating mechanism, substantially as described.

5. In a switch-stand, the combination with an operating-shaft, of a driving-wheel thereon, having a segment-gear with a long tooth at one end and a smooth peripheral portion with a notch at the end adjacent to said long tooth, a shaft provided with operating connections for a signal or switch mechanism, a driven wheel on said shaft having a segment-gear meshing with said gear on the driving-wheel, a lock-segment on said driven wheel having a concave edge adapted to fit the smooth peripheral portion of said driving-wheel, and a deep notch between said lock-segment and the gear-teeth, substantially as described.

6. In a switch-stand, the combination with a single operating-shaft, of a driving-wheel thereon having two segment-gears with a short space between their adjacent ends, a long tooth at their distant ends, a smooth peripheral portion having a notch at each end adjacent to said long teeth, two shafts provided with operating connections for a distant signal and a switch mechanism, respectively, a driven wheel on each shaft, having a segment-gear adapted to mesh with one of the segment-gears on the driving-wheel, a lock-segment on each driven wheel having a concave edge to fit the smooth peripheral portion of the driving-wheel, and a deep notch between said lock-segment and the gear-teeth, said driven wheels being arranged to be actuated successively, substantially as described.

7. In a switch-stand, the combination with a driving-shaft, of two driven shafts, one connected with a distant signal and the other with a switch mechanism, a lock-rod attached to the switch-point, and two locking-rims on the driving-shaft adapted to engage with said rod, one rim being long enough to engage the rod while the distant signal is being set or cleared, and the other rim being short to lock the switch-point open after the switch mechanism has been operated, substantially as described.

8. In a switch-stand, the combination with a driving-wheel, of a lock-rod attached to the switch-point, and two adjustable and reversible locking-rims secured to one side of the driving-wheel, substantially as described.

9. In a switch-stand, the combination with a driving-wheel, of two similar driven wheels, a removable and reversible segment bevel-gear secured to one of said driven wheels, and switch-operating mechanism in gear with said bevel-gear, substantially as described.

10. In a switch-stand, the combination with a casing A, of three transverse shafts B, C, D journaled therein, segmental gears connecting said shafts, distant-signal connections operated by the shaft C, a switch mechanism operated by the shaft D, a crank *d* on said shaft, a switch-signal N mounted on an upright staff, a crank *n* on said staff, and a rod *d'* connecting the cranks *d* and *n*, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

GEORGE SAMUEL PFLASTERER.

Witnesses:
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FRED. WM. HOPPER.