

CHARLES VERNY & A. VEILLET. 2 Sheets--Sheet 1.
 Improvement in Electrical Apparatus for Preventing Railway Accidents.
 No. 123,527. Patented Feb. 6, 1872.

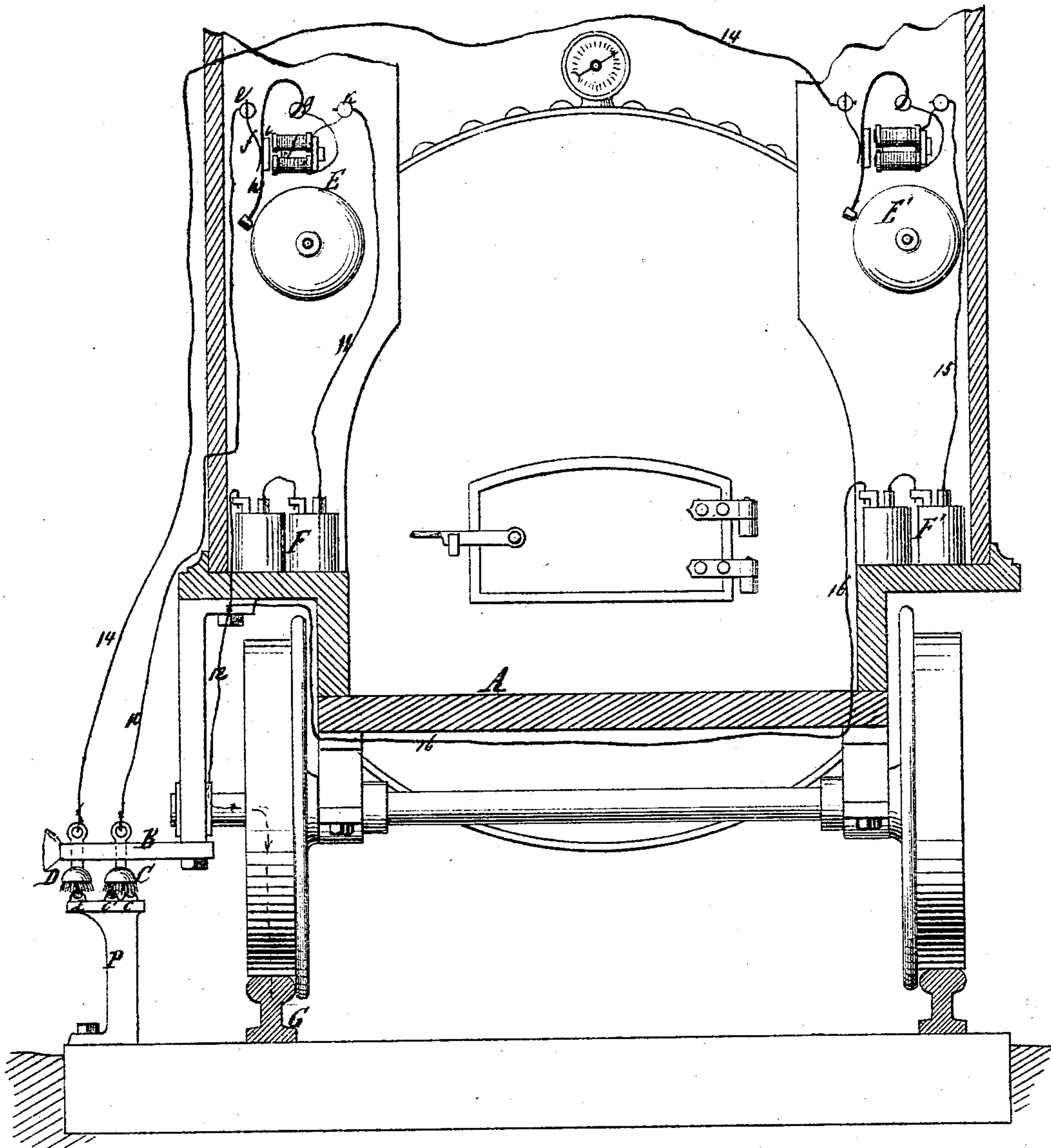
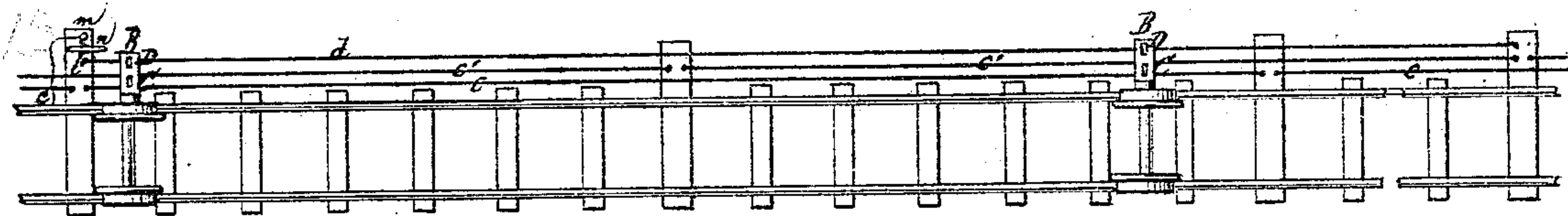


Fig. 2.



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Fig: 3.

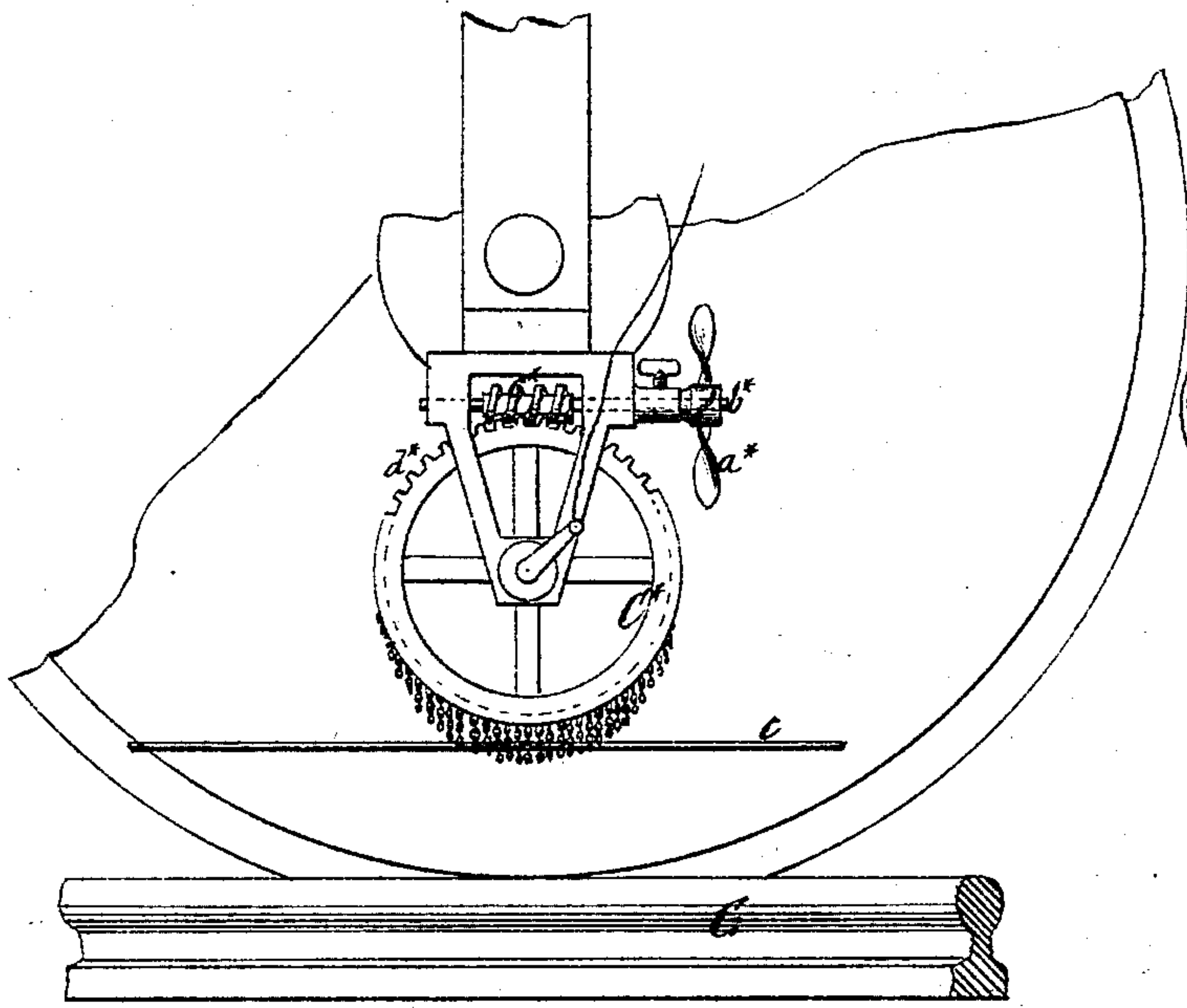


Fig: 4.

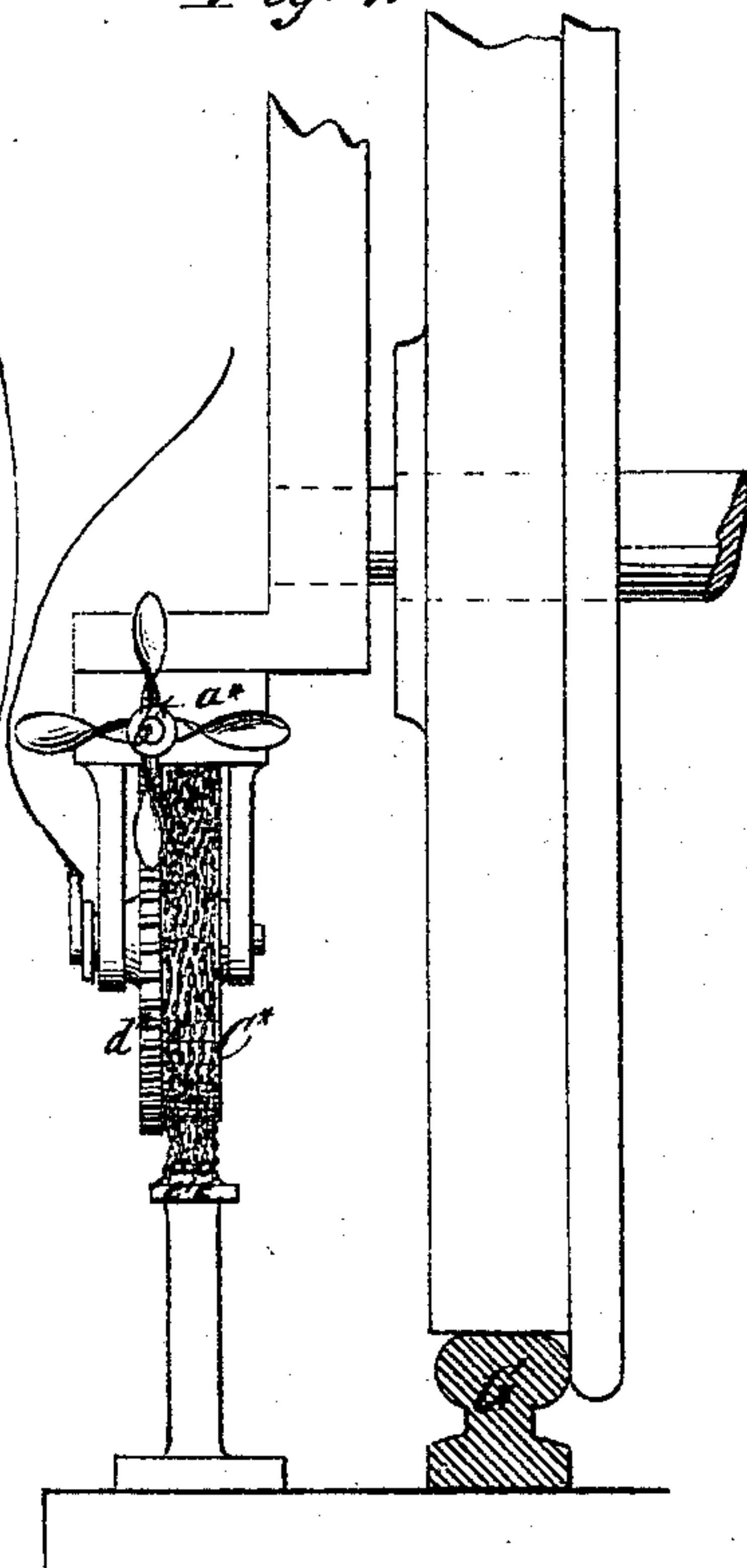
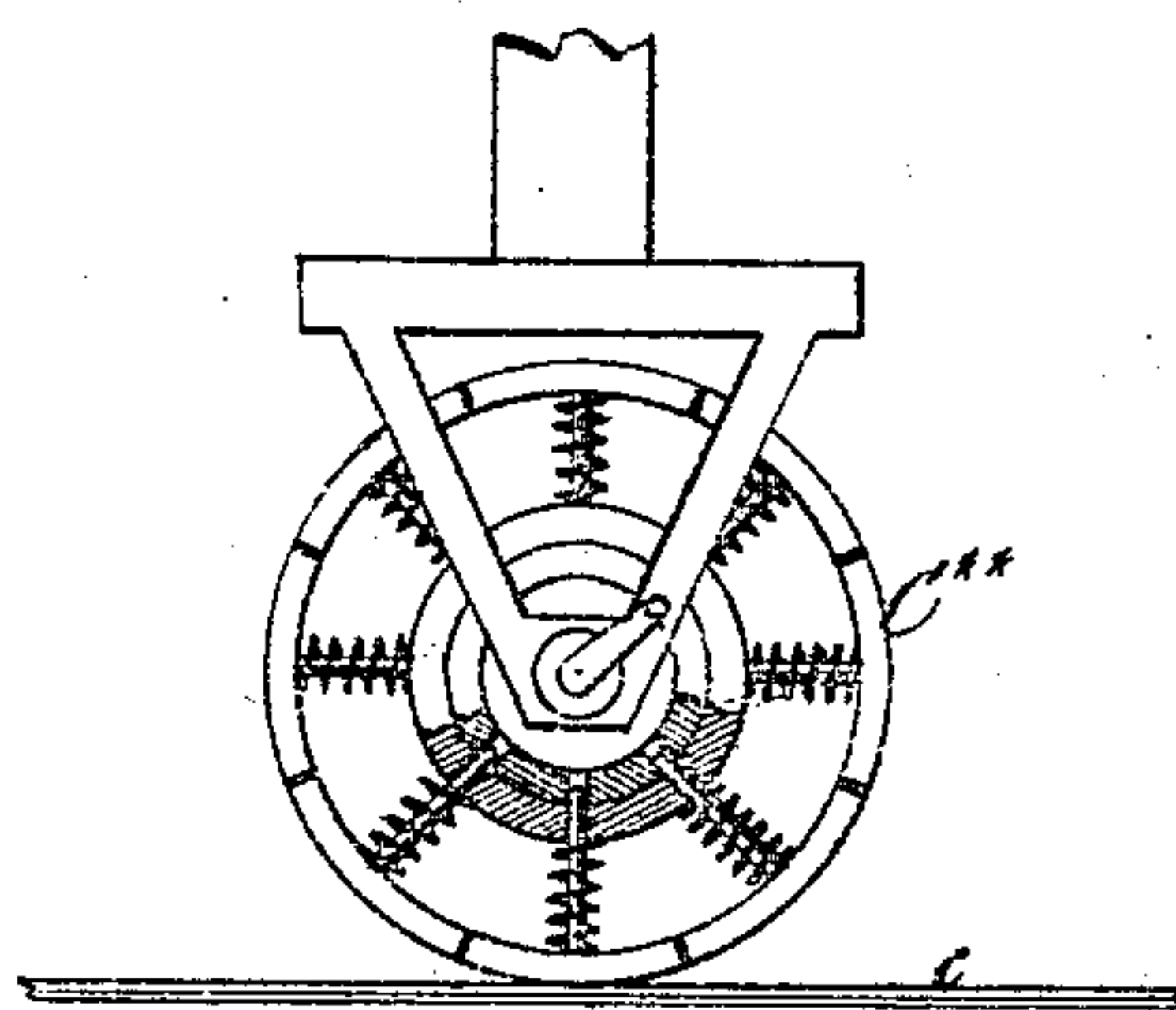


Fig: 5.



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UNITED STATES PATENT OFFICE.

CHARLES VERNY AND ADRIEN VEILLET, OF LILLE, FRANCE.

IMPROVEMENT IN ELECTRICAL APPARATUS FOR PREVENTING RAILWAY ACCIDENTS.

Specification forming part of Letters Patent No. 123,527, dated February 6, 1872.

To all whom it may concern:

Be it known that we, CHARLES VERNY and ADRIEN VEILLET, both of Lille, France, have invented a new and useful Improvement in Electric Railway Signals; and we do hereby declare the following to be a full, clear, and exact description thereof, which will enable those skilled in the art to make and use the same, reference being had to the accompanying drawing forming part of this specification, in which drawing—

Figure 1 represents a transverse section of our invention. Fig. 2 is a plan or top view of the same. Fig. 3 is a side view of a modification thereof. Fig. 4 is an end view of the same. Fig. 5 is a side view of another modification thereof.

Similar letters indicate corresponding parts.

The invention consists in the arrangement of a wiper in combination with a single section-wire of suitable length, with a key on the point of danger, and with a galvanic-battery and alarm mechanism in the engineer's stand of the locomotive, or in a car, in such a manner that by the motion of the key over two buttons, one of which connects with the rail, and the other with the line-wire, the circuit through the alarm in the locomotive or car is closed, and the engineer is informed beforehand if he can pass the point of danger in safety. It further consists in the combination of the above with a wiper secured to a locomotive or car with two line-wires secured on the side of or between the track in sections, the sections of one line-wire being made to break joints with those of the other in such a manner that by connecting the wiper with an electric magnetic-alarm mechanism, from which a wire extends to one pole of a galvanic battery, the other pole of which is a metallic connection with the rails, the circuit through the alarm mechanism will be closed whenever the trains approach within the length of one of the sections of the line-wires, and by the action of the alarms the engineer or conductor of each train is immediately apprised of the proximity of the other train, and all danger of a collision is thereby avoided.

In the drawing, the letter A designates the engineer's stand of a locomotive, from which extends an arm, B, of wood or other non-con-

ductor of electricity, that carries two wipers, C D. These wipers are either constructed in the shape of metallic brushes, as shown in Fig. 1 of the drawing, or they may be constructed in the form of wheels, as shown in Figs. 3, 4, and 5. The brush-wheels C*, as shown in Figs. 3 and 4, are provided on their circumference with a series of loose chains, and when the train is in motion they receive a slow revolving motion by means of fan *a**, which is mounted on a shaft, *b**, carrying a worm, *c**, that gears in a worm-wheel, *d**, connected to the brush-wheel C*. The current of air created by the motion of the train imparts a revolving motion to the fan *a**, which is transmitted to the brush-wheel by the worm and worm-wheel. The object of this revolving motion is to bring new portions of the brush-wheel in action, as will hereafter be readily understood. The brush-wheel C**, shown in Fig. 5, consists of a series of metallic segments, which are pressed outward by spiral springs. The wiper C is intended to travel on the line-wires *c c'*, which are stretched on posts P, either on the side or between the track, and which are made in sections of convenient length, say about three miles each. The sections of the two line-wires are so arranged that they break joints, (see Fig. 2,) and that the several sections are isolated from each other; but the wiper C is so constructed that it is constantly in metallic contact with both line-wires *c c'*. From the wiper C extends a wire, 10, to a post, *e*, of an alarm-bell, E. In the post *e* is secured a spring, *f*, which bears on the elastic shank of a hammer, *h*, that is secured in a post, *g*, and carries the armature *i* of an electro-magnet, *j*. The post *g* connects with one end of the helix of the electro-magnet, the other end of which connects with a post, *k*, from which extends a wire, 11, to one, say the positive, pole of a galvanic battery, F. The negative pole of this battery connects, by a wire, 12, with an axle-box or any other part of the locomotive which is in metallic contact with one of the rails G.

If two trains, moving on the same track, approach to within the distance of three miles, (the length of the sections of the line-wires,) the wipers of both trains are simultaneously in contact with the same section of one of the

line-wires, and the circuit through the alarm-bells on both trains is closed, and by the action of these bells the engineer or conductor is informed of the close proximity of the two trains.

It will be readily understood from this description that one continuous line-wire would not work, because, in that case, the circuit through the alarm-bells would be closed immediately two trains were put on the track at any distance, and the object of our apparatus would be defeated. But by using two line-wires stretched in sections, each three miles, more or less, long, the circuit through the alarm-bells will only be closed, if two trains approach each other within the distance of three miles, whether said train move in the same or in opposite direction, and all danger of a collision or of one train running into another can easily be avoided.

When two trains approach within three miles the circuit is as follows: From the battery in first train through wire 12 to the rail, through the rail and wheels of the second train to the battery there, through this battery, wire 11, alarm-bell E, and wire 10 to the wiper C of the second train, thence through wire 10, alarm-bell E, and wire 11, back to the battery of the first train.

The wiper D travels on a single wire, *d*, which may be stretched on the same posts, P, which support the line-wires *c c'*, or different posts may be used. This wire is intended to extend only for a certain distance from either side of a station, or of a switch, or of a draw-bridge, or of any point where danger may be apprehended, and it connects with a button, *l*, which is so situated in relation to a second button, *m*, and a key, *n*, (see Fig. 2,) that by turning this key the two buttons *l* and *m* are brought in metallic connection. From the button *m* extends a wire, 13, Fig. 2, to the rail, while the wiper D connects by a wire, 14, with an alarm-bell, E', from which a wire, 15, ex-

tends to one pole of a battery, F'. The other pole of this battery connects by a wire, 16, with an axle-box or other part of the locomotive which is in metallic contact with the rail.

The section-wire *d* extends to a distance of five miles, more or less, from the point of danger, and if the train is free to pass this point the man stationed there turns the key *n* over the buttons *l m*. When the wiper D of the train strikes the far end of the section-wire, the circuit through the alarm-bell E' is closed, and as this bell sounds the engineer knows that the switchman, drawbridgeman, or other person in charge is at his post, and that the road is clear. But if the key *n* is not turned over the buttons *l m* the alarm-bell E' will not sound, and the engineer of the approaching train is warned to stop.

The construction of the alarm-bells E E' may be as above described, or said alarms may be constructed in any desirable manner suitable for this purpose.

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

1. The wiper D or its equivalent, connected to a locomotive or car, and acting on a section-wire, *d*, in combination with a key, *n*, and an electro-magnetic alarm secured in the engineer's stand or car, substantially in the manner set forth.

2. The subject-matter of the above claim, in combination with a wiper, C, connected to a locomotive or car, and acting on sectional line-wires *c c'* and electro-magnetic alarm E, secured in the engineer's stand or car, the whole forming a complete signal apparatus, for the purpose and substantially as described.

This specification signed by us this 4th day of October, 1871.

CH. VERNY.
A. VEILLET.

Witnesses:
LECRAIG,
CRIBALY.