

(No Model.)

2 Sheets—Sheet 1.

C. SELDEN.
AUTOMATIC CAR BRAKE.

No. 361,089.

Patented Apr. 12, 1887.

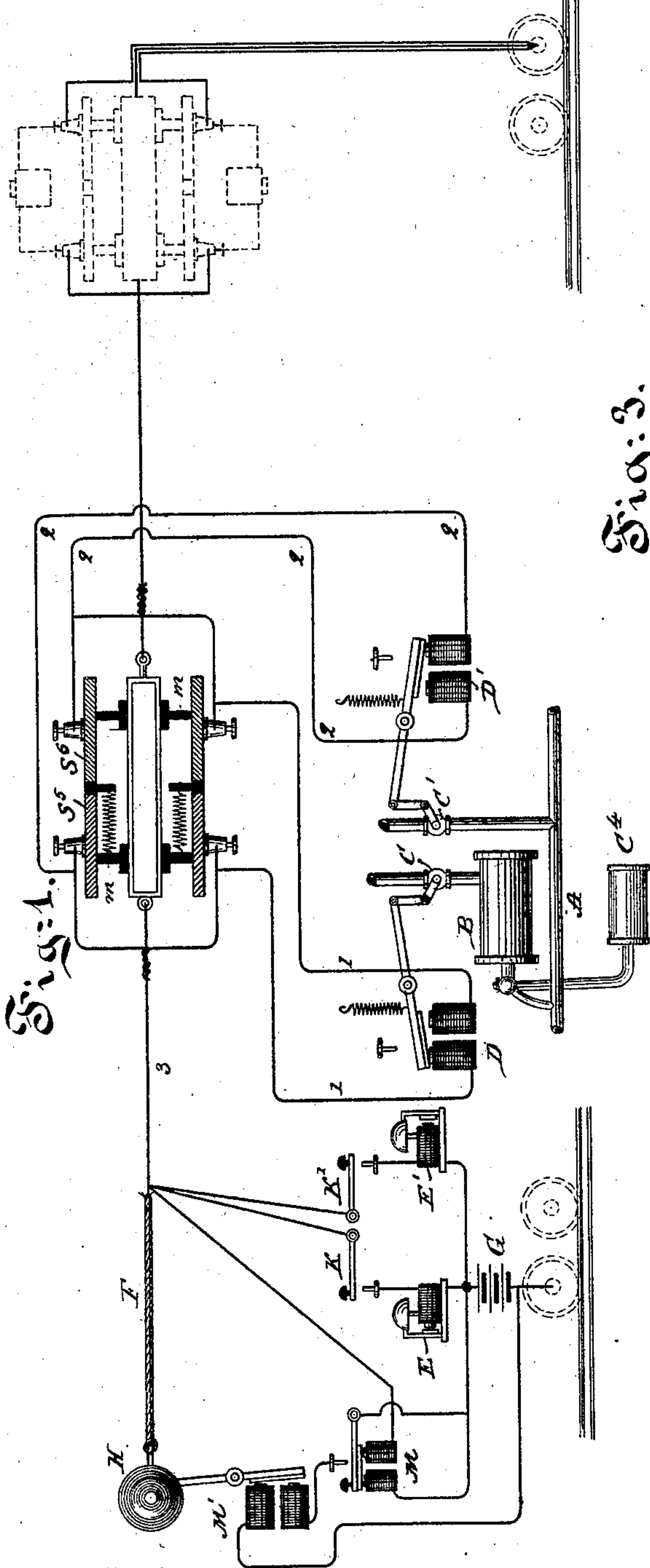


Fig. 1.

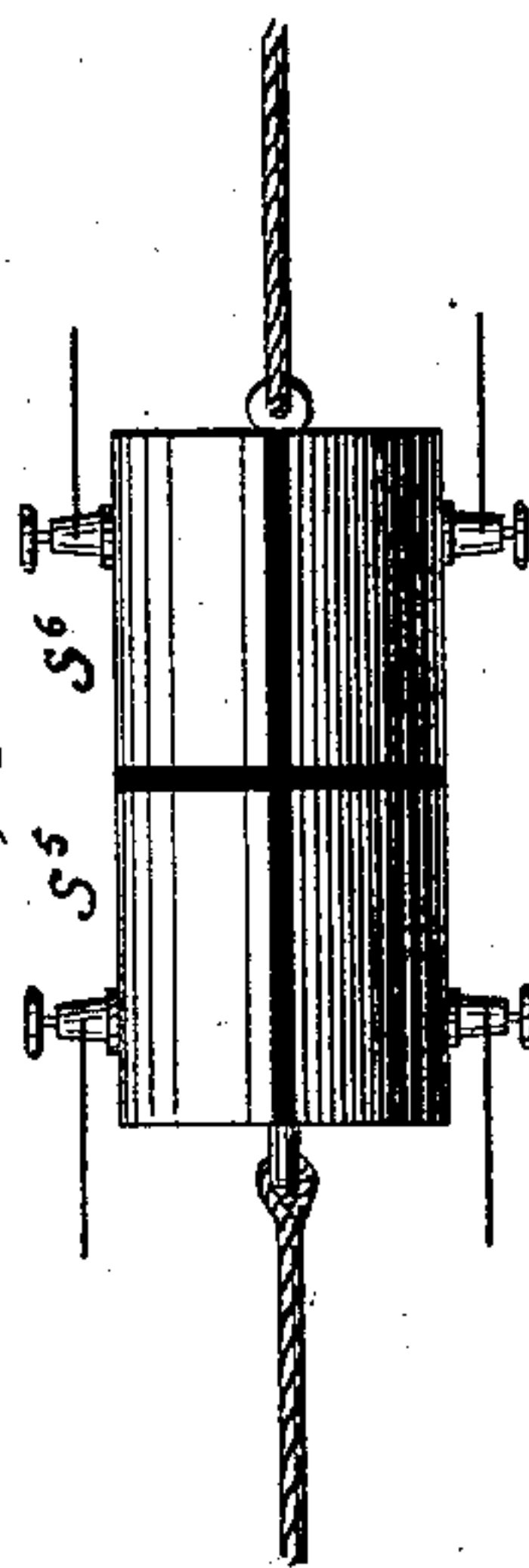
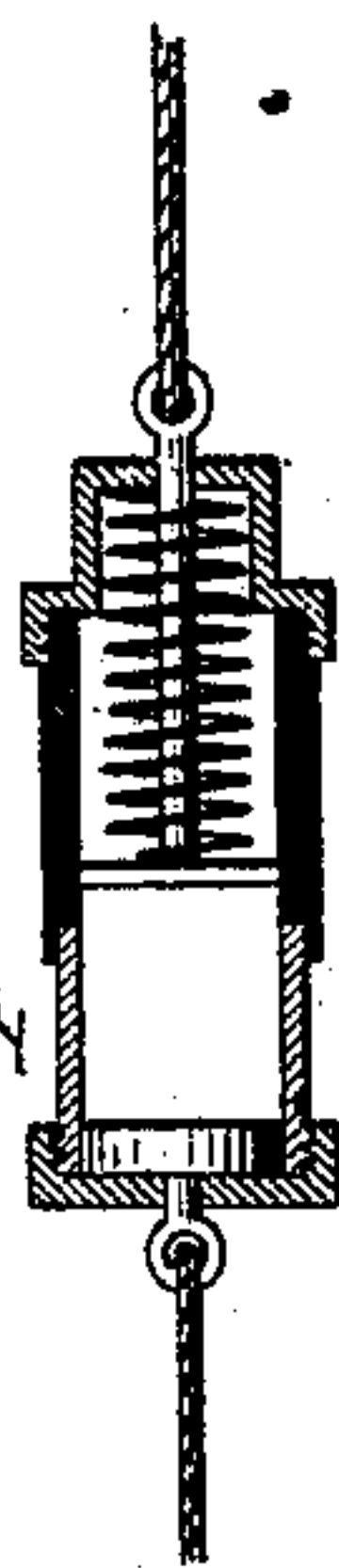


Fig. 2.



Witnesses.

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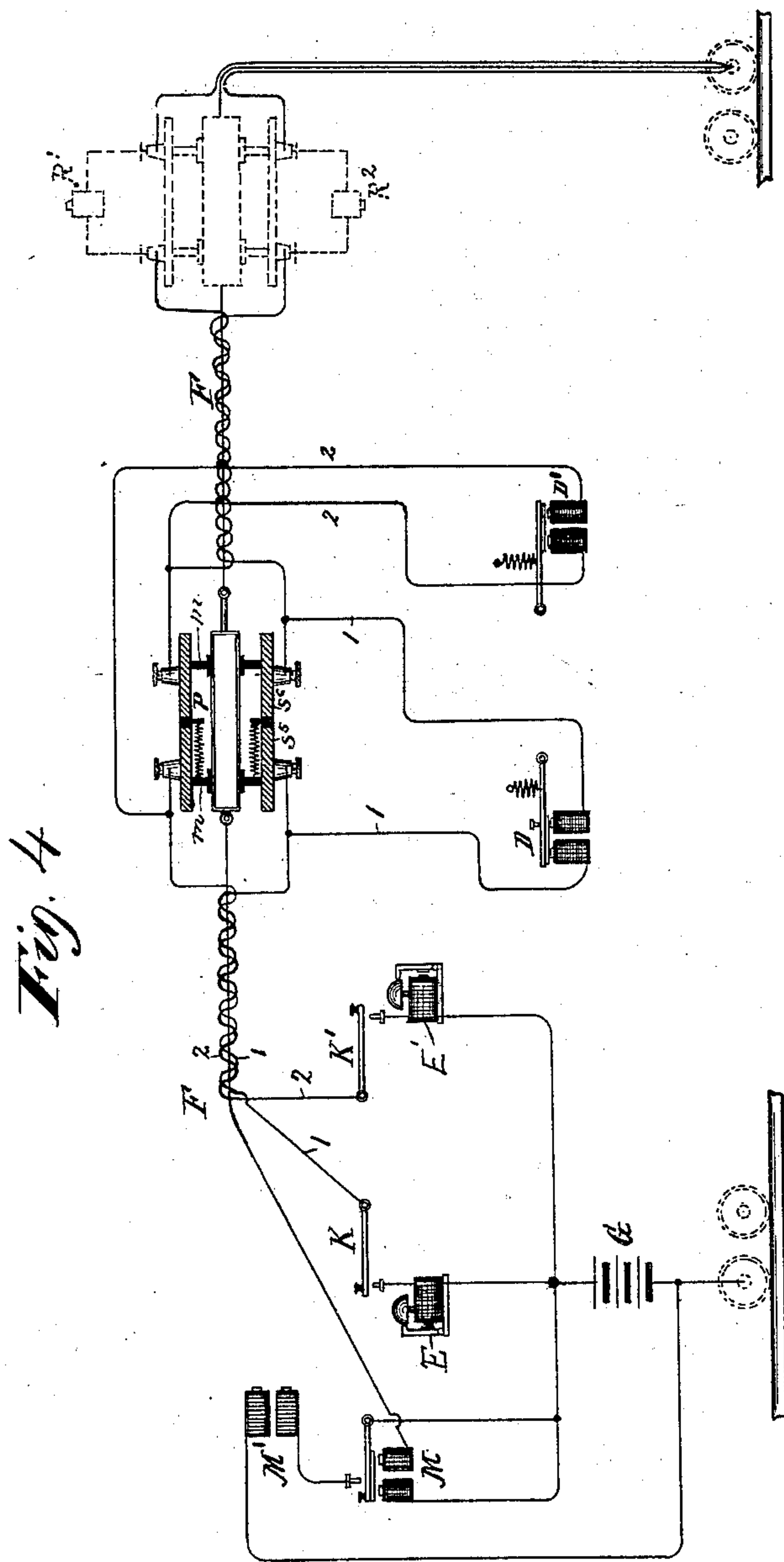
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WITNESSES:

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UNITED STATES PATENT OFFICE.

CHARLES SELDEN, OF ST. LOUIS, MISSOURI.

AUTOMATIC CAR-BRAKE.

SPECIFICATION forming part of Letters Patent No. 361,089, dated April 12, 1887.

Application filed December 29, 1883. Serial No. 115,901. (No model.)

To all whom it may concern:

Be it known that I, CHARLES SELDEN, a citizen of the United States, and a resident of St. Louis, Missouri, have invented certain new and useful Improvements in Automatic Car-Brakes, of which the following is a specification.

My invention relates to automatic brakes of the kind in which air or steam under the control of the locomotive-engineer is employed for automatically applying the brakes on the cars of the train.

My invention is intended more particularly for application to the well-known automatic air-brake now in use, and is designed to give a double control of the brake to the engineer, so that in case the means now ordinarily employed fail to produce the desired effects of applying the brakes on the cars or of letting them off he may resort to the auxiliary devices supplied by my invention.

A well-known difficulty in the operation of automatic brakes is the frequent inability of the engineer by the means ordinarily at hand to unset the brakes after a train has been brought to a stop, thus causing much delay and necessitating the turning by hand of a relief valve or cock connected with the air-reservoir under each car to release the brake. My invention entirely overcomes this difficulty.

My invention consists in controlling the operation of the brakes on each car by electro-magnets in a circuit extending through the train and suitable cocks or valves operated by said electro-magnets for letting off the air-pressure at the proper parts of the apparatus on the car, so as to either set or release the brake according to the magnet that is operated. Suitable circuit-controlling keys or other devices on the engine put it in the power of the engineer to apply or release the brakes by means of such electro-magnets.

My invention consists, also, in the combination, with the usual auxiliary air-reservoir upon a car, of an electro-magnet for controlling the relief-cock of said reservoir, an electric circuit containing said magnet and extending to the locomotive, and a circuit-controller upon the locomotive, whereby in case the brake should become accidentally set it may be released by the operation of said magnet and

the consequent opening of the usual cock connected with the auxiliary reservoir.

In the accompanying drawings, Figure 1 is a diagram illustrating my invention. Fig. 2 is a detail of construction of the train-signaling apparatus in conjunction with which I prefer to employ my invention. Fig. 3 shows another detail of construction. Fig. 4 is a diagram illustrating in detail the circuits of the cable and magnets.

A indicates the usual air-brake pipe, extending through the train, through which pipe air under pressure is stored in the auxiliary reservoir B.

C¹ indicates the usual brake-cylinder, by means of which air supplied from the auxiliary reservoir is made to apply the brakes whenever there is a lessening of the air-pressure in the brake-pipe.

C indicates any usual or proper stop-cock on the auxiliary reservoir, which may open a vent for the escape of air, so that the brakes may be unset in the well-known manner, and D is an electro-magnet of any proper construction, whose armature or movable core is connected with the operating mechanism or handle of the stop cock or valve in such way that when the magnet is energized or de-energized, as the case may be, said stop-cock will be operated so as to release the brakes.

C' indicates another stop cock or valve, of any desired construction, connected with some portion of the air pipes, valves, or automatic valve-chambers on the car, in which a relief of air-pressure will cause the brakes to be applied. I have herein shown it as connected with the air-supply pipe extending through the train. The cock C' is also under the control of an electro-magnet, D', so that it also may be operated by said electro-magnet. The electro-magnets are placed in a circuit extending through the train and connected with a suitable battery or generator, G, placed on the train, preferably on the locomotive-tender, which battery is in the present instance also the battery for a train-signaling apparatus. The circuits of the magnet are made by a flexible or other conductor, which may, if desired, be constructed in sections, to be united at the ends of the cars when the train is made up, after the manner employed in electrical train-signaling apparatus. The return-circuit is,

by preference, made, as usual, by connecting to the running-gear of the car or locomotive and so to the rails. The manner of constructing the circuit is, however, immaterial.

5 The circuits of magnets D D' are indicated, respectively, by the figures 1 and 2, and each circuit is controlled by a key, circuit-closer, or other suitable device, K or K', which latter are placed on the locomotive and are readily
10 accessible to the engineer or fireman. By the operation of key K, the circuit of battery G and magnet D is closed, and the latter is thus made to open the cock or valve C, so as to allow the air to escape from the auxiliary res-
15 ervoir, thus releasing the brake in well-known manner. The operation of key K' similarly causes magnet D' to open cock or valve C', thus permitting a relief of air-pressure in the air-brake pipe or other suitable portion of
20 the apparatus in the car, so as to apply the brakes.

E E' are electro-magnetic signal-bells of ordinary construction in the circuits 1 and 2, which indicate to the engineer that the circuit
25 is complete when the key is closed.

The conductors 1 2 may be insulated conductors and made up in a cable with a third insulated conductor, which forms the train-signal conductors, the cable thus formed be-
30 ing also, as described in a prior application for patent filed by me April 2, 1883, No. 90,415, the usual mechanical device by which a bell upon the locomotive may be mechanically operated. Said third conductor also, as
35 described in my application mentioned, affords a means whereby said bell may be operated electrically.

F indicates the cable, connected with the bell H so that a pull upon the cable will op-
40 erate the bell mechanically, as usual.

Interposed in said conductor 3 is a circuit-breaker of the form shown in Fig. 2, or of any other desired form, consisting of a hollow cylin-
45 der, P, made of conducting material at one end and of non-conducting material at the other, and having a metallic piston to which the cable on one side is connected, while to the cylinder at the opposite end the cable on the other side is connected. The piston-rod
50 is connected to the conductor on one side and the metallic portion of the cylinder to the conductor on the other, as indicated, so that, as is obvious, a pull will break the circuit 3, and thus cause the magnet M in said circuit to lose
55 its power, whereupon the armature of the latter will fall back and close the circuit to a magnet, M', whose armature is mechanically connected with the bell mechanism, so as to cause the bell to sound.

60 The cable F is herein indicated in Fig. 1 merely as a straight line; but the manner of combining the three separate wires or circuits 1 2 3 into a single cable, such circuits being at the same time kept insulated from one an-
65 other, is very well understood in the art and need not be described more in detail. The separate wires or circuits are shown in Fig. 4.

It is sufficient to say that the circuit 3, con-
taining the magnet which operates on the bell H, is carried throughout the train, and that
70 in the same manner circuit 1, controlled by a key on the locomotive and including magnets D, is carried through the train and kept sep-
arate from circuit 3 and also from the circuit 2, controlled also by an independent key and
75 containing electro-magnets D'. At the points where the brake-magnets are interposed in the circuit suitable connections are made from the terminals of said magnets to the said con-
ductor by simply disconnecting the conductor
80 from the cable at the proper point and cutting the same so as to form terminals adapted for connection with the terminals, respectively, of the electro-magnet. The manner in which
85 this may be done under one construction of the apparatus will be presently described.

When the brake-controlling conductors 1 and 2 are combined with the conductor 3 in a cable, the circuit-breaker P may be con-
90 structed and the connection to the brake-magnet may be made as indicated in Fig. 1. In this case the cylinder of the circuit-breaker is provided with suitable insulated supports,
95 m, which carry or support an external cylinder, forming in turn a support for four binding-posts, as indicated in Fig. 1. The four
binding-posts are insulated from one another by simply dividing the exterior cylinder trans-
versely and longitudinally by proper insulat-
100 ing material, as indicated by the dark lines, Fig. 3. Two of said binding-posts—as, for instance, the upper posts—serve for attach-
ment of the three ends of one of the conductors in the cable—as, for instance, the con-
ductor forming the circuit 2. To the same
105 posts, or to the wires leading to the same, the terminals of magnet D' are connected, as clearly shown, so that said magnet will be in the circuit 2. The wires and connections of the bind-
ing-posts just mentioned—to wit, the two up-
110 per posts—are kept entirely separate from and insulated from the other circuits and conductors contained in the cable in any suitable man-
ner, and as this is a matter of common knowl-
115 edge to electricians it need not be more described in detail. To the two lower binding-
posts, Fig. 1, insulated from one another and from the upper posts, the free ends of the severed conductor forming circuit 1, leading from
120 the transmitter K, are connected. The terminals of electro-magnet D are connected, respectively, either to the two binding-posts or to the wires or connections running to the same from the insulated conductor embodied in the cable
125 and forming the circuit 1.

The engineer being provided with the ordinary means now in use, the apparatus herein
described furnishes him with an extra or sup-
130 plemental control, which may be called into play at any time in case the usual means should
fail to produce the proper operation of the
brakes. For instance, if the brakes should fail to act on operating the ordinary mechanical de-
vices on the locomotive, the engineer would

then operate the circuit-closer controlling the magnet D', thus allowing air to escape from the pipe beneath the cars on the various cars themselves and causing the brakes to be applied in the same way that they would have been applied if a relief of air-pressure in the pipe had been effected by the operation of the ordinary controlling-cock on the locomotive. In the same way, if the brakes should not be released on turning the cock on the locomotive to restore the pressure in the pipe, the engineer has simply to close the circuit of magnet or magnets D, thus "bleeding," as it is ordinarily termed, the air-reservoirs on the cars, an operation that has ordinarily to be performed by some person or persons passing from car to car on the ground and opening the vent-cocks of the reservoirs by hand, one at a time, in order that the brakes may be released.

It is obvious that the two electric circuits and devices controlled thereby may be employed at all times as the ordinary means of setting and unsetting the brakes.

I do not limit myself to the employment of a normally-open circuit as herein described, but may obviously employ in its stead a normally-closed circuit, the circuit-controllers on the locomotive being made in such case to open the circuit when they are operated, so as to de-energize the magnet on the car and permit the retractor of the magnet's armature to operate the stop-cock. The arrangement of the operating mechanism of the cock for this purpose is an obvious matter.

What I claim as my invention is—

1. In an automatic air-brake, the combination, with the air-brake apparatus upon the car constructed to apply and release the brake in the ordinary way, of a suitable auxiliary cock or valve by the opening of which the brake may be released, an electro-magnet controlling said cock or valve, and a circuit-controller upon the locomotive controlling the circuit of said magnet, as and for the purpose described.

2. The combination, with the usual auxiliary

air-reservoir upon a car, of an electro-magnet for controlling the relief-cock of said reservoir, an electric circuit containing said magnet and extending to the locomotive, and a circuit-controller upon the locomotive, whereby in case the brake should become accidentally set it may be released by the operation of said magnet and the consequent opening of the usual cock connected with the auxiliary reservoir.

3. In an automatic air-brake, the combination, with the air-brake apparatus upon the car constructed to apply and release the brake in the ordinary way, of a suitable auxiliary vent-pipe connected with said air-brake apparatus, by the opening of which exit the brakes may be applied, an electro-magnet controlling said exit, and means upon the engine for controlling the circuit of the electro-magnet, whereby, through the operation of said magnet, the brakes may be set in case they should fail to work by the operation of the cock or valve upon the locomotive in the usual way, as and for the purpose described.

4. In an automatic air-brake, the combination, with the air-brake apparatus upon the car constructed to apply and release the brake in the ordinary way through relief and increase of air-pressure in the pipe leading to the locomotive, of an auxiliary vent-pipe upon the car and a magnet controlling the same for permitting the brake to be applied by the action of a suitable circuit-controlling device in a circuit extending through the train.

5. The combination, in a railway air-brake apparatus, of two electric train-circuits, a magnet in one circuit controlling a valve by which the brakes of a car may be applied and a magnet in the other controlling independently a valve by which the brakes may be released.

Signed at Toledo, in the county of Lucas and State of Ohio, this 14th day of December, A. D. 1883.

CHARLES SELDEN.

Witnesses:

FRANK B. SWAYNE,
H. E. KING.