

No. 692,533.

Patented Feb. 4, 1902.

G. DEL MONACO.

ELECTRIC SIGNALING DEVICE FOR PREVENTING RAILWAY COLLISIONS.

(Application filed Sept. 4, 1900.)

(No Model.)

2 Sheets—Sheet 1.

Fig. 1

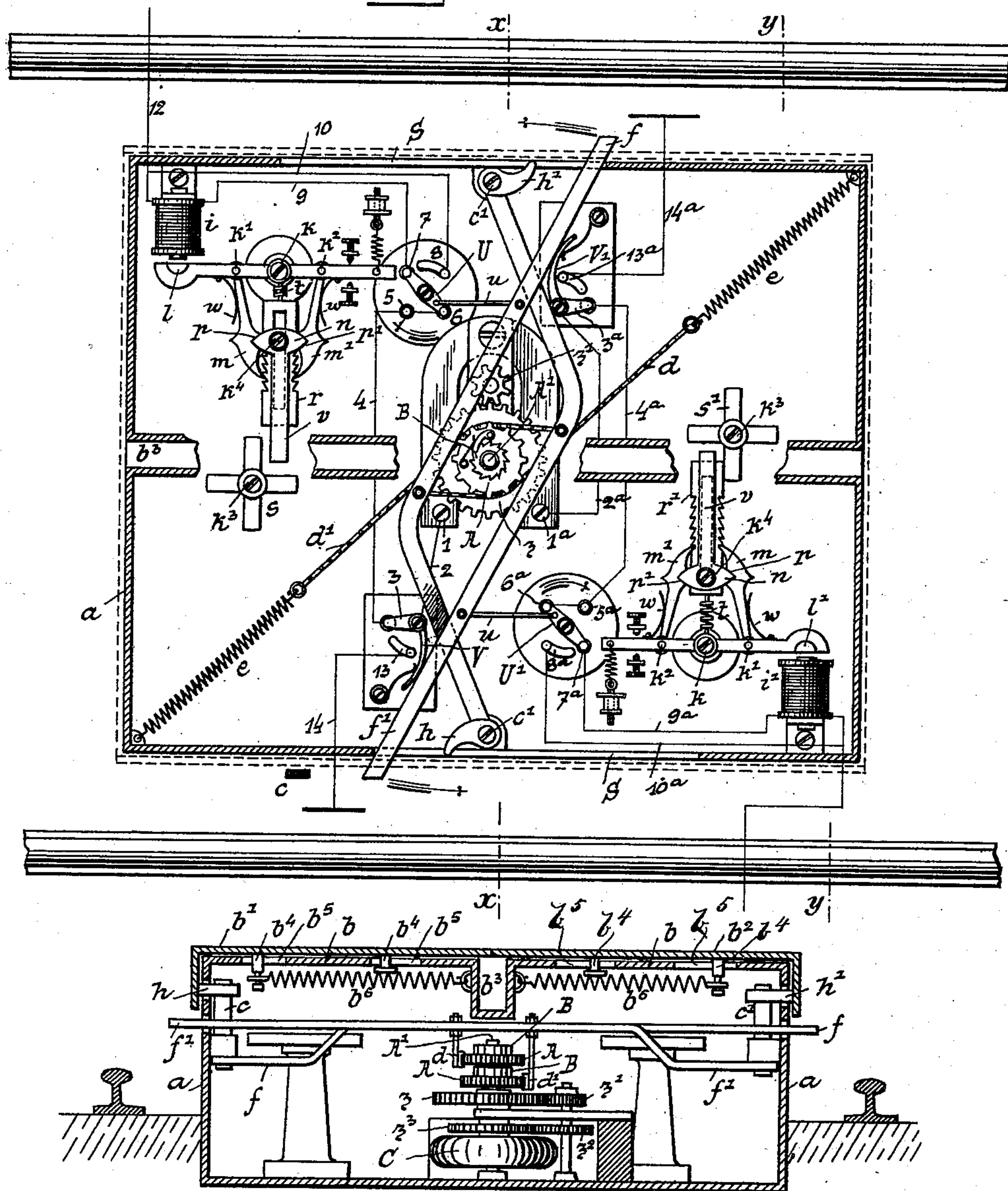


Fig. 2.

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Fig. 5.

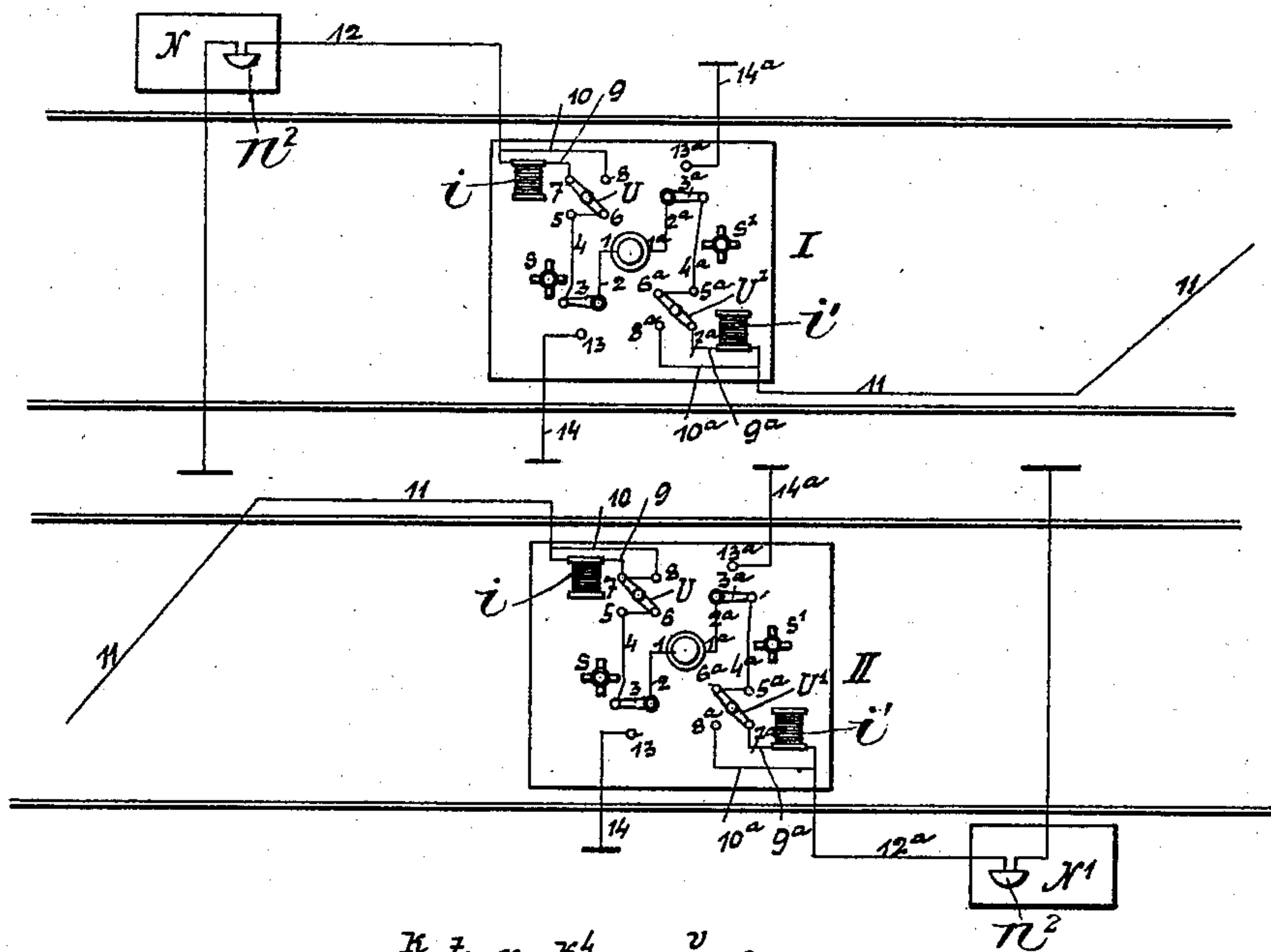


Fig. 3.

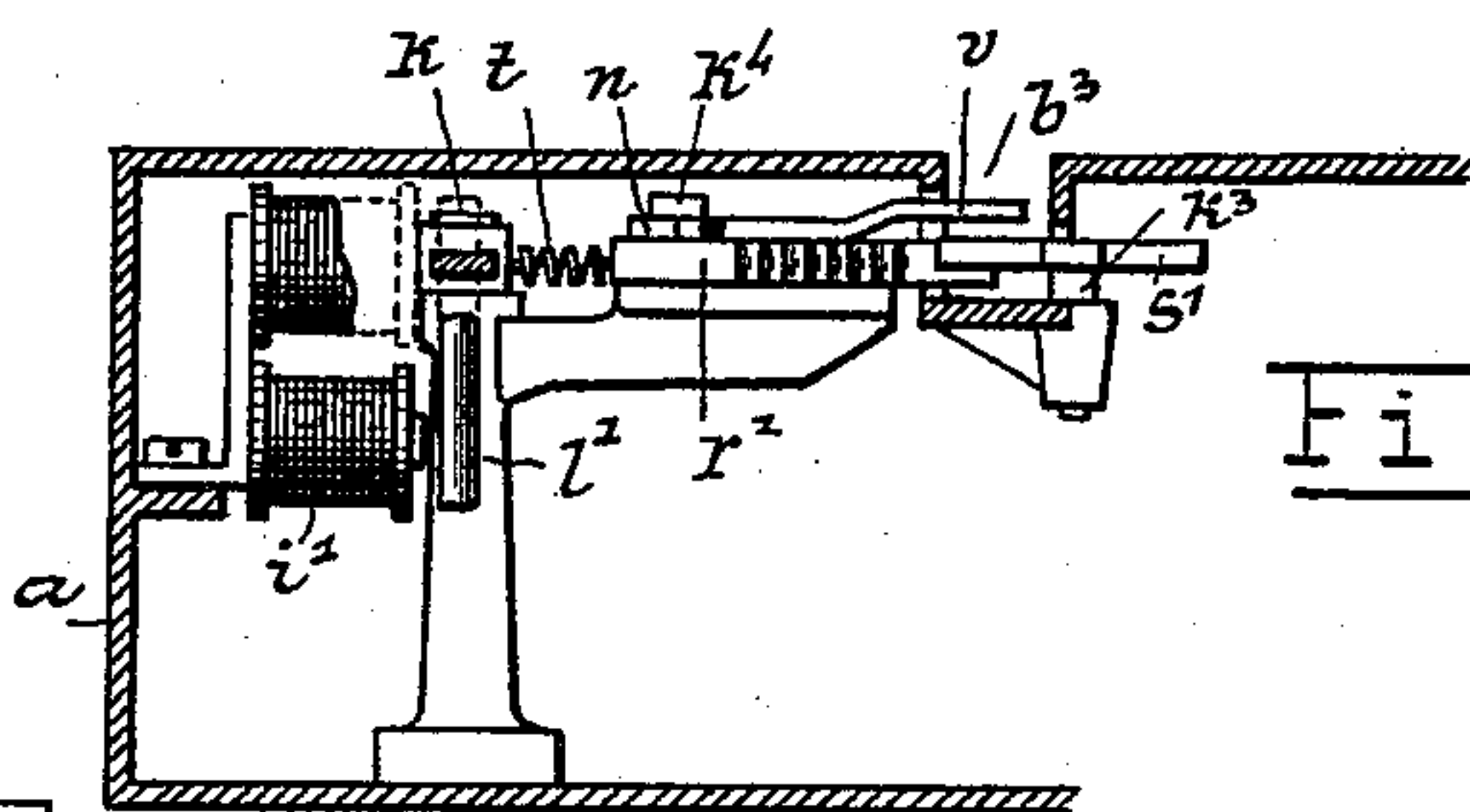


Fig. 4.

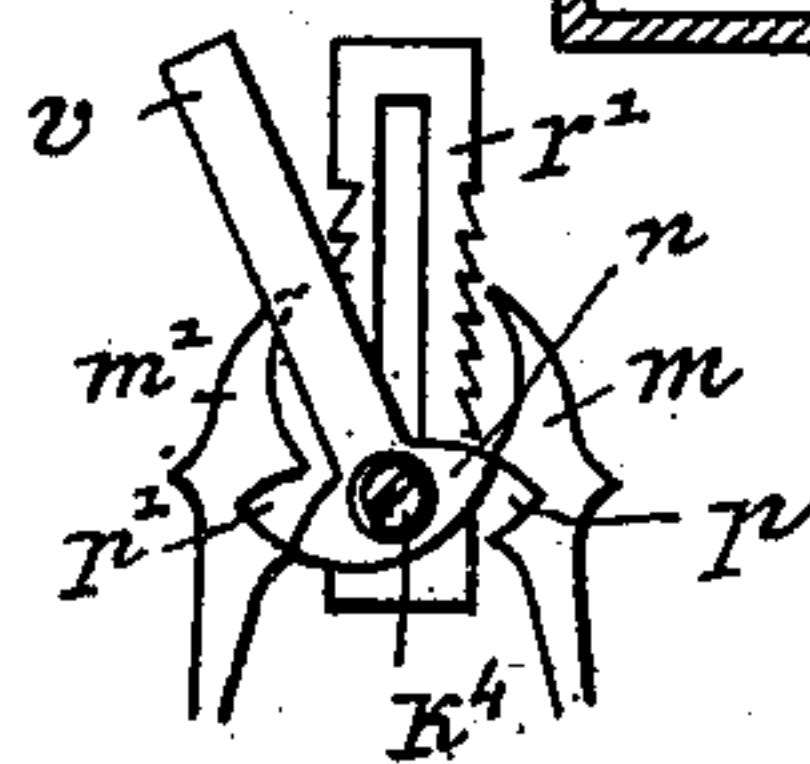


Fig. 6.

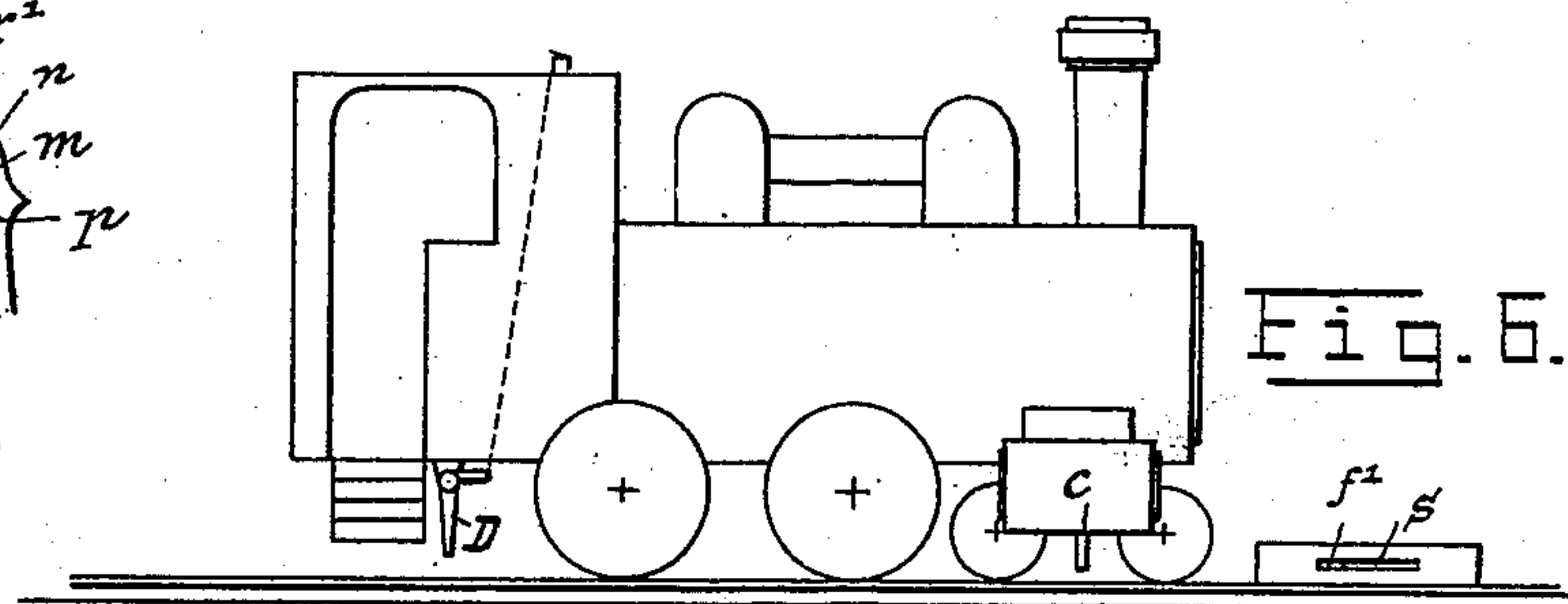
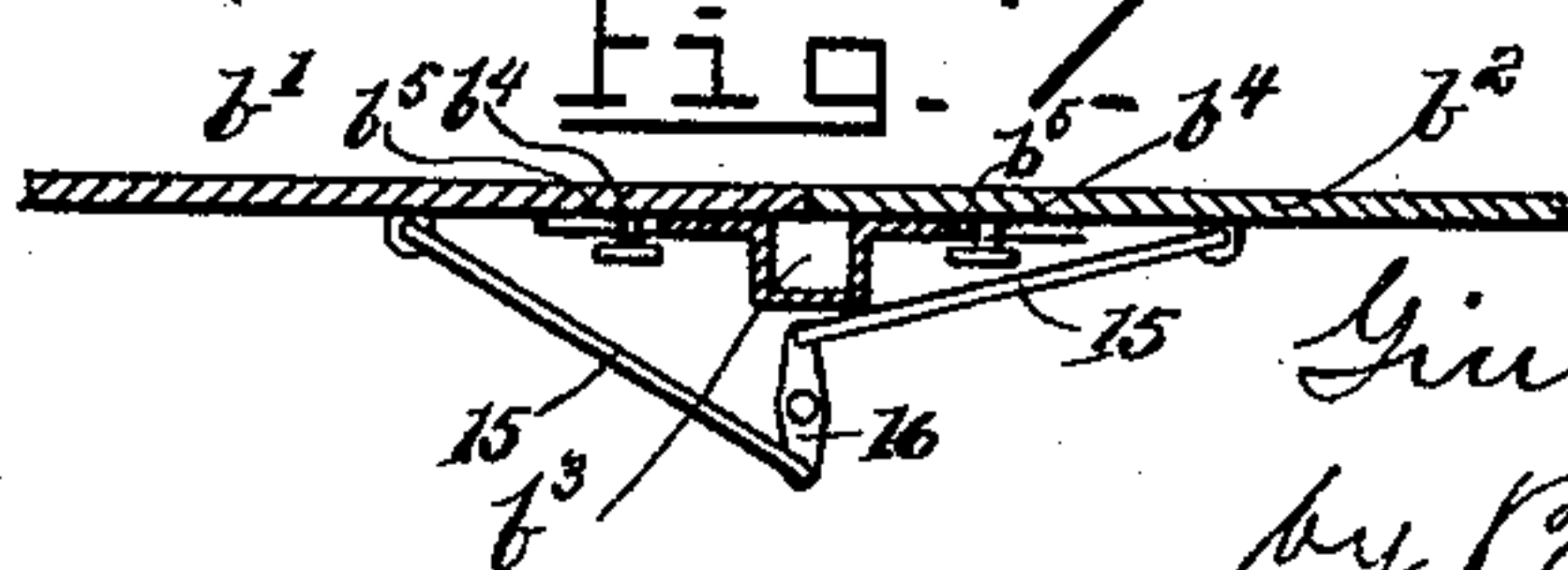


Fig. 7



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UNITED STATES PATENT OFFICE.

GIUSEPPE DEL MONACO, OF TRIEST, AUSTRIA-HUNGARY.

ELECTRIC SIGNALING DEVICE FOR PREVENTING RAILWAY COLLISIONS.

SPECIFICATION forming part of Letters Patent No. 692,533, dated February 4, 1902.

Application filed September 4, 1900. Serial No. 28,950. (No model.)

To all whom it may concern:

Be it known that I, GIUSEPPE DEL MONACO, a subject of the Emperor of Austria-Hungary, and a resident of Triest, Austria-Hungary, have invented certain new and useful Improvements in Electrical Signaling Apparatus, of which the following is a specification.

My invention relates to an electric signaling device for preventing collisions of two railway-trains running toward each other on the same track.

The apparatus is illustrated in the accompanying drawings, which show, in—

Figure 1, a plan view of the mechanism placed in its casing, the cover of the latter being removed; Fig. 2, a vertical sectional view taken on line xx , Fig. 1, as seen from the left-hand side, the operating-levers and tappets being shown, however, in full lines; Fig. 3, part of a vertical sectional view taken at line yy , Fig. 1; Fig. 4, a detail of the catch-and-rack device; Fig. 5, a diagram of the electric connections between the apparatuses of two stations; Fig. 6, a side view of a locomotive provided with the levers for actuating the signaling device, and Fig. 7 is a detail of mechanism for causing the two covers to open simultaneously.

The casing a , inclosing the apparatus, is provided with a stationary cover b and two slightly-movable covers b' and b^2 , each covering one-half of the casing and resting upon the cover b , which is provided at its longitudinal center line with an inside projecting channel b^3 , by which enters a lever fastened to the locomotive. The covers b' and b^2 serve for excluding dust or rain from the channel b^3 when the apparatus is not in use and are slidingly arranged on top of the cover b by bolts b^4 , entering into the slots b^5 of the cover b and held closed by springs b^6 , connecting the exterior walls of channel b^3 with the outside bolts b^4 . Between the front wheels of the locomotive is fastened a down-projecting lever c , Fig. 5, which in passing over the apparatus strikes against one of the oscillating levers f or f' , secured, respectively, to rocking pivots c and c' , and by turning these levers the tappets h or h' , fastened to said pivots, will move one of the covers b' or b^2 to one side. The other cover b^2 or b' is at the same time moved to the other side through some

suitable mechanism connecting the two covers—for instance, by links 15, connecting the respective covers to the two arms of a rocking lever 16, pivoted to the frame or casing beneath the slot b^3 . Thereby the channel b^3 is opened on top, permitting the bell-crank D , mounted at the rear part of the locomotive, Fig. 6, to enter the channel. As soon as the locomotive has passed over the apparatus the covers b' and b^2 will close over the channel b^3 by the tension of springs b^6 , thus preventing dust or rain from entering the apparatus.

Spiral springs e are fastened at diagonally opposite corners of the casing a and connected to chains $d d'$, engaging in sprocket-wheels A and fastened to lateral arms from the levers f and f' , respectively, Figs. 1 and 2. The sprocket-wheels A are loosely mounted on the spindle A' , and adjoining these wheels are ratchet-wheels B , securely fastened to the spindle A' and engaged by detents fastened to the wheels A , thereby permitting the wheels A to be rotated idly in but one direction. The gear-wheels $z z^3$, mounted on the spindle A' , engage the speed-pinions $z' z^2$, respectively, in order to rotate the armature C of a magnetic electric generator which produces the current actuating the apparatus.

The mounting of the apparatuses for connecting two stations will be described later on, and it will be only remarked that the current produced by the generator of one apparatus is transmitted to another similar apparatus, or vice versa, and excites one of the electromagnets $i i'$ in said apparatus. The armatures $l l'$, respectively, of these magnets are thereby vibrated and alternately move the catches $m m'$, Fig. 1, pivotally mounted to the magnets $i i'$ at $k' k^2$, which by engagement with the racks of the bars $r r'$ move these bars forward into the channel b^3 , and thereby keep the rotatably-movable crosses $s s'$, mounted on pivots k^3 , Figs. 1 and 3, from rotating, and one of the arms of the cross engaged engages the bell-crank D , Fig. 6, draws it back, and by suitable connections causes the steam-whistle to sound. The rack-bars $r r'$ are guided by the pivots k^4 , moving in slots of the rack-bars, said pivots being connected to oscillating double cams n at the end of the arm v , placed on top of the rack-bars $r r'$ and engaging suitable notches $p p'$ of the catches $m m'$. When

the bell-crank D of the locomotive in passing through the channel b^3 catches the arm v of the double cam n , Fig. 4, and turns it around the pivot k^1 to one side, thereby retracting the catches $m m'$ from the rack-bar r or r' , this bar is free to be redrawn into its normal position by the spring t , and the double cams n' are returned to notches $p p'$ by the action of spring w , and the catches $m m'$ are brought into normal engagement with the rack-bar by said spring w' . By the motion of the lever $f (f')$ the link u is pulled back and turns one of the contacts U U' ninety degrees, and one of the spring-pressed contact-levers V V', normally resting against the corresponding lever, is set free to engage with an earth-contact pin 13 or 13^a. The levers $f f'$ move in slots S, provided in the sides of the casing a , and the ratchet-wheels B are arranged in such manner that the inductor is turned only during the time the lever $f (f')$ is released, and being drawn back to its initial position by spring e . Consequently breaking of any part of the apparatus will be impossible, even when the locomotive is running at a high speed.

The connection between the apparatuses of two stations is shown by the diagram Fig. 5. The wire 2, fastened to the binding-post 1 of the inductor, is carried over the contact-surface 3 of the contact-lever V, which is connected by the wire 4 with the contact-buttons 5 6 of the switch U. In a similar way the binding-post 1^a is connected by wire 2^a with 3^a, 4^a, 5^a, and 6^a with switch U'. The contact-buttons 7 7^a 8 8^a are connected by wires 9 9^a 10 10^a with the spools $i i'$ at one side and with the track-wire 11 and the station-wires 12 12^a, which connect at the stations N N' with bells n^2 and from these bells to the ground. The contact-buttons 13 13^a also are connected with wires 14, leading to the ground.

The working of the apparatuses is as follows: Starting from the position of the parts as shown at the right-hand side of Fig. 1, it is supposed that a locomotive runs in the direction from N to N', Fig. 5. Then the lever f' in swinging back into its normal position will excite the inductor of the apparatus marked I, while the forward oscillating motion of the said lever f' swings the contact-lever U' into engagement with contact-pins 5^a and 8^a and releases spring-pressed swinging contact-arm V', which is thereupon carried into engagement with earth-contact pin 13^a, these parts U' and V' being brought back in the initial position only after the return-lever motion is stopped. The circuit then is from binding-post 1^a to 2^a 3^a 4^a 5^a 6^a, the converted contact-surface U', contact-button 8^a, wire 10^a, track-wire 11 to the spool i (contact U being open) of the apparatus II, through the windings of the spool i to wire 9, through contacts 7, 6, and 5 by wire 4, contact-bridge 3, and wire 2 to the inductor of said apparatus II, and from this over 2^a 3^a 4^a 5^a 6^a 7^a 9^a of said apparatus II to the spool i' , wire 12^a

to apparatus N', thence to ground. From clamp 1 of the apparatus I the current is carried over the closed contact V' through wire 14^a to the ground, and thereby the circuit is closed. By the current in the apparatus II both crosses 5 5' are stopped, as described above, and consequently when a locomotive runs over this apparatus toward a locomotive running on the same track the steam-whistle of this locomotive will sound, and at the same time the apparatus II will return in its normal position. Vice versa, when a locomotive runs in the direction from N' to N the working of the apparatus will be similar; but the current emanating from apparatus I will cause the adjustment of the apparatus I. The circuit will be easily followed according to the above description, if it is considered that the contacts of the apparatus II have to be closed.

I claim—

1. In an electric signaling device for preventing collisions of railway-trains, the combination of a lever $f (f')$ arranged to be oscillated by an arm or lever c on the locomotive, an inductor C of one apparatus and suitably-connected electromagnets $i i'$ of a similar apparatus excited in the reverse movement of said lever to its initial position, swinging armatures $l l'$ coacting with said magnets, double-acting catches $m m'$ actuated by said armatures; rack-bars $r r'$, rotating crosses $s s'$ engaged thereby to lock an arm of the cross in the way of a bell-crank D on a locomotive running from the opposite direction, said bell-crank being thereby turned back and by suitable connections causing the steam-whistle to sound.

2. In apparatus of the nature described the combination with the rack-bars r, r' , of the double cams n pivotally mounted in slots of said rack-bars and provided with arms v adapted to be actuated through the bell-crank D of a locomotive passing over the apparatus, whereby the catches m, m' are moved in opposite directions and the rack-bars r, r' disengaged from the catches are permitted to slide back in their normal position.

3. In apparatus of the nature described the combination with slidingly-movable covers b', b^2 , covering the channel b^3 , when the apparatus is not in use, of the levers f, f' arranged to be actuated by an arm c fastened at the fore part of the locomotive, the rocking pivots to which said levers are secured, and the tappets on said pivots arranged to push the sliding covers outward when the levers are actuated.

In testimony that I claim the foregoing as my invention I have signed my name in presence of two subscribing witnesses.

GIUSEPPE DEL MONACO.

Witnesses:

EMILIO MONTE,
VINCENT BURES,