(No Model.)

W. F. Z. DESANT.

ELECTRIC RAILWAY SIGNAL.

No. 467,478. Patented Jan. 19, 1892.

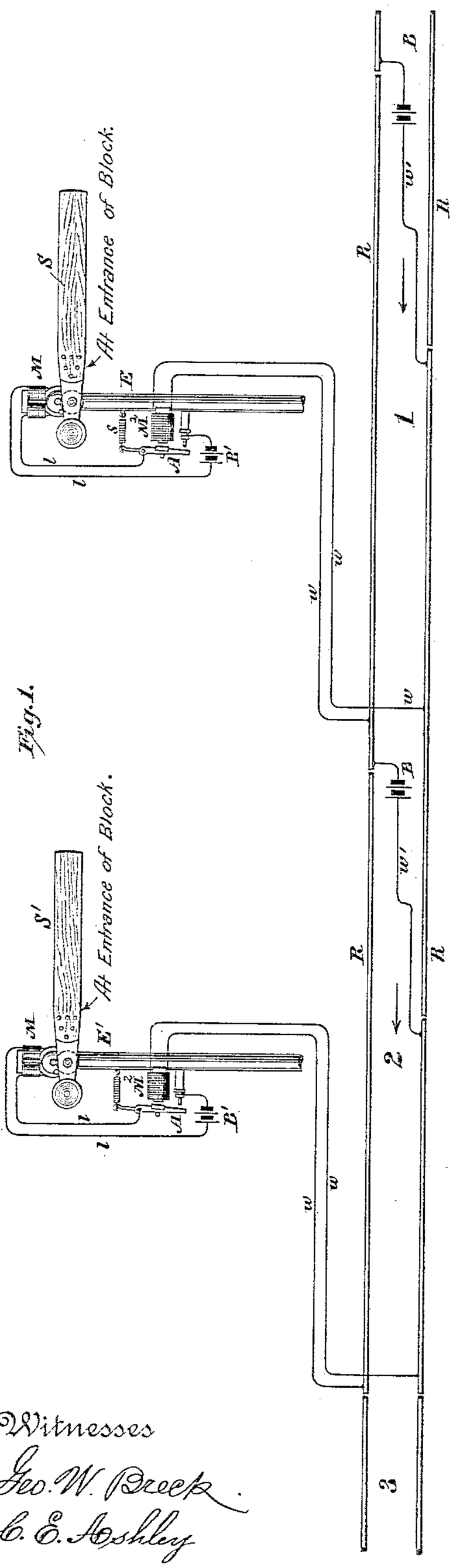

Fig. 1.

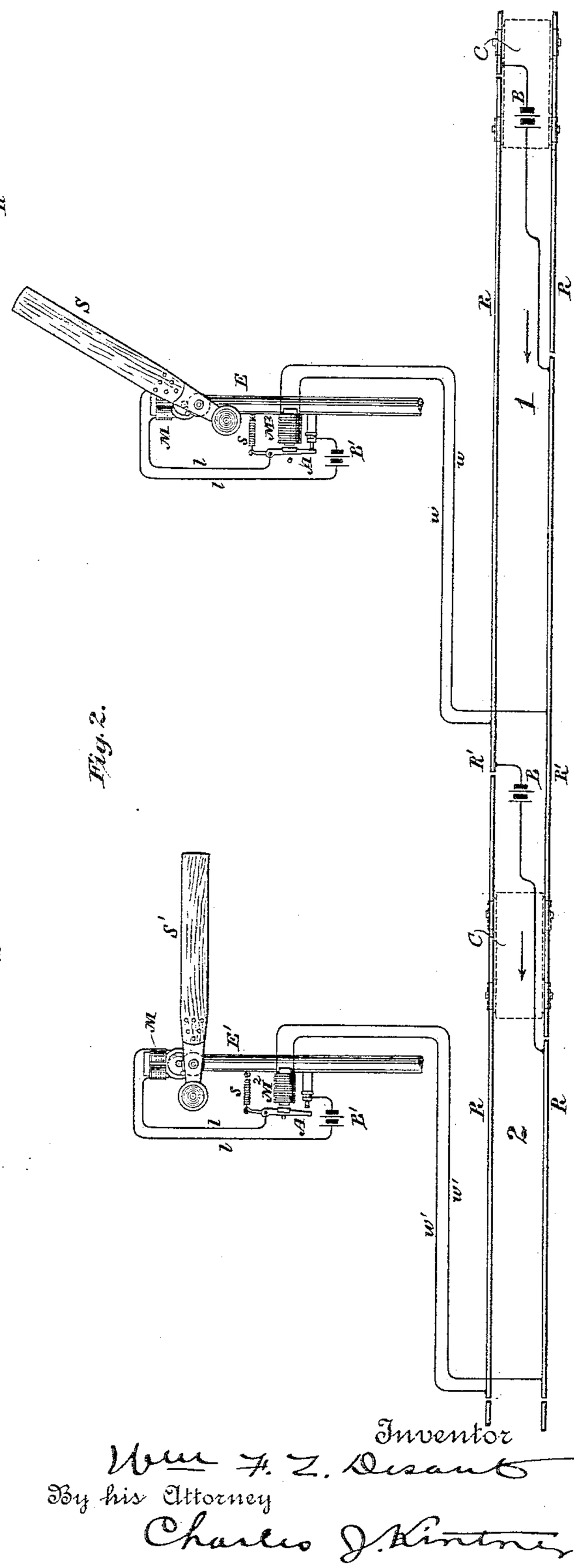

Fig. 2.

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ELECTRIC RAILWAY-SIGNAL.

SPECIFICATION forming part of Letters Patent No. 467,478, dated January 19, 1892.

Application filed September 26, 1890. Renewed November 27, 1891. Serial No. 413,157. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM F. Z. DESANT, a citizen of the United States, residing at New York, county of New York, and State of New York, have made a new and useful invention in Electrical Railway-Signals, of which the following is a specification.

My invention relates, particularly, to improvements in electrical railway-signals of the type known as "block-signals," in which semaphores or visual signals are located at the ends of successive blocks and electrically controlled; and it has for its objects, first, the simplification and certainty of action of signals of this generic type; second, the production of a waving or moving signal, which, when actuated, will be more certain to attract attention.

In another pending application, bearing Serial No. 366,267, filed of even date herewith, I have described and claimed a system of block-signals in which semaphores are electrically controlled both in the advance and rear of trains as they pass over a railway, said system of semaphores being controlled by electric motors through the agency of advance and rear circuit connections actuated by the trains themselves as they pass the ends of the successive sections or blocks.

The present invention is directed to an improvement upon the system therein disclosed, and it is much more simple, in that I avoid the use of the compound system of circuits and switch-magnets described in the application referred to, and am enabled to actuate or control the signals both in the advance and rear, as the trains proceed by a much simpler system of electrical circuits and devices, as I will now proceed to describe.

Referring to the drawings, Figure 1 is a plan view of a double-track line of railway in which all of the trains pass in a single direction, as indicated by the arrows, the second or return track not being herein shown. Fig. 2 is a similar view of the entire apparatus, showing a train of cars entering block 1 and a second train of cars on block 2, the position of the semaphores being shown in response to the action of the trains.

E E′ are signal-posts situated, respectively, at or near the entrance ends of blocks 1 and 2.

S S′ are balanced semaphore-arms geared each to an electrical motor M, located in a local circuit *e*, containing an energizing-battery B′. These motors, semaphores, and immediate electrical connections constitute in part the subject-matter of the other pending application above referred to, and need not be further described, except as I shall indicate the mode of operation.

R R are parallel lines of rails electrically insulated from each other in blocks and having their advance ends connected by conductors *w w* to relay-magnets M^2, secured to posts E E′, the function of said relays being, when energized, to actuate the armatures A and close the local circuits or batteries B′, as will be more particularly described hereinafter.

B B are signaling-batteries located at the junction of each pair of blocks. These batteries B B are connected to the opposite rails R in sets diagonally by conductors *w′*, as clearly shown, the sets of rails being divided into blocks by insulated spaces and the length of the diagonal conductor *w′* being such that an entire train of cars might stand upon the track between the point where it joins the lower rail R to the end of the upper rail R near the insulated section, this insulated section being sufficiently slight to permit a car-wheel in passing to electrically connect the ends of the rails, as will be described. Each time one of the wheels of a train of cars C passes the insulated joint between the upper set of rails the circuit from battery B is closed as follows: By wire *w′*, rail R, wire *w* to relay-magnet M^2, by wire *w* to the return-rail R, and back to the battery through the car-wheel. This momentarily closes the circuit through the relay M^2 and causes the armature A to momentarily close the circuit of the local battery B′ through the motor M, which immediately lifts the semaphore a short distance. Instantly the circuit is broken and the semaphore again drops. As each car-wheel passes the insulated joint this waving motion is imparted to the semaphore, and the engineer is made aware of the fact that the track is clear throughout block 1, and this action continues until the train passes beyond the point where the conductor *w′* joins the rail R, provided the train C is of sufficient length to fill the entire space covered by the diagonal wire *w′*. As soon as the train passes

this joint the semaphore S immediately returns to "danger," and should an incoming train attempt to enter block 1 the circuit from battery B would be short-circuited through the rails R and axles of the car-wheels of the train which is passing over block 1, so that so long as the preceding train remains upon block 1 an incoming train would not affect the semaphore S, and hence the engineer would have warning that a train was preceding him upon the same block. In a similar manner should there be a broken rail in this block the signal will remain at "danger."

In Fig. 2 I have shown one train just entering block 1 and a second train just leaving block 1 and entering block 2. In the first block the semaphore is in the act of being waived for the incoming train, thus showing the engineer that that block is clear, while in block 2 a train has just passed the battery B, and the semaphore S, which was waived successively during that time, has again settled to "danger" for the first train coming from block 1, should that train reach block 2 before the train now on block 2 passes out and into block 3.

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

1. In a block-signal system, a series of electrically-divided blocks, a series of semaphores or visual signals, electrical conductors joining the blocks, and electro-magnetic means for controlling local circuits, one at each signal, with batteries and electrical motors in said local circuits, the motors being geared to the signals, circuit connections being had through the adjoining ends of one pair of rails and the car-wheels as they pass successively over said ends, whereby the signals are continuously vibrated or moved as the train enters each block, substantially as described.

2. A visual signal consisting of a movable part geared to an electric motor located in a local circuit, in combination with a relay which controls said local circuit and a track-circuit closer which closes the relay-circuit and thereby opens and closes the local circuit each time a car-wheel passes it, substantially as described.

3. A visual signal controlled in one direction by its weight and geared to an electric motor adapted to raise or move it, in combination with a battery and a track-circuit closer having circuit connections through a relay with a local electrical generator having circuit connections through the motor, whereby each passing car-wheel causes the relay to close and open the local circuit, thus causing the signal to be momentarily moved, substantially as described.

4. A visual signal having electro-magnetic means for moving it in one direction against a constantly-acting force, in combination with electrical circuit connections made and broken or otherwise varied by a passing train, said circuit connections including a relay connected in circuit with a main battery and a local circuit controlled by the relay and controlling the electro-magnetic means for moving the signal, whereby it is caused to vibrate during the time that a train is passing into a block, substantially as described.

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