

(No Model.)

2 Sheets—Sheet 1.

F. W. WATSON.
AUTOMATIC ELECTRIC GATE.

No. 251,009.

Patented Dec. 13, 1881.

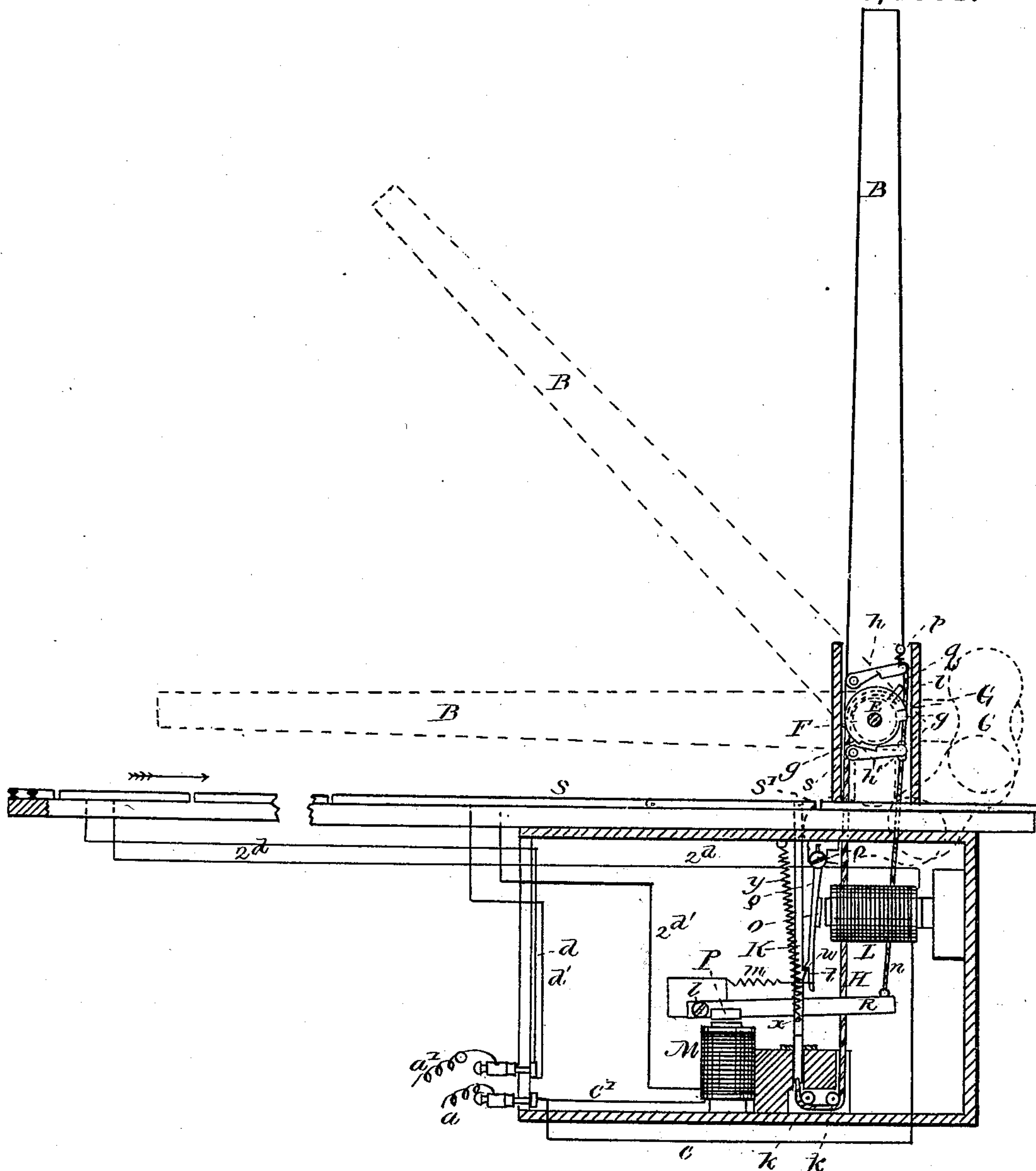


Fig. 1.

WITNESSES

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H. J. Nash.

INVENTOR

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By Charles E. Pratt
att'y

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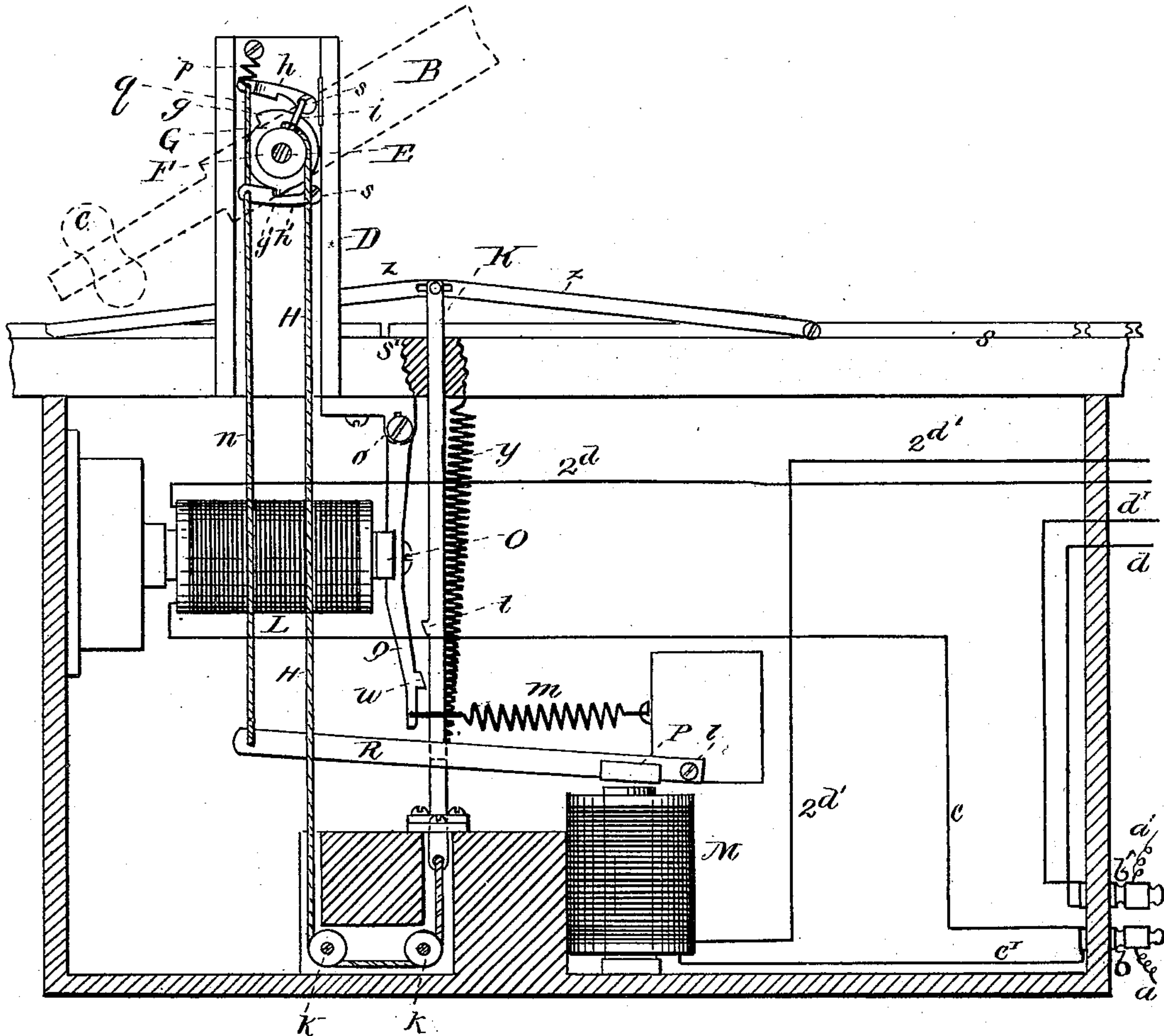


Fig. 2.

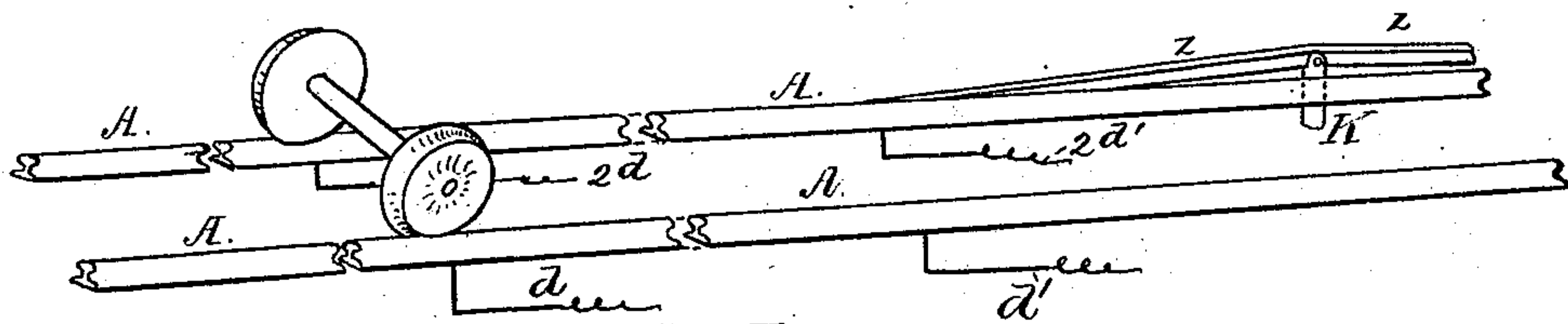


Fig. 3.

WITNESSES

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UNITED STATES PATENT OFFICE.

FRED W. WATSON, OF HARVEY, NEW BRUNSWICK, CANADA, ASSIGNOR OF
ONE-HALF TO CHARLES F. CONLEY, OF BOSTON, MASSACHUSETTS.

AUTOMATIC ELECTRIC GATE.

SPECIFICATION forming part of Letters Patent No. 251,009, dated December 13, 1881.

Application filed October 7, 1880. (No model.)

To all whom it may concern:

Be it known that I, FRED W. WATSON, of Harvey, Albert county, New Brunswick, in the Dominion of Canada, now commorant of the city of Boston, Massachusetts, have invented certain new and useful Improvements in Automatic Gates for Railways, Roads, and other Purposes, of which the following is a specification.

My improvements relate to devices for preventing the passage of carriages, &c., along one way, across another way on which there is an approaching train or carriage, and also for removing gates or opening a way in places where it is desired to keep a passage closed, except when temporarily opened for passing through, and which devices are operated for opening or closing such way, or both, by the approach of a passing train or carriage, without the immediate attention of an attendant. I am aware that heretofore many contrivances for the same general purpose have been constructed and patented; but with the automatic gates so far in use, especially in connection with railway-tracks, several difficulties have arisen which have not yet been practically obviated. The machinery by which they are operated has been complex, expensive, and contrived to operate in such a way as to close immediately on beginning to close, which sometimes results in danger to those passing under at the time.

The objects of my improvements are to provide a simple, economical gate, operated with certainty automatically, and so as to be partially closed at first, and then fully, or to close so gradually as not to cause accidents, and then to be held in position, either closed or open, while its operation is desired, and also to be put automatically in condition by any passing train or carriage to be operated in the same way by the next one.

The nature of my improvements will appear more fully from the following description, taken in connection with the drawings, in which—

Figure 1 shows, in section, a contrivance embodying my improvements, the half-closed and closed position of the gate being shown in dotted lines. Fig. 2 represents a vertical section through the same, enlarged and reversed. Fig. 3 represents rails and a truck.

Similar letters represent the same thing in the different figures.

A A are railway-rails. B is a bar or gate

hung on a shaft, E, and weighted at C. D is a support or hollow pillar. F is a wheel fixed on the shaft E. G is a cam-flange on the wheel F, also fixed to the shaft E, and having teeth or catches *g g'*. *h h'* are pawls or notched levers pivoted at *s s*, and connected by a cord or jointed rod. *i* is a pin in the wheel F, which is connected by a chain or cord under pulleys *k k* with the bottom of the stud or rod K, and connected with the pin *i* in such a way that it lies over a part of the circumference of the arbor or wheel F. The stud or rod K has its upper end near the rail A, and has below the road-bed, and as shown, a catch, *t*, and a pin, *x*.

a a' are conductors to be connected with the positive and negative poles of an electric machine or battery, and which may be connected with the knobs *b b'*.

c c' are wires, connected with the knob *b* at one end and with the helices around the magnets L and M, respectively. *d d'* are other wires, connected with the knob *b'* at one end, and are connected at the other ends with conductors at the rails A A, of which *d* has a break or opening at *e*, which are in turn connected with the wires *d' d'*, which are also connected with the coils of the magnets L and M, respectively.

O is an armature of the magnet L, attached to the lever Q, which latter is pivoted at *o*, and has a catch, *w*.

P is an armature of the magnet M, attached to the lever R, pivoted at *l*.

m is a spring connected with the end of the lever Q, and operated to draw the latter, with its armature O, away from the magnet L and toward the stud K.

n is a wire, cord, or chain connecting the lever R to the pawls *h h'*.

p is a spring operating the pawls *h h'* and the lever R in opposition to the force of the magnet M.

y is a spring operating to raise the stud K vertically. *z z* are levers pivoted at one end, and operating upon the stud K at the other.

S S' are conductors on the track, each of which may consist either of a section of the rail or of wires near the rail, and are connected with the wires *d' d'* at one end, and are disconnected at the other end, and these conductors S S' are longer than the width of the way intended to be closed by the operation of the gate.

The operation of my contrivance is as fol-

lows: When the gate B is upward and open, and held there by the weight C, in the form shown in the drawings, and the stud K is downward, the catch *t* engaged with catch *w*, and the armatures P and O are free from their magnets and held off by the springs *p* and *m*, and the negative wire from an electric battery or machine is connected with the knob *b'* and the positive wire is connected with the knob *b*, the battery or machine being in operation, supposing a car or train approaching on the rails A A in the direction of the arrow, when the wheels of the car reach the point *e* the break in the wire *d* is closed at *e* directly if both parts of the wire *d* are at the same rail, and through the medium of the car-axle if they are at opposite rails, and the electric circuit thereby closed, the current passing through *c*, through the coil L, through *d* and *d'*, to the negative pole, inducing magnetism, which, acting on the armature O, draws the lever Q, setting free the catch *w*, when the spring *y*, being set free, lifts the stud K, drawing the chain H, which, operating upon the circumference of the wheel F, turns it, with its shaft E, through a part of a revolution, and carrying the gate B downward part way until it is caught by the pawl *h'* and held at a sufficient height to allow any person or carriage passing under at the time of its beginning to drop to escape from under it. The gate is held in this position for a brief period of time, the stud K having been moved upward by the spring *y*, and, lifting the levers *z z*, remains in that position. When the wheels of the car arrive at the nearest end of the conductors S S', the circuit is again closed, so that a current passes through *c'*, the coil around the magnet M, the wire *d'*, and the conductors S S', inducing magnetism, attracting the armature P, so as to operate the lever R, and the wire *n*, draws the pawl *h'*, which frees the catch *g'*, and allows the wheel to revolve farther and the gate to be drawn down by the force of the spring *y*, while the pawl *h* engages with the tooth *g* of the cam G and holds the gate in its closed position. Now, when the car advances so that the wheels strike the levers *z*, the latter are depressed, carrying downward the stud K, until the catches *t w* are again engaged, and the spring *y* is tense and ready for action at the next approach of a train.

The conductors S S' are made of a length equal to or greater than the width of the way which the gate is designed to close, because so long as any of the wheels remain upon them the electric circuit is closed and the armature P is held to the magnet M, so that the gate remains closed. When the last pair of wheels passes off from the conductors at S S', the circuit is broken, the armature P is released, and the spring *p* raises the pawl *h*, releasing its catch from the tooth *g*, and the weight C causes the gate B to resume its open or vertical position. A rod may be used in place of part of chain H, with a lever pivoted at one end and connected at the other end to the stud K, all operating in like manner. I have thus described the

construction and operation of one form of a simple contrivance embodying my improvements.

It is obvious that when used for closing highways that run across railroads, where it may be desirable to have two or four gates instead of one, they can easily be arranged by substantially the same mechanism, the one gate being connected with a second by cords and pulleys or other simple arrangement, and the apparatus being duplicated for other tracks when necessary.

I am aware of English Letters Patent No. 1,270 of the year 1855, and do not claim anything described or shown therein.

I claim as new and of my invention—

1. A gate, B, with its shaft E and weight C, an electro-magnet, L, wires *c d*, arranged to connect the magnet with an electro machine or battery and with the track, and to induce a circuit by the closing of a break at the track, an armature, O, lever Q, spring *y*, stud K, chain H, pawl *h'*, and catch *g'*, constructed and combined to operate in connection with a car-track or carriage-way for the partial automatic closing of the gate by the approach of a carriage, substantially as set forth.

2. A gate, B, with its shaft and weight, an electro-magnet, M, with wires *c' d'*, arranged to connect the magnet with an electro machine or battery and with the track, conductors S S' at the track, an armature, P, lever R, wire *n*, wheel F, pawl *h'*, catch *g'*, spring *y*, pawl *h*, and catch *g*, constructed and combined to operate in connection with a car-track or carriage-way for the automatic closing of the gate by a passing carriage, substantially as set forth.

3. In an automatic mechanism for closing a gate by a passing car, substantially as herein set forth, the combination of rail A, lever *z*, stud K, catches *t w*, spring *y*, spring *m*, and lever Q, constructed and adapted to set the automatic closing mechanism by one passing car for the approach of another, essentially as set forth.

4. The described automatic mechanism for opening and closing a way by the passing of a carriage, consisting of magnets M and L, gate B, wheel F, conductors S S', and the herein-described wires, armatures, levers, and connections, or their equivalents, constructed and combined to operate such gate by the breaking and closing of an electric circuit, essentially as herein set forth.

5. A mechanism for operating a gate for railway-crossings and other purposes, consisting of conductors at the rails, electro-magnets, and armatures with connected levers, and the springs acting in opposition to said magnets, and of a spring acting in opposition to the desired motion of the gate, and to a lever operated by a passing wheel, constructed and combined substantially as herein set forth.

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Witnesses:

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