No. 853,886. PATENTED MAY 14, 1907.

O. F. KLOETZER & W. A. BORDERS.

SAFETY DEVICE FOR RAILWAYS.

APPLICATION FILED NOV. 9, 1906.

3 SHEETS—SHEET 1.

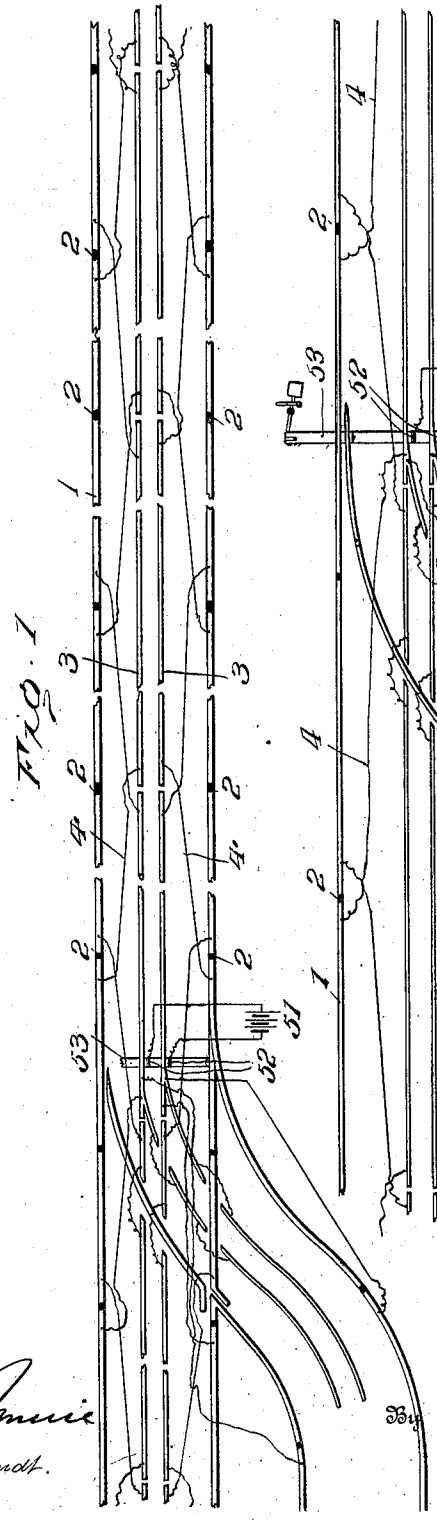

FIG. 1

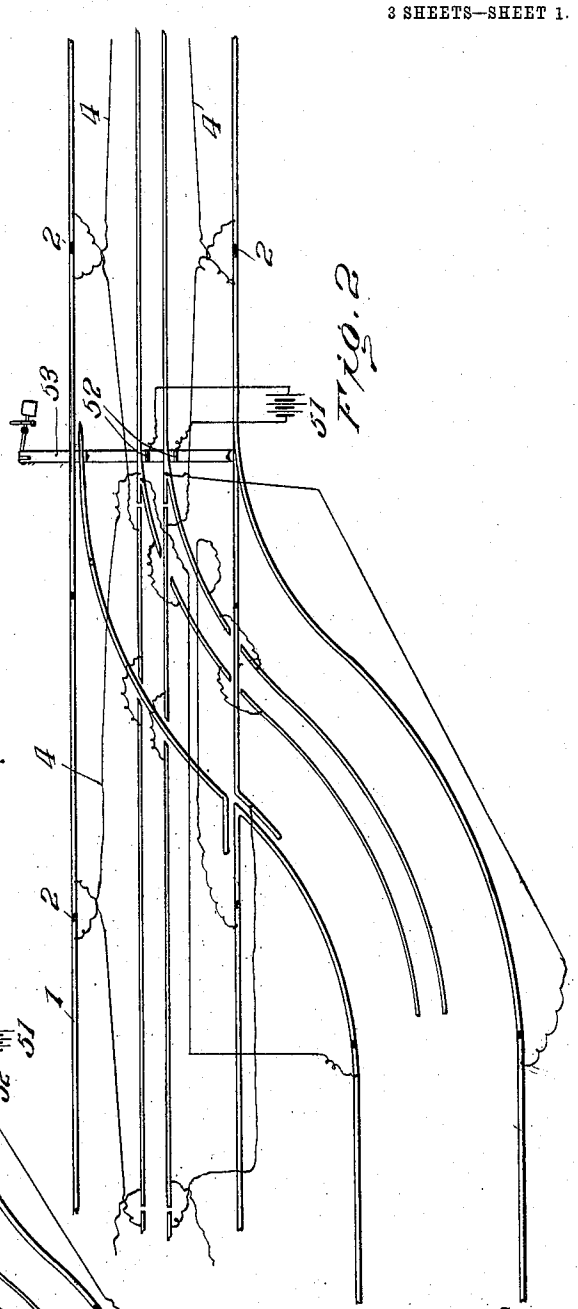

FIG. 2

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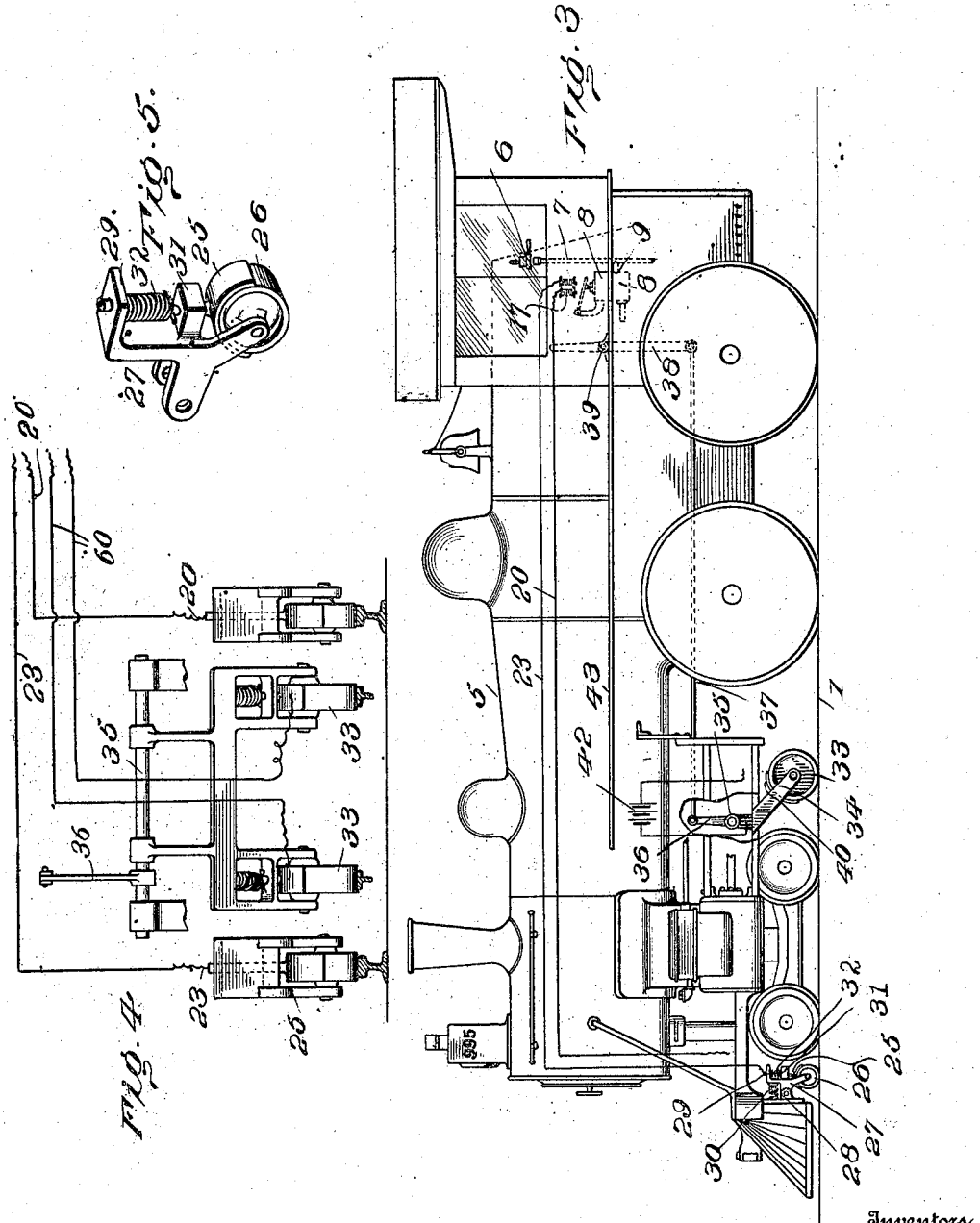

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3 SHEETS—SHEET 3.

Fig. 6.

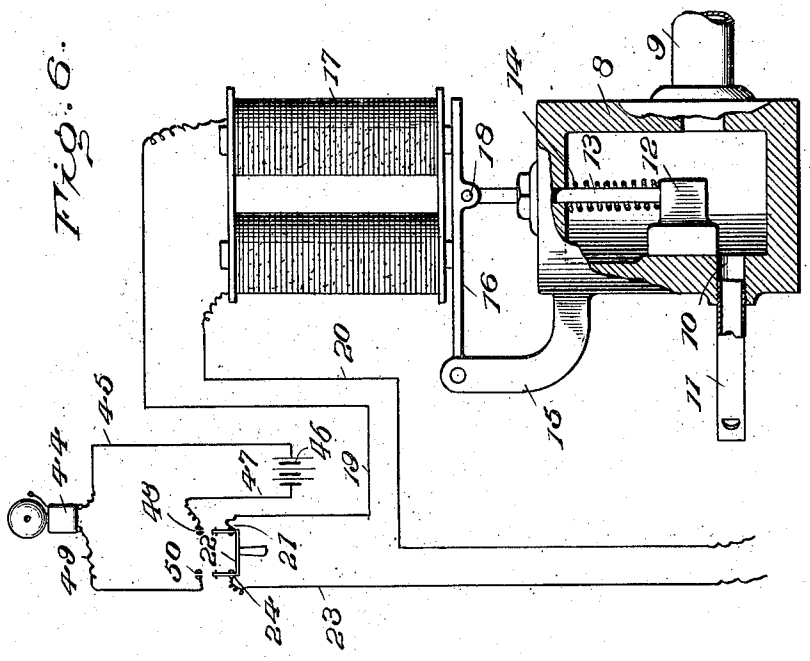
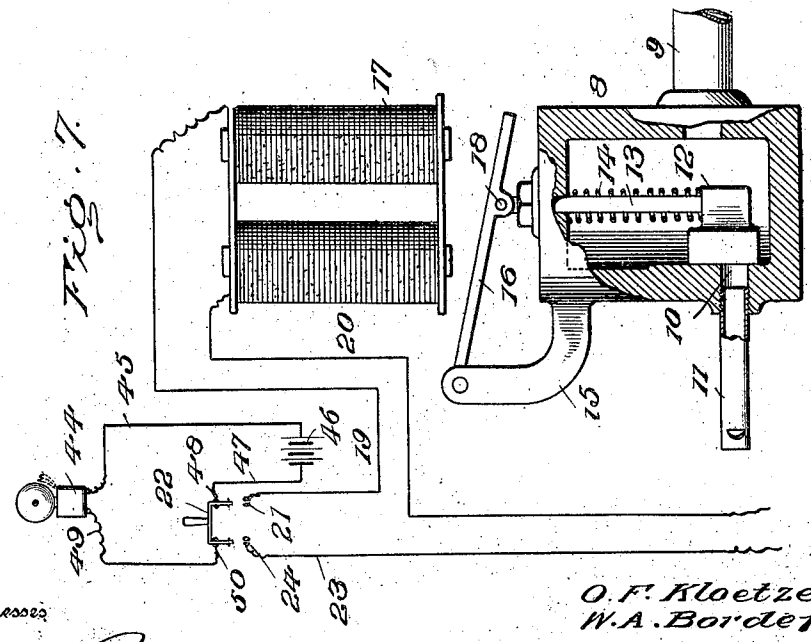


Fig. 7.



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UNITED STATES PATENT OFFICE.

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SAFETY DEVICE FOR RAILWAYS.

No. 853,886. Specification of Letters Patent. Patented May 14, 1907.

Application filed November 9, 1906. Serial No. 342,680.

To all whom it may concern:

Be it known that we, OTTO F. KLOETZER and WILLIAM A. BORDERS, citizens of the United States, residing at Washington, in the county of Daviess and State of Indiana, have invented certain new and useful Improvements in Safety Devices for Railways; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

Our invention relates to certain new and useful improvements in safety devices for railways.

The object of our invention is to provide a construction which will prevent either head-on or rear-end collisions between trains, or what is known as "side-swiping" or running into open switches.

Our device is adapted for any form of construction in which air brakes are used, as in the preferred form of our invention, the construction is adapted to operate directly upon the air brake. It will be obvious however, that certain features of our construction can be used in connection with devices other than air brakes.

With these objects in view, the invention consists in constructing a track, the rails of which are divided into blocks insulated from each other, and locating between the tracks a pair of conductors which are also divided into blocks. The trains are provided with an electric current supplying means and a means adapted to receive the current from the track, which current is supplied to the tracks by another train.

Referring to the drawings wherein we show the preferred form of our invention and wherein the same part is designated by the same reference numeral wherever it occurs, Figure 1 is a diagrammatic view of a section of track constructed in accordance with our invention. Fig. 2 is a view similar to Fig. 1, showing the switch construction on a larger scale. Fig. 3 is a view of a locomotive showing diagrammatically our invention applied thereto. Fig. 4 is a diagrammatic view showing the contacts which are mounted on the locomotive. Fig. 5 is a perspective view of one of the contacts which runs on the track. Fig. 6 is a diagrammatic view showing the air controlling valve, its electro-magnet and circuits for controlling the same. Fig. 7 is a view similar to Fig. 6, showing the circuit when the switch is in the other position from that shown in Fig. 6.

The rails 1—1, of the track on which the trains run are divided into sections by means of the insulations 2—2. These insulations are preferably located opposite each other in the opposite rails of the track and are separated a distance apart equal to one-half the length of a block.

3—3 are conductor rails which are located between the rails 1, and are connected in lengths equal to the length of a block. At the ends of each block these rails are preferably separated in order to insulate the conductor rails of each block from the rails of the adjacent blocks. The ends of the conductor rails 3 are connected by means of wires 4 to the track rail of the next section beyond that at which the conductor rail terminates, as is clearly illustrated in Figs. 1 and 2 of the drawings. From this construction, it will be seen that when a current is supplied to the conductor rails in a given block, at any point therein, the current can be taken from the track rails of the next adjacent blocks.

For the sake of illustration, we will describe our invention in connection with a steam locomotive, but it is to be understood that the same may be applied to an electric car, an electric locomotive, or similar engine.

5 designates a locomotive of ordinary construction provided with the ordinary air brake system, the engineer's valve of which is designated at 6 and the pipe carrying train pressure at 7.

8 designates a valve chest which is connected to the train pipe by means of the connecting pipe 9.

Referring particularly to Figs. 6 and 7, 10 designates an exhaust port to the open end of which is connected a whistle 11.

12 designates a slide valve adapted to cover the exhaust port 10, the slide valve being provided with a stem 13 surrounded by a spring 14 which constantly tends to hold the valve over the port.

15 designates a bracket pivoted to which is one end of an armature 16 of a magnet 17, the valve stem 13 being pivoted to the armature 16 at 18. From this construction, it will be seen that the magnet 17 when energized will move the valve 12 to the position shown in Fig. 6, opening the exhaust port and

permitting air from the train pipe to pass out to the atmosphere, consequently applying the emergency to the air brakes of the train.

By the whistle 11, the engineer will be notified as soon as the valve 12 has been moved off the exhaust port.

19 and 20 are the wires leading from the electro-magnet 17, the wire 19 extending to a post 21 of a double throw switch 22.

23 is a wire leading from the post 24 of the switch 22. This post can be connected to the post 21 by means of the switch. The wires 20 and 23 lead down to a pair of brushes 25 in contact with the wheels 26 which run upon the track rails 1. As shown, each of these wheels 26 is mounted in a bracket 27 pivoted to a lug 28 extending out from the rear of the cow-catcher. The brackets 27 are each provided with an upwardly extending arm 29, and 30 is a spring located between the rear of the cow-catcher and the arm 29 to force the wheel in contact with the rail. Each of the brushes 25, as shown, is mounted in an extending arm 31 of the bracket 27 and 32 is a spring wound around the upper end of the brush, one end of which rests against one of the projections on the bracket and the other against a suitable lug or projection on the portion of the brush or shoe 25 holding the same in contact with the wheel 26. By this construction, if there is a current in the track rails over which the engine is passing, the current will be picked up by the wheels 26 and conducted to the magnet 17 which will be energized and will operate to move the valve 12 to uncover the exhaust port 10, releasing the air in the train pipe and applying the brakes.

33 is a pair of wheels mounted in the arms 34, pivoted to a rock shaft 35 from which extends an arm 36 connected by a rod 37 to a lever 38 pivoted at 39 in the cab. By means of the lever 38, the wheels 33 can be raised and lowered by the engineer when desired. These wheels 33 run upon the sectional conductor rails 3—3.

40 is a brush mounted in each of the arms 34 and in contact with the wheels 33.

42 is a battery suitably located on the engine, as for instance, under the running board 43, one pole of which is connected to one of the wheels 33 and the other pole of which is connected to the other wheel 33 by means of the wires 60. By this means, current from the battery is constantly supplied to the sectional conductor rails 3. It being remembered that these sectional conductor rails are connected by the wires 4 to the track rails of the adjacent blocks, it will be seen that when a locomotive is on one of the blocks, should another locomotive come on the adjacent block, current will pass from the battery 42 through the wheels 33 to the sectional conductor rails 3, through the wires 4 to the track rails 2 to the wheels 26, through the wires 20 and 23 to the electro-magnet, operate the electro-magnet and open the exhaust valve. It will consequently be seen that the emergency brake on each of the trains which come on adjacent blocks will be set and the train stopped. In consequence of this, it will be impossible for two trains to come within a distance which is less than the length of one block from each other, being stopped by having their brakes applied.

In order to permit the engineer of a train to move his train after the brakes have been set, we preferably provide the switch 22 by which the engineer can break the circuit to the magnet 17, thus releasing the armature 16 and permitting the valve 12 to move back under the influence of the spring 14 and cover the exhaust port 10. Preferably, we provide a signal which will continue to operate as long as this circuit is broken so that the engineer by no chance can forget to reset the apparatus in operative position. As shown, this signal consists of a bell 44 located in the cab having a wire 45 extending therefrom to a battery 46. The wire 47 extends from the battery to a post 48 on the other side of the double throw switch 22. 49 is another wire from the bell leading to the other post 50 of the switch. This switch is preferably so constructed that as soon as the circuit between the posts 21 and 24 is broken, it will be completed between the posts 48 and 50, and consequently, one circuit or the other will be always established. From this construction, it will be seen that as long as the switch is out of contact with the posts 21 and 24 and consequently in contact with the posts 48 and 50, the signal 44 will continue to operate.

By the track construction heretofore described, we provided against either a head-on or tail-end collision and in order to prevent "side-swiping" by a car or engine drifting onto the main line from a siding, we preferably provide the sidings with the construction shown in Figs. 1 and 2. From the construction shown, it will be seen that sectional conductor rails 3 are located between the rails of the switch or siding and that these conductor rails are electrically connected with the conductor rails 3 of the main line. In other words, the sectional conductor rails of the main line have a switch construction at the point at which the switch from the main line is formed. The sectional conductors of the switch, by being connected to the conductors of the main line, cause them to act as a part of the main line and consequently, an engine or car provided with a battery 42 and contacts 33 standing upon the siding so that its conductors 33 are in contact with the sectional conductors 3 of the siding, will transmit current to the tracks of the adjacent block sections on the main line, the same as if it stood on the main line at the switch.

In addition to this, we provide a construc-

tion whereby, should the switch not be fully closed, a train approaching from either direction on the main line will be stopped at the adjacent block. As shown, this construction consists of a battery 51 which is connected to a pair of contacts 52 mounted upon the switch operating rod 53. These contacts, as shown in Figs. 1 and 2 are so positioned on the switch rod as to be out of contact with the sectional conductor rails when the main line is clear, but to be in contact with the sectional conductor rails 3 of the main line should the point of the switch be separated from the rail of the main line. From this construction, it will be seen that a current will be supplied to the adjacent block sections of the main line from the battery 51 as long as the switch of the siding is open.

While we have described the use of batteries as a source of current, we desire to have it understood that any other source of electric current may be employed if desired and also that the form and construction of the other parts of the mechanism shown can be changed or varied without departing from the spirit of our invention and that the mechanical construction shown in this application is only chosen to illustrate one embodiment of our invention.

Having thus described our invention, what we claim as new and desire to secure by Letters Patent is:—

1. A safety appliance for railways, comprising track rails divided in blocks, sectional conductor rails divided into blocks, electrical connections connecting each block of the sectional conductor rails with the blocks of the track rails which are located on each side of the blocks of the sectional conductor rails, a pair of contacts carried by the train and contacting with the track rails, a second pair of contacts also carried by the train and contacting with the sectional conductor rails, a source of electric current connected with one pair of contacts, an electro-magnet connected to the other pair of contacts, and means for stopping the train operated by said electro-magnet.

2. A safety appliance for railways comprising track rails divided in blocks, sectional conductor rails divided in blocks, electrical connections connecting each block of the sectional conductor rails with the blocks of the track rails which are located on each side of the blocks of the sectional conductor rails, a pair of contacts carried by the train and contacting with the track rails, a second pair of contacts also carried by the train and contacting with the sectional conductor rails, a source of electric current connected with one pair of contacts, an electro-magnet connected to the other pair of contacts, and means for giving a signal to the engineer, operated by said electro-magnet.

3. A safety appliance for railways, comprising track rails divided into blocks, sectional conductor rails divided into blocks of twice the length of the track rail blocks, electrical connections connecting each block of the sectional conductor rails with the blocks of the track rails which are located on each side of the blocks of the sectional conductor rails, a pair of contacts carried by the train and contacting with the track rails, a second pair of contacts also carried by the train and contacting with the sectional conductor rails, a source of electric current connected with one pair of contacts, an electro-magnet connected to the other pair of contacts, and means for stopping the train operated by said electro-magnet.

4. A safety appliance for railways, comprising track rails divided into blocks, sectional conductor rails divided into blocks, electrical connections connecting each block of the sectional conductor rails with the blocks of the track rails which are located on each side of the blocks of the sectional conductor rails, a pair of contacts carried by the train and contacting with the track rails, a pair of contacts connected with each switch rod and adapted to contact with the sectional conductor rails when the switch is open and a source of electric current connected with said contacts on the switch rod.

5. A safety appliance for railways, comprising track rails divided into blocks, sectional conductor rails divided into blocks, the sectional conductor rails being connected to the track rails of adjacent blocks and means carried by the train for delivering a current of electricity to the conductor rails and receiving a current from the track rails.

6. A safety appliance for railways, comprising track rails divided into blocks, sectional conductor rails divided into blocks, electrical connections connecting each block of the sectional conductor rails with the blocks of the track rails which are located on each side of the blocks of the sectional conductor rails, a pair of contacts carried by the train and contacting with the track rails, a second pair of contacts also carried by the train and contacting with the sectional conductor rails, a source of electric current connected with one pair of contacts, an electro-magnet connected to the other pair of contacts, an air brake mechanism on the train and a valve on the air brake mechanism connected to the electro-magnet and adapted to be operated thereby, whereby when the magnet is energized the valve will be opened and the brakes applied.

7. A safety appliance for railways, comprising track rails divided into blocks, sectional conductor rails divided into blocks, a pair of contacts carried by the train and contacting with the track rails, a second pair of contacts also carried by the train and contacting with the sectional conductor rails, a

source of electric current connected with one pair of contacts, an electro-magnet connected to the other pair of contacts, a switch in the circuit of said electro-magnet, an electrically operated alarm, said switch being adapted to close the circuit of the alarm mechanism when it is thrown to open the circuit to the electro-magnet.

In testimony whereof we affix our signatures, in presence of two witnesses.

OTTO F. KLOETZER.
WILLIAM A. BORDERS.

Witnesses:
WILLIAM R. GARDINER,
J. EARLE THOMPSON.