

1,028,568.

W. S. HENRY.
ELECTRIC LOCK.
APPLICATION FILED MAY 8, 1911.

Patented June 4, 1912.
2 SHEETS—SHEET 1.

FIG. I.

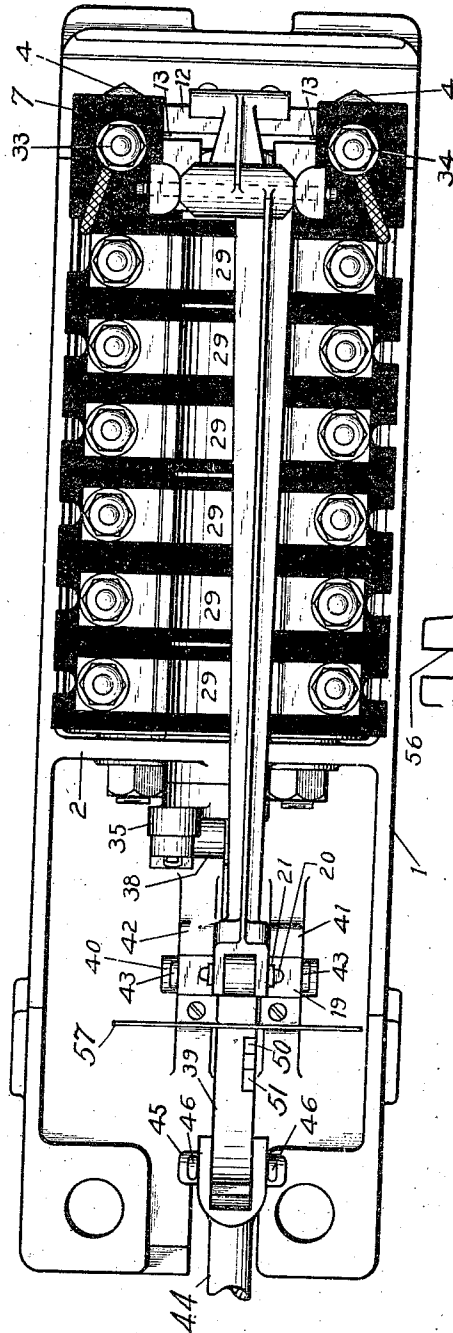
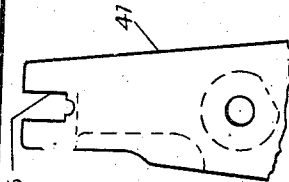


FIG. VI.



WITNESSES:

George T. Whitney
James E. Stephenson

INVENTOR.

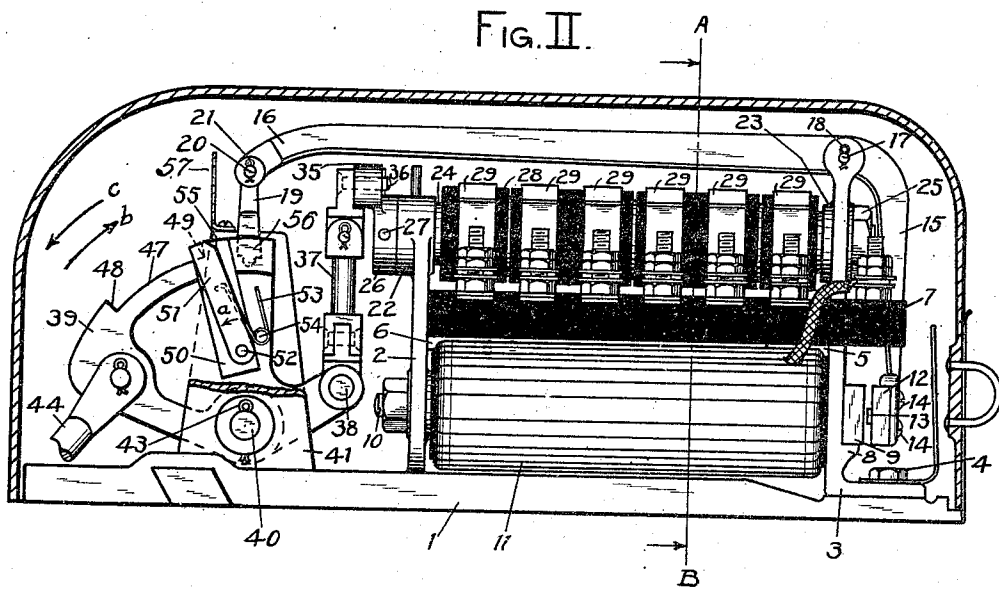
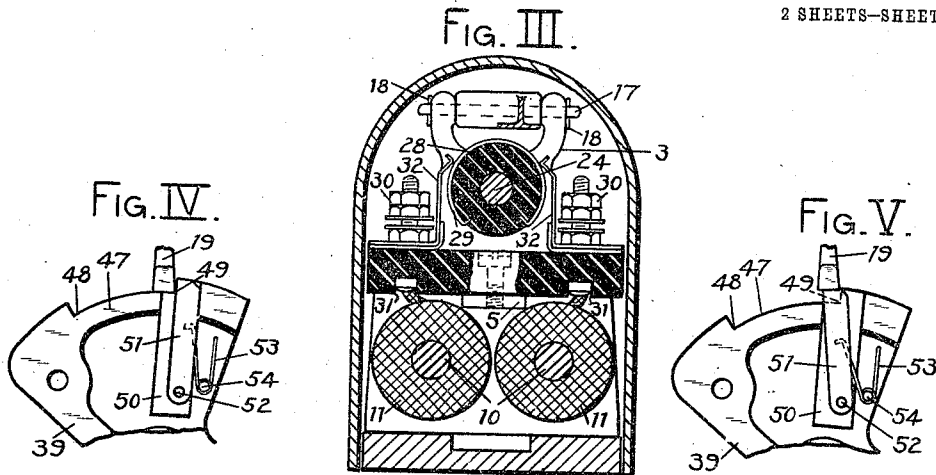
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2 SHEETS-SHEET 2.



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George T. Whitney.
James E. Stephenson

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UNITED STATES PATENT OFFICE.

WILLIAM S. HENRY, OF ROCHESTER, NEW YORK, ASSIGNOR TO GENERAL RAILWAY
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ELECTRIC LOCK.

1,028,568.

Specification of Letters Patent.

Patented June 4, 1912.

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To all whom it may concern:

Be it known that I, WILLIAM S. HENRY, a citizen of the United States, and resident of the city of Rochester, in the county of Monroe and State of New York, have invented a new and useful Electric Lock, of which the following is a specification.

This invention relates to an electric lock, and particularly to an electric lock governed by a remote device in such a manner as to give notification at the place where the lock is situated of one of its conditions by releasing the lock.

The primary object of this invention is to so construct a lock that it may be placed in condition to be unlocked by a momentary impulse of electricity, and will thereafter remain unlocked although so acted upon by gravity as to be placed in the locked position.

The invention consists in the idea of means, a practical embodiment of which is shown in the form selected to illustrate the invention, which is hereinafter described in detail.

In describing the invention in detail, reference will be had to the accompanying drawings in which like characters of reference designate like parts, and in which:

Figure 1, is a plan view of the form of lock selected to illustrate the principle of the invention and associated mechanism with the inclosing cover removed. Fig. 2, is a side elevation, with the inclosing cover in section, and certain parts broken away to more clearly show the construction. Fig. 3, is a section on the line A—B of Fig. 2, looking in the direction of the arrows. Figs. 4, 5 and 6 are detail views.

Construction: 1, designates a base member having the up-standing support member 2 formed integral therewith which has a bracket 6 formed integral therewith, best shown in Fig. 2; 3 designates a right angled member, one flange of the same resting upon the base 1, and being fastened thereto by the cap screws 4, and having a forked upper end, best shown in Fig. 3, and having an outstanding bracket 5, best shown in Figs. 2 and 3 upon which rests the insulating block 7 at one end, the block being supported at the other end by the bracket 6 upon the support 2; 8 designates a projection upon right angled member 3, best shown in Fig. 2, which has a flat upper face against which rest the square heads 9 of bolts 10

which pass through both the member 3 and the member 2, fitting tightly thereto and forming cores for the coils 11, the said heads 9 thus form the 2 poles of an electro-magnet, the yoke of which is formed by the member 2 the armature of which is designated by 12, which has residual pins 13 in the face thereof, the residual pins being made of some non-magnetic material to prevent sticking of the armature to the poles, and which is supported by means of screws 14 by short arm 15 of a lever, the other arm of which is designated by 16, the same being pivoted by means of pin 17 in the forked end of the right angled member 3, best shown in Fig. 3, the two-armed lever being of such width that it fits nicely between the sides of the fork, and cotter pins 18 being passed through holes in each end of the pivot pin 17 to hold it in place, the end of the double armed lever is bifurcated best shown in Fig. 1, and has placed between the arms formed thereby, the lock dog 19, the dog being free to swing upon the pivot pin 20, which pivot pin is held in place by the cotter pins 21; 22, designates a bearing formed in the upper end of member 2, and 23 designates a bearing formed in right angled member 3, in which bearings is placed the shaft 24, being prevented from moving longitudinally in one direction by the nut 25, best shown in Fig. 2, and being prevented from moving in the other direction by crank 26, which is pinned upon the end of the shaft by means of the pin 27. The shaft 24 bears insulating cylinders 28 which have fastened thereto the metallic strips 29, best shown in Fig. 3, the insulating blocks being made in sections so that any number desired may be placed upon the shaft within its maximum limit and being fastened thereto in any approved manner so as to turn therewith. The insulating block 7 has binding posts 30 attached at regular intervals thereto, the bolt forming part thereof having a square head and being adapted to fit within a longitudinal groove 31 in the lower face of the block, best shown in Fig. 3, so that the bolt will not turn; 32 designates springs which normally press against the metallic strip 29 upon the insulating drums 28, the whole forming a circuit breaker which is actuated by the movement of the shaft 24 so that by connecting wires to opposite binding posts 110

30, a circuit or circuits can be made or broken by the oscillation of shaft 24, the two end posts 33 and 34 being the terminals to which the wires connected to the coils 11 are connected.

The crank 26 has an arm 35 which has a pin 36 fastened therethrough, which also passes through the end of a universal link designated by 37, the other end of the universal link being connected by the pin 38 to an arm extending from a sector 39, which sector is pivoted on a pin 40 journaled in two up-standing bearings 41 and 42, best shown in Fig. 1, one of the bearings, namely, 41, being broken in Fig. 2 to more clearly show the construction of the sector; 43 designates cotter pins which hold the pin 40 in place; 44 designates a link connected to the sector 39 by means of the pin 45, said pin being held in place by the cotters 46; this link 44 serving as a connection between sector 39 and any desired mechanism which is capable of movement to reciprocate link 44, and which in turn is locked by the operation of the lock herein illustrated. The sector 39 has a notch 47 cut in its periphery having two shoulders 48 and 49 best shown in Fig. 2, and also has a depressed portion on its face 50, in which is placed a latch 51, pivoted on a pin 52, and spring pressed in the direction of the arrow *a*, Fig. 2, by the spring 53, which is coiled about the pin 54 and has one end bent at right angles and inserted in a hole in the sector and has the other end bent at right angles and inserted in a hole in the latch 51. The latch 51 is of such a length that its upper end coincides with the extreme outer face of the sector 39 and has a slight beveled portion 55 for a purpose to be later described.

By Fig. 6 is shown a detail of the up-standing bearing 41, showing the notch 56 in its upper end, which is made of such a width that the dog 19, will fit nicely therein when in its lower position. Bearing 42, as shown in Fig. 2, has a like notch 56 formed therein.

Numeral 57 designates a shield, which is attached to the two bearings 41 and 42 and is for the purpose of preventing a maliciously inclined operator from inserting a wire through the hole in the base of the device through which the member 44 passes, and by skilful manipulation, lifting the member 19 out of engagement with the shoulder 49 so that an improper movement of the levers of the interlocking machine may take place.

Operation: It is to be understood that link 44 is to be connected to that part of a mechanical interlocking machine which performs, what is usually termed as, "preliminary locking," and would if the ordinary and well known so-called Saxby & Farmer improved interlocking machine were used,

be connected to the rocker and if the so-called style A interlocking machine were used, it would likewise be connected to the rocker, and in either case, with the lever in the normal position and the latch carried thereby, down, the link 44 and the sector 39 would be in the position shown in Fig. 2, with the dog 19 resting upon the periphery of the sector 39. The raising of the latch carried by the lever in either style machine, would, in the ordinary and well known manner transmit motion to link 44 to move sector 39 in the direction of the arrow *b*, Fig. 2, and after the lever was reversed and the latch dropped, further movement as is well understood in the art, would be transmitted to the link 44 to further move the sector 39 in the direction of the arrow *b*. With the lever fully reversed in the case of either mechanical interlocking machine mentioned and the latch dropped, the sector 39 would be moved in the direction of the arrow *b* to such an extent that the dog 19 would be over the cut-out portion 47, so that under normal conditions the dog 19 would drop directly in front of the shoulder 48.

In a great many constructions the lever of a mechanical interlocking machine is used to close the circuit of a signal which is actuated by electricity so that the movement previously described would, in such case, clear the signal. If, now, it is desired to return the signal to danger, the latch would be lifted, thus actuating the link 44 to move the sector 39 in the direction of the arrow *c*, Fig. 2, to such an extent that the dog 19 would bear against the shoulder 49 thus preventing further movement of link 44 until the dog 19 is raised, at the same time the latch 51 will be pressed in the direction of the arrow *b*, compressing the spring 53 so that at that time the condition of the dog 19 as regards the sector 39 and the latch 51, is as represented by Fig. 4. The result of preventing further movement of the sector 39 and link 44 is to prevent the operator from dropping the latch after the lever has been returned to the normal position so that the mechanical locking in the machine is not released and, therefore, no conflicting routes can be set up, all of which is well known in the art and has been practised for many years. The electric locks heretofore invented and used have been subject to one disadvantage, however, for, after the lever has been put in the normal position, some time must necessarily elapse before the signal governed thereby, returns to normal position which, although slight, in a busy interlocking plant results in considerable valuable time in the aggregate being lost waiting for the signal to return to the normal position and by returning to the normal position sending a current through the coils 11, so that the armature 12 is at-

tracted and the dog 19 raised out of contact with the shoulder 49, so that the latch of the mechanical interlocking lever can be dropped thereby releasing the mechanical locking governing the levers controlling the signals of conflicting routes.

In electric locks heretofore invented, it has been necessary for the operator to remain at the lever after placing it in such position that the current holding the signal in the clear position is broken for he had to be prepared to drop the latch with the lever in the normal position the instant the current passed through the coils of the lock by virtue of the return of the signal to danger position, for, if he did not, the dog locking the sector would again drop in locking position, so that it would be necessary if he did not drop the latch at just the proper moment to again clear the signal by reversing the lever and then put the lever normal again, holding the latch up ready to drop it, the instant the coils of the lock were energized, and even when the operator was standing right at the lever when the old form of locks were employed, he failed many times to drop the latch at the proper instant. In applicant's device, however, the great care and watchfulness required of an operator is entirely eliminated. Applicant's invention is particularly directed to a structure which will obviate such loss of time for with an electric lock constructed as is applicant's, after the mechanical interlocked lever has been returned to normal position, the operator can go about other business and is not obliged to wait at the lever until the return indication is received from the signal, for when a current of electricity is sent through the coils 11 by virtue of the fact that the signal governed by the mechanical lever has returned to the normal position the armature 12 is pulled toward the ends of the cores 10, the dog 19 is raised, and immediately the latch by virtue of the spring 53 snaps under the dog 19 thereby holding it in its upper position, the condition of the members then being as shown in Fig. 5 and at any time thereafter the operator may allow the latch to drop thus releasing the mechanical locking controlled thereby. It is to be understood that in practice, however, on account of the fact that dog 19 is liable to

bind if the full power of the mechanical lever latch spring is exerted upon sector 39, the mechanical lever is not returned to the normal position but is stopped a little short of it, so that the latch rests upon the quadrant of the mechanical inter-locking machine and then, after the lock has been energized and the dog 19 withdrawn, the lever is pushed the remainder of the distance to full normal position; for if the lever is placed in the full normal position before the dog 19 is raised, the spring on the latch of the mechanical lever would bind sector 39 and dog 19 together so tightly, that the armature 12 would not be able to raise dog 19.

In order to prevent the latch 51 from catching on the dog 19 when the sector is being reversed, the latch 51 is beveled so as to slide easily under the dog 19.

The circuit controllers represented by springs 32 and metallic strip 29 on drums 28 are, of course, actuated simultaneously with the sector 39 and may be used in the well known manner to govern any desired circuits.

Having thus explained the principle of my invention and having described one particular physical embodiment and fully illustrated the same, what I claim as new and desire to secure by Letters Patent, is:

In an electric signal lock, a pivoted sector, a shoulder upon the sector, a dog, a member having a guiding slot for the dog, said dog adapted to engage the shoulder, a latch pivoted to said sector and having its free end coinciding with the periphery of the sector, a spring for pressing the latch in one direction, means for limiting its movement in said direction so that the end of the latch will lie in proximity to the shoulder on the sector, means for moving the sector and thereby compressing the said spring when the dog is in locking position, and causing the shoulder to abut the dog thus preventing further movement, means for raising the dog thereby allowing the spring to expand and force the latch under the dog, so that the sector can be thereafter further moved.

WILLIAM S. HENRY.

Witnesses:

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O. H. BRYAN.