(No Model.) 2 Sheets—Sheet 1.

G. A. COULTER.

ELECTRIC HORSE DISCONNECTOR.

No. 406,629. Patented July 9, 1889.

Fig. 1.

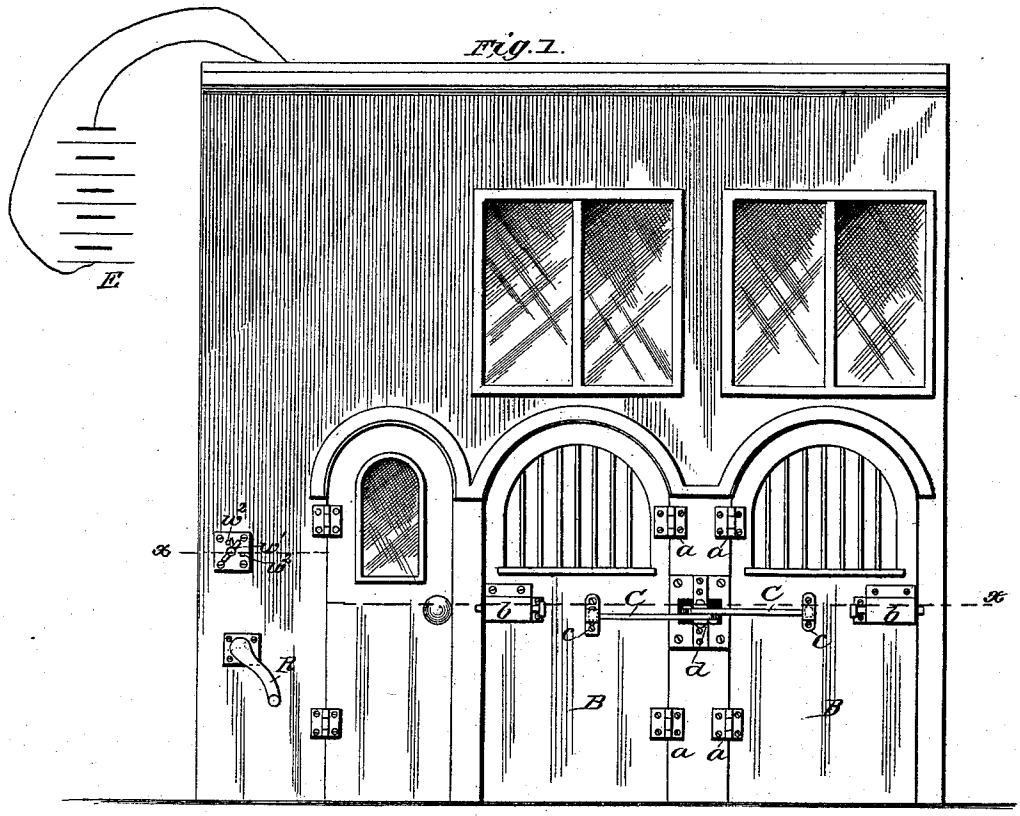


Fig. 4.

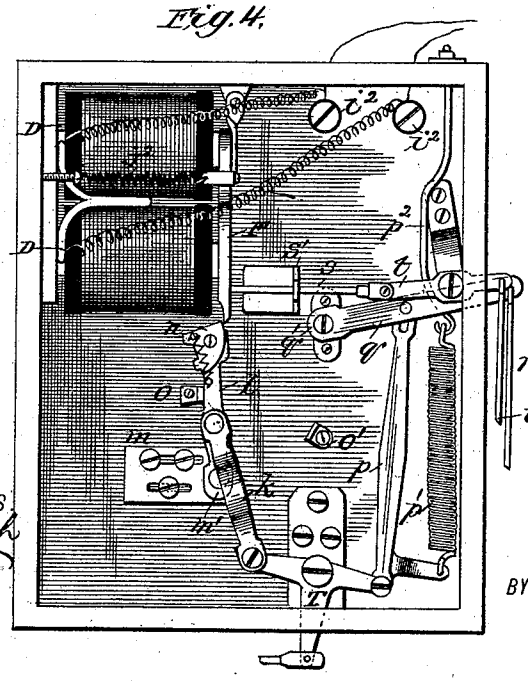
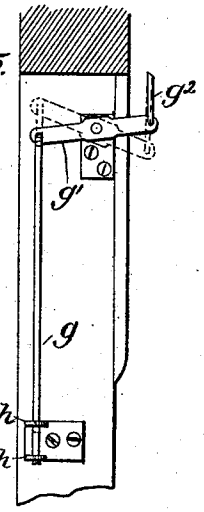


Fig. 5.



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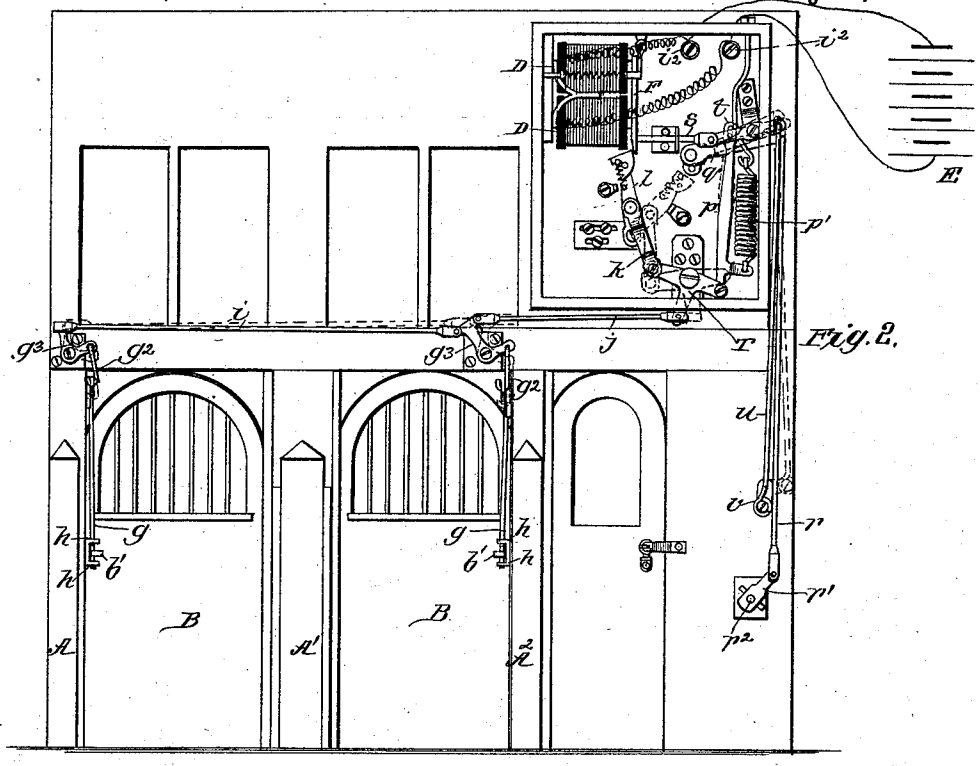


Fig. 2.

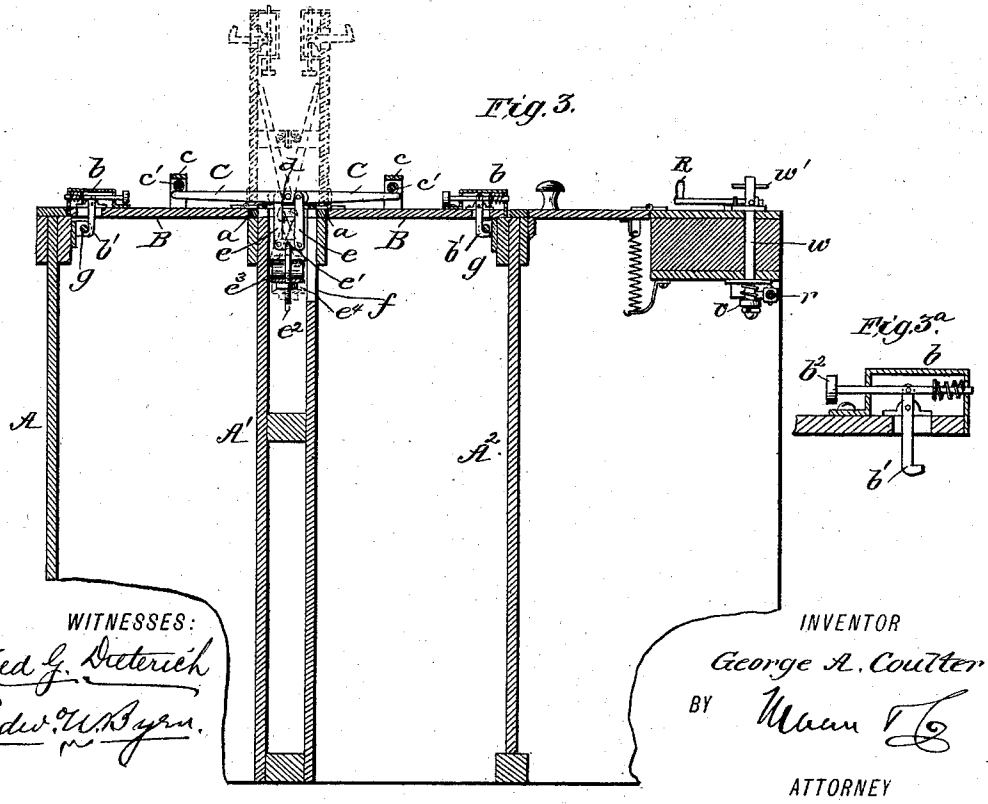


Fig. 3.

Fig. 3a.

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UNITED STATES PATENT OFFICE.

GEORGE A. COULTER, OF OMAHA, NEBRASKA, ASSIGNOR OF ONE-HALF TO JAMES C. ISH, OF SAME PLACE.

ELECTRIC HORSE-DISCONNECTOR.

SPECIFICATION forming part of Letters Patent No. 406,629, dated July 9, 1889.

Application filed September 15, 1887. Serial No. 249,811. (No model.)

To all whom it may concern:

Be it known that I, GEORGE A. COULTER, of Omaha, in the county of Douglas and State of Nebraska, have invented a new and useful Improvement in Electric Horse-Releasing Apparatus for Fire-Engine Houses, of which the following is a specification.

My invention is in the nature of an improved electrical apparatus for automatically releasing the horses from their stalls in the fire-engine house by the electric impulse on the fire-alarm circuit, whereby the horses may be geared to the engine with the least possible delay; and it consists in the peculiar construction and arrangement of the devices for locking and opening the stall-doors and electrical devices for tripping and releasing the same, as will be hereinafter fully described.

Figure 1 is a front elevation of the stable-stalls. Fig. 2 is a rear or inside view of the same with the box containing the electrical devices opened. Fig. 3 is a horizontal section through line $x\ x$ of Fig. 1. Fig. 3^a is an enlarged sectional view of the locking-latch. Fig. 4 is an enlarged view of the electrical devices in the box, and Fig. 5 is a detail of the latching and releasing devices for the door of the stall.

A A′ A^2 are three partitions forming two stalls, in front of which are doors B B, that are normally kept closed, but which, when the horses are to be released, automatically fly open. These doors are hinged at $a\ a$, Fig. 1, and have locking-latches b upon the sides opposite the hinges. These doors each bear a bracket c, carrying in it a friction-roller c', arranged about a vertical axis, and against which friction-rollers there bear the outer ends of horizontal levers C C. These levers are fulcrumed at d, Figs. 1 and 3, to a plate on the casing between the doors, through which casing at which point there is formed a hole to give passage to link-bars $e\ e$, that are connected to the short ends of the levers C, and which links pass into the hollow space of the middle partition between the stalls, and there connect with a cross-head e', which in turn is connected to a screw-bolt e^2, that passes through a vertically-arranged semi-elliptical spring e^3, and is provided on the rear side of the same with a nut e^4, by which the tension of the spring is regulated. This spring, it will be seen, exerts a tension on the bolt e^2, the links $e\ e$, and the short ends of levers C, so that the tendency of the spring is to open the stall-doors, as shown in dotted lines, as soon as the latch shall have been released.

To give access to the tension-regulating nut e^4, a hand-hole f is left in the casing of the middle partition. The latch b, which holds the doors closed, is provided with a horizontally-acting lever-hook b' on the inside of the door, which is (see Fig. 3^a) operated by a sliding spring-bolt b^2 on the outside. This lever-hook is made to engage with a vertically-sliding rod g, Figs. 2, 3, and 5, whose lower end slides through guides or keepers $h\ h$ above and below the hook. When this rod is raised above the lever-hook, this action, it will be seen, withdraws the rod from the lever-hook b', and allows the stall-doors to fly open in response to the spring. The rods g are at their upper ends jointed to one end of a lever g', Fig. 5, the other end of which is connected to a short rod or link g^2, which in turn is connected to one arm of an elbow-lever g^3. The elbow-levers of both doors are connected for simultaneous operation by a horizontal connecting-rod i above them, and this train of mechanism is in turn connected by rod j to one arm of a T-shaped lever T in the box containing the electrical trip devices. (See Fig. 4.)

D D are a pair of electro-magnets, whose terminal wires are connected to the posts $i^2\ i^2$, and proceed thence to a battery E and the fire-alarm circuit. F is the armature of the magnet, which is held close against the poles of the magnet by a spring j^2, in addition to the attractive influence of the magnet.

To one arm of the T-shaped lever T there is jointed a link-bar k, whose upper end is connected to a lever l, fulcrumed to a plate m at m', and having at its upper end a pivoted spring yielding knuckle-plate n, which is adapted to yield and pass by the armature of the magnet when moved backward, but which, when moved forward, engages with the armature and is held thereby. To limit

the range of movement of the lever *l*, stops *o* *o'* are arranged upon opposite sides of the same.

To the T-shaped lever on the opposite side from link *k* there is jointed a vertical bar *p*, which is pulled upwardly by a spiral spring *p'*, attached to a hook-rod p^2, secured by an adjusting-nut in the top of the box. The upper end of this bar *p* is slotted and loosely connected by a pin to a horizontal lever *q*, which is fulcrumed at *q'* to the box, and, extending through the side of the same, is attached to a vertical rod *r*. This rod *r* is at its lower end connected to a crank *r'* on a rock-shaft r^2, which extends to the outside of the stable, and is connected rigidly to and operated by a hand-lever R. Now, when this lever R is deflected so as to bring down the rod *r* within, it has the effect of setting the trip devices as follows: As rod *r* comes down it forces down lever *q*, and this, acting upon vertical bar *p*, rocks the T-shaped lever. The motion of this lever throws up link *k* and lever *l*, and throws the knuckle end of lever *l* behind the armature. The same movement also serves to force down the rods *g*, which, engaging with the lever-hooks *b'*, hold the door closed. In this position of parts the apparatus is set ready to be tripped and the doors opened by the electric fire-alarm circuit. As the circuit is normally closed, the armature is held upon the poles of the magnets by the combined influence of the spring j^3 and the attraction of the magnet, which together are sufficient to hold the lever *l* against the tension of the spring *p'*; but as soon as a fire-alarm signal causes a break in the circuit the attractive influence of the magnet on its armature ceases, and the armature being then only held by the slight tension of spring j^2 the superior tension of spring *p'* causes lever *l* to push back and pass by the armature, allowing the T-shaped lever to be shifted by the spring *p'*, which has the effect of raising the locking-rods *g* from the hooks *b'* and releasing the doors, so that they fly open in response to their spring-actuated levers.

In order to lock the armature of the magnet so as to render it inoperative for automatic action, a stop-rod *s* is guided through a plate *s'* in the box, and is jointed to a lever *t*, fulcrumed in the middle and extending through the side of the box and attached to a vertical rod *u*, which at its lower end is jointed to a crank-arm *v* on a rock-shaft *w*, which has upon the outside a handle *w'* for turning it, and also stops w^2 w^2 for limiting its oscillation. By pulling the rod *u* down through this handle the lever *t* and stop-rod *s* are thrown into line, as in Fig. 4, and the stop-rod is brought to abut against the armature, so that it cannot move. This also furnishes means for quickly opening the stable-doors at will by simply turning handle *w'* when the magnets are not charged.

Having thus described my invention, what I claim as new is—

1. The combination, with the two stall-doors hinged adjacent to each other, and electromagnetic releasing devices, of a pair of horizontal levers C C, having a stationary fulcrum on the casing and their free ends loosely connected to the doors, the link-bars *e* *e*, connected to the short ends of the levers, the cross-head *e'*, screw-bolt e^2, spring e^3, and nut e^4, substantially as shown and described.

2. The combination, with the stall-doors and the locking devices for the same, of the rods *i* *j*, the T-shaped lever T, vertical bar *p*, attached to one arm thereof and provided with an upwardly pulling spring *p'*, lever *q*, loosely connected to the bar and having vertical pull-rod, link *k*, attached to the other arm of the lever T, lever *l*, with knuckle-plate *n*, pivoted to the box and also to the link, the magnets D D, and the armature having a spring pulling in unison with the magnets, substantially as shown and described.

GEORGE A. COULTER.

Witnesses:
W. H. ELLIS,
JOHN ANDERSON.