Feb. 2, 1943. N. C. HARRIS ET AL 2,309,952

STARTING GATE

Filed Nov. 6, 1940 2 Sheets-Sheet 1

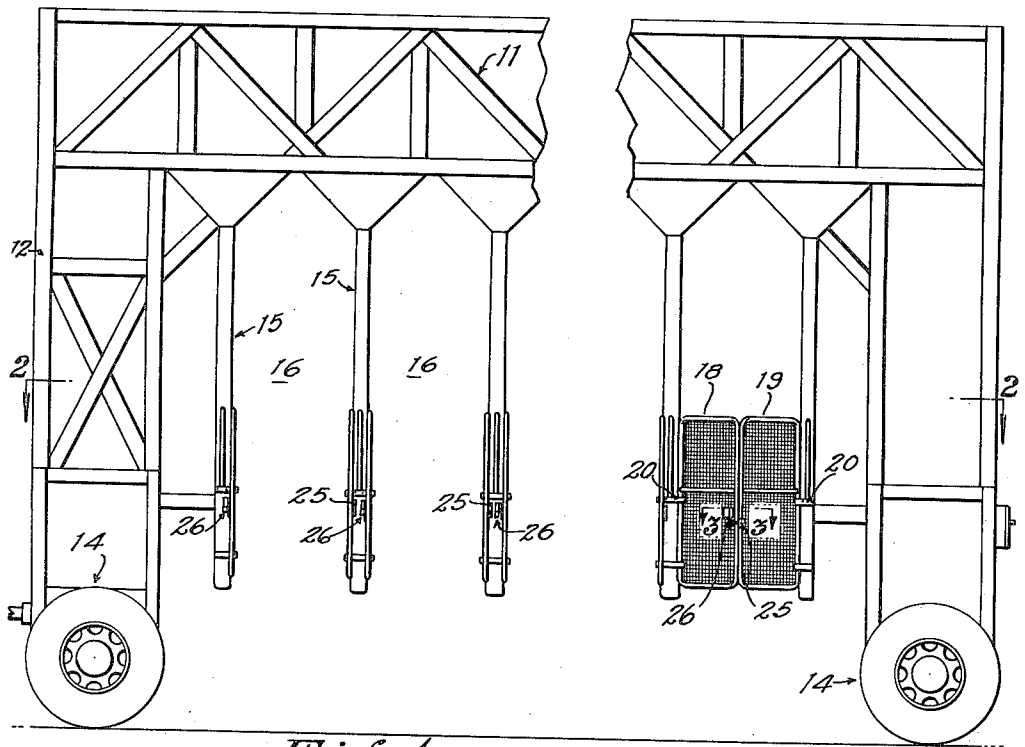


Fig. 1

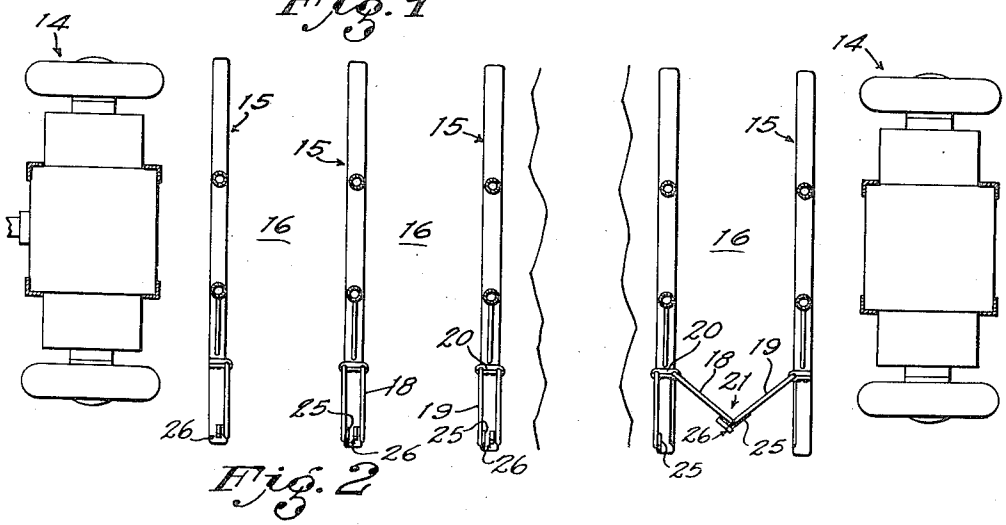


Fig. 2

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STARTING GATE

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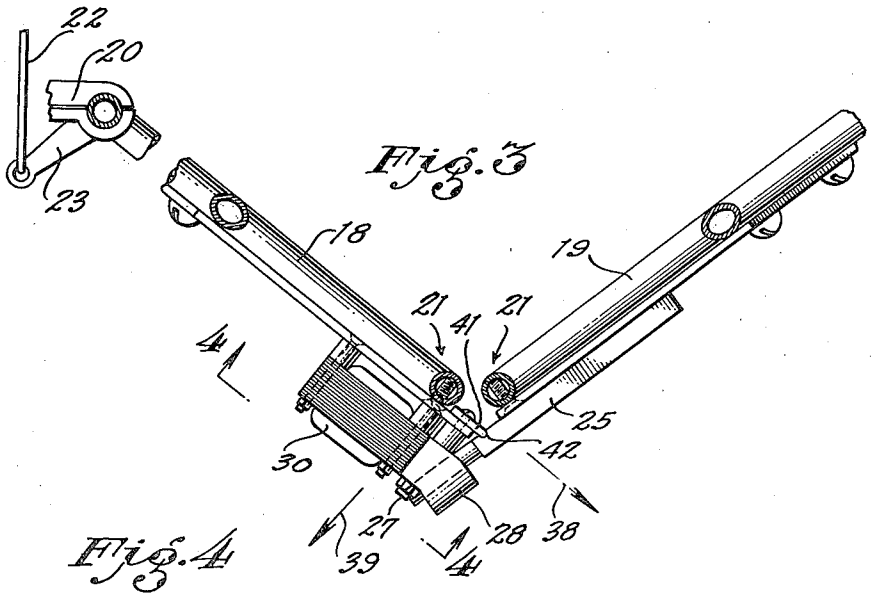


Fig. 3

Fig. 4

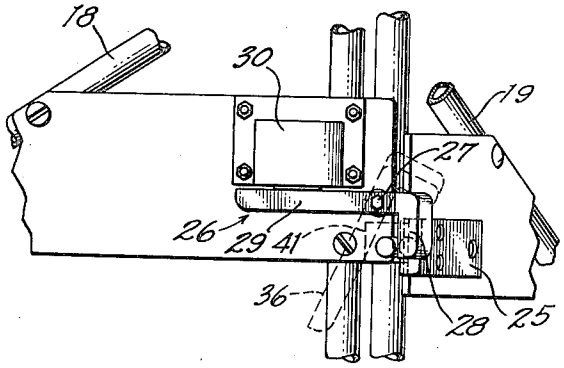
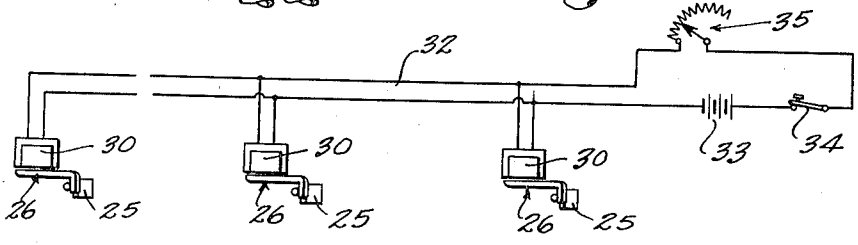


Fig. 5



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Patented Feb. 2, 1943

2,309,952

UNITED STATES PATENT OFFICE

2,309,952

STARTING GATE

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Application November 6, 1940, Serial No. 364,502

10 Claims. (Cl. 119—15.5)

Our invention relates to starting gates, such as are employed at race tracks to give the racing animals an even start at the beginning of the race, and it relates particularly to starting gates having mechanical latch means for holding the gates in closed position and which is releasable upon deenergization of magnetic holding means to permit the gates to simultaneously move into open position.

In starting gates it is important that all of the gates simultaneously open. Mechanical means heretofore employed for holding the gates in closed position have sometimes failed because the latching means is restrained from immediately unlatching by pressure or friction between the mechanical parts. A single failure of this type is sufficient to discredit any such device and obviously would spoil the race in which the failure of the starting gate occurred.

It is an object of our invention to provide a starting gate in which a pair of gates is employed for closing the forward end of the starting stall, and in which the pair of gates is held closed by a latch mechanism including mechanical parts which interengage, the parts being held in interengaged position by magnetic means, the latch being operable upon deenergization of the magnetic means to permit pressure of the gate against the latch mechanism to disengage the mechanical parts and permit the gates to open.

It is a still further object of our invention to provide a starting gate of the character generally referred to in the preceding paragraphs in which the latch mechanism includes two separate mechanical latch means, one of which may be selectively released, and the other of which may be self-releasing upon the selective releasing of the first mentioned mechanical latch means.

Other objects and advantages of our invention will be brought out during the course of the following detailed description of a preferred form of our invention.

Referring to the drawings:

Fig. 1 is an elevational view which diagrammatically illustrates a starting gate incorporating the features of our invention, one pair of gates being closed, while the other pairs of gates are shown in open position.

Fig. 2 is a view taken on the line 2—2 of Fig. 1.

Fig. 3 is a fragmentary plan view partly in section illustrating a pair of gates having the holding and released mechanism of our invention applied thereto.

Fig. 4 is a fragmentary view taken as indicated by the line 4—4 of Fig. 3.

Fig. 5 is a schematic view showing the manner in which the magnetic means is connected to a source of electrical energy.

Referring to the drawings in detail, and more particularly to Figs. 1 and 2, in accordance with the usual practice our starting gate includes an overhead frame structure 11 having depending frames 12 at each end which are supported by suitable trucks 14 whereby the starting gate may be moved on and from the track. Depending from the overhead structure 11 are partitions 15 which cooperate to provide starting stalls 16. The structure thus far described may be of any well known design as may be commonly employed in the racing art, and the various partitions are suitably upholstered so that the horse will not be injured.

In the preferred form of our invention each starting stall 16 is provided with a pair of gates or closures 18 and 19 which are pivotally supported by brackets 20 mounted on the partitions 15. When the gates are in closed position, as illustrated in the right-hand stall of Figs. 1 and 2 and as illustrated in Fig. 3, the gates extend forwardly and toward each other so that they occupy the angular relation shown in Figs. 2 and 3 and so that the free ends 21 thereof are adjacent each other. For the purpose of automatically swinging the gates from closed to open position when the latch means is released, any suitable structure may be provided, such as an elastic member 22 connected to a lever 23 of each gate. This structure is fragmentarily illustrated in Fig. 3, and is more fully illustrated in the Puett et al. Patent Number 2,232,675, granted February 18, 1941. It should be understood that any type of means for urging the gates into open position may be employed. The gates 18 and 19 are each preferably composed of pieces of tubes, preferably welded (or bolted) to each other to form an integral structure. Figure 4 shows one of these pieces of tubing as being in slanting relation with respect to another piece of tubing on each gate, in order to make these gates strong, integral structures which are not likely to become broken or bent out of their proper alignment with their supporting structures or with each other.

The latch means of our invention includes a latch element 25 secured to the gate 19 and extending therefrom in a plane substantially parallel to the plane of the gate. Supported by the gate 18 is a latch lever 26 which is pivotally supported by a pivot 27 and has a depending lug 28 adapted for interengagement with the end of the latch element 25. The latch

lever 26 also has a horizontal portion which constitutes an armature 29. Mounted on the same gate as the latch lever 26 is a magnetic means in the form of an electromagnet 30 which, when energized, attracts the armature 29 and will hold the latch lever 26 in latching position as shown in Figs. 3 and 4. As shown in Fig. 5, the magnets 30 are connected in parallel in an electrical circuit 32 so as to be energized by a battery 33 when a manually operable switch 34 is closed. In order to vary the strength of the magnetic field and thus vary the force with which the latch lever is held in latching position, the electrical circuit 32 may have a variable rheostat 35. By opening the switch 34 the magnets 30 are deenergized, and the latch lever 26 may then swing from the position shown in full lines in Fig. 4 into unlatched or released position as indicated by dotted lines 36 of Fig. 4.

It will be noted that the latch means just described is effective in preventing the gate 19 from moving outwardly from the gate 18 in a direction indicated by the arrow 38, but in this particular form of our invention this latch means just described is not effective in preventing the gate 18 from moving away from the gate 19 in a direction indicated by the arrow 39. We therefore provide a second latch means which prevents movement of the gate 18 from the gate 19 in the direction of the arrow 39. This second latch means includes a latch lug 41 which projects forwardly from the gate 18. Formed on the gate 19 or a part associated therewith, such, for example, as the latch element 25, is a groove 42 into which the latch lug 41 extends when the parts are positioned as shown in Fig. 3. It will be seen that interengagement between shoulders formed by the latch lug 41 and by the walls of the groove 42 prevent the gate 18 from moving away from the gate 19 in the direction of the arrow 39. It will further be seen that the latch lug 41 is retained in the groove 42 as long as the latch lever 26 is in latching position.

In the operation of our invention the gates are manually swung into the positions shown in Figs. 3 and 4. The latch lever 26 at this time may be in unlatched position, as shown by dotted lines 36. When the parts have been moved into the positions as shown in Fig. 3 the latch lever 26 may be swung into its full line position shown in Fig. 4, and, the switch 34 being closed, the magnet 30 will attract the armature 29 and thus retain the latch lever 26 in this position. The operator of the gate may go from one stall to the other successively closing the gates. After each gate is closed and the racing animals are in their respective stalls 16 and the starter is ready to start the race, he opens the switch 34 which deenergizes all of the magnets 30 and thus releases all of the latch levers 26. The weight of the latch lever 26 may be such that it tends to swing into unlatched position, as indicated by dotted lines 36, but in addition to this the pressure of the latch element against the lug 28 is in a direction tending to swing the latch lever into unlatched position. Therefore, when the magnets 30 are released the mechanical latch associated therewith is substantially simultaneously released therewith, and the gate 19 is free to swing toward open position relative to the gate 18 in the direction indicated by the arrow 38. Upon but very slight movement of the gate 19, as stated, the lug 41 is disengaged from the groove 42 and the gate 18 is thereupon free to move toward open position away from the gate 19, as indicated by the arrow 39. All of the action just described takes place substantially instantaneously, and the two gates 18 and 19 of each stall are simultaneously and almost instantly moved from closed position into open position by the operation of the gate opening means, such as illustrated at 22 and 23 in Fig. 3.

From the foregoing description it will be apparent that our invention includes all of the advantages of a mechanical latch but eliminates absolutely any possibility of binding action due to the fact that there are no parts which are subjected to pressure or friction which could in any way interfere with the free movement of the latch element 26 from latching position to unlatching position. The coengagement between the latch element 25 and the lug 28 produces a pressure against the latch lever 26 which will assist in its opening and, in fact, cause its instantaneous opening upon deenergization of the magnet. The other latch means which includes the parts 41 and 42 is automatically released upon initial outward movement of the gate 19.

In the foregoing description we have disclosed a preferred form of our invention. It should be understood, however, that various alterations and modifications may be made without departing from the spirit and scope of our invention. We wish our invention to be construed in accordance with the preceding statement of invention and appended claims. For instance, it is within the scope of this invention to mount the magnet and latch lever in any position on the starting gate where the lever may engage the latch element of each pair of gates.

We claim as our invention:

1. In a race starting gate, the combination of: a pair of gates pivotally supported at the forward part of said starting gate, said gates being swingable from closed position in which said gates are angularly positioned with respect to each other and with their outer ends adjacent each other to an open position in which said gates are in substantial parallelism; latch means for latching said gates in closed position including a first latch for preventing one gate from moving relative to the other, a second latch for preventing the other gate from moving relative to the first gate, and means for selectively releasing said first latch which permits said first mentioned gate to move relative to the second mentioned gate, whereupon said second latch is automatically released; and means for moving said gates into open position.

2. In a race starting gate, the combination of: a pair of gates pivotally supported at the forward part of said starting gate, said gates being swingable from closed position in which said gates are angularly positioned with respect to each other and with their outer ends adjacent each other to an open position in which said gates are in substantial parallelism; latch means for latching said gates in closed position including a first latch for preventing one gate from moving relative to the other, said first named latch including a latch element on one gate and a latch lever on the other gate engageable with said latch element but movable to release said latch element, and magnetic means on the same gate as said latch lever for holding said latch lever in engagement with said latch element, a second latch for preventing the other gate from moving relative to the first gate, and means for deenergizing said magnetic means to allow said latch lever to re-

lease said latch element, thus releasing said first latch which permits said first mentioned gate to move relative to the second mentioned gate, whereupon said second latch is automatically released; and means for moving said gates into open position.

3. In a race starting gate, the combination of: a pair of gates pivotally supported at the forward part of said starting gate, said gates being swingable from closed position in which said gates are angularly positioned with respect to each other and with their outer ends adjacent each other to an open position in which said gates are in substantial parallelism; latch means for latching said gates in closed position including a first latch for preventing one gate from moving relative to the other, said first named latch including a latch element on one gate and a latch lever pivotally mounted on the other gate and having a lug engageable with said latch element and also having an armature, said latch lever being movable to release said latch element, and magnetic means on the same door as said latch lever for magnetically attracting said armature for holding said latch lever in engagement with said latch element, a second latch for preventing the other gate from moving relative to the first gate, and means for deenergizing said magnetic means to allow said latch lever to release said latch element, thus releasing said first latch which permits said first mentioned gate to move relative to the second mentioned gate, whereupon said second latch is automatically released; and means for moving said gates into open position.

4. In a race starting gate, the combination of: a pair of gates pivotally supported at the forward part fo said starting gate, said gates being swingable from closed position in which said gates are angularly positioned with respect to each other and with their outer ends adjacent each other to an open position in which said gates are in substantial parallelism; latch means for releasably latching said gates in closed position, said latch means including a latch element on one gate, a latch lever on the other gate engageable with said latch element but movable to release said latch element, magnetic means on the same gate as said latch lever for holding said latch lever in engagement with said latch element, and means for deenergizing said magnetic means to allow said latch lever to release said latch element for permitting said gates to open; and means for moving said gates into open position.

5. In a race starting gate, the combination of: a pair of gates pivotally supported at the forward part of said starting gate, said gates being swingable from closed position in which said gates are angularly positioned with respect to each other and with their outer ends adjacent each other to an open position in which said gates are in substantial parallelism; latch means for releasably latching said gates in closed position, said latch means including a latch element on one gate, a latch lever pivotally mounted on the other gate and having a lug engageable with said latch element and also having an armature, said latch lever being movable to release said latch element, magnetic means on the same gate as said latch lever for magnetically attracting said armature for holding said latch lever in engagement with said latch element, and means for deenergizing said magnetic means to allow said latch lever to release said latch element for permitting said gates to open; and means for moving said gates into open position.

6. In a race starting gate, the combination of: a pair of closures pivotally mounted on said gate, said closures being swingable from closed position in which the closures are angularly positioned with respect to each other and with their outer ends adjacent, to an open position where their outer ends are separated from each other, latch means for releasably latching said pair of closures in closed position, said latch means including a latch element on one closure and a latch lever pivotally mounted on the other closure said latch lever being constructed and arranged to move to its disengaged position by gravity when released, magnetic means mounted on the last mentioned closure for holding when energized said latch lever in engagement with said latch element, means for energizing said magnet means including an electric circuit, and means for breaking said circuit whereby said magnet means becomes deenergized to allow said latch lever to drop by gravity and to release said latch element to thereby permit said pair of closures to open, and means to open said pair of closures when released.

7. In a race starting gate, the combination of: a pair of closures pivotally mounted on said gate, said closures being swingable from closed position in which the closures are angularly positioned with respect to each other and with their outer ends adjacent, to an open position where their outer ends are separated from each other, latch means for releasably latching said pair of closures in closed position, said latch means including a latch element on one closure and a latch lever, means pivotally mounting said lever on the other closure, said lever pivot supporting said lever in overbalanced position whereby said lever is biased by gravity to open position, magnetic means mounted on said last mentioned closure for holding when energized said lever in closed position and in engagement with said latch element, means for energizing said magnet means including an electric circuit, and means for breaking said circuit whereby said magnet means becomes energized to allow said latch lever to move to open position by gravity and to release said latch element to thereby permit said pair of closures to open, and means for moving said pair of closures to open position when released by said latch levers.

8. In a race starting gate, the combination of: a pair of closures pivotally mounted on said gate, said closures being swingable from closed position in which the closures are angularly positioned with respect to each other and with their outer ends adjacent, to an open position where their outer ends are separated from each other, latch means for releasably latching said pair of closures in closed position, said latch means including a latch element on one closure and a latch lever pivotally mounted on the other closure, said latch lever being constructed and arranged to move to its disengaged position by gravity when released, magnetic means mounted on the last mentioned closure for holding when energized, said latch lever in engagement with said latch element, means for energizing said magnet means including an electric circuit, and means for breaking said circuit, whereby said magnet means becomes deenergized to allow said latch lever to drop by gravity and to release said latch element to thereby permit said pair of closures to open, and a second latch means in-

cluding a rigidly mounted part on one of said closures and engaging said other closure when said pair of closures are angularly positioned with respect to each other.

9. In combination, a pair of closures, means pivotally mounting said closures on a support, the closures being angularly positioned with respect to each other when in closed position, said pair of closures having a weighted latch pivoted on one closure and being heavier on one side of the pivot than on the other side and thereby biased to released position by gravity, a latch element on the other closure adapted to be engaged by said weighted latch when the closures are in angular position with respect to each other, magnet means for said pair of closures for retaining when energized, said weighted lever in engagement with said latch element, means for energizing said magnet means including an electric circuit, and means for breaking said circuit to de-energize said magnet means to thereby permit said weighted latch to move by gravity and release said latch element and said pair of closures.

10. In a race starting gate, the combination of: a pair of closures pivotally mounted on said gate, said closures being swingable from closed position in which the closures are angularly positioned with respect to each other and with their outer ends adjacent to an open position where their outer ends are separated from each other, latch means and magnet means for said pair of closures, said latch means including a latch lever and a latch element, said latch lever being constructed and arranged to move to its disengaged position by gravity when released, said latch element being mounted on one closure and said latch lever being adapted to engage said latch element when said pair of closures is in converged position and when said magnet means is energized, means for energizing said magnet means including a source of electrical energy and an electric circuit, means for breaking said circuit to de-energize said magnet means to allow said latch levers to drop and to thereby release said latch lever from said latch element to permit opening of said pair of closures, and means for moving said pair of closures to open position when released by said latch lever.

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