March 12, 1940. B. STEELE 2,193,257

DOOR FOR STARTING GATES

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Fig. 1.

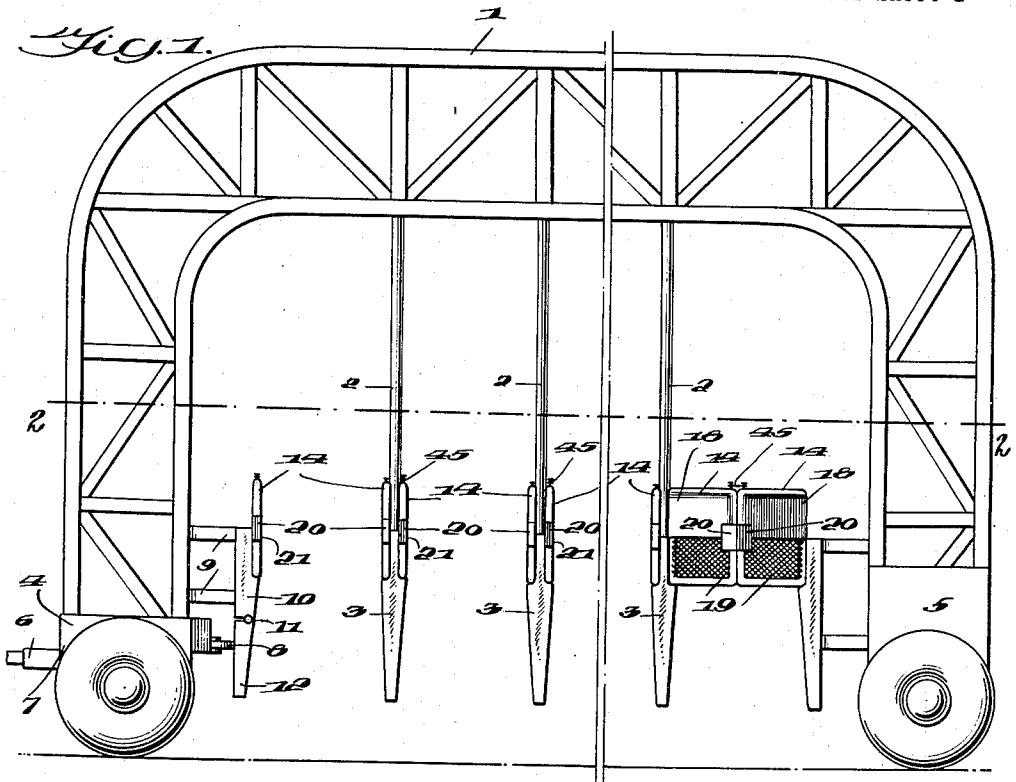


Fig. 2.

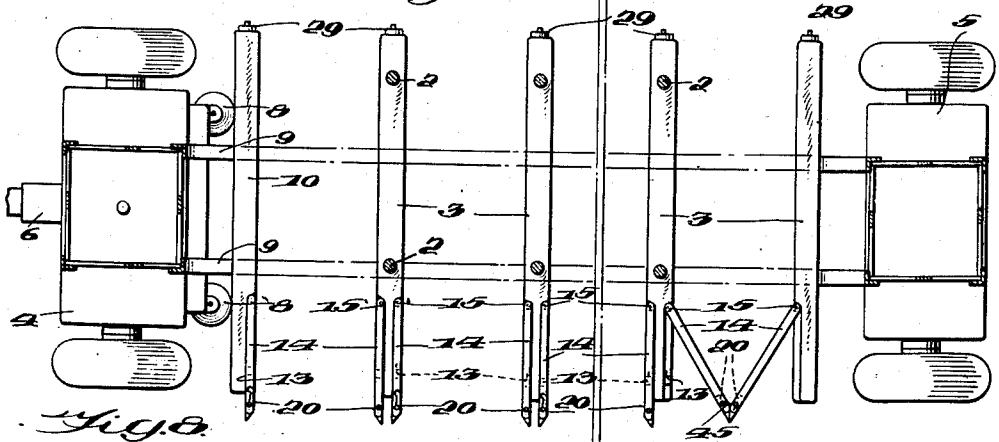


Fig. 3.

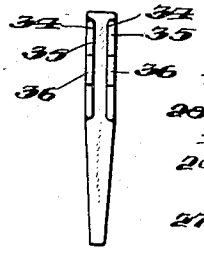
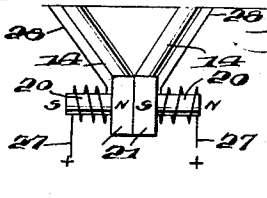


Fig. 6.



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DOOR FOR STARTING GATES

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Fig. 3.

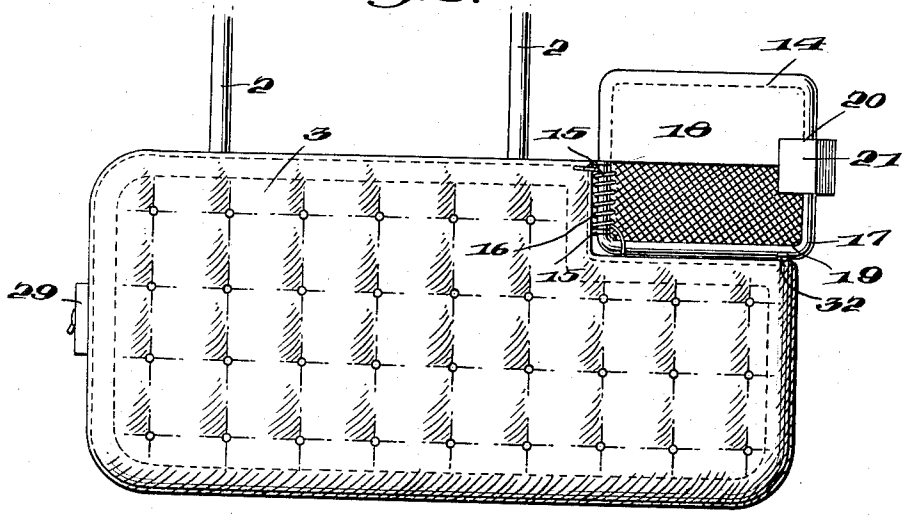


Fig. 5.

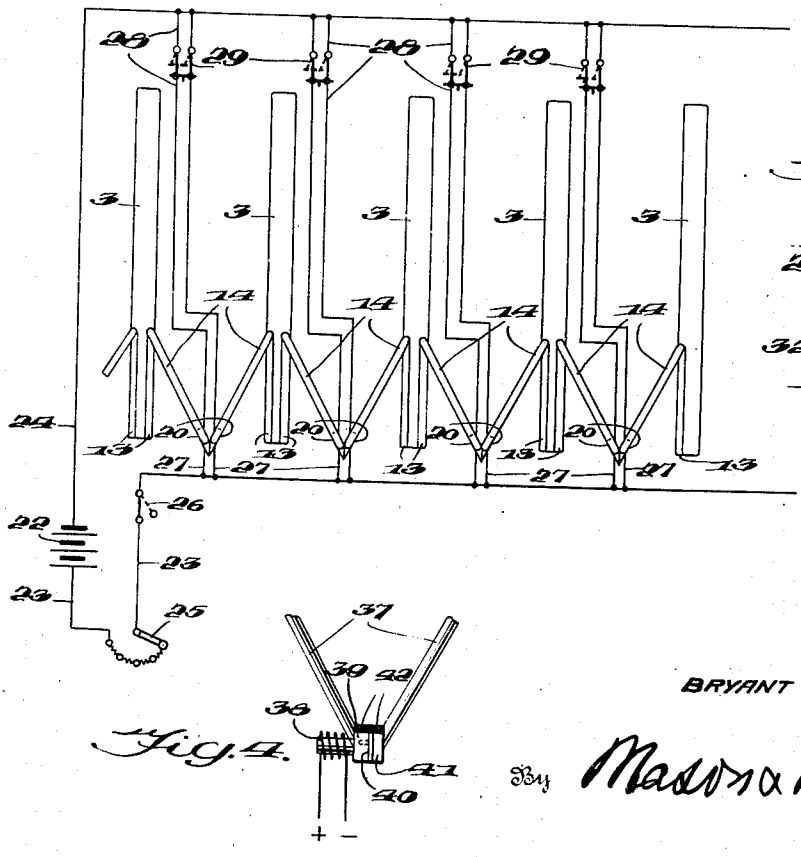


Fig. 7.

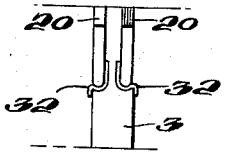


Fig. 4.

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Patented Mar. 12, 1940

2,193,257

UNITED STATES PATENT OFFICE

2,193,257

DOOR FOR STARTING GATES

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Application November 30, 1939, Serial No. 306,939

8 Claims. (Cl. 119—15.5)

This invention relates to doors for starting gates, preferably portable starting gates of the type used at race tracks to give the horses an even start at the beginning of a race.

This invention is characterized by the provision of positively actuated means for simultaneously opening all of the doors between the pairs of stall partitions, so that there will be an equal opportunity for each of the horses in the race.

Another object of the invention is to provide electro-magnetic means for retaining the doors in their closed position, and spring or other biasing means for simultaneously opening all of the doors, upon the de-magnetizing of the electro-magnetic means.

A further object of the invention is to provide electro-magnetic means for holding the doors between the partitions in closed position, so that they will be held in such position by magnetic attraction, and further, including means for increasing or decreasing the magnetic attraction of the magnets at will, so that the doors may be forced open upon the application of a given amount of force, even though the magnets of each of the doors are energized at the time. Provision is thus made to allow a particularly fractious horse to break through, without causing damage to the gate or to other horses in the race.

Other objects will appear hereinafter throughout the specification.

In the drawings—

Figure 1 is a side elevational diagrammatic showing of a starting gate, partly broken away, disclosing an embodiment of my invention attached thereto.

Figure 2 is a horizontal section of the structure shown in Figure 1 taken on the line 2—2 thereof.

Figure 3 is a detailed view of one of the stall partitions with an embodiment of my invention attached thereto.

Figure 4 is a diagrammatic view partly broken away of a pair of doors, employing the magnetic means of this invention, and showing a single electro-magnet.

Figure 5 is a wiring diagram disclosing the electric circuits, and showing also the partitions, doors extending therebetween, and electrical connections thereto.

Figure 6 is a detailed view of a pair of magnets, and showing the doors partly broken away.

Figure 7 is a fragmentary elevational view of the doors and stall partition, showing the spring latches.

Figure 8 is an end elevational view of a modified form of a stall partition of Figure 3.

Various types of barriers, and movable doors between the stall partitions of a starting gate have been proposed for simultaneously releasing all of the horses at the start of a race. The releasing means heretofore used for releasing barriers or doors has been generally accomplished by some mechanical means. It has also been proposed to release the doors by providing solenoid released doors, or solenoid controlled latches, which latter latch the dors in closed position. When an electrical circuit has been completed, said latches are withdrawn by solenoids from their keepers thus permitting the barrier or doors to open by spring or other biasing means. Such solenoid operated switches and releases, due to the fact that one or more mechanical parts are used to release the doors, fail on occasion to operate one or more of the switches or latches, thus preventing the release of one of the horses in time to start the race, and causing the elimination of that horse from the race. Release devices of this type are hence not entirely practical.

The construction hereinafter described while possessing all the advantages of prior door operating means, additionally provides for the positive release of the doors under all conditions of operation.

Referring to the drawings, and particularly to Figures 1 and 2 thereof, 1 indicates the overhead framework of a starting gate of conventional design which may be provided with a plurality of spaced supports 2 for the stall partitions 3.

The overhead framework is supported at its ends by trucks 4 and 5, and truck 4 may be provided with draft means 6. The forward and rear trucks 4 and 5 may be provided with a fifth wheel turning mechanism such as shown in Figures 4 and 5 of Mason Patent No. 2,103,968, granted December 28, 1937. In such instance the forward truck 4 has a lower swinging truck member 7 which has mounted thereon the rollers 8. Rigidly attached by blocks or members 9 to the upper truck member or to the overhead framework is an end stall partition 10 having a hinge 11. Pivotally mounted for swinging movement on this hinge is a lower portion or skirt 12, which is adapted to be operated to move out of the way of the ground engaging wheels and supporting axle, when the lower truck member is turned about the central pivot in the same manner as the partition shown in the above figures of the

Mason patent. These parts, however, form no part of the present invention.

Adjacent the upper forward end of each stall partition are one or more recesses 13 for the reception of the doors 14 when in their retracted positions. Each is mounted on a pivot 15 located within each of said recesses. Each of said doors is normally urged to its open position by a biasing spring 16. The doors may be constructed in any suitable material, but I prefer to construct the same to include a framework 17, generally rectangular in shape having its upper portion covered with opaque material in the form of a panel 18, which is preferably located almost directly in front, in a horizontal line, of the eyes of the horse as it stands behind the panel and between a pair of stall partitions 3 ready for the start of the race. The lower panel may be formed of wire netting such as illustrated at 19.

The numeral 20 designates an electro-magnet which is mounted adjacent to or extends slightly in front of the forward edge of each door 14. Each magnet is provided with a metallic plate or pole piece 21.

Referring particularly to Figure 5, 22 indicates a suitable source of power, which may be a battery or other source of direct current, but alternating current may be used when only one of a pair of doors is provided with an electromagnet. Lines 23 and 24 are connected to the source of power. Interposed in the line 23 is a rheostat 25 and switch 26, both of which are preferably mounted in a suitable position on the starting gate, or other location, accessible for operation by the starter. Electrical connections 27 are connected at their opposite ends to the line 23 and the electro-magnets 20. Line 24 is provided with electrical connections 28 leading therefrom to each of the electro-magnets. Each pair of electrical connections 28 may have interposed between the ends thereof a double throw switch indicated at 29. By means of this switch, the electrical connections to each pair of electro-magnets 20 may be disconnected manually at any time to permit the release of one pair of doors even though the other doors are held closed by the electro-magnets, assuming of course that the current is being fed to said magnets, the doors being in the position diagrammatically illustrated in Figure 5. Each switch 28 may be mounted in any suitable position, such as on the rear portion of each stall partition as shown in Figure 3.

It will be understood that prior to the start of each race, switches 26 and 29 are closed, and each pair of doors is closed. The rheostat 25 has also been adjusted to cause the necessary amount of current to flow into the electro-magnets 20. A latch such as shown at 45 in Figures 1 and 2 may be used to hold each pair of doors in closed position, prior to the time the switch 26 is closed, but such latch should be released as soon as the switch 26 is closed, otherwise the doors when latched would not open when the circuit 23—24 is opened by operation of switch 26. In this position with each pair of doors closed and held in this position by the magnets 13 (and with all mechanical latches 45 when used, in released position), the magnetic attraction of each electro-magnet of each pair of doors for the other magnet of said pair will be such as to hold said doors firmly closed against the action of the springs 16. Each spring 16 is biased to open its door and hold said door in the position shown at the left hand side of Figures 1 and 2. The amount of magnetic attraction of each electro-magnet for its companion magnet may be regulated by adjusting the rheostat 25. In this manner the doors may be held closed as indicated in Figure 5 when the current is flowing through circuit 23—24. However, should one of the horses at the starting gate become unusually fractious, he may cause a pair of doors 14 to open upon applying a given amount of pressure to these doors. The amount of pressure necessary to open the doors may be governed by adjusting the rheostat 25. It is within the scope of the present invention to substitute a rheostat for each switch 29, thereby providing for the adjustment of the attractive force of each pair of magnets, to separately regulate the amount of pressure necessary to open a given pair of doors when held together by the energized electro-magnets. Assuming that each pair of doors are closed and are held in closed position by each pair of electro-magnets, when the starter is ready to start the race, he opens the switch 26 which breaks the current in the circuit 23—24, simultaneously de-magnetizing all of the electro-magnets and permitting each spring 16 to snap each door 14 to its open position as shown at left in Figures 1 and 2. Each door is automatically latched in its open position by suitable latches indicated by numeral 32.

It will therefore be fully understood that once the current has been disconnected from the source 22, by operation of the starter's switch 26, the immediate effect is to cause each of the doors to spring open and remain open due to the action of the latches 32 and springs 16.

Failure of one or more of the doors to open at the start of a race and the leaving at the post of one or more of the horses is entirely obviated by the present invention, inasmuch as the doors are held closed by magnetic attraction only, no mechanical means being employed for this purpose whatever. All of the doors will be immediately opened by their springs at the instant the current is no longer fed to the electro-magnets. Latches 45 may be dispensed with as their use is complementary only and not necessary to the operation of the electro-magnetic door retaining means.

It will be understood, of course, that instead of providing a pair of doors between each pair of stall partitions, a single door may be used. A single electro-magnet may be employed for each pair of doors instead of using a separate magnet on each door, and in such instance the source of current may be either D. C. or A. C.

Each magnet may have, as shown, a separate pair of connections from the lines 24, 25 so that each electro-magnet may be used by itself to hold the doors closed, if for any reason the opposite magnet should become demagnetized, because of a broken connection or for any other reason.

Prior to the starting of the horses, the doors 14 are closed by hand and held in closed position by the latches 45, or by the pairs of electro-magnets, 20, or the single electro-magnets 31, assuming, of course, that current is being fed to the electro-magnets when the doors are closed. The doors may also be held closed by both the electro-magnets and the latches, but in such case, care must be exercised to see that the latches are all released, and that the doors are held closed by the electromagnets alone. Said latches should be released before the horses are led into the stalls prior to the start of the race.

Figure 8 shows a diagrammatically modified construction of stall partition, the recess 34 of

which houses the entire door 35 therein, and 36 indicates the electro-magnets.

I have shown diagrammatically in Figure 4 a modified form of door retaining mechanism which employs only one electro-magnet for each pair of doors. In this construction, 37 indicates the pivoted doors which may have a similar mounting to the doors shown in Figures 1 and 2. 38 indicates the electro-magnet which is provided with a pole piece 39. 40 is a thin steel plate attached by a screw to the pole piece 39. 41 indicates a metal plate attached to the right hand door 37. 42 may be a strip of insulation for covering the pole piece, thin steel plate and metal plate 41. This insulation is for the purpose of protecting the nose of a horse from contact with the pole piece, thin steel plate and metal plate. The source of current may be either A. C. or D. C. The purpose of the thin steel plate 40 is to prevent remanent magnetism which may occur in the magnet 38 after the current has been cut off from holding the plate 41.

The occurrence of remanent magnetism is well known, and I may provide each of the magnets 20 with a similar plate if necessary to prevent remanent magnetism after the current has been disconnected.

Figure 6 is a detailed showing of one form of the electro-magnets, which have been diagrammatically illustrated in Figures 1, 2, 3 and 5.

It is to be understood that the drawings and specification are furnished for illustrative purposes only, the invention not being limited to the structure shown.

The devices of the present invention are adapted for installation on starting gates of all types, and may be embodied in the structure of gates when the same are constructed, or installed on a gate at any time during the life of the same.

It is to be understood that the device of the present invention may be used not only on gates for starting horses at a race track, but also for other courses, such as starting devices for dog races and other races where it is desired to release simultaneously the participants in a race.

The term "between" in the claims is to be construed so as to include a construction where the doors are in front of the stall partitions, or are partially in front of the same, as well as a construction where the doors are located directly exactly between said partitions.

The statement in the claims that the doors are pivotally mounted on substantially vertical axes on the said partitions, or similar language, is intended to include, and should therefore be construed to include a construction where the doors are mounted directly on the partitions, or a construction which includes doors mounted on the supports for the partitions.

I claim:

1. A door arrangement adapted to be assembled between the means defining the partitions of a starting gate comprising a pair of doors pivotally mounted in position between each pair of stall partitions, a pair of electro-magnets mounted on said pair of doors, an electrical circuit connected to said electro-magnets, a switch in said circuit whereby when said pair of doors is closed and said circuit is closed said magnets will be in juxtaposition to each other and will hold said doors in closed position by the magnetic attraction only of one magnet for the other magnet, and spring means for opening said doors whereby when said magnets are de-magnetized said doors will be opened by said spring means.

2. A door arrangement adapted to be assembled between the means defining the partitions of a starting gate comprising a pair of doors, each door being pivotally mounted on a substantially vertical axis in position between each pair of stall partitions, magnetic means mounted on said doors consisting of at least one electro-magnet for each pair of doors and magnetically attractive material on the other door, an electrical circuit connected to said electro-magnet, a switch in said circuit whereby when said pair of doors are closed and said circuit is closed the magnet on one door will be in juxtaposition to said magnetically attractive material on the other door and will hold said doors in closed position by magnetic attraction only, and spring means for opening said doors whereby when said magnet is demagnetized said doors will be opened by said spring means, and means in said circuit for regulating the amount of magnetic attraction of said magnet.

3. A door arrangement adapted to be assembled between the means defining the partitions of a starting gate comprising a pair of doors, each door being pivotally mounted on a substantially vertical axis in position between each pair of stall partitions, an electro-magnet on one door and a metallic plate on the other door of said pair of doors, an electrical circuit connected to said electro-magnet, a switch in said circuit whereby when said doors are closed and said circuit is closed said electro-magnet will be in juxtaposition to said plate and hold said doors in closed position by the magnetic attraction only of said magnet for said plate, and spring means for opening said doors whereby when said magnet is de-magnetized said doors will be opened by said spring means.

4. A door arrangement adapted to be assembled between the means defining the partitions of a starting gate comprising a pair of doors, each door being pivotally mounted on a substantially vertical axis in position between each pair of stall partitions, magnetic means on adjacent parts of both doors, an electrical circuit connected to at least one of said magnetic means, a switch in said circuit whereby when said doors are closed and said circuit is closed said magnetic means of one door will be in juxtaposition to the magnetic means of the other door, and hold said doors in closed position by the magnetic attraction only of the one for the other, and spring means for opening said doors whereby when said magnet is de-magnetized said doors will be opened by said spring means.

5. A starting gate including stall partitions and a pair of doors pivotally mounted in position between each pair of stall partitions, cooperating electro-magnetic means on said pair of doors, an electrical circuit connected to said magnetic means, a switch in said electrical circuit whereby when said doors are closed and said circuit is closed, said magnetic means will be in such relation to said doors as to hold said doors in closed position by the magnetic attraction only of said magnetic means, and spring means for opening said doors whereby when said magnetic means is de-magnetized said doors will be opened by said spring means, said magnetic means being so constructed and arranged that release of the doors will effect susbtantially horizontal arcuate movement of said magnetic means and its corresponding door.

6. A starting gate including stall partitions

and pairs of doors pivotally mounted in position between each pair of stall partitions, an electro-magnet mounted on each door at a point remote from the pivotal mounting of the same, an electrical circuit connected to each of said magnets, whereby when said doors are closed and said circuit is closed, said magnets of each pair of doors when closed will be in juxtaposition to each other and will hold said doors closed by the magnetic attraction only of the pairs of magnets which are in juxtaposition, and spring means for opening said doors whereby when said circuit is opened, said magnets will be de-energized and said doors will be opened by said spring means, said magnets being moved in the horizontal arcuate path of said doors during opening movement thereof, and a switch for opening and closing the circuit.

7. A starting gate including stall partitions and pairs of doors pivotally mounted in position between each pair of stall partitions and an electro-magnet mounted on one of each pair of doors, and magnetic material on the other door of each pair, said magnet being mounted at a point farthest away from the pivotal mounting of the door, and an electrical circuit connected to each of said magnets, whereby when said doors are closed and said circuit is closed, each door mounted magnet will be in juxtaposition to the said magnetic material on the other door of said pairs of doors, and will hold said doors closed by magnetic attraction only, and spring means for opening said doors, a switch in said circuit whereby when said switch is opened each magnet will be de-energized and said doors will be opened by said spring means, each magnet being moved in the horizontal arcuate path of its door during movement thereof.

8. A race track starting gate including stall partitions, doors pivotally mounted on substantially vertical axes on said partitions and adapted to extend between a pair of stall partitions, electro-magnetic means comprising cooperating parts, at least one part of which is mounted on one of said doors of each pair, said other cooperating part being of magnetic material and swingably mounted in juxtaposition to said door mounted part when said doors are in closed position, an electrical circuit connected to at least one of said parts, whereby said magnetic means when energized will hold said doors in closed position by the magnetic attraction only of one of said parts for the other part, and spring means for opening said doors when said magnetic means is de-energized, said circuit including a switch.

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