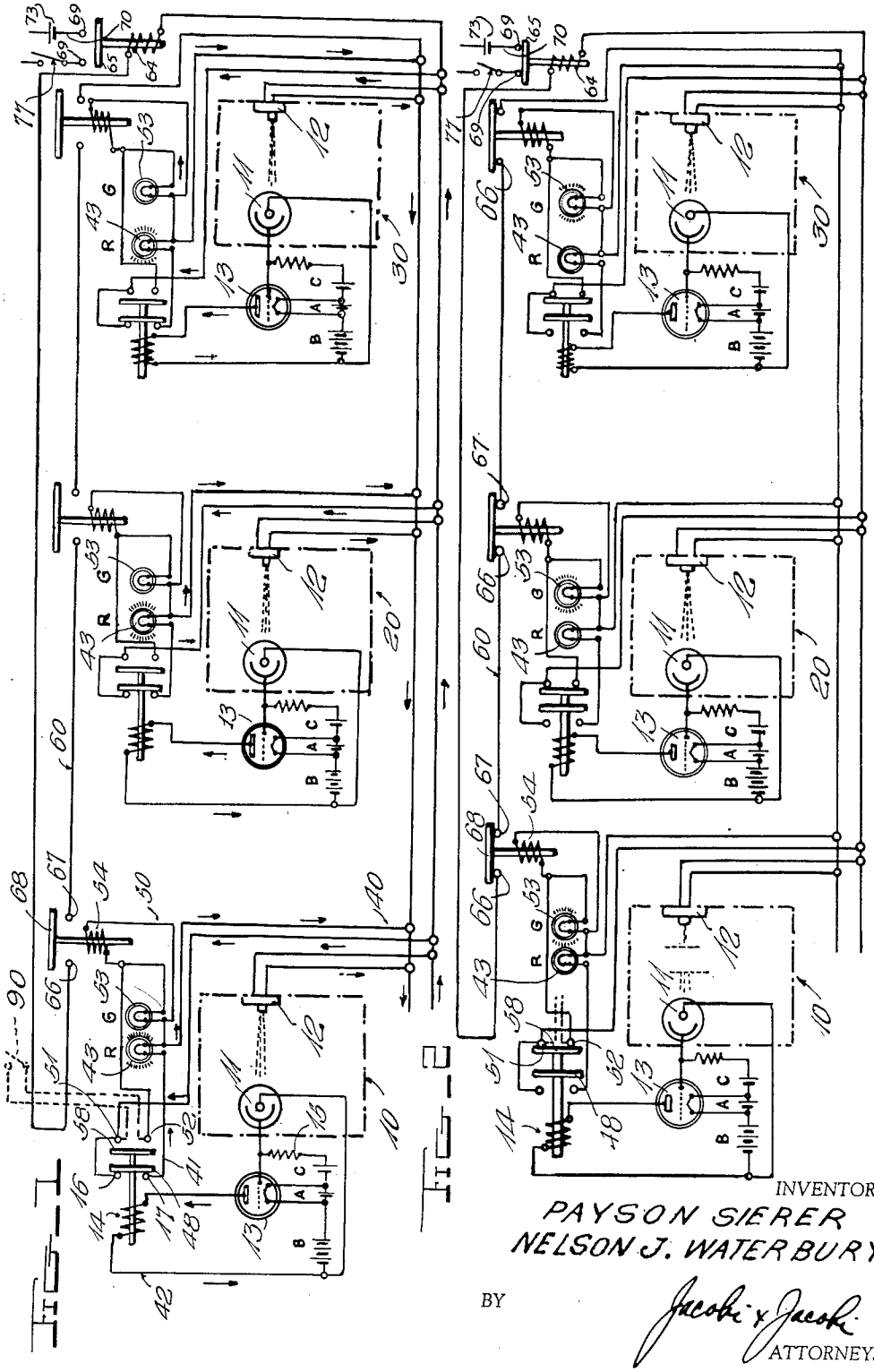
Dec. 29, 1953 P. SIERER ET AL 2,664,559

VISUALIZED RACE TRACK GATE CIRCUIT

Filed Jan. 31, 1951

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

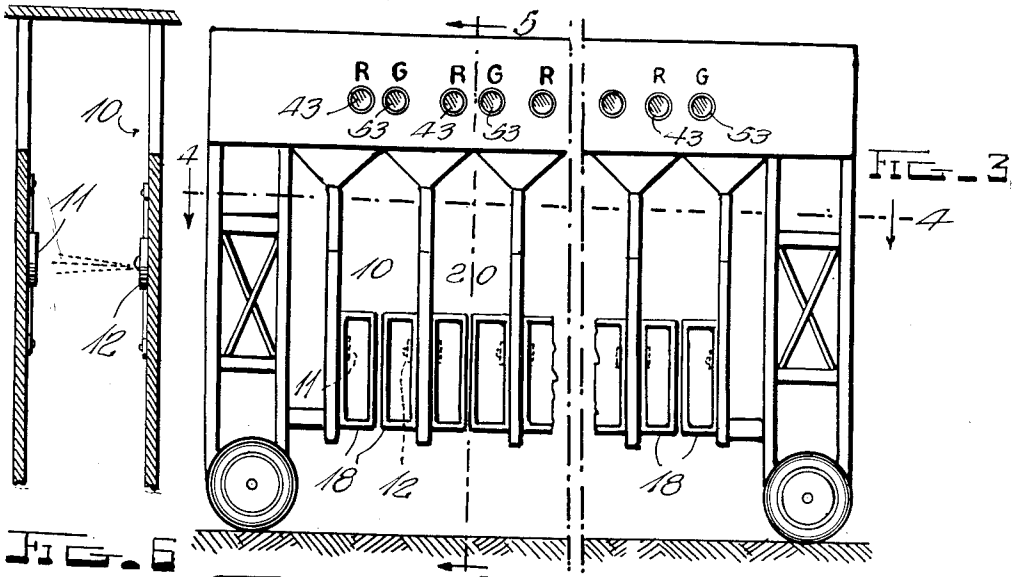

FIG. 3

FIG. 6

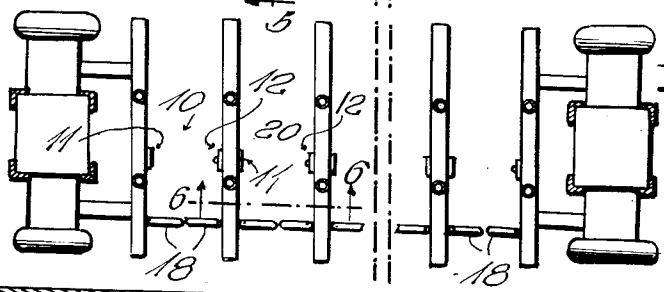

FIG. 4

FIG. 5

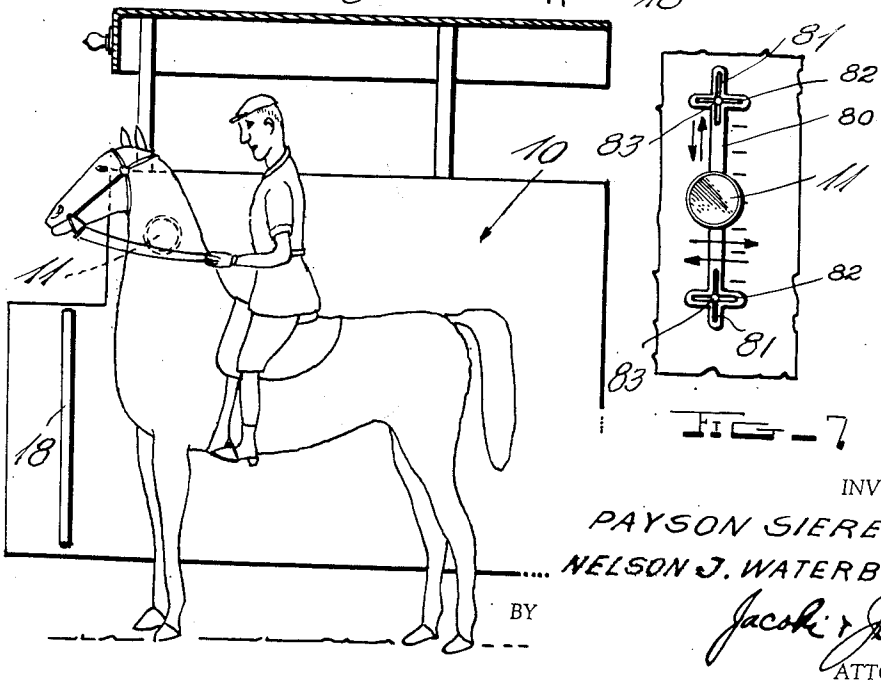

FIG. 7

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VISUALIZED RACE TRACK GATE CIRCUIT

Payson Sierer, Ozone Park, and Nelson J. Waterbury, New York, N. Y., assignors, by direct and mesne assignments, of thirty-five per cent to said Waterbury, twenty per cent to Peter Rotko, Jr., Yonkers, fifteen per cent to Hammond E. Fisher, New York, five per cent to Alfred R. Rich, New York, N. Y., five per cent to Gloria Hulin, Durham, N. C., five per cent to Ken Kling, New York, five per cent to Audrey Ritter, Richmond Hill, five per cent to Robert Winkler, Brooklyn, and five per cent to Gertrude Dorsey Campbell, New York, N. Y.

Application January 31, 1951, Serial No. 208,684

3 Claims. (Cl. 340—282)

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This invention relates to race track equipment and more particularly to the starting gates used on race tracks where contestants such as horses and other animals are employed in a competitive manner to determine their individual abilities to win a running contest. Such gates are mechanical contrivances placed at the starting post across a track to hold the animals in position and in line before starting. They are opened up when the starting gun is fired to enable all the contestants to begin the race simultaneously. The present gate structures while mechanically effective, depend on the human equation for their operation. The starter or starting official manipulates the mechanism when he believes the horses or other animals employed in the race are in line, and sends them off on their way around the track. Unfortunately individual horses or animals are apt to be temperamental and fractious. This is frequently exemplified at the moment of starting in many ways that render the beginning of the race very unsatisfactory. Thus one horse may decide to back out of the gate and start jumping and prancing about. Another will refuse to go into the stall selected for him in the gate. Others will proceed halfway and stop there, and so on.

During all these performances and the various antics of the horses, the starting steward frequently becomes confused and unable to determine whether the animals are properly lined up or not. It follows that he is compelled by the confusion, and the lack of capacity to form a definite timing of the actual lining up of the racers, to make a guess at the starting instant most appropriate. This guess may be an honest one or it may be otherwise, depending on the psychology of the starting steward. However, errors in judgment usually cannot be remedied, because the racers are on their way immediately afterwards, and everyone's interest becomes directed to the running of the race rather than to the matter of whether it was started rightly or wrongly. Thus in the majority of cases, the matter of the start is not questioned. If it is questioned, responsible officials are apt to raise the point, as to how it could be otherwise, at the present time. They do not deny that improvement in the method of starting is desirable, but do not visualize how it can be accomplished, therefore they do not insist upon a more positive system of starting the race at the right moment than is used on race tracks under present conditions.

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This invention provides a solution to the problem and avoids this lack of accuracy in the starting of animals, by providing an optical system for the determination of the lining up of the contestants by electrical means properly adapted to such purpose. The use of an electric eye or its equivalent is primarily employed to determine the instant of "lining up" and transmit the intelligence to a system of conspicuous signals observable by the starting official and the public. This is accomplished together with a simultaneous alignment of circuits that can be operated by him so he can note the fact and synchronize the manipulation of the gate opening mechanism.

The system offers automatic operation up to the point where the starter is positively assured that it is the proper instant to operate the switch or mechanism that opens the starting gate. At that moment he takes over the duty of actuating the gate.

It is an object of this invention to provide a new and improved race track gate circuit that will avoid some of the disadvantages and limitations of the prior art.

Another object of the invention is to provide a new and improved race track gate circuit that will permit the operation of a track gate at the exact moment of the alignment of the contestants.

A further object of this invention is to provide a new and improved race track gate circuit that will provide visual signals apparent to all, showing when the contestants are properly aligned and ready to start.

An additional object of the invention is to provide a new and improved race track gate circuit that will be put into operation automatically by the predetermined positioning of the contestants in the gate structure while at the same time providing a signal to publish the fact.

Still another object of this invention is to provide a new and improved race track gate circuit means that will employ an optical device for discerning the placement of the contestants in a predetermined alignment and thereby actuate a system of relays that will provide signals visible to onlookers and officials and initiate the automatic switching of the circuit so the track gate structure may be opened simultaneously at such alignment.

Other objects will become apparent as the invention is more fully outlined.

For a better comprehension of the invention, its objects, principles and operation, reference is

made to the accompanying drawings. These drawings in conjunction with the following description portray a particular form of the invention, by way of example, not of limitation, while the claims connected therewith emphasize the scope of the invention.

In the drawings:

Figure 1 is a diagram of a rack track gate circuit in open circuit arrangement when the gates are closed and embodying this invention;

Figure 2 is like Figure 1, with the same circuit closed, and the gates ready to be opened and the contestants started;

Figure 3 is a front elevation of the gate structure partly broken away to indicate its interior construction and arrangement of the invention therein;

Figure 4 is a transverse sectional view on line 4—4 of Figure 3;

Figure 5 is a vertical section of Figure 3, on line 5—5 thereof, with a horse contestant disposed in normal starting position therein;

Figure 6 is a vertical transverse section on line 6—6 of Figure 4, and

Figure 7 is a detail in elevation of an adjustable electric-eye holder used in this embodiment.

Similar reference characters refer to the same part throughout the drawings.

In Figure 1 is indicated the general layout of an electrical system embodying this invention as applied to a horse racing gate structure of conventional manufacture. It is of course to be understood that other racing gate structures usable for other animals, birds and human beings, as contestants, are within the meaning of the term, racing gate structures. The essential items of the system include a control circuit employing light or ultraviolet rays for the operation of a photoelectric cell; a triode tube whose grid is activated by this circuit and which in turn operates a relay switch for opening and closing an extraneous circuit having signals for the attention of those individuals interested in the time for starting a race so they will know definitely when the horses are positioned ready to start. The wiring of the cell and triode follows a conventional layout as indicated in Figures 1 and 2. These items are positioned in the stall or stalls of the gate structure, with the cell in one of the side walls and placed in the path of the beam from the light source located in the opposite wall. A horse properly located in the stall, will obstruct the beam thus interrupting the photoelectric cell circuit, and thereby actuating the relay system to energize the extraneous circuit which enables the starting gate to be actuated.

A control circuit for three stalls 10, 20, 30, is shown in Figs. 1 and 2 but it is understood that any desired number of stalls may be similarly equipped. The stalls and equipment in each are substantially similar. Thus the photoelectric cell 11 located in the stall 10 has its counterpart 11, in the stalls 20 and 30 respectively. Each cell 11 is controlled by the beam of light or rays from the light source 12 aligned with it on the opposite wall of the stall. The rays affect the cell so the grid of the triode vacuum tube 13 will be operatively influenced thereby.

The grid controls the flow of electrons from the cathode to the plate of the tube 13 in a conventional way so the current passing through the tube will operate the double pole double throw relay 14 and thereby control extraneous circuits 40 and 50. The circuit from the plate of the tube 13 and relay 14 is completed to the cathode in the usual manner with the relay 14 connected therein. The heater element in the tube is combined with the cathode and energized by the battery A. The batteries or sources of current B and C are included for their customary duties, and need not be explained further herein.

The other cells 11 are similarly used in connection with the light sources 12 in the stalls 20 and 30 respectively, together with the relays 14 and the circuit 40. The grid, anode and cathode in each tube 13 have similar functions to those described above. The resistances 15, provide the necessary grid bias to the tube 13, to make the latter function effectively. Each cell 11 and the relay 14 controlled thereby functions independently. With the light beam from the source 12 uninterrupted the contacts 16 and 17 of the relay 14 are normally closed by the movable contact 48 thus energizing the red signal lamp 43.

When the relay 14 is actuated by interruption of the beam of light directed at the cell 11 by an object such as a horse, a second movable contact 58 connects the contacts 51, 52 to energize the green signal lamp 53 and to actuate a secondary relay 54. At the same time the red signal lamp 43 is deenergized.

When the relay 54 at stall 10 is energized through the circuit 50 the movable contact 68 engages the contacts 66, 67 to close the portion of the secondary circuit 60 associated with the stall 10. When all the relays 54 associated with the stalls 10, 20, 30 are energized the complete secondary circuit 60 is closed and energizes a primary relay 64. Upon operation of relay 64 the movable contact 65 engages fixed contacts 69 thus closing primary circuit 70. This permits control of the primary circuit 70 by the manual switch 77 which is normally held in the hand of the starting official. Closing of the switch 77 energizes the motors used for opening the doors 18 of the stalls so the horses therein can proceed on their way for the race. This will happen only if all the green lights 53 are lit and the secondary relays 54 have closed their contacts to complete the secondary circuit 60.

If desired the manual switch 77 may be closed or omitted and the primary circuit 70 opened and closed by operation of the primary relay 64. This will result in full automatic control of the primary circuit 70 and the gate operating mechanism associated therewith.

Summing up the operation of the arrangement described above. The horses are led to the stalls, all of which have their individual red signals 43 illuminated, since the light beam to the electric eye 11 controlling each signal is unobstructed and the contacts 16 and 17 of relays 14 are closed.

The circuit 50, at this time is not activated since the contacts 51 and 52 are open. This prevents the green signals from operating.

As the individual horse enters its own stall, and moves to the position indicated in Fig. 5, his body interrupts the light beam, and thereby operates the relay 14 to open the contacts 16, 17, and close the contacts 51, 52 which energizes the circuit 50. The circuit 50 on being closed by the movable contact 58 illuminates the green signal and energizes the secondary relay 54. When the secondary relay 54 is energized the movable contact 68 engages contacts 66, 67 which close that portion of secondary circuit 60. When all of the secondary relays 54 in the secondary circuit 60 are closed and the green signals 53 lighted the secondary circuit is completed and primary

relay 64 operates. The primary relay 64 closes the primary circuit 70 by bringing the movable contact 65 into engagement with the contacts 69 so that when the switch 77 is closed, it will complete the primary circuit and energize the motors to open the doors 18.

The starting steward cannot close the primary circuit 70 and open the doors 18, until all of the secondary relays 54 close the secondary circuit 60 and all of the green signals 53 are illuminated. This is automatically arranged when all the horses are properly lined up in the stalls, and not before. If there are less horses than stalls, the empty stall is put out of commission and ineffective in its action, by bridging the associated contacts 66, 67 with a suitable conducting link, or by using an extra bridging switch 90.

The electric eye unit 11, and the light source 12 are attached to holders 80 that permit vertical and horizontal adjustment, after installation on the wall of the stalls. The purpose of this is to provide for their adjustment to suit animals of different sizes that will be put in the stalls. The holders have vertical slots 81 and horizontal slots 82 through which bolts 83 extend to hold them in place.

The arrangement is particularly desirable for use at up-to-date race tracks, as it eliminates errors induced by human frailty and wrong impressions created by the actions of the horses in the stalls before starting. The public are kept informed as to the time of lining up and is assured that a wrong or erratic start will be avoided. The devices are simple, require little skill for their installations and the cost of maintenance can be kept low.

While but one form of the invention is illustrated in this application, it is not intended to limit its application to such a specific form as it is appreciated that other constructions could be designed and made that would employ the same principles and come within the scope of the appended claims.

Having thus described the invention what is claimed is:

1. A system for controlling the operation of visual signals and the operation of electrically controlled mechanism comprising a primary control circuit for said mechanism, a normally open primary relay in said primary control circuit, a manually operated switch in said primary control circuit, a secondary circuit for operating said primary relay, a plurality of stations, a normally open secondary relay for each station in said secondary circuit, a red and a green signal for each station, a double pole double throw relay for each station, one pair of contacts of said last named relay being normally closed and connected to said red signal for that station for illuminating the same, the second pair of contacts of said last named relay being normally open and connected to said green signal and said secondary relay for that station, a light source at each station, a photoelectric cell at each station disposed in the path of a light beam emanating from said light source, a vacuum tube control circuit connecting said photoelectric cell and said double pole double throw relay whereby upon interruption of said light beam by an object at one station the corresponding double pole double throw relay will be operated to open said one pair of contacts and close said second pair of contacts to extinguish said red signal and illuminate said green signal and operate the associated secondary relay to close that portion of said secondary circuit and upon interruption of the light beams at all of said stations by objects all of said red signals will be extinguished and said green signals illuminated and all of said secondary relays will operate to close said secondary circuit and operate said primary relay to close the same and condition said primary circuit for control of said mechanism by said manually operated switch and upon removal of said objects said system will automatically return to original condition with said primary circuit open, said green signals extinguished and said red signals illuminated.

2. A system for controlling the operation of visual signals and the operation of electrically controlled mechanism comprising a primary control circuit for said mechanism, a normally open primary relay in said primary control circuit, a secondary circuit for operating said primary relay, a plurality of stations, a normally open secondary relay for each station in said secondary circuit, a red and a green visual signal for each station, a double pole double throw relay for each station, one pair of contacts of said last named relay being normally closed and connected to said red signal for that station for illuminating the same, the second pair of contacts of said last named relay being normally open and connected to said green signal and said secondary relay for that station, a light source at each station, a photoelectric cell at each station disposed in the path of a light beam emanating from said light source, a vacuum tube control circuit connecting said photoelectric cell and said double pole double throw relay whereby upon interruption of said light beam by an object at one station the corresponding double pole double throw relay will be operated to open said one pair of contacts and close said second pair of contacts to extinguish said red signal and illuminate said green signal and operate the associated secondary relay to close that portion of said secondary circuit and upon interruption of the light beams at all of said stations by objects all of said red signals will be extinguished and said green signals illuminated and all of said secondary relays will operate to close said secondary circuit and operate said primary relay to close the same and thereby close said primary circuit to operate said mechanism and upon removal of said objects said system will automatically return to original condition with said primary circuit open, said green signals extinguished and said red signals illuminated.

3. A system for controlling the operation of visual signals and the operation of electrically controlled mechanism comprising a primary control circuit for said mechanism, a normally open primary relay in said primary control circuit, a secondary circuit for operating said primary relay, a plurality of stations, a normally open secondary relay for each station in said secondary circuit, a first and second visual signal for each station, a double pole double throw relay for each station, one pair of contacts of said last named relay being normally closed and connected to a first signal for that station for illuminating the same, the second pair of contacts of said last named relay being normally open and connected to the second signal and said secondary relay for that station, a light source at each station, a photoelectric cell at each station disposed in the path of a light beam emanating from said light source, a vacuum tube control circuit connecting said photoelectric cell and said double pole double throw relay whereby upon

interruption of said light beam by an object at one station the corresponding double pole double throw relay will be operated to open said one pair of contacts and close said second pair of contacts to extinguish said first signal and illuminate said second signal and operate the associated secondary relay to close that portion of said secondary circuit and upon interruption of the light beams at all of said stations by objects all of said first signals will be extinguished and said second signals illuminated and all of said secondary relays will operate to close said secondary circuit and operate said primary relay to close the same and thereby close said primary circuit to operate said mechanism and upon removal of said objects said system will automatically return to original condition with said primary circuit

open, said second signals extinguished and said first signals illuminated.

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