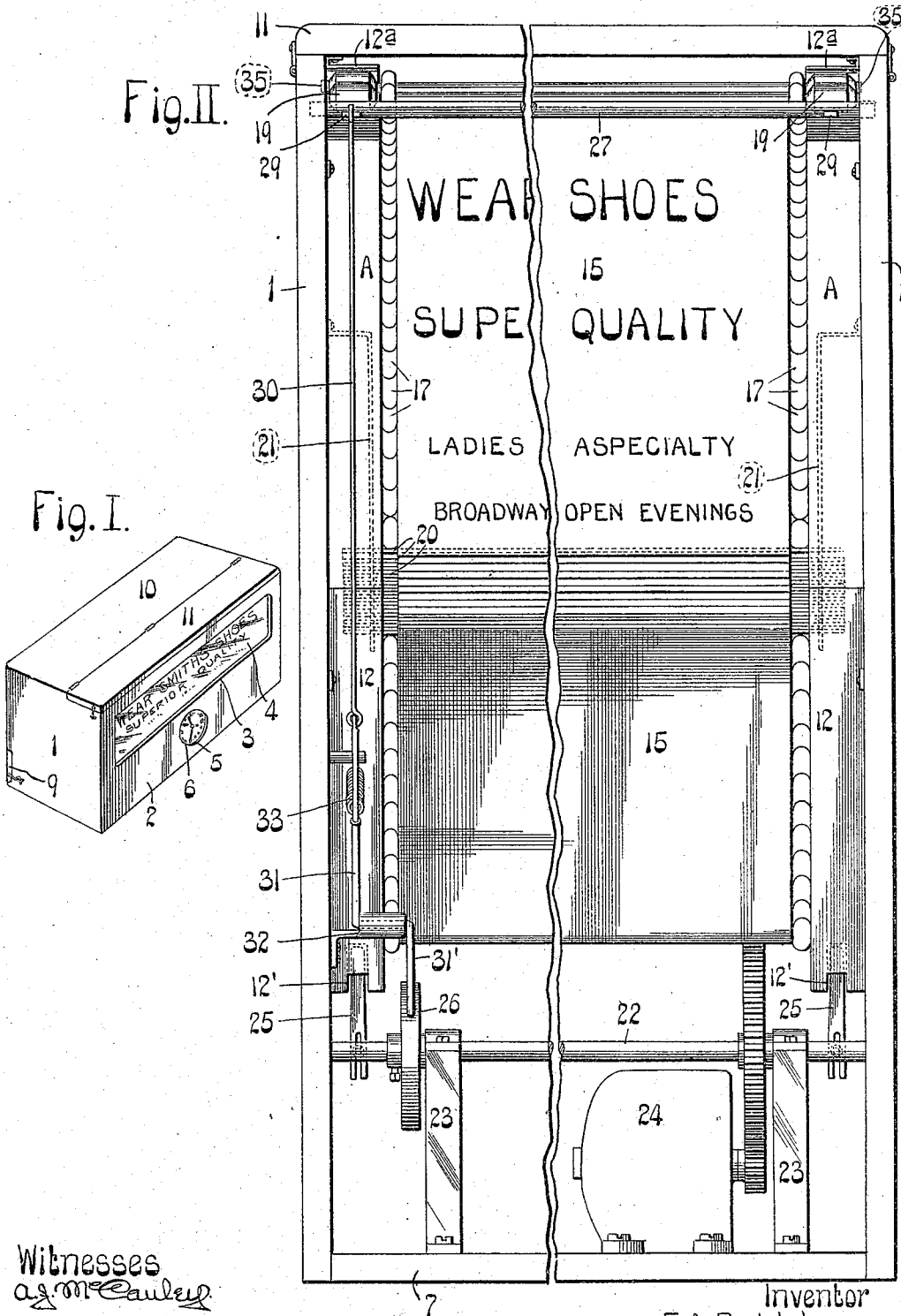


F. A. RUDOLPH.
 REPEATING MECHANICAL SIGN APPARATUS.
 APPLICATION FILED JULY 27, 1908.

939,550.

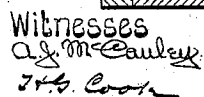
Patented Nov. 9, 1909.

3 SHEETS—SHEET 1.



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3 SHEETS—SHEET 2.



Inventor:
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by *Geo. W. King* for Atty.

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Fig. IV.

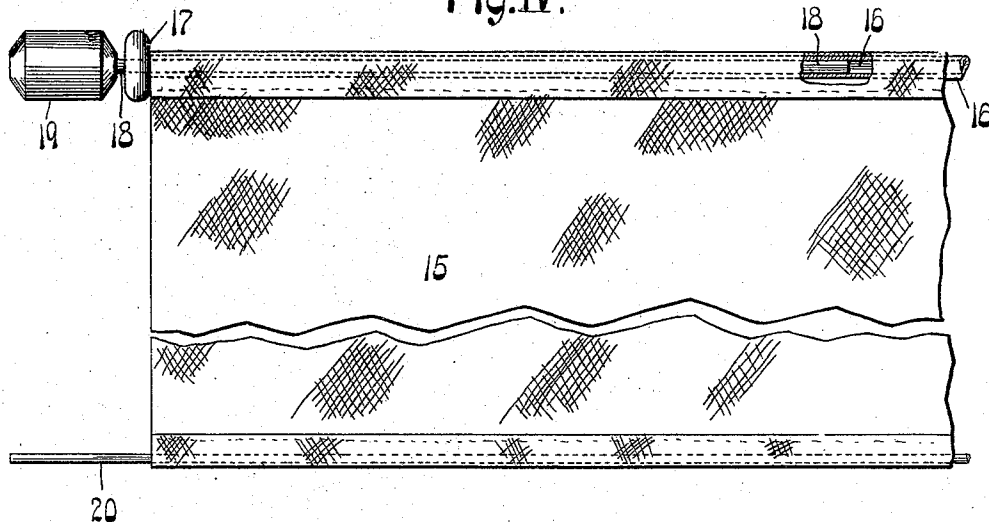


Fig. V.

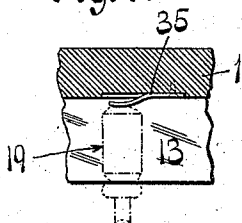
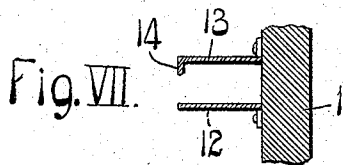
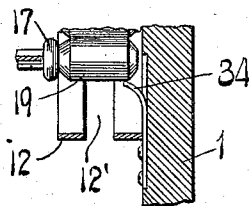


Fig. VI.



Witnesses
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UNITED STATES PATENT OFFICE.

FLAVEL A. RUDOLPH, OF MAPLEWOOD, MISSOURI.

REPEATING MECHANICAL SIGN APPARATUS.

939,550.

Specification of Letters Patent.

Patented Nov. 9, 1909.

Application filed July 27, 1908. Serial No. 445,504.

To all whom it may concern:

Be it known that I, FLAVEL A. RUDOLPH, a citizen of the United States of America, residing in Maplewood, in the county of St. Louis and State of Missouri, have invented certain new and useful Improvements in Repeating Mechanical Sign Apparatus, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

My invention relates to a mechanical sign apparatus whereby a plurality of signs may be displayed in rotation and repeatedly during the operation of the apparatus, the apparatus being so constructed as to permit of the signs being replaced from time to time by other signs.

Figure I is a perspective view of my sign apparatus viewed from the exterior thereof. Fig. II is a front elevation of the apparatus with the front wall of the casing omitted. Fig. III is a vertical cross section taken through the apparatus. Fig. IV is an elevation of one of the signs used in the apparatus, said sign being partially broken out. Figs. V, VI and VII are enlarged sections taken on lines V—V, VI—VI, and VII—VII, Fig. III.

In the accompanying drawings: 1 designates the side walls of the casing in which the operating mechanism of my apparatus is housed.

2 is the front wall of the casing provided with a sight opening 3 that may contain a plate 4 of transparent material, such as glass, to afford a view of the signs which are brought into position back of said sight openings as will hereinafter appear. The front wall is also preferably provided with a sight opening 5 through which a clock 6 placed within the casing, may be viewed.

7 is the bottom of the casing and 8 is the rear wall provided with a door 9 that controls a doorway through which access may be gained to the lower portion of the casing.

10 is the top of the casing provided at its front with a doorway that is normally closed by a door 11 through which access to the forward upper corner of the interior of the casing may be gained.

A designates runways in the casing of the apparatus located at the sides thereof, that provides for the guidance of sign carriers, as will hereinafter appear. These runways, as seen most clearly in Fig. III, have a front

vertical portion located immediately back of the front wall 2 and the sight opening 3 therein, a downwardly and rearwardly extending portion leading from the lower end of the vertical portion toward the rear and lower corner of the casing and an upwardly and forwardly curved rear portion that extends from the lower termination of the last named portion to a point above the upper ends of the forward vertical portion of the runways. The upper ends of the forward vertical portions of the runways are separated from the forward and upper ends of the rear portion of the runways to provide a gap through which the signs may be introduced into the runways when the door 11 of the casing is opened, as will hereinafter more fully appear. The runways A comprise an outer guide rail 12 and an inner guide rail 13 and one of these guide rails, for instance that 13, is provided throughout the vertical and rearwardly extending portions of the runways with a guard flange 14.

15 designates the signs used in my apparatus which are preferably made of some suitable flexible material, such as cloth or paper, and which are conducted through the apparatus by carriers to which the upper ends of the signs are affixed and which carriers are guided in their movement through the apparatus by the runways A. Each sign carrier comprises a tube 16, see Fig. IV, to which the sign is attached in a suitable manner, heads 17 at the ends of said tube, rods 18 slidably or telescopically fitted in the tube and rollers 19 upon said rods. The rollers 19 are adapted to operate in the runways A to make complete continuous circuits through said runways, whereby the sign carriers and signs in the apparatus are consecutively and repeatedly brought to a position back of the sight opening in the casing of the apparatus.

20 are hanger rods mounted in the free ends of the signs 15 and projecting outwardly from the side edges of said signs.

21 designates supporting rails located at the sides of and interior of the casing of the apparatus and which are adapted to receive the hanger rods for their support during the period in which the signs are being conducted rearwardly and again upwardly after they have been exposed to view at the front of the apparatus. The object in providing the supporting rails 21 and the hanger rods that are supported by said rails is to so support the free ends of the various signs that

they will be maintained in their proper positions relative to each other to move in exact rotation in their repeated returns to exposed positions at the front of the apparatus and with their sign bearing faces presented to said sight opening.

At the lower and rear corners of the runways A and in the outer guide rails 12 of said runways, which rails are lowermost at the points mentioned, are slots 12', see Figs. II and VI, that extend through both the downwardly and rearwardly extending portion of said rails and in the lower end of the rear portions of the rails. These slots are adapted to receive members as will hereinafter appear, by which the sign carriers are advanced or moved upwardly in the rear portions of the runways A.

22 designates an operating shaft that is journaled in suitable bearing supports 23 mounted upon the bottom 7 of the apparatus. This operating shaft may be driven by any suitable power, such as the motor shown at 24, Fig. II. The operating shaft has adjustably secured to it pusher or lift arms 25 that are adapted to operate through the slots 12' in the outer rails of the runways A and by pressure against the rollers of the sign carriers that are lowermost in the rear portions of said runways, cause all of the sign carriers present in said rear portion to be moved upwardly a single step at a time, in order that the sign carrier that is foremost at the upper end of the rear portions of the runways will be discharged through the front ends of said rear portions and into the gap in the runway at the upper and forward corner of the apparatus above the sight opening 3 in the front wall of the casing. The operating shaft is so driven as to provide for the operation of the pusher arms 25 upon the carriers after they descend through the forward portions of the runways, as will hereinafter appear, and at any desired predetermined intervals.

26 is a cam wheel or controller wheel which is preferably made with a mutilated rim and is fixed to the operating shaft 22 near one side of the apparatus.

27 designates a rock shaft extending transversely of the apparatus and located within the front and upper corner of the casing. This shaft is journaled in suitable brackets 28 secured to the side walls of the casing and it is located in front of the open forward or upper ends of the rear portions of the runways A.

29 are catcher arms fixed to the rock shaft 27 and adapted to be moved into and occupy positions in front of the forward ends of the rear portions of the runways A and above the open upper ends of the vertical front portions of said runways so that the rollers of the sign carriers may lodge upon said catcher arms as they are discharged through

the front ends of the rear portions of the runways and be temporarily supported above the vertical front portions of the runways.

The rock shaft 27 has fitted to it a connecting rod 30 that leads downwardly back of the front casing wall and is fitted at its lower end to a trip lever 31 that is journaled in a bracket 32 attached to the adjacent side wall of the casing. The trip lever 31 has connected to it a retracting spring 33 that has a normal tendency to actuate said trip lever in a manner to move the connecting rod 30 upwardly when the trip lever is free of restraint and to cause it to so rotate the rock shaft 27 as to move the catcher arms 29 downwardly within the open upper ends of the vertical portions of the runways A. The lower free arm 31' of the trip lever 31 extends to the perimeter of the controller wheel 26 and is adapted to operate upon the rim of this wheel and also to enter into the gap in the wheel at intervals for a purpose to be hereinafter made clear.

As the rollers of the various sign carriers are advanced in the rear portions of the runways A by the exertion of pressure thereupon through the medium of the pusher arms 25 against the lowermost carrier rollers, the rollers of the lowermost carriers are moved past retaining springs 34 that project into the lower ends of the rear portions of the runways from the side walls of the casing, see Figs. III and VI, and these retaining springs act to sustain the rollers and the sign carriers, of which said rollers constitute parts, from downward movement in order that the rollers of the next sign carrier may move into positions beneath the previously advanced rollers and at the bottoms of the rear portions of the runways A.

To provide against the sign carriers being delivered too rapidly through the forward and upper open ends of the rear portions of the runways and for the discharge of the sign carriers individually through the ends of the said portions of the runways, I attach to the side walls of the casing and within the forward ends of the rear portions of the runways spring brakes 35, see Figs. III and V, that serve to retard the forward movement of the rollers of the sign carrier next succeeding the one that is being discharged from the rear portions of the runways.

To provide for the ready removal and introduction of the signs and sign carriers into my apparatus through the doorway at the top of the casing normally closed by the door 11, I discontinue the outer rails 12 of the runways A back of the front ends of the rear portions of the runways as seen in Fig. III, and provide for the completion of the outer rail of said runways by rail sections 12^a that are carried by the door 11. These rail sections are moved with the door 11 when it is opened, thereby permitting ready access to

the front ends of the rear portion of the runway A to afford access to the runways for the introduction and removal of the sign carriers.

5 In the practical use of my sign apparatus, each sign when exposed to view is suspended back of the sight opening in the front of the casing by reason of the rollers 19 at the ends of the sign carriers resting upon the catcher arms 29 carried by the rock shaft 27. 10 Each sign remains so suspended during the period required for rotation of the controller wheel 26 to bring the gap in said wheel to the free end of the trip lever 31. When said gap reaches the free end of said trip lever 15 the trip lever is released and the retracting spring 33 exerts a pull upon said lever to move the connecting rod 30 upwardly and as a result the rock shaft 27 is rotated so 20 that the catcher arms 29 are lowered into the vertical front portions of the runways A and the sign carrier previously supported by said catcher arms descends through the front and rearward extending portions of the runways 25 to the lower ends of the portions of the runways during which period the free ends of the signs are supported by the hanger rails 21 that receive the rods 20 in the free ends of the sign. Immediately after the sign carrier 30 just referred to has descended as explained, the pusher arms 25 enter into the slots 12' of the outer runway rails and move the just previously descended sign carrier upwardly in the rear portions of the runways 35 and cause it, by pressure against the preceding carrier, to advance the entire number of carriers in the rear portions of the runways to a degree sufficient to discharge the rollers of the foremost carrier from the 40 forward ends of the rear portions of the runways and onto the catcher arms 29, it being understood that said catcher arms have been returned to horizontal positions, due to renewed actuation of the trip lever 31 by the controller wheel 26. The operations are continuously repeated throughout the period of 45 operation of the apparatus.

I have herein before stated that the rollers 19 of the sign carriers are carried by rods 50 18 that are slidably or telescopically fitted in the tubes 16 of the carriers. The object in so constructing the carriers is to provide for their self adjustment during their movements through the runways of the apparatus in order that should they become 55 canted they will resume their proper positions in the runways. The inner ends of the carrier rollers are prevented from escape from the forward portions of the runways while they are descending therethrough, due to the existence of the flanges 14 projecting from one runway rail toward the other runway rail. 60

I claim:

1. In a mechanical repeating sign apparatus, the combination of a casing, circuit runways in said casing, a plurality of sign carriers operable in said runways, signs carried by said carriers, means for imparting step 65 by step movements to said sign carriers, and means interior of the circuit of, and independent of, said runways for supporting the inner ends of said signs during the movements of the sign carriers through the lower portions of the runways, substantially as set 70 forth. 75

2. In a mechanical repeating sign apparatus, the combination of a casing, circuit runways in said casing, a plurality of sign carriers operable in said runways, signs carried 80 by said carriers, means at the bottoms of said runways for imparting movement to said sign carriers in upward and forward directions whereby said carriers are moved to the fronts and tops of the runways, and a member 85 having connection with said last named means whereby said sign carriers are temporarily arrested at the fronts and tops of the runways during the period that the signs are exposed to view, and previous to the descent of the carriers through normally unoccupied portions of the runways to the 90 aforesaid means for imparting movement thereto, substantially as set forth.

3. In a mechanical repeating sign apparatus, the combination of a casing, runways in 95 said casing, a plurality of sign carriers operable in said runways, signs carried by said carriers, an operating shaft, pusher arms carried by said shaft and arranged for engagement with said carriers, a controller 100 wheel carried by said shaft, a rock shaft having catcher arms to receive said carriers and operable in said runways, and means operable by said controller wheel whereby said 105 rock shaft is actuated to move said catcher arms into sign carrier receiving position, substantially as set forth.

4. In a mechanical repeating sign apparatus, the combination of a casing, runways 110 in said casing, a plurality of sign carriers operable in said runways, signs carried by said carriers, an operating shaft, pusher arms carried by said shaft and arranged for engagement with said carriers, a controller 115 wheel carried by said shaft, a rock shaft having catcher arms to receive said carriers operable in said runways, and spring governed means operable by said controller wheel whereby said rock shaft is actuated to 120 move said catcher arms into sign carrier receiving position, substantially as set forth.

FLAVEL A. RUDOLPH.

In the presence of—

H. G. COOK,
BLANCHE HOGAN.