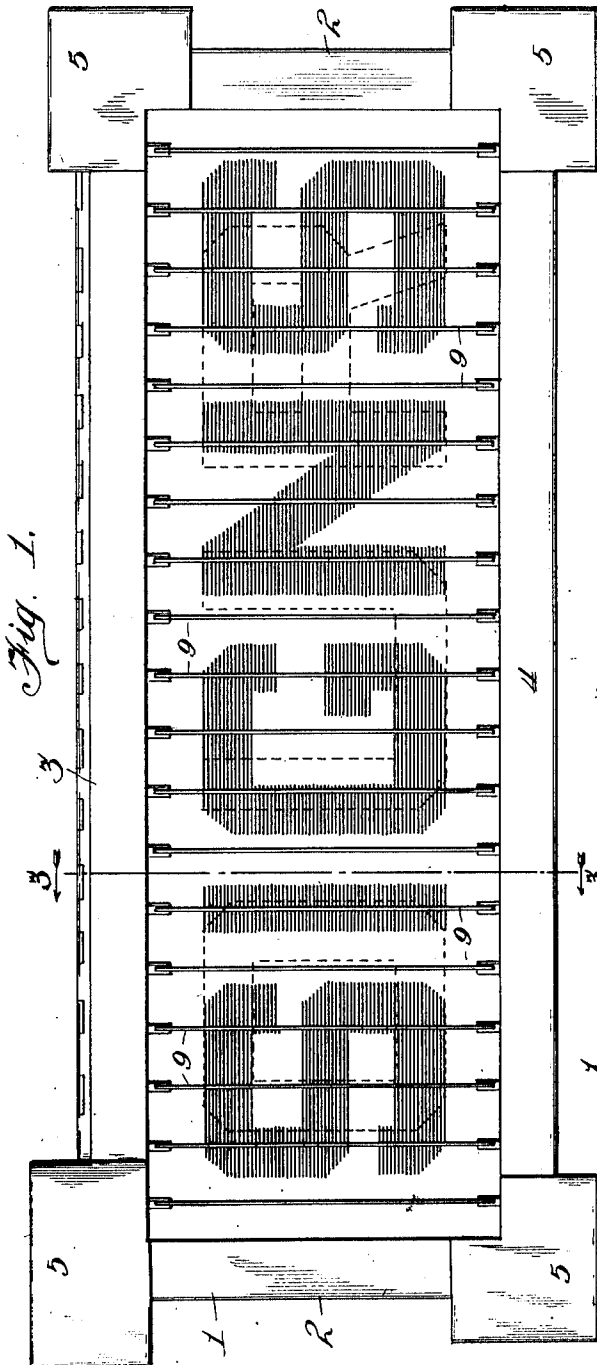


M. J. DONER.
 AUTOMATIC SIGN.
 APPLICATION FILED NOV. 2, 1908.

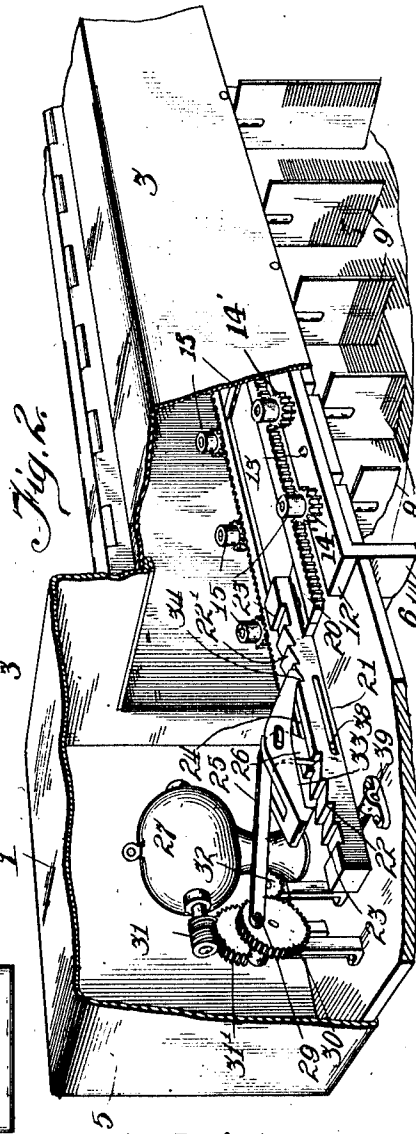
1,019,770.

Patented Mar. 12, 1912.

2 SHEETS—SHEET 1.



Witnesses
 Milton Senior
 Emilie Rose.



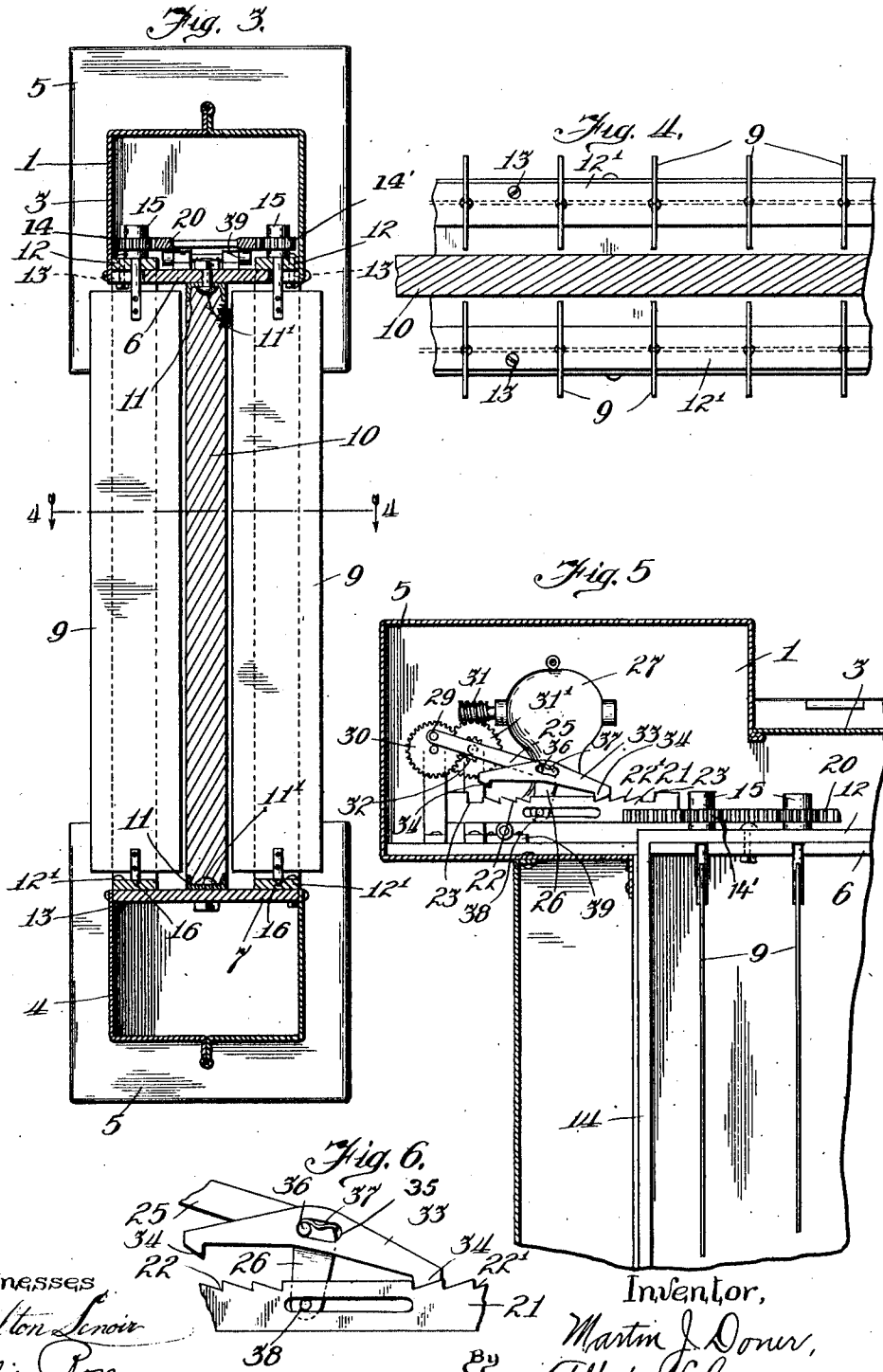
Inventor,
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2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

MARTIN J. DONER, OF CHICAGO, ILLINOIS, ASSIGNOR OF ONE-HALF TO H. A. PETERS, OF CHICAGO, ILLINOIS.

AUTOMATIC SIGN.

1,019,770.

Specification of Letters Patent.

Patented Mar. 12, 1912.

Application filed November 2, 1908. Serial No. 460,641.

To all whom it may concern:

Be it known that I, MARTIN J. DONER, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Automatic Signs, of which the following is a specification.

This invention relates to improvements in automatic signs, and has among its salient objects to provide a construction in which a plurality of signs carrying a number of different advertisements may be successively displayed upon a single frame, and in which the operation may be automatically carried on for an indefinite period; to provide in a construction of the character referred to, novel step-by-step mechanism for automatically shifting the various signs into and out of position; to provide novel means for automatically reversing the direction of movement of the step-up mechanism; to provide a construction in which the sign shifting or changing mechanism is directly connected to the driving shaft of an electric motor; to provide a novel construction of the sign-board or frame itself whereby a maximum number of advertisements may be placed upon a single frame and in which the advertisements may be readily changed without disturbing the operating mechanism; to provide a construction in which the operating mechanism may be entirely inclosed in a suitable casing which also serves as a frame work for the device as a whole; to provide a construction which is devoid of complex or delicate mechanism and which can be readily adapted for use with electric illumination if so desired; and in general to provide an improved construction of the character referred to.

The invention consists in the matters hereinafter described and more particularly pointed out in the appended claims.

Referring to the drawings, Figure 1 shows a side elevation of the device, the slats of the sign being shown in closed position. Fig. 2 is a fragmentary perspective view of the upper part of the device showing more particularly the sign shifting mechanism. Fig. 3 is an enlarged vertical sectional view taken on lines 3—3 of Fig. 1. Fig. 4 is a fragmentary horizontal sectional view of the signboard. Fig. 5 is a fragmentary vertical sectional view of the device and showing more particularly the actuating mecha-

nism. Fig. 6 is a fragmentary side elevation of the reversing pawl and rack bar.

In the drawings 1 designates as a whole a hollow sheet metal casing comprising vertical end members 2, horizontally extending side frame members 3 and 4 respectively and enlarged corner portions 5 projecting over the ends of the frame as shown and serving to strengthen the former. The inner faces of the horizontally extending members 3 and 4 are closed by means of plates 6 and 7 respectively which serve as base supports for the operating mechanism hereinafter described. The ends of the upper member 6 extend into the enlarged corner portions 5 forming the floor of the latter as shown more clearly in Fig. 2.

The upper and lower supporting strips 6 and 7 are mounted upon the edges of a board or board like support 10 the side faces of which constitute the sign boards as will hereinafter appear. As a preferred construction the channel irons 11 are secured to each edge of the board 10 and the base supports secured to the channel iron by bolts 11' as indicated clearly in Fig. 3. At each side of this board 10 is detachably mounted a series of rotatable slats 9, likewise adapted to receive advertisements on their faces. In order that each set of slats may be removed independently of the other, the several members of each row have their trunnions engaged with supporting bars 12, 12' and these supporting bars are detachably secured to the respective plate members 6 and 7 by bolts as indicated at 13. The ends of the supporting members 12, 12' are connected by means of bars 14 (see Fig. 5) so that each set of slats and supports is removable in the form of a rectangular frame. The upper trunnions of the slats extend through and are journaled in the supporting plate 12 as shown clearly in Fig. 3. Each trunnion is provided with a pinion 14', non-rotatably fixed thereon, and confined in position by an end cap 15. The upper supporting member 6 is slotted from each trunnion laterally outward so that the set of slats may be disengaged therefrom. The trunnions at the lower ends of the slats are seated in bearing recesses 16 forming step bearings.

The sets of slats are moved step by step, so as to perform exactly one-half revolution and back, each half revolution and back be-

ing accomplished in four steps. To impart this movement to the slats, mechanism is provided as follows: Upon the base support 6 is mounted to reciprocate in suitable guides, a duplex rack-bar 20, provided at its laterally outer edges with rack-teeth which engage with the respective series of pinions of the slats. With one end of the rack-bar is connected a ratchet block 21 provided with two sets of oppositely disposed ratchet teeth, as 22 and 22'; each series of teeth comprising four corresponding to the several steps of movement in each direction. A short distance beyond the outermost tooth of each series is formed a stop shoulder 23 which coöperates with a reversing pawl, as hereinafter described. Between the respective sets of ratchet teeth a groove 24 is provided in the face of the block, which groove is adapted to receive and guide a downturned end or head 26 of an actuating pitman 25. The pitman 25 is at its opposite end connected with a wrist-pin 29 upon a gear 30 forming one member of a train of gears actuated in the present instance by an electric motor 27. The driving train referred to comprises a worm-gear 31 mounted directly upon the shaft of the motor armature, an intermediate worm-gear 31', a pinion 32 fast with the worm-gear, and the gear 30 hereinbefore referred to, which connects with the pitman.

Upon the head of the pitman is mounted a reversing pawl, designated as a whole 33. This pawl is a bent member provided at each end with pawl-hooks, as 34, 34, and has a slot-and-pin connection with the pitman head, being to this end provided with a centrally located longitudinally extending slot 35 engaged with a pin 36 carried by the upper part of the head of the pitman. Within the slot 35 is arranged a bow-spring 37 which projects into the central portion of the slot in such manner as to tend to hold the supporting pin 36 in whichever end of the slot it happens to rest until the pawl is shifted positively by engaging with one end or the other against the corresponding one of the stop shoulders 23 hereinbefore referred to. In order to lessen the friction and mechanical power required to actuate the rack-bar, I prefer to mount the latter to roll back and forth upon anti-friction bearings, as indicated at 39. Inasmuch as the reversing pawl is symmetrical in construction, and the slot 35 thereof centrally located, it will be obvious that whenever the pin 36 is in one end of the slot the opposite end of the pawl will overweight the other and descend by gravity into engagement with the corresponding set of ratchet teeth. Accordingly the pawl will step the rack-bar in one direction four steps, but upon commencement of the fifth step the then lower end of the pawl will engage the corresponding stop shoulder,

shift the pawl into its reverse position, whereupon the succeeding revolutions will step the rack-bar in the opposite direction four steps. In order to confine the pitman member in proper engagement with the groove in which it slides, the latter is desirably made of inverted T-shape in cross section and a guide-pin 38 inserted through the engaging end of the pitman head and arranged to engage the undercut portions of the groove.

Upon the outer faces of each side of the fixed division board 10 are painted or otherwise placed any suitable signs which will be fully displayed when the slats are standing with their edges at right angles to the plane of said surfaces and the observer is approximately opposite either side of the sign. When the slats are oscillated into oblique angles with relation to the stationary signboard and the observer is approaching, *i. e.* stands at an angle approximately coincident to the oblique angles of the slats, he can then also see the stationary sign.

In addition to the fixed signs thus provided, each slat is provided upon each of its faces with a fragmentary portion of a sign, so that when all of the slats are in the same plane with one face out, a given sign will be displayed which will ordinarily, of course, be different from that then concealed on the fixed signboard, and upon the opposite faces of the same slats is painted or otherwise provided a different sign, so that when the slats are turned and again brought into the same plane with their opposite sides out another sign will be displayed. Obviously when an observer is standing in a position at an oblique angle to the sign mechanism, and the slats are turned so as to stand approximately at right angles to his line of view, the slats will appear to form a continuous surface and the sign will be readable substantially the same as though it stood at right angles to the main signboard and the observer stood directly in front of the sign. It will be obvious, therefore, that the sign not only is continually changed as viewed by the observer from any given point but also that all three of the signs on either side of the mechanism will be successively exposed to view to an observer located anywhere so that he can see the side of the sign.

The provision which enables the sets of slats to be detached insets is of importance, since it enables duplicate sets of slats to be provided, and while one complement of slats is in operation another complement may be in course of being re-painted with new signs.

I claim as my invention:

1. In a changeable sign, the combination with a frame member, of a plurality of slats rotatably journaled therein, pinions carried by said slats, a reciprocatory rack-bar inter-

meshing with said pinions, a ratchet block connected to said rack-bar, a reversing pawl for operating said ratchet block, and means for actuating said reversing pawl.

5 2. In a changeable sign, the combination with a frame member, of a longitudinally extending row of slats rotatably journaled therein, a pinion carried by each slat, a reciprocatory rack bar intermeshing with said
10 pinions, a step by step mechanism for actuating said rack bar, and means for actuating said step by step mechanism.

15 3. In a changeable sign, the combination with a stationary signboard, of a series of slats rotatably journaled each about its own axis in front of said signboard, step-by-step mechanism for synchronously and intermit-
20 tently rotating said slats at oblique and right angles to said signboard, and means for actuating said step-by-step mechanism.

25 4. In a changeable sign, the combination with a frame member, of a changeable sign mounted thereon, a step-by-step mechanism for actuating said sign, means for automati-
cally reversing the direction of movement of said step-by-step mechanism and means for operating said mechanism.

30 5. In a changeable sign, the combination of a stationary signboard, a row of slats upon each side of said stationary signboard, each slat being journaled to rotate about its own axis, a pinion carried by each slat, a rack-bar intermeshing with the pinions of each row of slats, step-by-step mechanism
35 operatively connected to said rackbar, and means for operating said step-by-step mechanism.

40 6. In a changeable sign, the combination with a frame member, of a stationary sign mounted therein, a row of slats upon each side of said stationary sign, each slat being journaled to rotate about its own axis, a pinion carried by each slat, a rack-bar intermeshing with the pinions of each row of
45 slats, a ratchet block connected to said rack-bar a reversing pawl for actuating said ratchet block, and means for operating said pawl.

50 7. In a changeable sign, the combination with a suitable frame or support, and a series of rotary slats mounted in said frame of a rack-bar mounted to reciprocate thereon, and provided with two series of spaced apart and oppositely disposed teeth, a pitman
55 mounted to reciprocate between said spaced apart rows of teeth, an automatic reversing pawl carried by said pitman and adapted to engage said teeth, means for actuating said pitman, and connections between the rack-
60 bar and rotary slats.

8. In a changeable sign, the combination with a supporting frame, and a series of rotary slats mounted therein, of a rack bar connected with said slats to turn them and
65 provided with spaced apart and oppositely

disposed teeth, leverage mechanism reciprocating between said spaced apart teeth, an automatic reversing pawl, lost motion connections between said leverage mechanism and said pawl, and stops arranged to coop-
70 erate with said pawl, and means for operating said leverage mechanism.

9. In a changeable sign, the combination with a series of rotary slats, and means for actuating said slats, of a ratchet member
75 connected to said actuating means and provided with two sets of oppositely disposed ratchet teeth, a pawl-carrying member having its pawl-carrying portion arranged to reciprocate adjacent to said ratchet teeth, a
80 double-ended pawl mounted upon said pawl-carrying member, lost motion connections between said pawl and pawl-carrying member, stops arranged to arrest and shift said
85 pawl upon its lost motion connections at the end of a predetermined number of stepping movements in each direction, to effect the reversal of the pawl and the direction of movement of the seat actuating means.

10. In a changeable sign, the combination
90 with a series of rotary slats, and means for actuating them, of a ratchet member connected to said actuating means and provided with two sets of oppositely disposed ratchet
95 teeth and an intervening guide portion, a reciprocatory pawl member operatively mounted adjacent to said ratchet member and having one end arranged to engage the
100 guide portion of the latter, a double-ended gravity pawl member having slot-and-pin connection with said pawl-actuating member, stops upon said ratchet member ar-
ranged to engage said double-ended pawl at the end of a predetermined number of move-
105 ments of the ratchet in each direction and effect the shifting of the pawl member upon its slot-and-pin connections, whereby the center of gravity of the pawl member is shifted from one side to the other of its
110 support and change of engagement from one series of ratchet teeth to the other effected alternately.

11. In a changeable sign, the combination with a suitable frame and a series of slats
115 rotatably mounted therein, of means for imparting a step-by-step rotary movement to said slats, and means for automatically reversing the direction of such movement.

12. In a changeable sign, the combination
120 with a suitable frame and a series of slats rotatably mounted therein, of a pinion connected with each slat, a toothed driver engaging all of the pinions, and means for im-
parting a step-by-step movement to said driver, and means for automatically revers-
125 ing the direction of movement of the driver on the completion of a predetermined number of step-by-step movements.

13. The combination of a longitudinally
130 movable rack having abutments at the op-

posite ends thereof and having a longitudinal slot therethrough, a longitudinally movable crank-rod engaging with said slot, a pin in said rod, and a double-ended pawl having a slot engaging with said pin, the upper edge of said slot being recessed at either end thereof, said recesses being adapted to fit partially over the upper surface of the pin, the arrangement being such that the ends of said pawl are adapted to engage with said rack when the pin is in the recess at the end of the slot farthest from the engaging end of the pawl, and also such that when the engaging end of the pawl strikes the corresponding abutment, the pawl will be shifted on the pin so that its opposite end will be depressed to engaging position.

14. The combination of a series of rota-

table plates, pinions for rotating said plates, a rack engaging with said pinions, a slidable bar connected with said rack, said bar having oppositely disposed teeth in the upper surface thereof and having abutments adjacent to either end thereof, a double-ended pawl for actuating said bar, and means for actuating said pawl to cause it to move the bar a predetermined distance in one direction, said pawl actuating means acting in conjunction with said abutments to cause a reversal of the pawl at the completion of each series of step by step movements.

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