Dec. 16, 1930. O. J. NELSON ET AL 1,785,204

CHANGEABLE SIGN

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Fig. 1.

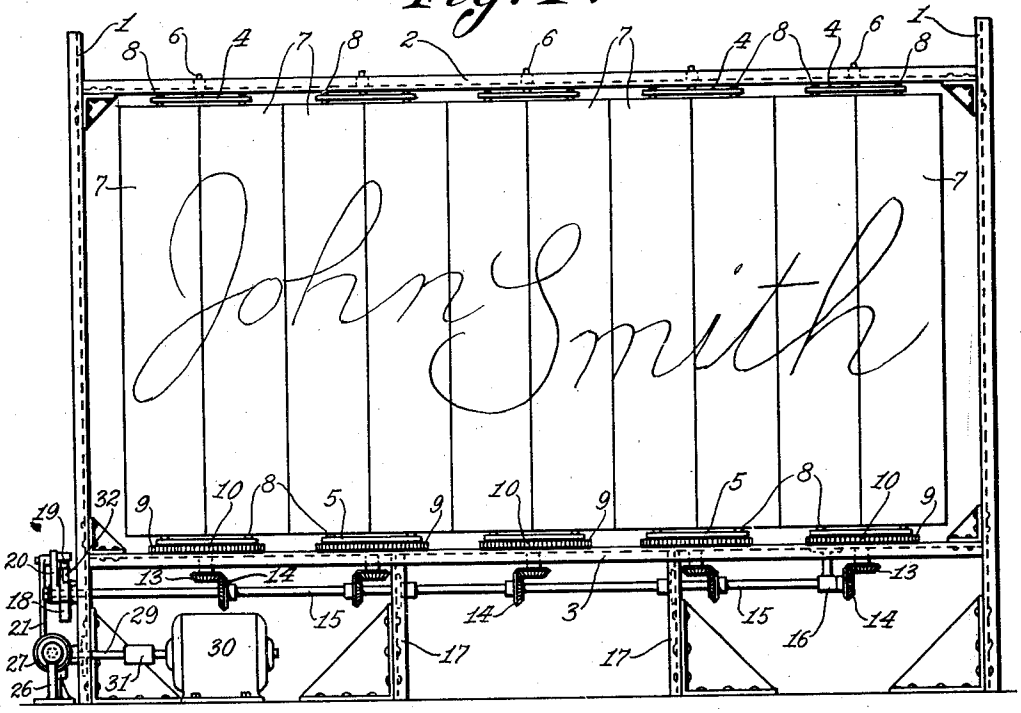

Fig. 2.

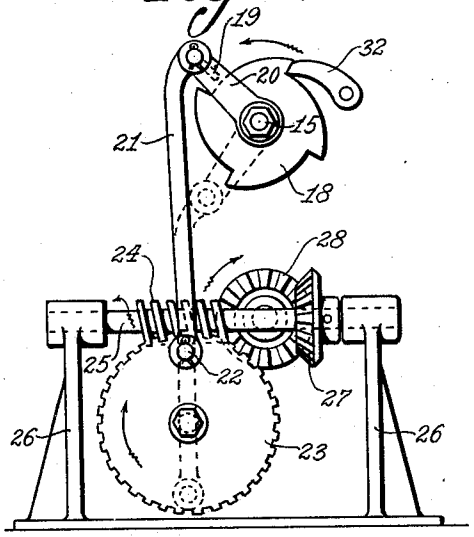

Fig. 3.

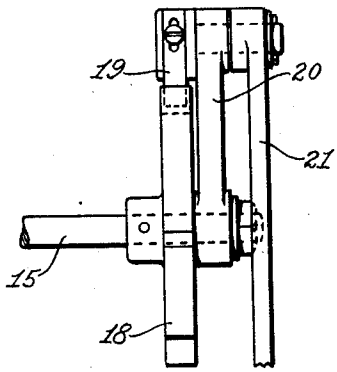

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Fig. 4.

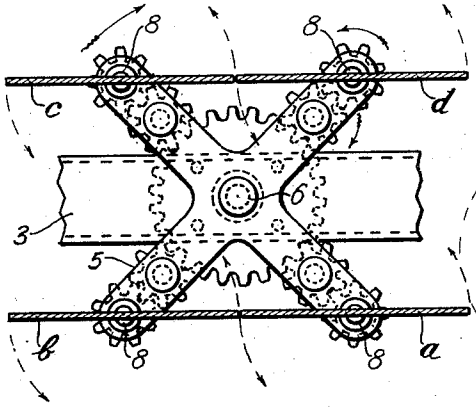


Fig. 5.

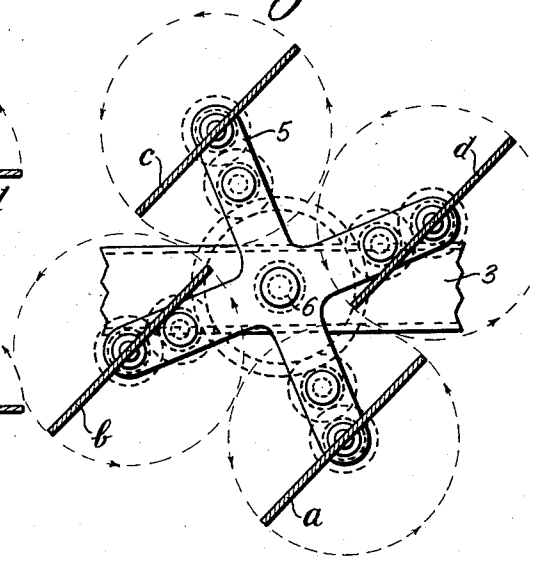


Fig. 6.

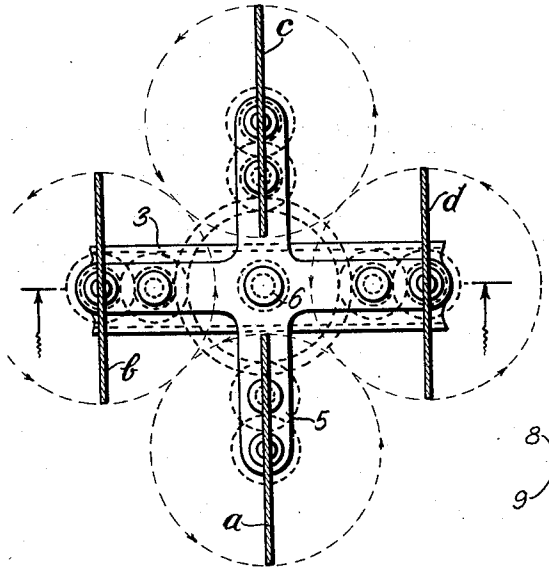
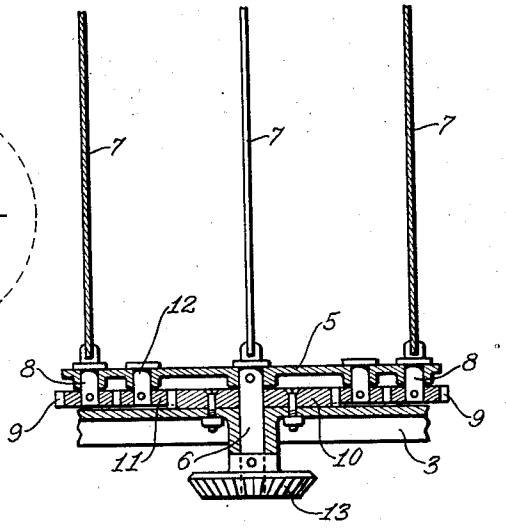


Fig. 7.



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Patented Dec. 16, 1930

1,785,204

UNITED STATES PATENT OFFICE

OLIVER J. NELSON AND FREDERICK G. BAENDER, OF PARSONS, KANSAS, ASSIGNORS, BY MESNE ASSIGNMENTS, TO FRED G. BAENDER, TRUSTEE, OF PARSONS, KANSAS

CHANGEABLE SIGN

Application filed March 31, 1927. Serial No. 179,741.

This invention relates to changeable or animated signs, more particularly of the type in which the display matter is arranged on a series of panels which are shifted at intervals to change the display.

One of the objects of this invention is to provide means whereby the panels are shifted in such a manner as to secure positive and certain alinement and avoid displacement.

Another object of this invention is to provide a changeable sign of the character described, in which the adjacent panel edges can be brought into close relation when in alinement.

Another object is to provide means whereby interference and binding of the panels is prevented, even though these panels be of substantial thickness.

Further objects will appear from the detail description, taken in connection with the accompanying drawing, in which—

Figure 1 is a front elevation of a sign embodying this invention, part of the framing being omitted in order to show the construction;

Figure 2 is a detail, showing a part of the driving mechanism;

Figure 3 is an end view of the same;

Figures 4, 5 and 6 are details showing one of the carriers with its panels and gearing in different positions; and

Figure 7 is a section on the line 7—7 of Figure 4.

Referring to the accompanying drawings, 1 designates the uprights and 2 and 3 the cross-pieces of a frame. Mounted along the frame are a series of carriers, each of which comprises an upper spider 4 and a lower spider 5, connected by a shaft 6, on which these spiders are pinned or otherwise secured. The upper end of each shaft has a bearing in the upper cross-piece, while the lower end has a bearing in the lower cross-piece. Panels 7, of any suitable construction, are rotatively mounted in the carriers by being provided with stub shafts 8 bearing in the spiders. Each shaft 8 has fixed thereto a pinion 9 intergeared with a gear 10, preferably fixed to the cross-piece by bolts, as shown in Figure 7, and this intergearing is preferably through an idler 11 on a stub shaft 12 loose in the spider. In the particular construction shown, only the lower ends of the panels are intergeared; it is obvious, however, that they may be intergeared at their upper ends through similar arrangement of pinions, gears and idlers.

Each shaft 6 has fixed thereto a bevel gear 13, meshing with a pinion 14 on a shaft 15 mounted in bearings 16 and brackets 17. Fixed on the shaft 15 is a ratchet 18 engaged by a pawl 19 on a carrier 20 pivoted on the shaft 15 and connected by a link 21 with a crank pin 22 on a worm wheel 23. Meshing with the worm wheel 23 is a worm 24 fixed to a shaft 25 mounted in brackets 26 and having fixed thereto a bevel gear 27, with which meshes a bevel gear 28 on a shaft 29 connected with an electric motor 30 through a suitable coupling 31. The motor may be provided with suitable starting arrangement, and, in order to prevent overthrow, the ratchet may be provided with a stop pawl 32.

Assuming that the panels are arranged as shown, for instance, in Figure 1 and with the panels on each carrier, as shown in Figure 4, it will be readily seen that there will at this time be exposed a sign face on the panels which are in alinement. These panels can, therefore, have arranged thereon any suitable display. Now, when the motor 30 is started, thereby causing the worm wheel 23 to rotate at a reduced speed, the pawl 19 will operate to shift the ratchet and the shaft 15 through one-quarter of a revolution. This will shift all of the carriers through one-quarter of a revolution. During this shifting, the panels will move through a series of positions, as indicated in Figures 4, 5 and 6, and to another position as indicated in Figure 4, with, however, the panel *a* now in the position occupied by *b*, and with the panel *b* in the position now occupied by *c*. During such one-quarter of a revolution each panel will be shifted through half of a revolution due to the ratio of the gearing between each panel pinion 9 and the stationary gear 10. The panels on the series of carriers will therefore, again be in alinement, and another display can be presented by

these panels. Similarly, during another one-fourth revolution of each of the carriers, another set of panel faces is brought in alinement to present another display. With the particular arrangement of four panels, as shown, four displays can be placed in position at different times; and, since the driving mechanism is automatic the display is changed automatically at intervals.

It will be noted that the panels are positively intergeared without the employment of stops and cam faces. A most suitable form of gearing is that of the planetary type and with a gearing of this nature in which no stops or cam faces are utilized it is not only assured that the panels will always be shifted in certain definite relation without liability of overthrow or displacement, but the mechanism, being a gearing of the planetary type, is such that it is not subject to wear or clogging and requires practically no lubrication. It will also be noted that, on account of the arrangement of the idler, the direction of rotation of each panel is opposite to the direction of rotation of the carrier on which it is mounted. Accordingly, the adjacent panel edges will move towards each other when moving into alinement, and will move away from each other when going out of alinement. This results in not only avoidance of interference, but permits the panel edges to be in close relation when in alinement, in order to avoid spaces between the panels or overlapping thereof. The sign can, therefore, be made so as to present a practically continuous display face, on which the characters can even run from one panel to another, as shown in Figure 1. Furthermore, as far as adjacent carriers are concerned, it will be seen that there is no interference between the panels; for the panel edges on adjacent carriers can move away from each other when moving out of alinement, and towards each other when moving in alinement; while, when the carrier arms are along the sign, the panels will be at right angles thereto, as shown in Figure 6, so that there will be ample clearance.

It is obvious that various changes may be made within the scope of the appended claims in the details of construction without departing from the spirit of this invention; it is to be understood, therefore, that this invention is not limited to the specific details shown and described.

Having thus described the invention, what is claimed is:

1. A changeable sign comprising, a rotatable carrier, panels rotatable on said carrier and arranged to be shifted into alignment with their adjacent edges in close relation, means for intermittently shifting said carrier, and planetary gearing connected to said panels to reverse same at each shift of said carrier.

2. A changeable sign comprising, a rotatable carrier, panels rotatably pivoted at their middle portions on said carrier and arranged to be shifted into alignment with their adjacent edges in close relation, and means for shifting said panels out of alignment adapted to cause their adjacent edges to move in opposite directions with every shift.

3. A changeable sign comprising, a series of carriers, a series of panels rotatably pivoted at their middle portions on each carrier, the panels on each of said carriers being shiftable into alignment thereon, and means for shifting said panels out of alignment adapted to cause adjacent edges to move in opposite directions with every shift.

4. A changeable sign comprising, a series of rotatable carriers, a series of panels rotatably pivoted at their middle portions on each carrier, the panels on each of said carriers being shiftable into alignment thereon with their edges in close relation, and gearing for shifting said carriers and said panels so as to move a new set of panels into alinement.

5. A changeable sign comprising a series of carriers, a series of panels on each carrier, the panels on each of said carriers being shiftable into alignment with panels on the remaining carriers and with their edges closely adjacent to one another, and means for shifting said panels out of alignment, adapted to cause adjacent edges to move in opposite directions with each shift.

6. A changeable sign comprising, a series of rotatable carriers, a series of panels rotatable on each carrier, the panels on each of said carriers being shiftable into alignment with panels on adjacent carriers, and with the edges of said panels in close relation, planetary gearing on each of said carriers for shifting said panels and gearing interconnecting said carriers.

7. A changeable sign comprising a series of rotatable carriers, a series of panels rotatable on each carrier, the panels on said carriers being shiftable into alignment with panels on adjacent carriers, planetary gearing interconnecting said panels and carriers, and means for operating said gearing.

8. A changeable sign, comprising a series of rotatable carriers, a series of panels rotatable on each carrier, the panels on said carriers being shiftable into alignment, gearing interconnecting said carriers, and planetary gearing operating upon rotation of said carriers to shift said panels.

9. A changeable sign comprising, a series of rotatable carriers, a series of panels rotatable on each carrier, the panels on said carriers being shiftable into alignment, gearing interconnecting said carriers, a gear wheel for each carrier, and pinions on the panels

on each carrier connected with the gear wheel therefor.

10. A changeable sign comprising a series of rotatable carriers, a series of panels rotatable on each carrier, the panels on said carriers being shiftable into alignment, gearing interconnecting said carriers, a gear for each carrier, pinions on the panels on each carrier, and idlers between the pinion and the gear for each carrier.

11. A changeable sign comprising a series of rotatable carriers, a series of panels rotatable on each carrier, the panels on said carriers being shiftable into alignment, gearing interconnecting said panels, means for operating said gearing, comprising a gear wheel for each carrier and pinions on the panels on each carrier connected with the gear wheel therefor.

12. A changeable sign comprising a series of rotatable carriers, a series of panels rotatable on each carrier, panels on said carriers being shiftable into alignment, gearing interconnecting said panels, means for operating said gearing, said gearing comprising a gear for each carrier, pinions on the panels on each carrier, and idlers between the pinions and the gear for each carrier.

13. A changeable sign comprising a rotatable carrier, panels rotatable on said carrier and arranged to be shifted into alignment, a gear for said carrier, a pinion for each panel in continuous cooperation with said gear, and means for shifting said carrier thereby to move each pinion and its panel to alignment in a new relation.

14. A changeable sign, comprising a movable carrier, a plurality of panels pivoted at their middle portions thereon, means for moving said carrier, and gearing connecting said panels constructed and arranged to cause, upon movement of said carrier, said panels to turn on their pivots so as to move successive pairs of said panels into alinement with each other whereby to provide a substantially continuous face adapted for the display of a sign.

15. A changeable sign, comprising, a plurality of movable carriers, a plurality of panels pivoted at their middle portions on each of said carriers, means for moving said carriers, and gearing connecting said panels and said carriers constructed and arranged to cause, upon movement of said carriers, said panels to turn on their pivots so as to move successive pairs of said panels on each carrier into alinement with each other and with panels on adjacent carriers, whereby to provide a substantially continuous face adapted for the display of a sign.

16. A changeable sign comprising frames mounted for rotation in opposite directions, a rotatable panel carried by each frame, means to rotate the panels upon rotation of the frames, and means to impart opposite rotation to the frames; certain panels of adjacent frames being normally in coplanar relation.

17. A changeable sign comprising a supporting structure, a gear wheel fixed to said structure, a frame journaled on said structure, a plurality of panels arranged in pairs journaled on said frame, the panels of each pair being in coplanar relation when in normal position, driving connections between each panel and said gear wheel, and means to effect rotation of the frame.

In testimony whereof we affix our signatures this 25 day of March, 1927.

OLIVER J. NELSON.
FREDERICK G. BAENDER.