Feb. 22, 1927. 1,618,718

J. LEES

ADVERTISING DISPLAYER

Filed Dec. 1, 1924 2 Sheets-Sheet 1

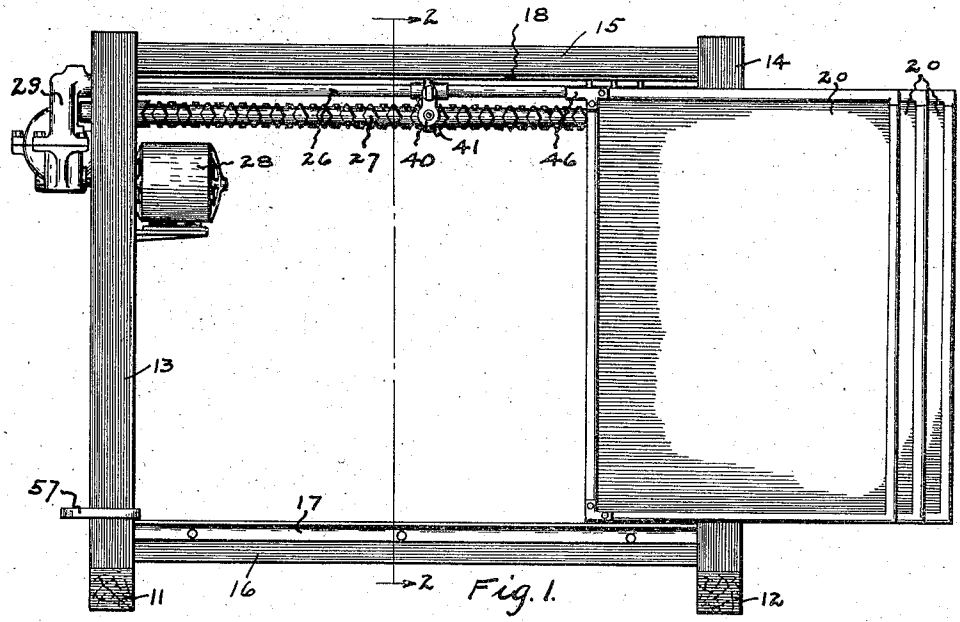


Fig. 1.

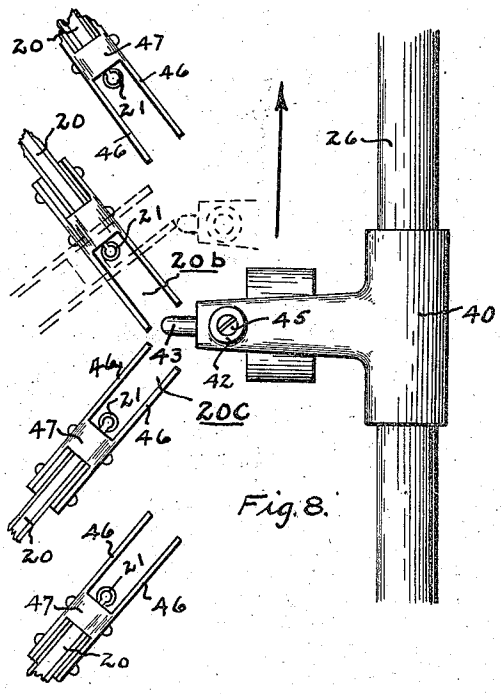


Fig. 8.

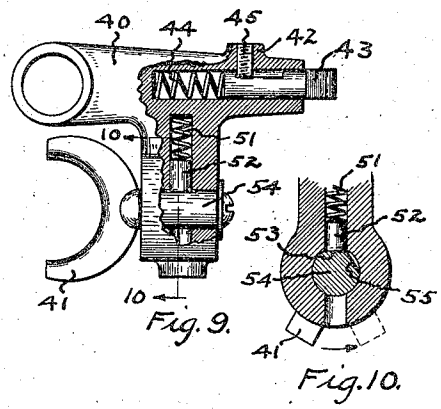


Fig. 9.

Fig. 10.

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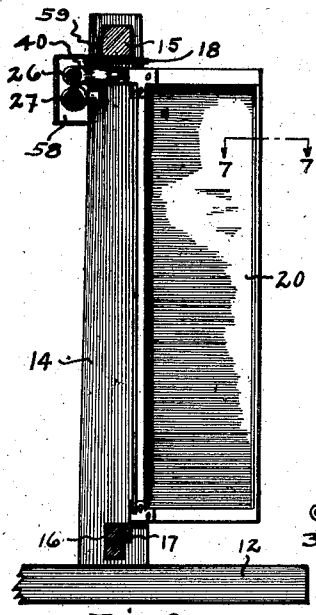


Fig. 2.

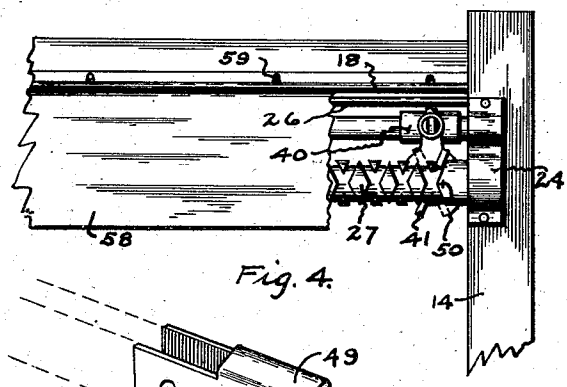


Fig. 4.

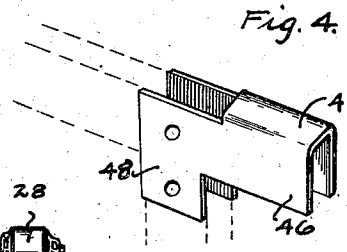


Fig. 11.

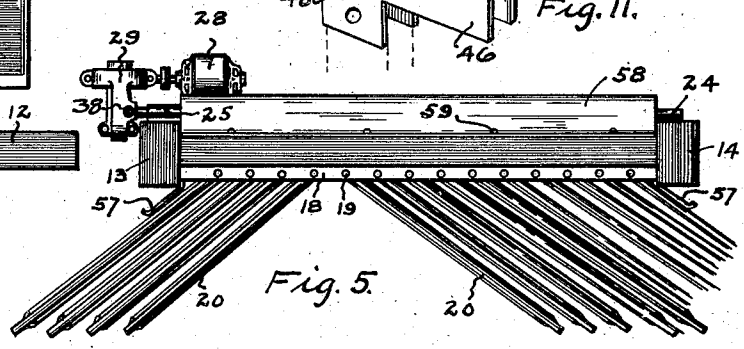


Fig. 5.

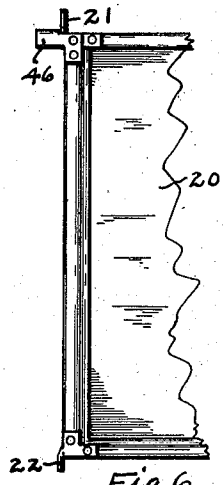


Fig. 6.

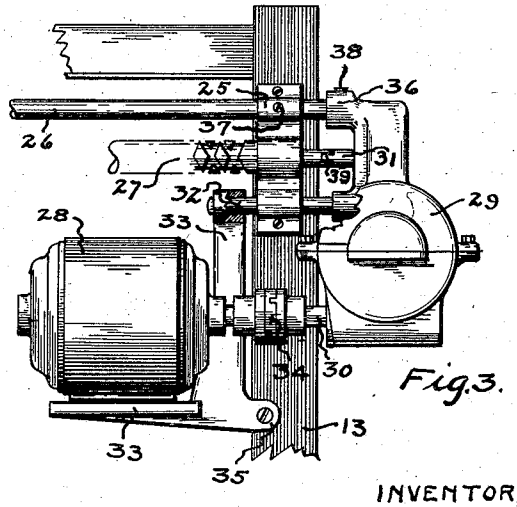


Fig. 3.

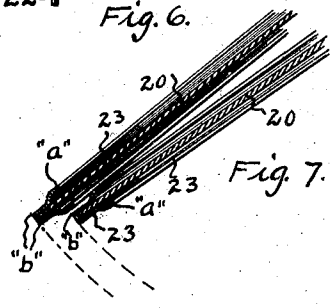


Fig. 7.

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Patented Feb. 22, 1927. 1,618,718

UNITED STATES PATENT OFFICE.

JOHN LEES, OF INDIANAPOLIS, INDIANA, ASSIGNOR OF ONE-HALF TO EDWARD O. NICHOLLS, OF INDIANAPOLIS, INDIANA.

ADVERTISING DISPLAYER.

Application filed December 1, 1924. Serial No. 753,369.

My invention relates to an advertising display device comprising a number of overlapping sign boards to be brought into view, first one side and then the other, consecutively from one side and then reversing the order to display the boards in the opposite sequence.

The primary object of my invention is to provide means whereby the overlapping sign boards are turned as the pages in a book, one at a time, with an appreciable lapse of time before the next succeeding board is turned, and upon completion of the turning of the boards in one direction, to provide such turning means that the continued operation of the device will cause the pages to be then turned in the reverse direction. Further objects lie in the provision of an extremely simple and unique board turning mechanism, means for preventing the interlocking of the boards by their outer edges, means for permitting the quick detaching or replacing of any or all sign boards in the supporting frame, and means enabling the quick and accurate assembly of the power operating means in cooperation with the turning mechanism.

Other minor objects are the providing of such a structure as to be extremely durable and positively acting under commercial conditions, to be easily manufactured and at an extremely low cost.

I accomplish these and such other objects as will become apparent in the following description by the means as shown in the accompanying drawings, in which—

Fig. 1 is a front elevation of my sign displayer, in which view all but three of the sign boards are removed for the purpose of showing the operating mechanism more clearly; Fig. 2, a vertical section through the sign displayer taken on the line 2—2 of Fig. 1; Fig. 3 an enlarged vertical elevation from the rear of the sign displayer, in fragment showing the method of mounting the driving motor, the gear housing and the guide and screw shafts; Fig. 4, an enlarged vertical elevation of a fragment of the opposite end of the sign displayer from the rear showing the cover plate broken away in part, and the cam on the screw shaft employed to reverse the travel of the crosshead; Fig. 5, a top plan view of the sign displayer showing all of the sign boards in position; Fig. 6, a vertical elevation in fragment of a single sign board showing the long hinge pin at the top and the short hinge pin at the bottom; Fig. 7, a horizontal, enlarged section through the outer edges of the sign boards, here shown as two in number, taken on the line 7—7 in Fig. 2, illustrating the means employed to prevent the outer edges of the sign boards from interlocking; Fig. 8, an enlarged diagrammatic view to illustrate the relation of the ears or the sign board, the crosshead, the guide shaft, and the movable crosshead turning finger; Fig. 9, an enlarged vertical side elevation of the crosshead with fragments removed to disclose the locking means; Fig. 10, a vertical section through the lower portion of the crosshead taken on the line 10—10 in Fig. 9; and Fig. 11, an enlarged modified form of sign board turning ears, shown in perspective.

Like characters of reference indicate like parts throughout the several views.

I employ a supporting frame comprising the feet 11 and 12 to which are secured the upright posts 13 and 14. The upper ends of the posts are tied together by the crossbar 15 and the lower ends similarly tied together by the lower crossbar 16. To the front side of the lower crossbar 16, I secure an angle iron 17 containing a plurality of holes in the horizontal flange and to the under side of the upper crossbar 15 I attach a flat bar 18 also having a plurality of holes 19 opposite the holes in the lower angle iron 17.

The sign boards or wings 20 are carried by the bar 18 and the angle iron 17 by means of the extending hinge pins 21 and 22 being received respectively in the holes in the bar 18 and the angle iron 17.

Referring to Fig. 6, it will be noted that the upper pin 21 is longer than the lower pin 22. It will also be noted in referring to Figs. 1 and 2, that there is an appreciable clearance between the tops of the sign boards 20 and the under side of the bar 18. I use this construction to permit the easy removal or replacement of the individual sign boards. To remove a sign board the board is lifted vertically, thus extending the upper pin 21 further through the hole 19 in the bar 18 and thereby withdrawing the pin 22 from the hole in the angle iron 17, where upon the sign board 20 may be tilted outwardly at the bottom to clear the angle iron 17, dropped slightly to withdraw the pin 21 from the hole 19, such that the sign board is then entirely

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free from the frame. The sign board may be replaced by reversing the foregoing method of removal.

The sign boards 20 are adapted to have the display matter secured directly to both the obverse and reverse faces. Where a removable card bearing the display is to be employed, the frame work of the sign board has the two vertical edges and bottom formed by a flanged molding 23, a cross-section of which is shown in Fig. 7.

When such a flange is used to retain a removable display card, I find means must be employed to prevent the accidental locking of two adjacent sign boards by the outer vertical corner of one becoming engaged against the vertical edge of the flange 23 on the adjacent board as the two boards are contacted and simultaneously swung about their pivots. To prevent such a possibility, I curve the flange 23 and bring its engaging edge "*a*" bock beyond any line that may be reached by the corner "*b*" of the adjacent board as in Fig. 7. Serious damage may be done to the turning mechanism should the sign boards accidentally lock, and consequently such provision as I have here made is highly important.

To the back sides of the posts 13 and 14 near the top I attach the shaft brackets 24 and 25 to receive and hold in parallel alignment the guide shaft 26, above, and the screw shaft 27, below, as in Figs. 3 and 4.

I use a common type of the fractional horse-power electric motors, 28, to drive the turning mechanism, and to obtain the low speed desired in the turning of the screw shaft 27, I employ a double reduction worm drive fully enclosed within the housing 29. As the guide shaft 26, the screw shaft 27, the armature shaft of the motor 28, the armature gear shaft 30, and the gear driving shaft 31 must all be properly centered and held in parallel alignment, a quick and easy method of assembly must be provided to hold down the manufacturing cost.

To accomplish this, I secure a stud 32 within a boss on the gear housing 29, which stud is passed through the lower portion of the bracket 25, thereby fixing the location of the housing 29 in respect to the bracket 25. The stud 32 projects sufficiently beyond the bracket 25 to receive thereon the upper end of the motor supporting bracket 33, such that the motor armature shaft is centered with respect to the gear shaft 30. A flexible coupling 34, here shown as a disk type, is used to connect the shafts and take up what slight variations may arise in the machine work. The bracket 33 is further secured by a screw holding the ear 35 in contact with the post 13.

The gear housing 29 is prevented from rotating about the stud 32 by having the guide shaft 26 extend through the bracket 25 and into and terminating in a boss 36 projected from the uppermost portion of the housing. A set screw 37 retains the guide shaft 26 in its bracket 25, and a set screw 38 holds the gear housing 29 on the guide shaft 26. The screw shaft 27 has a reduced bearing section extending through the bracket 25 with a transverse slot cut in its end to receive the tongue 39 of the gear shaft 31. It will be noted that by loosening the set screw 38 in the housing, that the housing 29 is at once removable and no other screws, nuts, or bolts are required to be removed or loosened, thereby presenting a very unique method of assembly and maintenance of properly positioned shaft centers.

The screw shaft 27 has a right hand and a left hand thread cut upon it. A crosshead 40, Fig. 9, is slidably carried by the guide shaft 26, and from the under side of the crosshead, projecting forwardly and pivotally mounted in the crosshead is a half-nut 41 adapted to engage the single thread of the screw shaft. The cross-head 40 is prevented from tipping up and breaking engagement with the screw shaft by means of a boss 42 slidingly contacting the under side of the bar 18.

The crosshead 40 carries a forwardly projecting finger 43 mounted within the crosshead and having a compression spring 44 normally holding the finger in an outward position against the stop screw 45 which is passed downwardly through the boss 42 into a slotted section of the finger.

To the upper back corner of each sign board 20, I attach side plates with the rearwardly projecting ears 46 preferably formed by stamping and forming the plates with a tie 47 between for convenience in assembly and to reinforce and stiffen the ears. A modified form of ears 46 is shown in Fig. 11, by the stamping 48 where a tie plate 49 is shown connecting the entire upper sides of the ears.

Referring to Fig. 8, assuming the crosshead 40 to be travelling by means of rotation of the screw shaft 27, in the direction of the arrow there shown, the finger 43 is shown as having left from between the pair of ears 46 of the sign board 20^c and is passing onwardly to between the pair of ears 46 of the sign board 20^b where it will contact the furthermost ear 46 and turn the board to the position as indicated by the dotted lines. Should, however, the board 20^b already be in the position of the dotted lines by being previously turned by hand, the finger 43 will contact the first appearing ear 46 and by reason of the board 20^b contacting the board 20^c, the finger 43 will compress the spring 44, thereby receding as indicated by the dotted line position, in view of the unyielding resistance of the ear, after the passage of which ear, the finger springs

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out to its normal position and is ready to engage the next set of ears.

To provide for continuous operation of the screw shaft in one direction, I provide a very simple means of changing the half nut 41 from the right hand thread to the left hand thread and the reverse at the corresponding ends of the screw shaft. As the crosshead reaches the end of its travel, as in Fig. 4, the half-nut 41 which engages only between two single threads, is contacted by the cam 50 and thereby rocked upon its pivot in the cross-head to the position indicated by the dotted lines whereupon the opposite thread becomes engaged and the crosshead starts back in the reverse direction.

To avoid accidental turning of the half-nut 41 before or after being turned by the cam 50, I provide a locking device within the crosshead as in Figs. 9 and 10. A compression spring 51 normally holds a plunger 52 against a flat 53 on the half-nut pivot shank 54 to retain the half-nut in the position indicated. When the half-nut is rocked to the reverse position as indicated by the dotted lines in Fig. 10, the plunger 52 engages with the corresponding flat 55.

In order that the sign boards 20 will not swing outwardly too far and strike the posts or prevent proper presentment of the ears 46 to the finger 43, I provide a stop 57, on each side, secured to the posts 13 and 14.

I use a cover 58 to conceal the screw shaft 27, guide shaft 26, and crosshead 40, thereby removing the temptation of tampering with the mechanism and protecting the mechanism against external injury. This cover 58 is secured to the cross bar 15 preferably by having slots therein adapted to slip over and engage under the heads of the retaining screws 59.

Having described my advertising displayer in the form now best known to me, and it being obvious that many variations in the structure may be had without departing from the spirit of the invention, I do not desire, therefore, to be limited to the precise structure as shown, nor any more than may be required by the following claims.

I claim:

1. In an advertising displayer, a supporting frame, a plurality of sign boards hingedly carried by the frame, ears carried by the sign boards, a screw, means for operating the screw, a cross head, a finger extending from the crosshead to contact the said ears and turn the sign boards, a nut engaging said screw and swivelly carried by said crosshead, and spring pressed means holding said nut at a predetermined angle.

2. An advertising displayer including a supporting frame, a plurality of pivoted sign boards carried by the frame, a rotatable screw provided with right and left hand threads, power means for operating said screw continuously in the same direction, a guide shaft, a crosshead slidably mounted on said guide shaft, a nut pivotally carried by said crosshead, a cam at each end of the screw to tilt the nut at the end of its travel to cause the nut to engage with the oppositely directed thread, a bar adapted to be slidingly contacted by said cross-head whereby said nut is held in engagement with said screw, ears on said sign boards, and a finger carried by said crosshead to contact said ears and thereby turn the sign boards.

3. An advertising displayer including a supporting frame, a rotatably supported screw, adapted to be operated continuously in one direction of rotation, a plurality of sign boards, a long pin projecting upwardly from the top of each sign board, a short pin projecting downwardly from the lower edge of each sign board, a lower cross member in said frame having a plurality of holes adapted to receive said short pins, an upper cross member in said frame having a plurality of holes to receive said long pins, said upper cross member being located at an appreciable distance above the tops of said sign boards, ears on said sign boards back of said pins and a crosshead engaged and operated back and forth by said screw and having a single finger to engage said ears and turn the sign boards.

4. An advertising displayer comprising a supporting frame, a plurality of pivoted sign boards carried by the frame, a rotatable screw shaft provided with right and left hand threads, a guide shaft, a crosshead slidingly retained on said guide shaft, a motor for operating the screw shaft in a continuous direction of rotation, a reduction gear means between said motor and said shaft, a nut pivotally carried by the crosshead and engaging said screw shaft, means carried at each end of the screw shaft for the purpose of rocking the said nut in the crosshead at the end of its travel to change the engagement of the nut from one of said threads to the other, ears carried by the pivoted sign boards, and a single finger carried by said crosshead to engage the ears to turn the sign boards.

5. An advertising displayer comprising a supporting frame, a plurality of pivoted sign boards carried by the frame, a supporting bracket, a rotatable screw shaft having a slot cut in one end projecting through the supporting bracket, a guide shaft having one end extending through the supporting bracket and secured therein, a reduction gear inclosed within a housing, a stud projecting from the housing and passing through said supporting bracket, a motor, a motor bracket carrying the motor and pivotally engaging the end of said stud projecting beyond said supporting bracket, said motor bracket being further secured by an arm contacting said

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frame, said gear housing further having a driving shaft connecting the shaft of said motor, and having a driven shaft terminating in a tongue adapted to be received by the slot in the end of said screw shaft, and said housing further having means to receive and demountably retain the end of said guide shaft, ears on said sign boards, a cross-head carried by said guide shaft and engaged and operated back and forth by said screw shaft and having a finger to contact said ears and turn said sign boards.

Signed at Indianapolis, county of Marion, State of Indiana, this the 20th day of November, 1924.

JOHN LEES.