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SIGN CHANGING DEVICE

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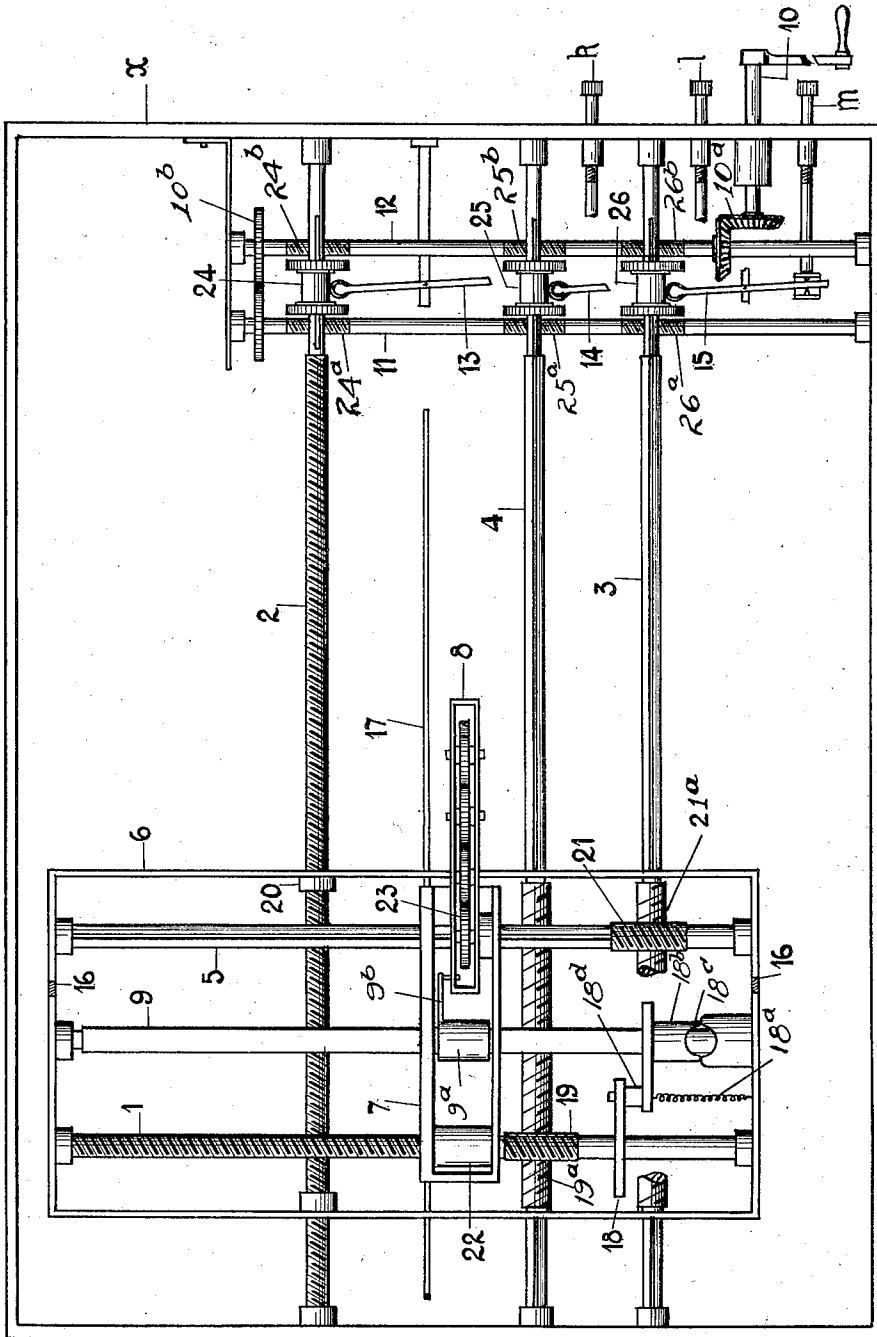


FIG. 2.

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SIGN CHANGING DEVICE

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5 Claims. (Cl. 40-86)

This invention relates to sign changing devices, and has for its object to provide a device whereby signs, programs, scores, and like matter, either for the dissemination of information, for the purpose of advertisement, or otherwise, may be readily produced or changed when necessary.

With this and other objects in view, the present invention consists in a sign changing device comprising a plurality of spools, on which are mounted a plurality of ribbons or tapes, a surface of each of which is provided with numerals, letters, signs or the like intended for display, the said ribbons or tapes being adapted to be wound on or off the spools by a change gear mechanism to effect the rotation of the spools to thereby bring a variety of predetermined numerals, letters, words, sentences, signs or the like into view.

The invention also consists in a sign changing device according to the preceding paragraph wherein the change gear mechanism is adapted to be traversed horizontally and also in vertical direction to bring the said change gear mechanism into functional engagement with a selected spool carrying a ribbon, or in association with a ribbon, to bring a predetermined numeral, letter, sign or the like into view.

Other features of the invention will be apparent from the following description—

In order that my invention may be clearly understood and readily carried into practice, a preferred form thereof will now be described with reference to the accompanying drawings wherein—

Figure 1 is a diagrammatic perspective view, partly broken away, of a sign board constructed in accordance with my invention.

Figure 2 is a front elevation of the gear mechanism.

Figure 3 is a detail in side elevation, partly broken away, of part of the gear mechanism.

Figure 4 is a detail in side elevation, partly broken away, showing more particularly the winding device.

Referring to the drawings:—

In Figures 1 and 2, there is shown a casing or frame *x*, which may form a unit of a sign board or displaying apparatus, which may include a plurality of ribbons or tapes, a surface of which is provided with numerals, letters, signs or the like. The said ribbons are mounted on a plurality of spools, which correspond to double the number of the ribbons. The spools are positioned in shelves *b*, defining separate rows of spools and ribbons. The fronts of the shelves are provided with groups of stretching wires *h*, over which the display parts

of the ribbons are adapted to pass. A ribbon, carried by two spools, is adapted to be wound on one and off the other. The said ribbon, in passing from one spool to the other, is led to the front of the shelf or casing over two adjacent wires of the group by means of which the flatness of the display part of the ribbon may be assisted. For example, the ribbon *e* mounted on two spools *c* and *d*, is adapted to be wound on one and off the other passing over two adjacent stretching wires *h* and *h*, and drawing thereby into view on the front of the casing a sign, as for instance the letter *A*. The fronts of the shelves with the ribbons constitute, when assembled in the outer casing, the display chart *a*, which may appear as a ruled sheet.

The apparatus also includes, as in Figure 2, a traveller *6* and a gear box *7*, which are adapted to operate a ribbon to bring a predetermined numeral, letter, sign or the like into view, as will hereafter appear. The spools carrying the ribbons have their outer ends mounted between the shelves, and the upper ends are adapted to mesh with the winding device, in such a manner that upon rotation of the winding device, a rotary movement is also imparted to the spools engaged therewith to effect the winding and unwinding of the ribbon.

The traveller *6*, carrying the gear box *7*, is adapted to be traversed laterally within the casing by means of a screwed horizontal spindle *2* engaging a nut *20* carried by the traveller. The gear box is adapted to be raised or lowered within the traveller by means of a screwed vertical spindle *1* engaging a nut *22* carried by the gear box.

The spindle *1* is adapted to be rotated by the horizontal spindle *4* which is provided with a worm wheel *19^a* meshing with the worm *19* secured to the spindle *1*. The worm wheel *19^a* slides on the spindle *4* by means of a feather key and key way and is fitted between the sides of the traveller *6*. The traveller carries a second vertical spindle *5*, to which is connected by means of a feather key and key way a gear wheel *23*, as in Figs. 2 and 4, for giving rotation to the gears of the winding device *8*. The spindle *5* is driven from the horizontal spindle *3*, which is provided with a worm wheel *21^a* meshing with the worm *21* secured to the spindle *5*. The worm wheel *21^a* slides on the spindle *3* by means of a feather key and key way and is fitted between the sides of the traveller *6*. The traveller also has journaled therein a vertical guide bar *9*, which passes

through the gear box 7 carrying the winding device 8 and is slidable and rotatable therein.

The winding device, it will be noted, swings horizontally about the spindle 5 and may be swung to one side or the other by oscillating the bar 9. The bar 9 is, for this purpose provided with the sleeve 9^a slidable on and rotatable with the bar. This sleeve is fitted between the top and bottom of the gear case so as to slide up and down therewith and is provided with an arm 9^b which has a pin-and-slot connection with the winder so as to swing the latter when the bar is oscillated. Normally the bar is resiliently held in position to engage the winding device with a pair of spools *c*, *d*, by means of a coil spring 18^a which is connected at one end to a stationary part and at the other to a sleeve 18^b slidable on and rotatable with the bar. This sleeve is formed with end cam faces 18^c engaging co-operating cam faces and adapted to thus position the bar in its central position, with the winding device engaged with the spools as hereinafter described.

It is necessary to bring the winding device from its spool engaging position between the shelves when the winding device is to be raised or lowered. For this purpose the spindle 1 is provided with the rock arm 18 adapted to engage the projection 18^d on the sleeve 18^b and to pass it by. Thus the bar 9 is rocked by the sleeve to swing the winding device to the position shown in Fig. 2 of the drawings. When the rotation of the spindle 1 ceases and the arm 18 and projection 18^d are clear of one another the spring 18^a takes control and swings the winding device to its spool engaging position.

The winding device is provided with a gear train 23^b journaled in the gear box and meshing with the gear 23. The outer gears 23^b are provided with pins 23^c for meshing with the ends of the spools *c* and *d* when the device is swung between the shelves.

On rotation of the winding device, a rotary movement is imparted to the spools to move the ribbon from one spool to the other to bring the displaying part thereof into view. For example, if there are twenty-six signs, say A-Z, then the ribbon can be moved to any one of these signs by suitably placing the gear box opposite the spools carrying the said ribbon and setting the winding device to operate the spools to the desired extent to bring the selected sign to the front of the casing.

Indicating arrows 16 and 17 are secured to the traveller 6 and gear box 7 respectively and are disposed within the casing, by which means the position of the gear box can be indicated from the front of the casing.

The driving mechanism within the casing comprises a drive shaft 10 which, by means of bevel gearing 10^a, actuates the shaft 12 which is geared to the shaft 11 by gearing 10^b. The spindles 2, 3 and 4 are driven from either of the shafts 11 and 12, which revolve in opposite directions, by means of the shiftable double worm gears 24, 25, and 26, each of which is adapted to occupy either a neutral position, as shown, or a position in engagement with one of the worms 24^a, 25^a or 26^a or with one of the worms 24^b, 25^b or 26^b as the case may be. Thus either spindle 2, 3, or 4 may be rotated in either direction or neither as required by suitably positioning the corresponding double worm gear and rotating the shaft 10. Each double worm gear is secured on its spindle 2, 3, or 4 by means of a feather key and key way and is

shiftable by one of the shift levers 13, 14, or 15 as the case may be, each lever being fulcrumed intermediate of its ends and engaging at one end between the ends of a double worm gear. Each lever is controlled by a manually operable rod slidable in the casing and suitably engaged with the free end of a lever. These rods are indicated in the drawings by the reference numerals *k*, *l*, and *m*, but the connection of the rod *m* with the lever 15 is alone shown, the others being broken away to show other parts.

In operation assuming a sign board or displaying apparatus, as in Figure 1, including thirty ribbons mounted on sixty spools and arranged in five horizontal and six vertical rows, on each ribbon are twenty-six signs, say A-Z, if it is desired to set the signs on the top row so as to read "Menu", the gear box is raised to the top row and to the left so as to set the winding device thereof into engagement with the two spools of the first ribbon. The winding device is rotated until letter M appears on the front of the casing. The traveller is then moved one stage to the right so as to come opposite the next ribbon and to bring the winding device into engagement with the spools of the second ribbon on the top row.

Having thus described my invention what I do claim and desire to secure by Letters Patent is—

1. A sign changing device or chart of display whereby indefinite variety of numerals, letters, words, phrases and the like can be readily produced and changed when necessary, and comprising in combination with a suitable casing, a plurality of ribbons or tapes, each wound upon a pair of rotatable spools; a plurality of shelves defining separate rows of ribbons and spools, said spools being positioned within the shelves; mechanism remote from said shelves for the operation of the spools upon which the ribbon is wound, said mechanism being adapted to be brought into position to effect the rotation of any predetermined pair of spools; and stretching devices with which the shelves are provided whereby the edges of any two adjacent ribbons are brought substantially in contact one with the other.

2. A sign changing device or chart of display whereby indefinite variety of numerals, letters, words, phrases and the like can be readily produced and changed when necessary, and comprising in combination with a suitable casing, a plurality of ribbons or tapes, each wound upon a pair of rotatable spools; a plurality of shelves defining separate rows of ribbons and spools, said spools being positioned within the shelves; and mechanism remote from said shelves for the operation of the spools upon which the ribbon is wound, said mechanism being adapted to be brought into position to effect the rotation of any predetermined pair of spools.

3. A sign changing device according to claim 2 provided with a single winding device or band-operating mechanism adapted to be traversed horizontally and also in a vertical direction to selectively bring the said band-operating mechanism into functional engagement with any given pair of spools upon which a ribbon or the like is wound to effect the winding and unwinding of the said ribbon and to bring a numeral, sign or the like into view.

4. A sign display apparatus according to claim 2 provided with a case having a single winding device or band-operating mechanism; a horizon-

tally movable traveller carrying the winding device; and a threaded vertical spindle connecting the traveller and engaging a nut carried by the winding device to move the latter vertically.

5 5. In a sign display apparatus, the combination with a case having incorporated means comprising three horizontal spindles of which one is screwed and the other two grooved, and two ver-

tical spindles of which one is screwed and the other grooved, adapted for mechanically operating a winding device or a band-operating mechanism and also to effect the horizontal and vertical motion of the said band-operating mechanism by means of a removable handle and operating buttons.

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