

Nov. 1, 1932.

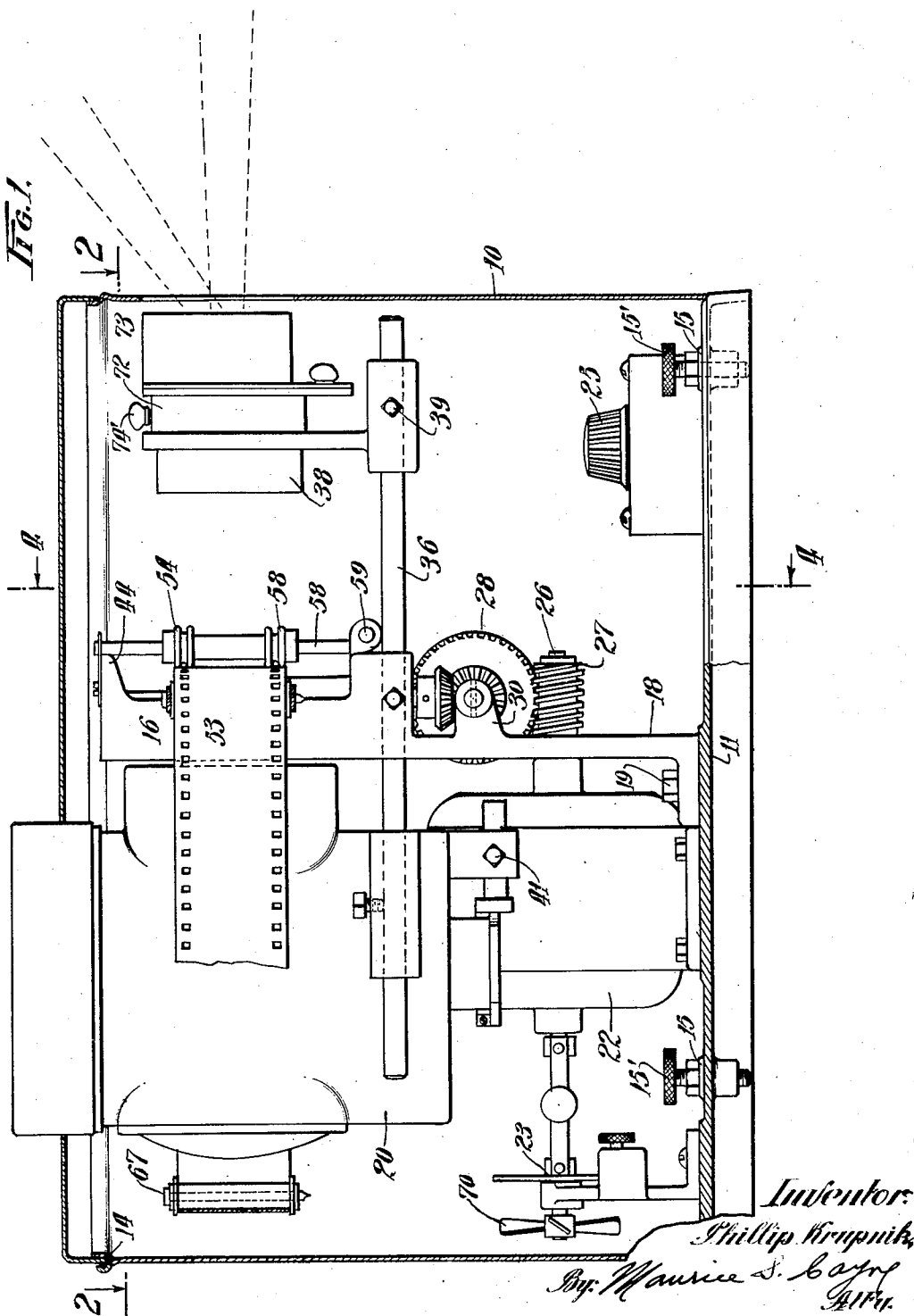
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SIGN PROJECTION APPARATUS

Filed Feb. 10, 1930

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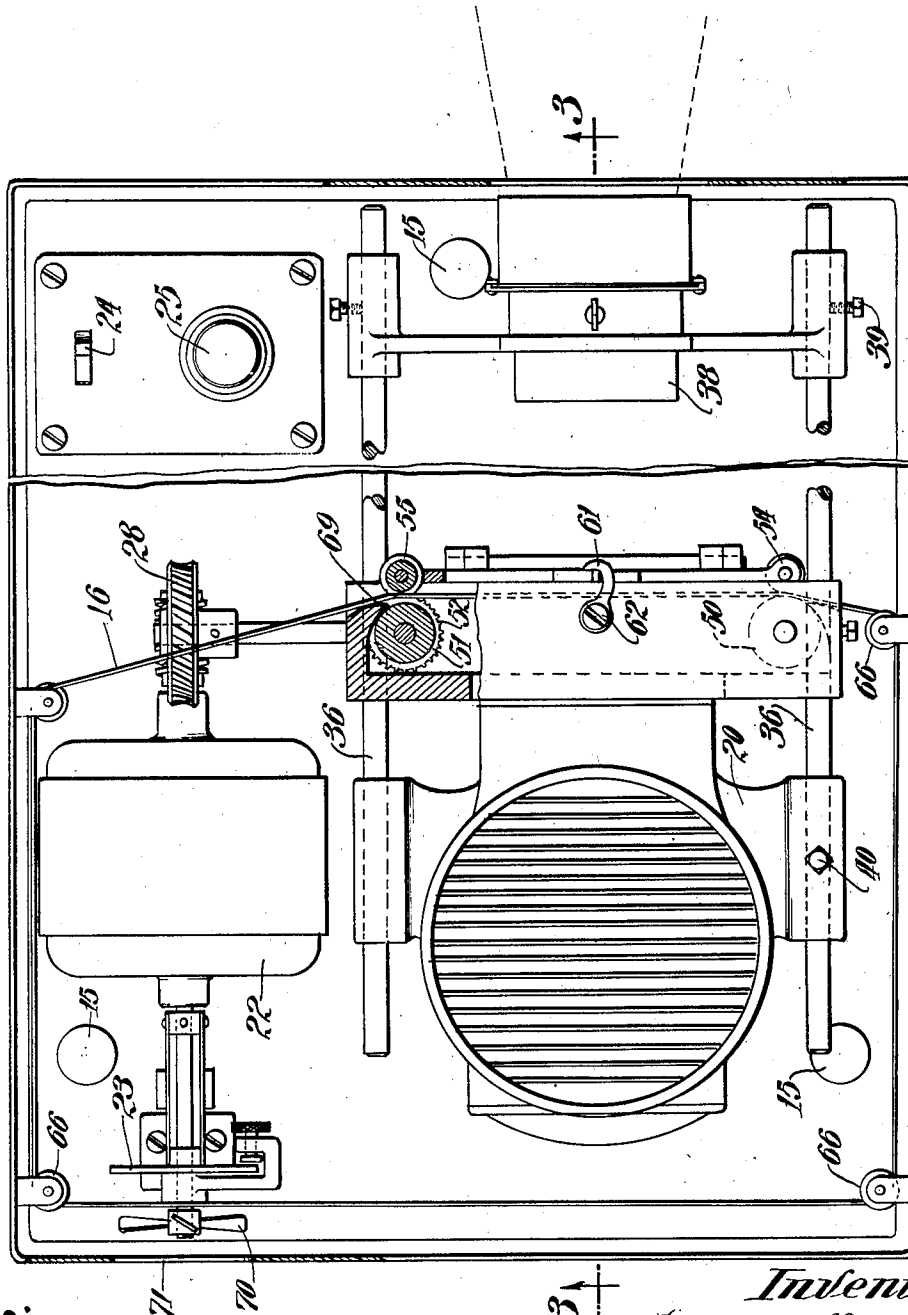


Fig. 2.

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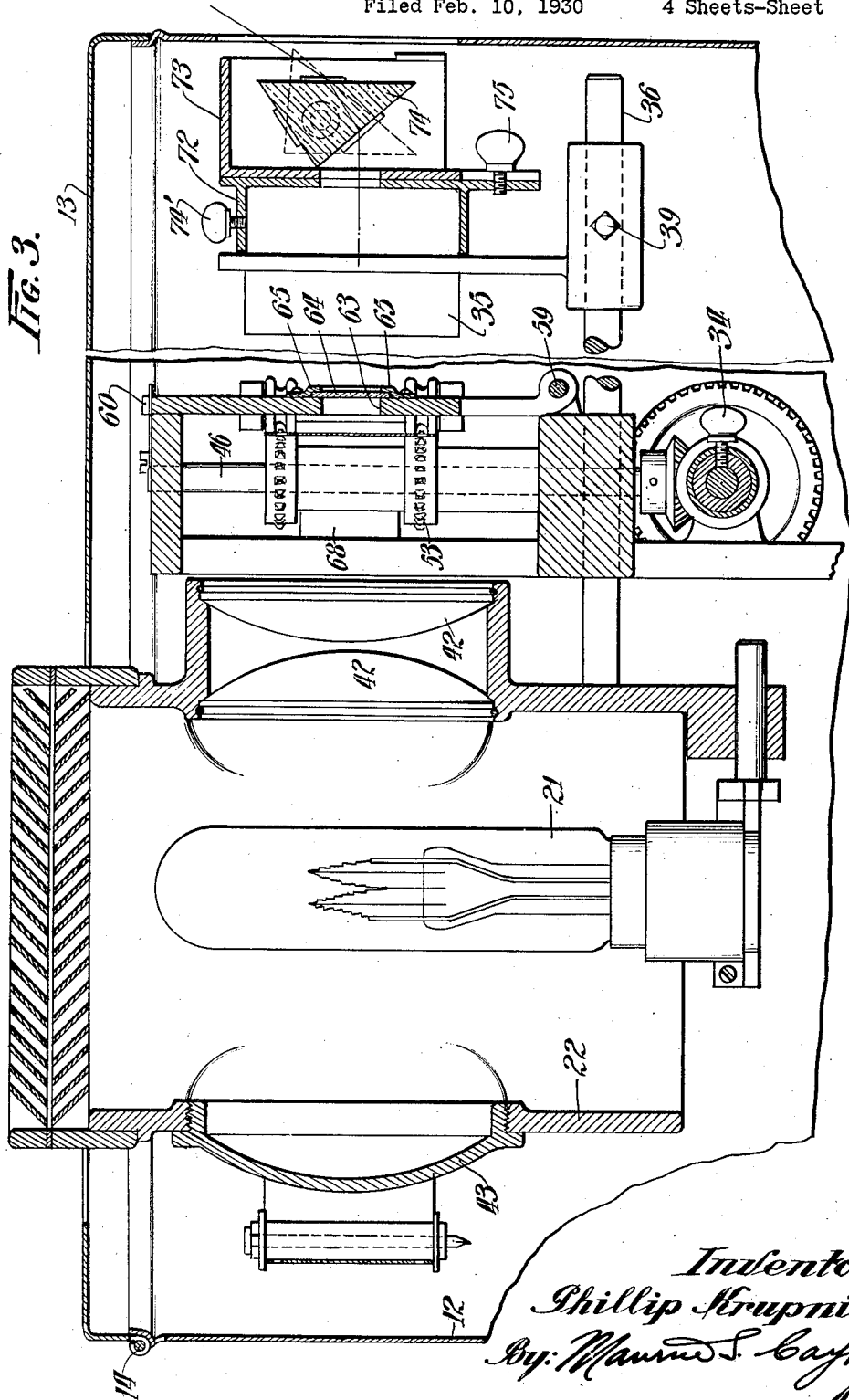
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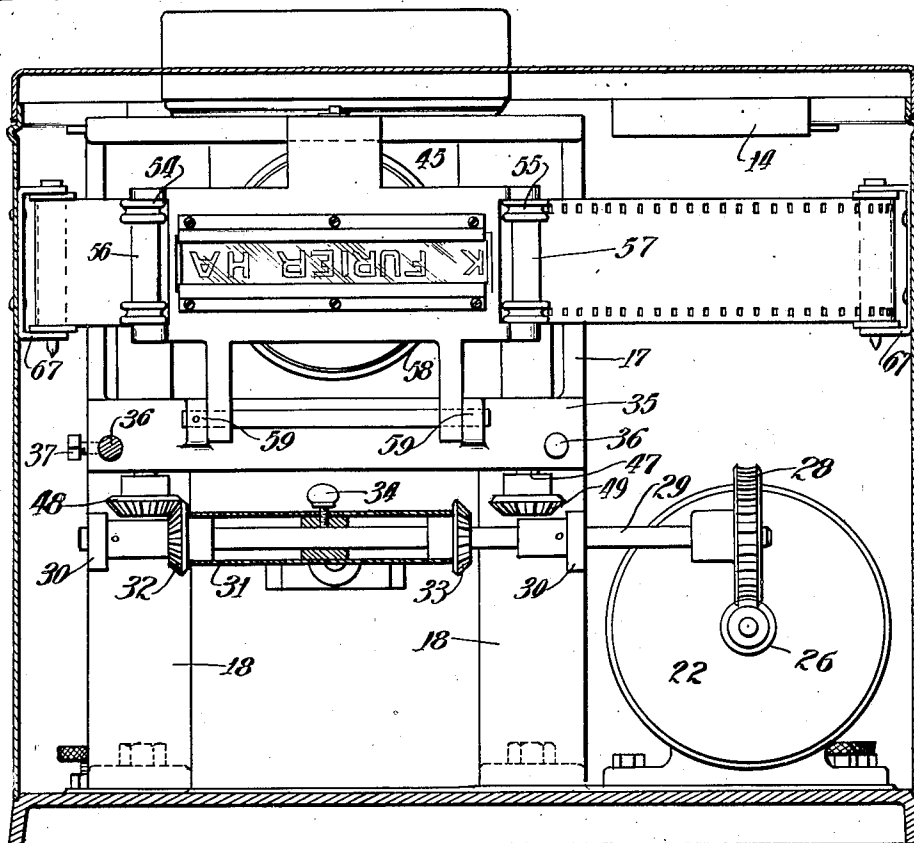
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Fig. 4.



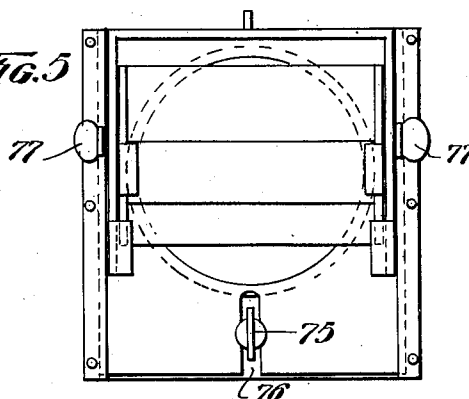
FURIER H

Fig. 5

Fig. 6.

Fig. 7.

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UNITED STATES PATENT OFFICE

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SIGN PROJECTION APPARATUS

Application filed February 10, 1930. Serial No. 427,112.

This invention relates to projection apparatus in general, and particularly to an improved sign projection apparatus adapted for use for display advertising purposes, by projecting words or symbols on a screen or other plain surface, the image of these words or symbols traveling across the surface of the screen at a constant pre-determined rate of speed so that long messages may be exhibited.

It is the main object of this invention to produce an improved sign of the image projection type which will be compact in form, cheap and simple of construction and operation, and which will be highly convenient for carrying out the purposes for which it is designed.

Another object of this invention is to produce an improved sign of the image projection type in which all of the mechanism may be housed compactly and uniquely in a suitable housing provided, therefore, said housing having associated therewith suitable ventilating means for cooling the same, and being so constructed as to permit of ready access to the interior thereof for adjusting the mechanism disposed therein.

The further object of this invention is to provide an improved sign of the image projection type, a novel and improved means for uniformly moving at a pre-determined rate of speed the character bearing element across the sign portion of the device, and having associated therewith means for preventing the character bearing element from getting caught on said element driven means and causing a stop in the uniform movement of the said element.

A still further object of the invention is to produce an improved sign of the image projection type, all of the mechanism of which may be compactly mounted within a single housing having suitable means associated therewith for carrying the same while the device is in operation, said mechanism being so disposed within said housing as to permit of a ready adjustment of the same.

A still further object of the invention is to provide an improved sign of the image projection type, having an improved means

associated therewith for projecting words or symbols on the surface of a screen, said projection being projected through a suitably mounted prism whereby the image of the words or symbols appearing on the screen may be formed in a straight line, or in a curved rainbow color effect.

With the foregoing and other objects in view, which will appear as the description proceeds, the invention consists in certain novel features of construction, arrangements, and combination of parts, hereinafter more fully described, illustrated in the accompanying drawings, and particularly pointed out in the appended claims, it being understood that various changes in the form, proportion, size, and minor details of the construction may be made without departing from the spirit or sacrificing any of the advantages of the invention.

Stated generally, the invention consists of a suitable housing in which is adjustably mounted the regular stereopticon projecting and condensing lenses, and light box. Disposed also within said housing is an endless film carried on suitable rollers, having associated therewith a suitable steadying device for the film, and means for driving the film, said means consisting of a rotatable motor electrically driven, said motor having associated therewith means for driving a fan for cooling the inside of the housing when the device is in operation. All of the above elements are adjustably mounted within the housing in a novel and compact manner.

Suitable means are provided for taking the motor to the film in order to drive the same in one of two directions, and when once adjusted for movement in one direction, there is no danger of the mechanism slipping or becoming loose or in any way moving into engagement with the means for driving it in the other direction. The words or symbols appearing on the character bearing element are projected on a suitable screen, the to a motor 22, which drives the film moving along the surface of said screen at a constant predetermined rate of speed so that long messages may be exhibited. In practice, a suitable prism may be disposed in front of

the projecting lens, said prism being adjustable to cause, in accordance with the well-known laws of physics, a breaking up of the light projected therethrough into the colors of the rainbow.

For the purpose of facilitating an understanding of my invention I have illustrated in the accompanying drawings, a preferred embodiment thereof, from an inspection of which, when considered in connection with the following description, my invention, its mode of construction, assembly and operation, and many of its advantages should be readily understood and appreciated.

Referring to the drawings in which similar characters of reference are employed to indicate corresponding parts throughout the several figures of the drawings:

Figure 1 is a side elevational view of a sign projecting apparatus embodying the present invention, the housing in which the said mechanism is mounted being shown in section;

Figure 2 is a top plan view of the same taken on line 2—2 of Figure 1;

Figure 3 is a cross-sectional view through the apparatus, taken on line 3—3 of Figure 2;

Figure 4 is an elevational view taken on line 4—4 of Figure 1 and looking in the direction of the arrows;

Figure 5 is a front elevational view of a mounting for the prism disposed in front of the projecting lens 2;

Figure 6 is a view of the words or symbols as they appear projected on the surface of a screen in a substantially straight line; and

Figure 7 is a similar view showing the words as they appear on the surface of the screen when said words are projected through the prism.

Referring to the drawings more specifically by characters of reference, the numeral 10 designates generally a housing of any suitable size and shape, and having a bottom 11, sides 12, and a suitable hinged top 13, said top being hinged to one of the side members 12 by means of the hinge 14, and is adapted for opening up to permit of ready access to the inside of the housing. The bottom wall 11 of the housing is provided with the threaded bearings 15, there being two such bearings at the rear of the casing or housing, and one at the forward end thereof, said bearing 15 being adapted for receiving in threaded engagement, the screws 15', said screws having knurled heads for rotating the same and are adapted for aiding in supporting the housing on a level plane. The said housing may be constructed of any suitable material, such for example, as metal or the like. The base 11 may be cast from suitable material, and is of sufficient strength to support the mechanism to be mounted thereon.

The character bearing element 16 used in

connection with this apparatus is preferably constructed of a flexible material such as paper or other material like the film which is found in motion picture films, and is made in an endless ring or band form as shown in the drawings.

The apparatus devised for moving the character bearing element 16, and for projecting therefrom images of the words or symbols which are punched, stamped, stenciled or otherwise placed thereon, consists of a frame generally designated by a numeral 17, said frame having the side members 18, the lower portions of which are secured to the base 11 by means of the screws 19, or some other suitable means. The said frame is disposed intermediate the ends of the casing and is adapted to support thereon, in a novel and improved manner, all of the mechanism necessary for the proper projection of the characters appearing on the film 16. Disposed on one side of said frame is a lamp box 20, and on the other side thereof is carried my improved film moving mechanism, as well as the projecting lenses and prism, to be presently more fully described. Through the base of the housing is adapted to enter an electric cable (not shown) for supplying electric current to the lamp 21 within the lamp box 20, as well as to a motor 22, which drives the film moving mechanism, said motor being provided with a suitable regulator or governor 23, of any well known construction, for increasing or decreasing the speed of the motor. There is also provided, within the housing, a suitable switch 24, for turning on and off the motor, as well as a rheostat control 25 for controlling the speed of the motor.

Driven directly by the motor shaft 26 is a worm 27. This worm meshes with a gear 28 which in turn drives a shaft 29. The shaft 29 is journaled in a pair of ears 30, provided on the side members 18, and has slideably mounted thereon a member 31, upon the ends of which are provided the bevel gears 32 and 33. The said member 31 is disposed between the ears 30 and is adapted for movement along the shaft 29 to engage either one of a pair of co-operating bevel gears for driving the character bearing element in the desired direction. A set screw 34 is provided on the member 31, and is adapted for positively securing said member to the shaft 29 in the desired position. It will thus be noted that the member 31 may be moved to engage the film-driving mechanism to drive the same in either of two directions, and when once adjusted to one of said positions it will be held in such position by positive means, thereby eliminating the danger of said mechanism becoming loose and out of adjustment.

The frame 17 is provided intermediate the top and bottom thereof with a front extension 35, said extension 35 connecting the two side members 18 and having extending there-

through, adjacent each end thereof, the horizontally disposed rod 36, each of said rods 36 being secured in place in said extension by means of a set screw 37. Said rods 36 have 5 adjustably mounted thereon the lamp box 20 on one side of said frame 17 and a projecting lens tube 38 on the other side of said frame. Said lamp box and projecting lens tube are slideably mounted on said rods as is clearly 10 shown in Figure 2, and are held in any desired position on said rods by means of suitably set screws 39 and 40. Disposed within the lamp box 20 is a luminous center 21, which, in the form shown, consists of the ordinary 15 incandescent light. Said lamp 21 is adjustably mounted within said lamp box and may be fixedly held in any adjusted position by means of the said screw 41. Within the forward end of the lamp box 20 is disposed, in 20 the usual and wellknown manner, the condensing lenses 42, and in the rear wall of said lamp box is disposed a suitable reflector 43. Said lamp box may be of any wellknown construction, and, as the same forms no part of 25 the present invention, it is thought unnecessary to describe the same more in detail.

The upper portions of the side members 18 are connected by a cross member 44, which cross member, together with the front extension 35 and side members 18, form the 30 opening 45, said opening being disposed directly in front of and in alignment with the condensing lenses 42 of the lamp box 20.

The character bearing element 16 is adapted to be mounted within said housing so as 35 to move across the front of said opening 45 for projecting the words or symbols appearing thereon to a suitable screen provided therefor. Said film is driven across the front 40 of said opening at a predetermined constant rate of speed by the motor 22. The mechanism employed for driving said film is as follows:

Vertically disposed shafts 46 and 47 are 45 journaled in the cross members 35 and 44, said shafts being provided at the lower ends with bevel gears 48 and 49, which gears are disposed in position for engagement with the bevel gears 32 and 33 respectively, provided 50 on the member 31. As already explained, the member 31 is adapted to be moved to a position where the gear 32 will be in engagement with the gear 48 for driving the film in one direction, and, as shown in the drawings, 55 when moved to that position, the gears 33 and 49 will be out of engagement with each other.

On each of the shafts 47 and 46 are rigidly secured a pair of sprockets 50 and 51 intermediate the ends of said shafts, said sprockets 60 being provided with teeth 52 which engage the sprocket holes 53 of the character bearing element, and cause it to be moved, as will be hereinafter set forth.

Co-operating with the sprockets 50 and 51 65 are rollers 54 and 55, which are rotatively

mounted on shafts 56 and 57 respectively 70 mounted in the ends of an auxiliary frame 58, the lower portion of which is pivotally secured to the extension 35 as shown at 59 in Figure 4 of the drawings. The upper portion of the auxiliary frame 58 is provided 75 with a lug 60, which is adapted for engagement by a hook 61 pivotally secured to the upper extension 44 by means of a screw 62, as shown in Figure 2 of the drawings. This 80 engagement of the hook 61 with the lug 60 will draw the auxiliary frame 58 toward the frame member 17 and hold the rollers 54 and 55 toward the sprockets 50 and 51 so that the character bearing element is held in proper 85 relation to the sprockets. About centrally between the extensions 34 and 45 and in axial alignment with the condenser lenses 42 of the lamp house and lens tube 38 is provided an 90 aperture 63 in the auxiliary frame 58, this aperture being somewhat wider than the height of the characters on the character bearing element 16. If desired, the said aperture 95 may be closed at the forward end thereof with a plate 64 of glass, or the like, said glass being held on said frame in any suitable manner such, for example, as by the guides 65 secured to the frame by screws or the like. The 100 character bearing element 16 is supported in the housing 10 on a plurality of idlers 66, supported in suitable brackets 67 provided therefor, the forward portion of said element being held in proper alignment between the frame 17 and the auxiliary frame 58. It will thus 105 be noted that by unhooking the auxiliary frame and swinging the same about its pivot 59, the rollers and sprockets will be separated and will permit the placing in position of the character bearing element; the said auxiliary 110 frame may then be hooked to the main frame again forcing the rollers into co-operating engagement with the sprockets for securely holding the character bearing element in operative position.

It sometimes happens, during the operation 110 of the machine, that the film 16 will catch on one of the sprocket teeth 52 and tend to wind around said sprockets causing the apparatus to be thrown out of operation. In order to 115 prevent this occurring, I provide an extension 68, which may be formed integrally with the side members 18, said extension having a curved forward end 69 disposed adjacent the shaft carrying the said sprockets and is adapted 120 for engaging the film to prevent the same from winding on the sprockets in the event the film is accidentally caught on one of the said sprocket teeth.

An additional feature of my apparatus lies 125 in the provision of a fan 70, electrically driven by the motor 22, for properly ventilating and cooling the interior of the housing while the device is in operation. This fan is disposed 130 opposite an opening 71, provided in the rear wall of the housing, and is adapted to draw

in cool air from the outside atmosphere, which air will circulate through the casing and pass out of the top of the lamp box 20.

Adjustably mounted on the front of the lens tube 38 is a mounting 72 in which is slideably mounted a frame or casing 73, in which frame is pivotally secured a suitable prism 74. The mounting 72 and frame 73 have central openings provided therein, said openings being in axial alignment with the lens tube 38. The mounting 72 may be adjustably secured on the lens tube 38 by means of the said screw 74' or in some other suitable manner. The frame 73 is adapted for vertical adjustment within the mounting 72, said adjustment being accomplished by the provision of a winged screw 75 disposed in the mounting 72 and extending through a slot 76 provided in the frame 73. Suitable operating knobs 77 are provided for actuating the prism in order to move the same to any desired position with reference to the openings in said frame and mounting.

The method of operation of the device may be described as follows:

The motor 22 is supplied with current from any suitable source, and the lamp 21 is energized so that it throws a beam of light against condensing lenses 42, the reflector 23 disposed in the rear of said lamp 21 concentrating said light through the said condensing lenses. The motor drives the shaft 29 through the worm 27 and the worm-gear 28, the shaft 29 driving the shaft 46 through the bevel gears 32 and 48. The shaft 46 drives the sprockets 50, which in turn drive the film in the desired direction, and the moving words and symbols provided on said film pass before the aperture 45 and in front of the aperture 63 provided in the auxiliary frame. The light through the perforations is directed by the projecting lenses in the projecting tube 38 through the prism 73 against the screen. As a result, the image of the words or symbols provided on the film 16 is thrown against the screen, these images traveling across the screen from right to left at a constant predetermined rate of speed, so that new words or symbols are constantly appearing on the screen.

It will be noted that the lamp housing, as well as the projecting lens tube is adjustably mounted on the rods 36, thus permitting the adjustment of these elements for purposes of proper focusing. Also, these elements are compactly housed within the casing which may be opened from the top for ready access to these elements for purposes of proper adjustment.

It will be further noted that by providing the adjustable feet 15', the image which is projected from the lens tube may be brought into proper elevation on the sight portion of the sign which may be the screen, wall or other background against which the image is

thrown. These adjustable feet 15' also permit the proper disposition of the apparatus on a surface which may not be properly leveled. Also, my improved construction permits of ease in changing from one character bearing element to another, it being but necessary to unlatch the auxiliary frame 58 from the frame 17 to cause the rollers to release the element when it may be removed and a new one put in to place, whereupon, the auxiliary frame may be again latched to the frame 17 and the apparatus may be again started.

The drawings show the apparatus arranged to display the subject matter of the element through a translucent sight portion such as ground glass or the like, instead of upon an opaque surface. Should it be desired to display the subject matter upon any opaque surface, it is but necessary to loosen the screw 34 and to move the member 31 to bring the gear 33 thereon into engagement with the gear 49, which will convert the sprocket 51 into the driver instead of the sprocket 50 which is now the idler. The character bearing element is now turned inside out causing the characters to be reversed from their previous position and to be presented to the apparatus side of the sight portion, in correct order and moving correctly from the viewer's side of the sight portion. The projection of the character images therefor will appear in correct order and move in proper sequence across the sight portion.

The style of projection just described, in which both the viewer and the apparatus are on the same side of the sight portion, is of value in the usual motion picture theatre, in projection against the walls of buildings, sign boards and the like; while the reverse method first described is particularly desirable in show windows and in similar cases where reverse side projection would have to be used.

It is believed that my invention, its mode of construction and assembly, and many of its advantages should be readily understood from the foregoing, without further description, and should also be manifest that while a preferred embodiment of the invention has been shown and described for illustrative purposes, the structural details are, nevertheless, capable of wide variation within the purview of my invention as defined in the appended claims.

What I claim and desire to secure by Letters Patent of the United States is:

1. An advertising device comprising an endless flexible strip, having at recurring intervals surfaces forming characters, said characters running lengthwise of the strip, the character bearing surfaces and characters being of different degrees of transparency, means for projecting the image of said characters on a screen, driving means including

sprockets for continuously moving said strip so that the projected image is in continuous motion, a strip steadying device consisting of an inner frame member and an outer frame member, pivotally supported thereon, means for opening said frame members to allow said strip to be inserted between the same and to be then closed to keep said strip thus inserted, cooperating rollers mounted upon said frame members adapted to hold said strip vibrationless as it passes therethrough, and projections formed integral with said inner frame for partially surrounding said sprockets for preventing the film from winding around said sprockets when accidentally caught thereon.

2. An advertising device comprising an endless flexible film, having words running lengthwise of the film, means for projecting the image of said words on the screen, driving means for continuously moving said film so that the projected image is in continuous motion, an adjustably mounted vertical frame having a centrally disposed opening therein across which the said film is adapted to move, sprockets mounted adjacent each side edge of said opening engaged by said film for propelling the same, means formed integral with said frame and surrounding a substantial portion of said sprockets for preventing the film from winding itself about said sprockets in the event of being caught thereby, and an auxiliary frame pivotally mounted to said first mentioned frame adjacent the lower end thereof, detachable means for securing said auxiliary and main frame in operative relation with each other, said auxiliary frame having rollers disposed adjacent said sprockets and being adapted for cooperating with the same to hold said film vibrationless as it passes therebetween.

3. An advertising device comprising an endless flexible film, having characters running lengthwise of the film, means for projecting the image of said characters on a screen, driving means for continuously moving said film so that the projected image is in continuous motion, a vertically disposed frame having a central opening therein across which the same film is adapted to travel, horizontally disposed rods adjustably supported within said frame, said rods having adjustably mounted thereon the projecting means including the usual stereopticon condensing lenses, light source, and projecting lenses, vertically disposed sprockets provided adjacent each side edge of said opening in said main frame for propelling said film, means formed integral with said frame and extending to a point adjacent the film engaging faces of said sprockets for preventing the said film from winding about said sprockets when caught thereby, and a pivotally mounted auxiliary frame provided

on said main frame adapted to open relative to said main frame to allow said film to be inserted therebetween, and to be then detachably closed to keep said film thus inserted, and vertically disposed rollers provided on said auxiliary frame adapted to cooperate with said sprockets for holding the film vibrationless as it passes therebetween, and a housing for all of said mechanism, said housing being provided with vertically disposed rollers on each side thereof, said rollers supporting said film in its travel between the two supporting frames.

4. In a sign projection apparatus, a housing, an upstanding frame mounted within said housing, horizontally disposed rods carried by said frame intermediate the ends thereof, an auxiliary frame pivotally secured to said first mentioned frame, a projection device, including the usual light source, carried on one side of said frame and the projection lens carried on the other side of said frame, said frames being provided with apertures in axial alignment with the light source and projection lens, an endless flexible film having words running lengthwise of the film supported in said housing by means of vertically disposed rollers secured to the sides of said housing, said film being adapted to travel in a continuous motion across the apertures provided in said frame members whereby the words appearing thereon will be brought into operative relation with the said apertures, means including motor driven sprockets provided on the main frame and cooperating rollers provided on said auxiliary frame for driving said film across the aperture in said frames and to hold the said film vibrationless as it passes therebetween, means formed integral with said main frame for partially surrounding said sprockets to prevent the film from winding thereon when accidentally caught thereby, manually operable means for reversing the direction of movement of the film, and means disposed within said housing for ventilating the same.

5. In a sign projection apparatus, a housing, an upstanding frame mounted within said housing, horizontally disposed rods carried by said frames intermediate the ends thereof, projecting means disposed adjustably on said horizontally disposed rods, an auxiliary frame pivotally mounted to said main frame being adapted to cooperate therewith for receiving therebetween a film, said film having characters running lengthwise thereon whereby said projecting means will project the image of said characters on a screen, driving means for continuously moving said film so that the projected image is in continuous motion, means including motor driven sprockets provided on said main frame and cooperating rollers provided on

said auxiliary frame for holding said film vibrationless as it passes between said frames, and means provided on the side walls of the housing for contacting that portion
5 of the film just beyond the said frames at either side thereof.

In testimony whereof, I affix my signature.
PHILLIP KRUPNIK.

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