

July 26, 1932.

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1,868,889

DUPLEX PROJECTION

Filed March 26, 1929

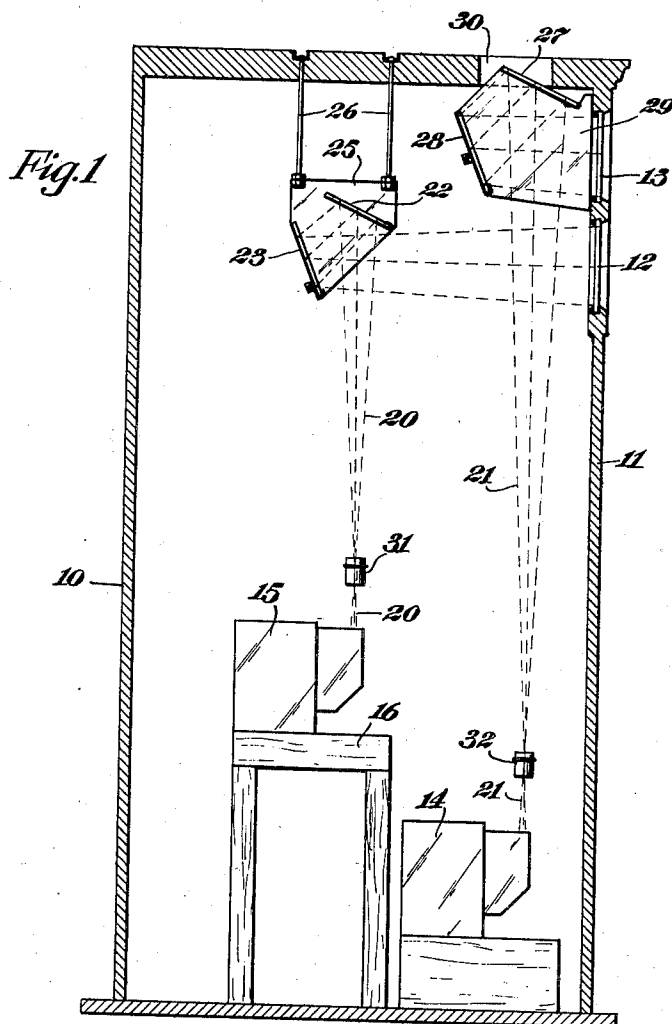


Fig. 2

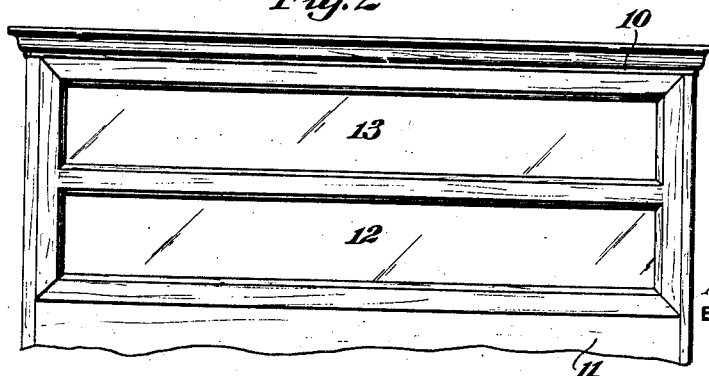
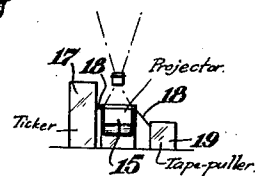


Fig. 3



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DUPLEX PROJECTION

Application filed March 26, 1929. Serial No. 350,113.

My present invention relates generally to stock ticker projecting machines, and has particular reference to the mounting of such machines in connection with the display screens cooperating therewith.

Although I have herein illustrated and shall hereinafter describe my invention as the same is applied to a projecting machine of the foregoing character, nevertheless it will be understood that certain phases of my invention are not limited to an application of this character and relate from a broader aspect to the projection of light beams in general.

A particular object of my present invention is to provide an improved projecting machine and mounting means therefor, whereby images are produced upon more than one screen at one time. For example, where the markings on one ticker tape relate to the transactions of one particular market, and where a second ticker tape bears indications of transactions in a different market, it is frequently desirable to render both tapes visible in a relatively large and displayed manner. Thus, in New York city, a pair of screens commanding a particular observation area may be employed for displaying stock market and curb market transactions.

A more specific object of my invention is to provide mounting means for the projecting devices and their appurtenant parts whereby the plurality of screens may be most efficiently arranged in maximum proximity to each other, and whereby the entire supporting structure, such as a suitable housing, may be rendered more compact and attractive.

My construction contemplates the employment of two projecting devices, each of which includes a source of light adapted to project a beam of light through a marked ticker tape passing therethrough; and it is an object of my invention to provide means for creating images on the plurality of screens, which images bear a predetermined size relationship to each other. For example, it may be desirable in certain cases to have the images on all screens identical in size; in other cases, it may be most satisfactory to have the upper-

most screen display an image of slightly greater size because of its greater distance from the observers.

In general, it is an object to provide at least two projecting devices in association with at least two preferably superposed vertical screens, and means for transmitting the beams of light from the projecting devices onto the screens in a manner which fully takes into account the most efficient mounting and mutual arrangement of the projecting devices and the possible inequalities of the distances through which the two beams must pass.

For the attainment of the foregoing objects and such other objects as may hereinafter appear or be pointed out, I have illustrated one form of my invention in the accompanying drawing wherein—

Figure 1 is an elevational cross-section through a structure embodying the features of my invention;

Figure 2 is a view taken from the right of the upper portion of Figure 1; and

Figure 3 is a diagrammatic view on a greatly reduced scale of one of the projecting devices of Figure 1 as viewed from the right thereof.

In the embodiment herein chosen for illustration and description, I have shown a housing 10 provided with the front vertical wall 11 in the upper portion of which a pair of superposed display screens 12 and 13 are arranged. These screens have been shown of equal size as illustrated in Figure 2 and the attractive proximity thereof, resulting in general compactness and inexpensiveness of manufacture, is clearly depicted in Figure 2.

Mounted in the housing and behind the front wall 11 I have shown two projecting devices 14 and 15, the latter being further to the rear of the wall 11 than the former. In the illustrated embodiment, the projecting device 15 is mounted higher than the device 14, as upon a suitable stand or pedestal 16, this arrangement being most efficient where the housing is substantially triangular and is mounted in a corner of a room or the like. Each of the projecting devices constitutes one element of an assembly of the character

illustrated in Figure 3. If, for example, the projecting device of Figure 3 be that which is designated by the reference numeral 15 in Figure 1, then it is associated with a stock
5 ticker 17 adapted to discharge a marked tape 18, the latter being directed through the projecting device 15 and thence to a suitable take-up or rewinding mechanism 19.

Each of the projecting devices includes a
10 source of light (not shown in the drawing) adapted to project a beam of light upwardly through the tape passing therethrough. I have shown a beam of light of this character, 20, emanating from the projecting device 15; and I have shown a similar beam of light 21
15 thrown upwardly from the projecting device 14.

It is to be noted that the beams 20 and 21 are directed in substantially parallel vertical
20 directions.

In the path of each upwardly projected beam I interpose suitable reflecting means for transmitting the beam in a substantially perpendicular direction onto the rear of one
25 of the screens on the front wall 11. For example, I have shown a mirror or reflecting member 22 interposed in the path of the rear beam 20, the mirror 22 being inclined upwardly and rearwardly so as to reflect the
30 beam downwardly and rearwardly toward a second mirror or reflecting member 23. The latter is inclined upwardly and rearwardly but at a greater angle to the horizontal, whereby it serves to receive the reflected rays
35 from the mirror 22 and to re-reflect the latter in a substantially horizontal and forward direction onto the rear of the screen 12. The mirrors 22 and 23 are preferably disposed at an angle of substantially 45° to each other
40 and are suitably mounted or supported by a device 25 fixedly associated with the housing 10, as by means of the upwardly extending tie members 26.

A similar pair of mirrors 27 and 28 has
45 been shown interposed in the path of the upwardly projected beam 21, these mirrors being carried by a supporting device 29 which is attached to the front wall 11. To accommodate the upper portion of the mirror
50 27 in an efficient and compact manner, I have provided a recess 30 in the upper wall of the housing 10.

It is obvious that the lower border of each image lies substantially on a horizontal plane
55 with the lower edge of the second reflecting member from which such image emanates. Thus, the lower border of the image on the screen 12 is substantially aligned horizontally with the lower edge of the mirror 23, and the
60 same is true with respect to the lower edge of the image produced on the screen 13, the latter lower edge being substantially aligned horizontally with the lower edge of the mirror 28. It is also to be observed that the upper
65 border of each image is similarly aligned

with the upper edge of the remaining mirror but is somewhat lower. For example, the upper border of the image on the screen 12 lies in a lower horizontal plane than the upper edge of the mirror 22; and similarly, the
70 upper border of the image on the screen 13 lies substantially lower than the upper edge of the mirror 27. Accordingly, in carrying out my invention, particularly with respect to the compactness aimed at, I have fully
75 taken into account the foregoing relationships of image borders and mirror edges, and I have mounted the mirror pair 22—23 below the mirror pair 27—28. This arrangement permits me to mount the screens 12 and 13
80 in minimum proximity to each other. If, for example, the mirror pair 22—23 were positioned behind the screen 13, and the mirror pair 27—28 were positioned behind the screen 12, the screens 12 and 13 would
85 have to be further apart so that the horizontal beam leading from the mirror 23 to the screen would be allowed to clear the upper edge of the mirror 27.

The foregoing relative mounting and arrangement of the two mirror pairs illustrated has a further advantage and carries into effect a further object of my invention in the light of the unequal distances through which
90 the two light beams travel. Thus, since the projecting device 15 is further from the wall 11 than the projecting device 14, it follows that the horizontal component of beam travel from the device 15 will be longer than the horizontal component of beam travel from the device 14. In an effort to compensate for this, and to equalize the total travels of the beams, the mirror set interposed in the path of the rear beam 20 is positioned lower than the other mirror set, as shown, so that the vertical component of travel of the beam 20 will be somewhat less than the vertical component of travel of the beam 21.
95 100 105

Where the projecting devices are arranged one behind the other, as shown, but on a substantially horizontal plane with respect to each other, the relative arrangement of the mirror pairs in accordance with the foregoing description will satisfactorily equalize the total travels of the two beams, so that if the projecting devices are otherwise the same, the images produced on the two screens will be substantially equal in size. By raising one of the projecting devices with respect to the other, as shown in Figure 1 wherein the projecting device 15 is higher, the relative sizes of the images on the two screens may be varied in accordance with requirements.
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In the illustrated embodiment, I have shown the possible combination with the foregoing control of size relationship, of a further means for controlling the relative sizes of the images. I have shown an objective lens 31 in the path of the beam 20, and an objective lens 32 in the path of the beam
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21. If these objective lenses were identical, or if they were omitted, the stepped mounting of the projecting devices 14 and 15 would cause the image on the screen 13 to be larger than the image on the screen 12. As an illustration of the manner in which this efficient stepped mounting of the projecting devices may be resorted to while at the same time controlling the image sizes to render them substantially equal, I have provided the objective lens 31 of a shorter focal length, say, 5.5 inches, than the focal length of the objective lens 32, which may be, for example, 6.5 inches. This variation of focal lengths results in different divergences of the beam whereby the image on the screen 12 may be rendered equal in size to that on the screen 13.

It will be obvious that where the projecting devices are mounted on the same plane, or in a less stepped relationship than that illustrated, then the provision of objective lenses of different focal lengths may still be resorted to to accomplish a desired and predetermined control of size relationship of images.

In general, it will be observed that I have provided a construction which is extremely simple and which serves to fulfill the contemplated function in an efficient and easily controllable manner. The structure illustrated by way of example is extremely compact and attractive in appearance. A minimum of parts are employed, and a pair of images of equal sizes are produced in an efficient manner upon a pair of closely adjacent equally sized screens.

It will be obvious that changes in the details herein described and illustrated for the purpose of explaining the nature of my invention may be made by those skilled in the art without departing from the spirit and scope of the invention as expressed in the appended claims. It is therefore intended that these details be interpreted as illustrative, and not in a limiting sense.

Having thus described my invention and illustrated its use, what I claim as new and desire to secure by Letters Patent is—

1. The combination with a housing having a wall, of a pair of display screens one above the other in said wall, a projecting device in said housing, a second projecting device in said housing between said wall and said first projecting device, each of said projecting devices including a light source adapted to project a beam of light in a direction substantially parallel to said wall, a reflecting means for transmitting the light beams from said first projecting device in substantially perpendicular directions onto said lower screen, and a second reflecting means for transmitting the light beams from said second projecting device in substantially perpendicular directions onto said upper screen whereby the distances traversed by the light

beams to said screens may be made substantially equal, said second reflecting means extending up partly into the top of said housing and the upper portion of said first reflecting means extending up above the lower edge of said second reflecting means.

2. The combination with a housing having a wall, of a pair of display screens one above the other in said wall, a projecting device in said housing, a second projecting device in said housing between said wall and said first projecting device, each of said projecting devices including a light source adapted to project a beam of light in a direction substantially parallel to said wall, a reflecting device for transmitting the light beams from said first projecting device in substantially perpendicular directions onto said lower screen, a second reflecting device disposed at a higher level than said first reflecting means for transmitting the light beams from said second projecting device in substantially perpendicular directions onto said upper screen, said second reflecting device extending up partly into the top of said housing and the upper portion of said first reflecting device extending up above the lower edge of said second reflecting device.

3. The combination with a housing having a wall, of a pair of display screens one above the other in said wall, a projecting device in said housing, a second projecting device in said housing between said wall and said first projecting device, each of said projecting devices including a light source adapted to project a beam of light in a direction substantially parallel to said wall, a reflecting device having an upper mirror and a lower mirror, the upper mirror receiving the light beams from said first projecting device and reflecting them onto said lower mirror, the lower mirror reflecting the light beams so received onto said lower screen, and a second reflecting device disposed at a higher level than said first reflecting device and also having an upper mirror and a lower mirror, the upper mirror of said second reflecting device receiving the light beams from said second projecting device and reflecting them onto the lower mirror of said second reflecting device and the lower mirror of said second reflecting device reflecting the light beams so received onto said upper screen, said second reflecting device extending up beyond the upper face of said housing, and the upper portion of said first reflecting device extending up beyond the lower edge of said second reflecting device.

4. The combination with a housing having a wall, of a pair of display screens one above the other in said wall, a projecting device in said housing, a second projecting device in said housing between said wall and said first projecting device, each of said projecting devices including a light source adapted

- to project a beam of light in a direction substantially parallel to said wall, a reflecting device having an upper mirror and a lower mirror, the upper mirror receiving the light beams from said first projecting device and reflecting them onto said lower mirror, the lower mirror reflecting the light beams so received onto said lower screen, a second reflecting device disposed at a higher level than said first reflecting device and also having an upper mirror and a lower mirror, the upper mirror of said second reflecting device extending up partly into the top of the housing and receiving the light beams from said second projecting device and reflecting them onto the lower mirror of said second reflecting device and the lower mirror of said second reflecting device reflecting the light beams so received onto said upper screen, the upper portion of said first reflecting device extending up beyond the lower edge of said second reflecting device, and optical means for each projecting device, each optical means having objective lenses of a focal length to correspond to the distances traversed by the light beam received to render the images on said screens of predetermined relative size.
5. The combination with a housing having a wall, of a pair of display screens one disposed longitudinally along the upper end of said wall, the other disposed longitudinally directly below said first mentioned screen, a projecting device in said housing, a second projecting device in said housing and between said wall and said first projecting device, said projecting devices and wall being compactly disposed adjacent to one another, each of said projecting devices including a light source adapted to project a beam of light in a direction substantially parallel to said wall, a reflecting device suspended from the top of said housing directly above said first projecting device and having an upper mirror and a lower mirror, the upper mirror receiving the light beams from said first projecting device and reflecting them onto said lower mirror, the lower mirror reflecting the light beams so received onto said lower screen, a second reflecting device disposed adjacent to the upper screen at a higher level than the level of said first reflecting device and also having an upper mirror and a lower mirror, the upper mirror of said second reflecting device extending up partly into the top of the housing and receiving the light beams from said second projecting device and reflecting them onto the lower mirror of said second reflecting device and the lower mirror of said second reflecting device reflecting the light beams so received onto said upper screen, the upper portion of said first reflecting device extending up beyond the level of the lower edge of the second reflecting device to form a compact arrangement in a vertical direction, and optical means for said projecting devices comprising objective lenses of different focal lengths cooperating with the distances traversed by the beams to said screens to render the images on said screens of predetermined relative size.
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