April 17, 1928. 1,666,305

B. A. PROCTOR

NEWS PROJECTION MACHINE

Filed Jan. 19, 1926 2 Sheets-Sheet 1

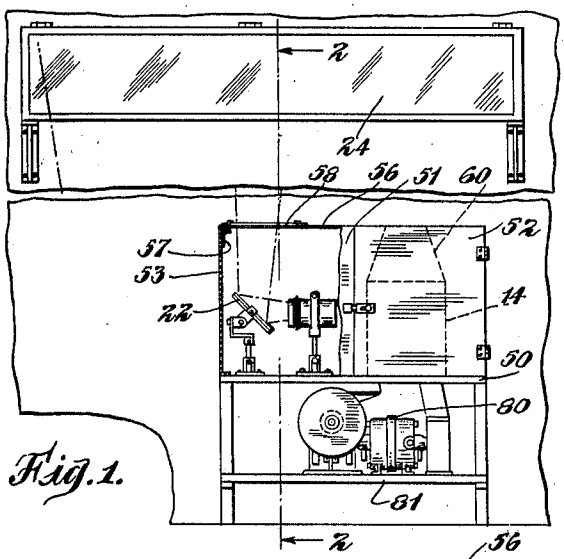


Fig. 1.

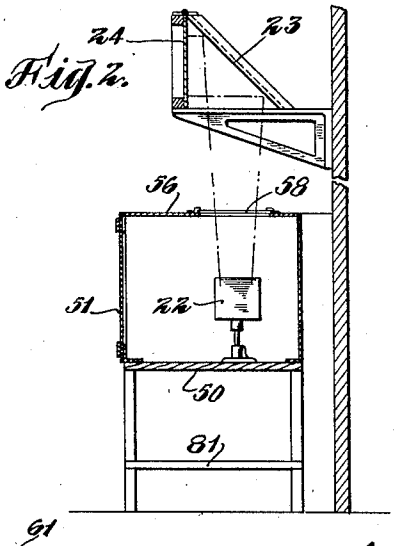


Fig. 2.

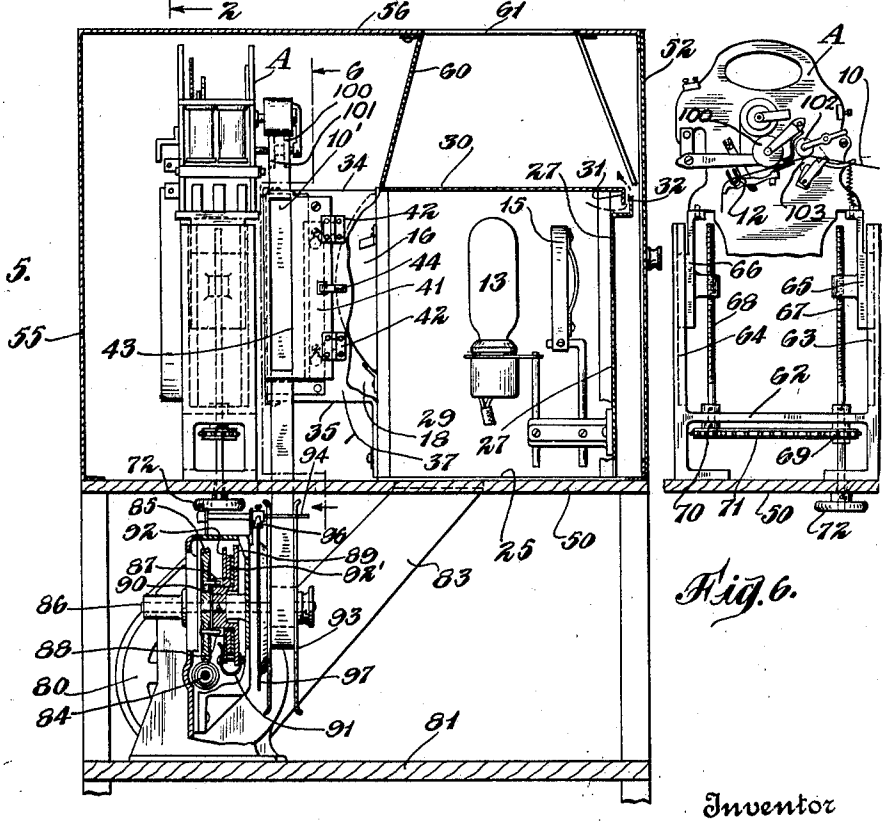


Fig. 5.

Fig. 6.

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Fig. 4.

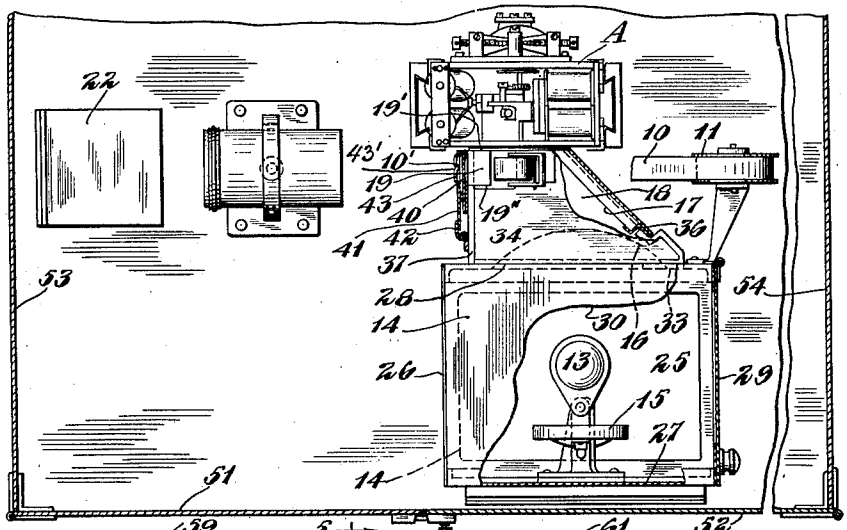
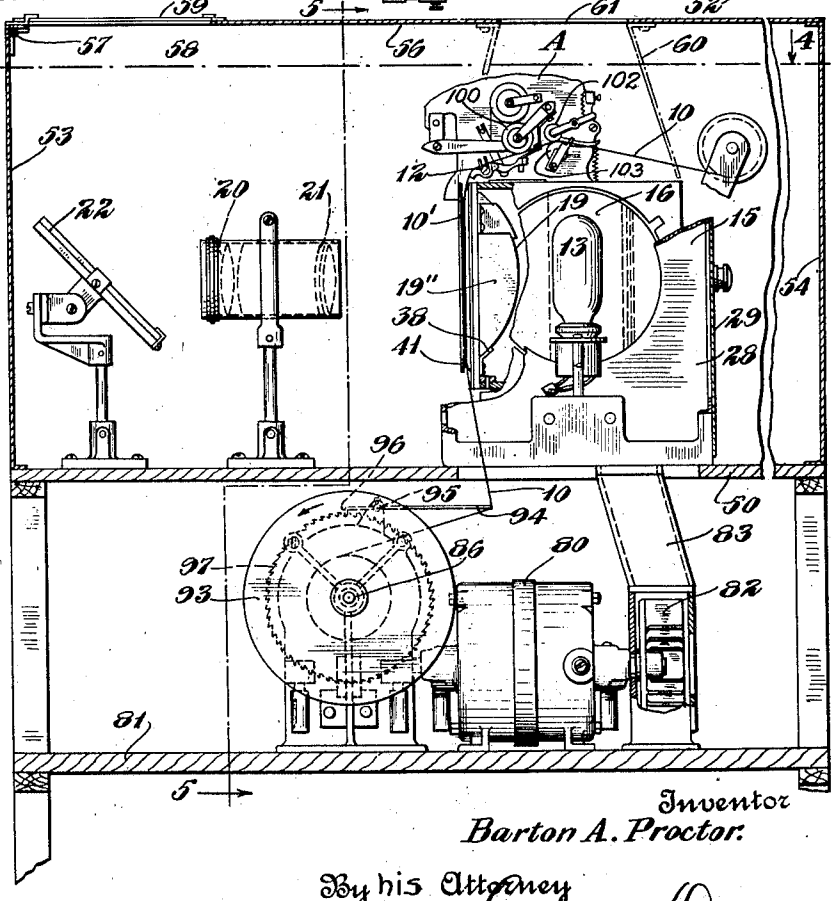


Fig. 3.



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Patented Apr. 17, 1928. 1,666,305

UNITED STATES PATENT OFFICE.

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NEWS-PROJECTION MACHINE.

Application filed January 19, 1926. Serial No. 82,295.

The present invention relates to news projection machines, and is more particularly directed toward a machine suitable for projecting news matter, such as stock quotations printed on a ticker tape or the like so as to enlarge the characters and display them on a screen for observation, and to an improved optical system, or lay-out, by which the heat from the lamp is effectively prevented from reaching the ticker.

Stock or news tickers, with which the present invention is more particularly adapted to be used, consists of well known mechanisms for printing the quotations or other news on a paper strip or tape, and delivering the printed strip for observation. Such machines, in which the quotations are printed on ordinary opaque paper have been in use for a great many years, but it has been impossible for a large number of persons to observe the quotations as soon as they come off the machine, thereby hindering those who desire to follow the market closely.

The present invention contemplates the provision of a projection machine associated with the ticker so that the quotations, preferably printed on transparent tape, may be readily observed by a number of persons as soon as possible after the quotation has been printed. It is very desirable to eliminate every possible delay between the printing of the quotation and its appearance on the screen, so that all the observers may have the latest information. To accomplish this, I have found that it is desirable to arrange the projection machine and ticker so that the tape is immediately passed through the projection machine without permitting the formation of any slack in the tape. Machines heretofore available do not project any particular quotation until after a considerable length of tape has passed through the printing mechanism and several later quotations have been printed. These machines are therefore several quotations behind the market.

According to the present invention, however, the parts are so arranged that the ticker tape is passed through the projection machine with a minimum delay so that the projected quotations may be seen as soon as possible after they are printed. In the present construction it is possible to keep the screen to within less than five quotations behind the market.

The present invention also contemplates the provision of a news projection machine in which the minimum number of lenses and mirrors are used to accomplish the projection of the quotation. By eliminating return paths in the projected beam of light, it is possible to reduce the number of optical inversions in the system. This results in improving the projection.

To obtain the results above referred to, it has been found to be desirable to arrange the ticker mechanism and the optical set-up including the light source, so that the ticker is placed to one side of the axis of the optical system, and to include in this optical system a mirror so arranged that the lamp may be placed on the other side of the ticker. By arranging the devices as thus suggested it has been found possible to bring the ticker mechanism lower than can be done when the ticker is placed above the lamp. This brings the ticker mechanism very close to the beam of light used in projecting the quotation without interference with the lamp or housing.

Inasmuch as the ticker mechanisms, with which the present invention is more particularly adapted to be used, generally deliver the printed tape some distance behind the front edge of the frame of the ticker, it is obvious that a delay of several quotations will be incurred if the tape is to be carried away from the machine in a horizontal direction. The present invention therefore contemplates the provision of a news projection machine in which the ticker tape is carried directly downward as soon as it is freed from the delivery roll of the ticker. By placing the lamp to one side of the vertically moving printed tape and using a pair of lenses and an interposed mirror to direct the light through the tape from behind, it is possible to provide a device in which the parts are placed very close to one another without bringing about undesirable heating, and at the same time provide a news projection machine in which the quotations are displayed with a minimum delay and with a minimum number of inversions in the optical train.

As these machines are to operate in lighted rooms, it is necessary to use a very bright light to produce an observable image. This necessitates the use of a high wattage electric lamp, placed in a light-tight ventilated

housing. To protect the ticker from over heating, and consequent drying of the ink and lubricant, the present invention contemplates the use of a motor driven ventilating system and a flue which will carry the heated air away from the machine. Preventing the hot air from coming in contact with the ticker, eliminates excessive drying of the ink on the printing wheels, and of the lubricant in the bearings. The ticker operates for a much longer time without attention, producing satisfactory printed characters on the translucent paper.

Another object of the invention is to provide an arrangement of projecting machine and ticker mechanism so that the ticker mechanism may be readily inspected. According to the arrangement to be herein described, it is possible to move the ticker mechanism so that it will become more easily accessible, without in any way interfering with the projection of the quotations, except that they are somewhat delayed. In this way it is possible to observe the operation of the entire apparatus during the inspection.

Other and further objects of the invention will appear as the description proceeds.

The accompanying drawings show, for purposes of illustrating the invention, one of the many possible embodiments in which it may take form, it being understood that the drawings are illustrative of the invention, which is not limited to the same.

In these drawings:

Figure 1, is a front view illustrating the assembly of the projecting machine and screen;

Fig. 2, is a vertical section on the line 2—2 of Fig. 1, looking in the direction of the arrows;

Fig. 3 is an enlarged elevational view omitting the screen, parts being broken away to show internal construction;

Fig. 4 is a horizontal sectional view taken on the line 4—4 of Fig. 3, parts being broken away to show internal construction;

Fig. 5 is a view at right angles to Fig. 3, taken along the line 5—5 of Fig. 3, parts being broken away to show construction; and

Fig. 6, is a view illustrating the elevating mechanism for the ticker to permit inspection of the same, the view being taken on the broken line 6—6 of Fig. 5.

A stock ticker of conventional design is indicated at A. This ticker has the usual selectors, printing mechanism consisting of the stock index printing wheel 100 and stock price indicating wheel 101, and tape feeding mechanism consisting of the feed rollers 102 and 103, and operates in the well known manner on a tape 10 which is drawn from a supply reel 11 and carried past the printing mechanism. After the quotations have been printed, the tape passes out of the ticker and is delivered over a guide roll, or the like, indicated at 12. The printed ticker tape hangs down from this ticker, as indicated at 10′. The present construction contemplates the use of a transparent tape onto which the ink is deposited by the printed mechanism in the same manner that the ticker would print the quotations on an opaque tape. The printed characters appear on the tape and would be legible when viewed as in Fig. 5.

An electric lamp 13, suitably mounted inside a lamp housing 14, is used as a source of light for projecting the quotations. The light is concentrated into a strong horizontal beam by a mirror 15 and condensing lens 16. This beam falls on an obliquely disposed mirror 17, placed in a lens chamber 18, which reflects the light and directs it through a second condensing lens 19. This lens is preferably cut away adjacent the ticker, as indicated at 19′, so that the axis of the lens is close to the ticker, directly underneath the delivery roll of the ticker. For symmetry, the other side of the lens may be cut away as indicated at 19″.

Since the lamp and lamp housing are placed to one side of the ticker, it is not necessary to elevate the ticker above the lamp housing, but it may be placed much lower. The closeness with which these parts may be brought together is indicated in Fig. 3, from which it will appear that the light passing through the upper end of the condensing lens 19 may pass through the tape close to the delivery roll of the ticker.

The projected beam of light passes through the tape and then through a pair of focusing lens 20 and 21 carried in a tube in the usual manner. These lens invert the image in both directions. The beam of light then falls on the oblique mirror 22 which reflects it upwardly as indicated in Figs. 1 and 2. This mirror serves to take out one of the inversions produced by the focusing lens. The beam of light then passes from the mirror 22 upwardly where it engages with an oblique mirror 23 which reflects the light forwardly in a horizontal beam, causing it to fall on a vertical screen 24, as indicated. This mirror takes out the other inversion and produces an upright image, which reads from right to left in the same manner as the figures appear on the tape adjacent the lens 19. These characters are reproduced on the screen in the proper order so that the latest quotation is at the left.

The lamp housing 14 is here shown in the form of a sheet metal box having a bottom 25, sides 26, 27 and 28, and a door 29 on one side of the box to permit access to the interior. The housing is closed by a roof or top 30 which has a flange 31 bent downwardly, as indicated in Fig. 5, to pass below

the upper outwardly bent edge 32 of the side wall 27. A blower, to be described, forces a draft of air into the bottom of the lamp housing and the hot air passes out between the flange 31 and the upper edge 32, as indicated by the arrow.

The condensing lens 16 is mounted opposite an aperture 33 in the side wall 28 of the lamp housing, and projects into the lens chamber 18 above described. This lens chamber is in the form of a light tight box having a top wall 34, bottom wall 35, back wall 36 and front wall 37. The mirror 17 is suitably mounted on the back wall 36 of the lens chamber and the condensing lens 19 is attached to the front wall by suitable supports, as indicated at 38 and 39. The front wall 37 of this lens chamber is provided with a slot 40 which is directly in front of the lens 19.

A plate 41 is hinged at 42 to the front wall 37 of the lens chamber and this plate is provided with a vertical slot 43 and an indent 43′, see Fig. 4, to engage the tape 10′ and press it into engagement with the lens 19 at the upper end thereof. This indent 43′ is preferably provided in the middle of the upper end of the plate 41 so as to engage the printed face of the tape 10′ in the space formed between the row of printed stock indices and the row of stock prices printed on the tape 10′, whereby the vibrations transmitted to the tape 10′ will be interrupted at this point and not transmitted to the portion of the tape opposite the slot 43 and at the same time not engage the printed portion of the tape 10′ thereby protecting the same from smearing. This plate 41 is pressed by a spring 44 against the portion 10′ of the tape so as to hold this tape flat and close to but not in contact with the face of the lens 19. The plate 41 may be swung to the left, as indicated in Fig. 4, when it is desired to thread the tape through the machine.

The ticker, lamp housing, lens chamber, focusing lens and lower mirror 22 are preferably placed in an inclosing cabinet to protect them from dust and dirt, and to prevent unauthorized tampering with the apparatus. Such a cabinet is indicated in some detail in the drawings. The parts above mentioned, are mounted on a platform 50 and enclosed, as indicated. This cabinet may be wooden or made of metal. It may be provided with two hinged front doors 51 and 52, permanently mounted sides or ends 53 and 54, a permanently mounted back 55 and a cover 56 which may be hinged at 57. The cover 56 will have an opening 58 above the mirror 22 and somewhat larger than this mirror so that light may pass through the opening. This opening may be closed by a glass plate 59, if desired.

To carry the heated air from the lamp housing out of the cabinet so as to prevent heating and drying of the ink on the ticker, there is preferably provided a flue 60 from the top of the cabinet. This flue may be attached either to the cover of the cabinet or to the top of the lamp housing as desired.

The ticker mechanism frequently needs inspection and adjustment, and in the present embodiment of the invention it is possible to accomplish these inspections with ease. Owing to the fact that the ticker is mounted to one side of the axis of the optical system, and away from the lamp housing, it is possible to support the ticker independently from the support of the lamp housing. While many forms of support for the ticker may be used, there is illustrated in Figs. 5 and 6 of the drawings, a framework 62 having vertical side members 63 and 64 which act as guides for movable followers 65 and 66 which directly support the framework of the ticker A. To bodily raise and lower the ticker, there is provided a pair of screws 67 and 68 which thread into the movable followers 65 and 66. These screws are suitably anchored in the bottom part of the frame 62, and sprocket wheels 69 and 70 attached to them are connected together by a chain 71. A hand wheel 72 suitably placed so that one may turn the screws and thereby raise or lower the ticker head. This raising or lowering of the ticker head will not in any way affect the operation of the printing mechanism or the tape feeding mechanism. It will merely bring about a longer delay between the printing of the quotation and its projection on to the screen. It will thus be obvious that the operation of the printing mechanism may be observed on the screen.

One of the many forms of take-up mechanisms which may be used to wind the tape as it is passed through the projecting mechanism is illustrated in detail in Figs. 3 and 5 of the drawings. A motor 80 is mounted on a platform 81 placed below the cabinet. This motor operates a fan 82 which blows air through a conduit 83 to the lamp housing. It also operates a worm 84 which is in mesh with a worm-wheel 85 loosely carried on a horizontal shaft 86. The worm-wheel is provided with a pair of pins 87 which engage in slots 88 in a friction member 89, loosely mounted on the hub 90 of a friction clutch. This hub is pinned to the shaft 86 so as to rotate with it. Springs 91 attached to the member 89 press a ring 92 toward a second ring 92′ adjacent the member 89. This friction clutch permits the application of a small amount of power to the shaft 86 and permits the motor to continue to run in case the shaft 86 is locked. The shaft 86 also carries a winding reel 93 onto which the tape 10 is to be wound. A finger 94, pivotally mounted at 95, rests lightly

on the ticker tape 10, while the other end 96 of this finger is engageable with a ratchet wheel 97 attached to the shaft 86. Whenever the tension of the tape becomes sufficient to lift the free end of the arm 94, it will be obvious that the lift end will be pressed down to engage with the teeth of the ratchet wheel. This will stop the take-up reel and cause the clutch to slip until the ticker has delivered enough tape to permit the arm 94 to lower and release the ratchet wheel.

From the foregoing it will be apparent that the present news projection machine is well suited for the purpose of projecting stock quotations from a ticker tape and reproducing these quotations in such a manner that they may be observed by a number of persons simultaneously. Owing to the peculiar arrangement of parts, it is possible to pass the quotations into the path of the beam of light with a minimum delay, thereby making it possible for a number of persons to follow the market as closely as the ticker mechanism permits. It is also possible to effectively shield the ticker mechanism from the heat produced by the high wattage electric lamp, and to permit inspection of the ticker without stopping either its operation or the operation of the projecting device.

It is obvious that the invention may be embodied in many forms and constructions, and I wish it to be understood that the particular form shown is but one of the many forms. Various modifications and changes being possible, I do not limit myself in any way with respect thereto.

I claim:

1. In a news projection machine, the combination with a stock ticker or the like, having tape printing mechanism and means for delivering the printed tape, of a light tight box supported directly below the printing mechanism and to one side of the ticker, said box having a window in one side past which the tape moves, an opening in the side remote from the ticker, a condensing lens adjacent the window, a second condensing lens in said opening, and a mirror to reflect light from one lens to the other, so as to illuminate the tape.

2. In a news projection machine, the combination with a stock ticker or the like, having tape printing mechanism and means for delivering the printed tape, of a light tight box supported directly below the printing mechanism, and to one side of the ticker, said box having a window in one side past which the tape moves, an opening in the side remote from the ticker, a condensing lens adjacent the window, a second condensing lens in said opening, a mirror to reflect light from one lens to the other, so as to illuminate the tape, a lamp housing removed from the ticker and adjacent the side of the box having the opening, and a lamp in focus with said lenses.

3. In a news projection machine, in combination, a stock ticker or the like having means to deliver a printed tape vertically downward, a housing having a vertical window past which the tape moves, a light source placed to one side of the window and removed from the ticker, means in the housing for concentrating light from the light source onto the tape as it passes the window, said source comprising a condensing lens, an oblique mirror and a second condensing lens placed back of the window, a focusing lens outside the housing, a screen, and a pair of mirrors between the focusing lens and the screen.

4. In a news projection machine, the combination with a stock ticker or the like having tape printing mechanism and means for delivering the printed tape for observation, of a projection machine for projecting the characters printed on the tape, said machine including a vertical guide for the printed tape which guide is placed closely adjacent to and directly underneath the delivering means so that the quotations thereon may pass into the projection machine with a minimum delay, a lamp located to one side of, and removed from, said stock ticker, and means between said lamp and said guide for directing a beam of light from said lamp through the guide.

5. In a news projection apparatus, an electric lamp, a lamp housing enclosing the lamp, a lens housing, a condensing lens mounted in an opening in one side wall of the lamp housing and adapted to project light into said lens housing, an obliquely disposed mirror in said lens housing, a second lens in said lens housing onto which the mirror redirects the light, and a ticker having a printing mechanism which delivers a printed tape vertically downward past the second lens, the bottom of the ticker being below the top of the housing and close to the top of the second lens so that the quotations printed by the ticker may pass by the lens without delay.

6. In a news projection apparatus, an electric lamp, a lamp housing enclosing the lamp, an obliquely disposed mirror, a condensing lens mounted in an opening in one side wall of the housing and adapted to project light onto said obliquely disposed mirror, a second lens onto which the mirror redirects the light, a ticker having a printing mechanism which delivers a printed tape vertically downward past the second lens, the bottom of the ticker being below the top of the housing and close to the top of the second lens so that the quotation printed by the ticker may pass by the lens without delay, and a ventilator for the lamp housing which prevents the hot air from reaching the ticker.

7. In a news projection apparatus, an electric lamp, a lamp housing enclosing the lamp, an obliquely disposed mirror, a condensing lens mounted in an opening in one side wall of the housing and adapted to project light onto said obliquely disposed mirror, a second lens onto which the mirror redirects the light, a ticker having a printing mechanism which delivers a printed tape vertically downward past the second lens, the bottom of the ticker being below the top of the housing and close to the top of the second lens so that the quotation printed by the ticker may pass by the lens without delay, the lamp housing having a vent for hot air, and a flue for preventing the hot air from reaching the ticker.

8. In a news projection apparatus, an electric lamp, a lamp housing enclosing the lamp, an obliquely disposed mirror, a condensing lens mounted in an opening in one side wall of the housing and adapted to project light onto said obliquely disposed mirror, a second lens onto which the mirror redirects the light, and a ticker having a printing mechanism which delivers a printed tape vertically downward past the second lens, the operating parts of the ticker being on one side of, and remote from, the lamp housing to prevent heating it from the lamp housing.

9. In a news projection apparatus, an electric lamp, a lamp housing enclosing the lamp, an obliquely disposed mirror, a condensing lens mounted in an opening in one side wall of the housing and adapted to project light onto said obliquely disposed mirror, a second lens onto which the mirror redirects the light, and a ticker having a printing mechanism which delivers a printed tape vertically downward past the second lens, the operating parts of the ticker being on one side of, and remote from, the lamp housing to prevent heating it from the lamp housing, the bottom of the ticker being below the top of the housing and close to the top of the second lens so that the quotation printed by the ticker may pass by the lens without delay.

10. The combination with a news ticker having side frame members and a printing mechanism at one side for printing quotations on a tape, of a lens chamber placed underneath the printing mechanism and having an opening past which the printed tape is moved, a lens adjacent the opening, another lens in the side wall of the lens chamber opposite the ticker, and a mirror to reflect light coming through the second lens into the first mentioned lens, the axes of the lens being in a horizontal plane.

11. The combination with a news ticker having side frame members and a printing mechanism at one side for printing quotations on a tape, of a lens chamber placed underneath the printing mechanism and having an opening past which the printed tape is moved, a lens adjacent the opening, another lens in the side wall of the lens chamber opposite the ticker, mounting means for the ticker to permit elevating the ticker for inspection, and guides for controlling the movement of the ticker when elevated to protect the tape against displacement.

12. The combination with an optical system for projecting the quotations printed on a ticker tape, of a stock ticker, or the like, mounting means for the stock ticker to permit elevating the ticker without removing the tape from the path of the light traversing the optical system, and guides for controlling the movement of the ticker when elevated to protect the tape against displacement.

13. The combination with an optical system for horizontally projecting the quotations printed on a ticker tape hanging downwardly, of a stock ticker, or the like, guides for the stock ticker to permit elevating the ticker without removing the tape from the path of the light traversing the optical system, and controlling the ticker during its elevation to protect the tape against displacement.

14. In a news projection apparatus, a fixedly mounted optical system for horizontally projecting the matter printed on a vertical tape, and a movably mounted ticker mechanism for printing on the tape, of guides for the ticker to position the same to permit moving it for inspection without removing the tape from the path of light.

15. In a news projection machine, the combination with a stock ticker having side frames, a printing mechanism mounted outside one of the side frames, and a delivery guide for the printed tape from which it may pass vertically downward, of a lens chamber having a side wall adjacent the side frame of the ticker, a rearwardly extending top wall directly underneath the delivery guide, and a vertical front wall placed so that the tape hanging from the guide will pass close to it, said front wall having a slot, and a lens carried adjacent the slot to project light through the tape, the upper end of the lens and slot being close to the top wall of the chamber.

16. In a news projection machine, the combination with a stock ticker having side frames, a printing mechanism mounted outside one of the side frames, and a delivery guide for the printed tape from which it may pass vertically downward; of a lens chamber having a side wall adjacent the side frame of the ticker, a rearwardly extending top wall directly underneath the delivery guide, and a vertical front wall placed so that the tape hanging from the guide will pass close to it, said front wall having a slot,

and a lens carried adjacent the slot to project light through the tape, the upper end of the lens and slot being close to the top wall of the chamber, said lens chamber being further provided with an oblique rear side wall carrying a mirror, and with a side wall opposite the first side wall and carrying a condensing lens.

17. In a news projection machine, the combination with a stock ticker having side frames, a printing mechanism mounted outside one of the side frame, and a delivery guide for the printed tape from which it may pass vertically downward; of a lens chamber having a side wall adjacent the side frame of the ticker, a rearwardly extending top wall directly underneath the delivery guide, and a vertical front wall placed so that the tape hanging from the guide will pass close to it, said front wall having a slot, and a presser plate hingedly carried by the front wall of the lens chamber for maintaining the tape in position.

18. In a news projection machine, the combination with a stock ticker having side frames, a printing mechanism mounted outside one of the side frames, and a delivery guide for the printed tape from which it may pass vertically downward; of a lens chamber having a side wall adjacent the side frame of the ticker, a rearwardly extending top wall directly underneath the delivery guide, and a vertical front wall placed so that the tape hanging from the guide will pass close to it, said front wall having a slot, and a lamp housing on the side of the lens chamber opposite to the ticker, the housing extending above the top of the lens chamber.

19. The combination with a ticker printing mechanism, of a projecting mechanism, means for imparting a feeding impulse to the ticker tape after a given printing impression to advance the tape toward said projecting mechanism, a ticker drawing means for drawing the tape from said projecting mechanism after it has been delivered, there being a space between said projecting mechanism and said ticker drawing means, and means for deflecting the tape into said space out of its path of movement from said projecting mechanism to said drawing means to maintain the tape in projecting position.

20. The combination with a ticker printing mechanism, of a projecting mechanism, means for imparting a feeding impulse to the ticker tape after a given printing impression to advance the tape towards said projecting mechanism, a ticker drawing means for drawing the tape from said projecting mechanism after it has been delivered, there being a space between said projecting mechanism and said ticker drawing means, and a lever for deflecting the tape into said space out of its path of movement from said projecting mechanism to said drawing means to maintain the tape in projecting position.

21. The combination with a ticker printing mechanism, of a projecting mechanism, means for imparting a feeding impulse to the ticker tape after a given printing impression to advance the tape toward said projecting mechanism, a ticker drawing means for drawing the tape from said projecting mechanism after it has been delivered, driving means operatively connected frictionally to drive said drawing means, and a lever for engaging the tape before it passes to said drawing means, said lever being sensitive to the tension created in said tape when said feeding means is arrested thereby to be tilted and being operatively associated with said drawing means to anchor said drawing means against operation when so tilted.

22. In a news projecting machine, the combination with a printing mechanism for printing two spaced parallel rows of news items on a tape and the like, of a projecting mechanism, means for feeding the tape through the projecting mechanism, an abutment located between the projecting mechanism and the printing mechanism, and a finger engaging the printed face of the tape between the rows of printed matter and pressing the tape into engagement with said abutment and functioning to dissipate the jump transmitted to the tape by the printing mechanism before the tape reaches the projecting mechanism.

23. The combination with a stock ticker, of an optical system for projecting the quotations on the ticker tape as the tape is discharged from said ticker, vertically extending guideways, guides connected to said stock ticker and slidable in said guideways properly to aline the stock ticker relative to said optical system when elevating the same, and means associated with said guides for anchoring the stock ticker at the elevation desired.

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