June 6, 1939. A. D. EITZEN 2,160,848

PAGE PROJECTOR

Filed Dec. 12, 1936 3 Sheets-Sheet 1

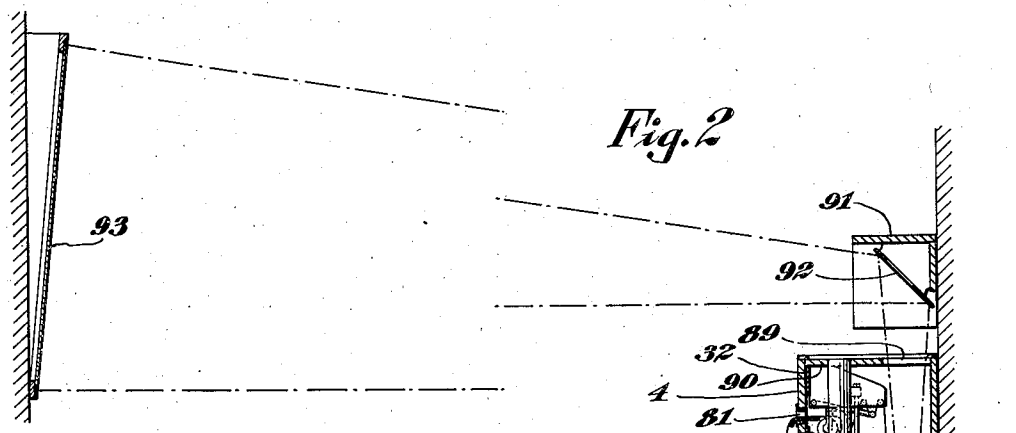

Fig. 2

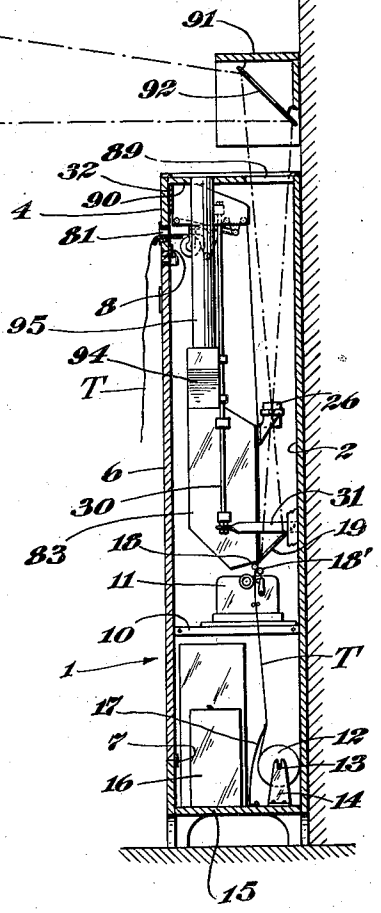

Fig. 1

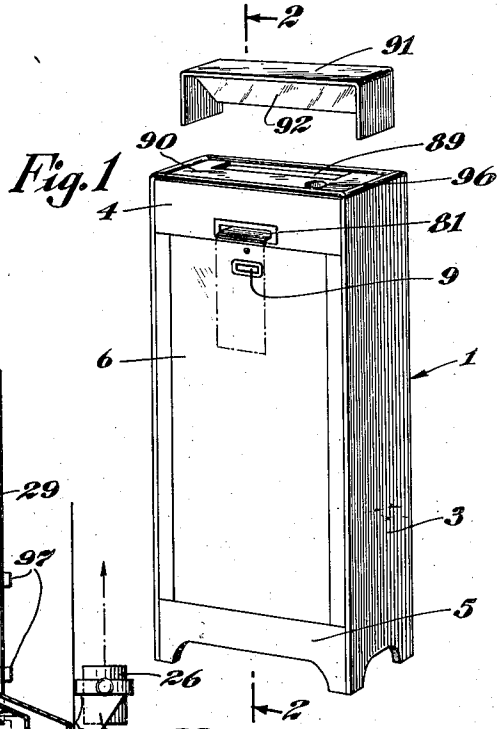

Fig. 3

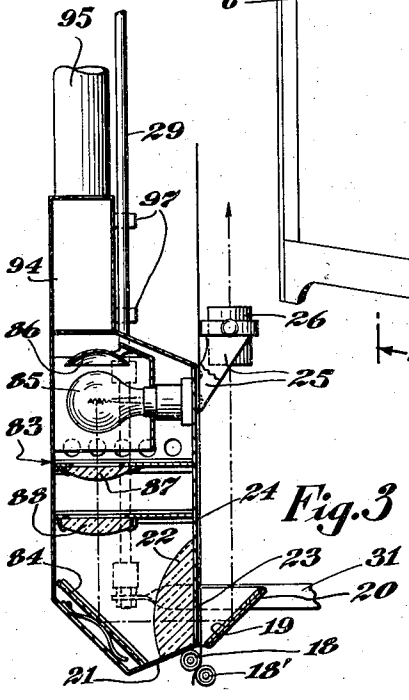

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Fig. 4

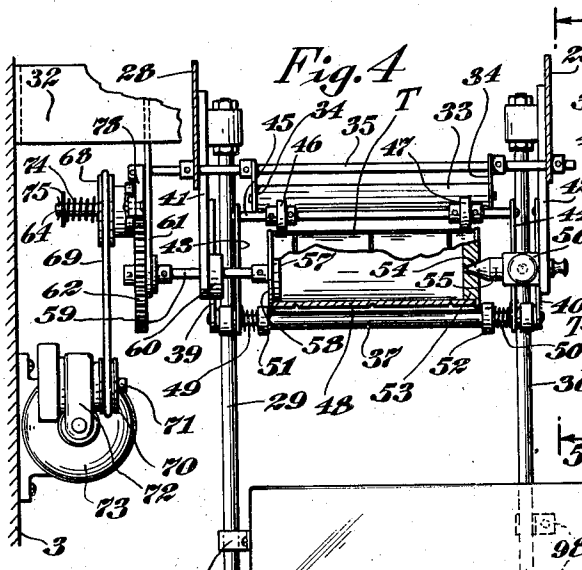


Fig. 5

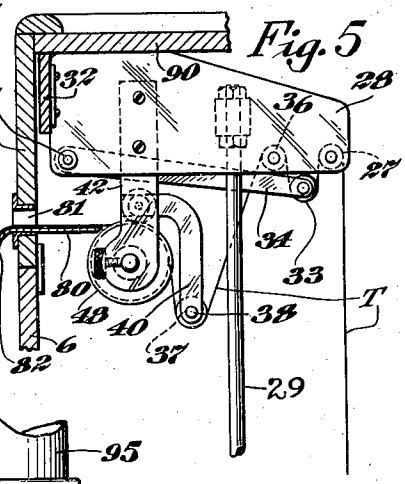
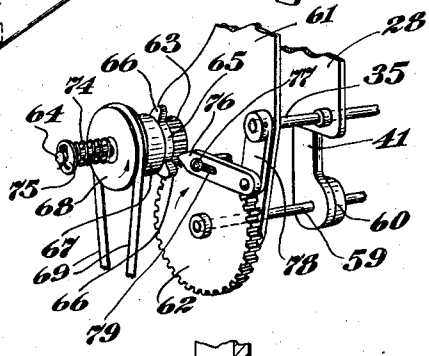


Fig. 6



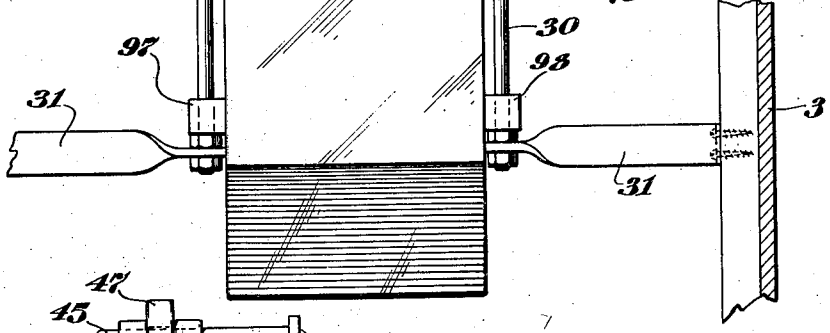


Fig. 7

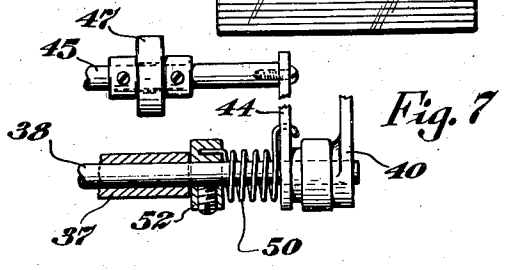


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Fig. 8

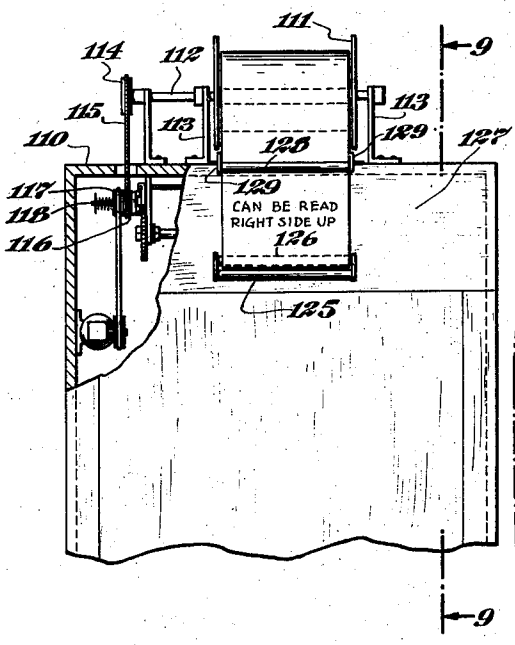


Fig. 9

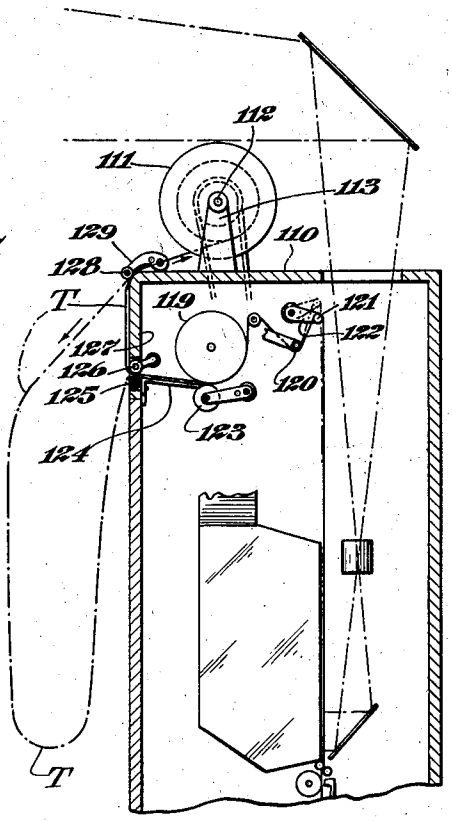


Fig. 10

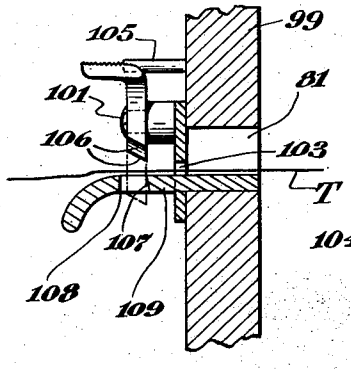
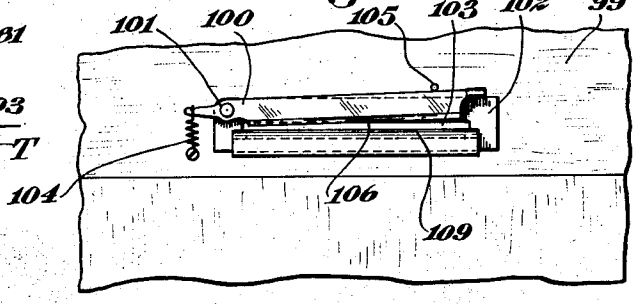


Fig. 11



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Patented June 6, 1939 2,160,848

UNITED STATES PATENT OFFICE

2,160,848

PAGE PROJECTOR

August D. Eitzen, Rockville Centre, N. Y., assignor to News Projection Corporation, New York, N. Y., a corporation of New York

Application December 12, 1936, Serial No. 115,513

7 Claims. (Cl. 88—24)

This invention relates to page projectors in general and more especially to page projectors associated with printing machines such as broad tape tickers and the like in which the broad page as it is being printed is passed through a light aperture to permit images thereof to be produced and ultimately projected onto a screen.

Among the objects of the present invention, it is aimed to provide an improved page projector in which the lamp housing and associated optical system may be moved vertically relative to the printer without affecting the position of the tape while it passes through the printer or without affecting the tape as it is ejected for inspection by an attendant.

It is still another object of the present invention to provide an improved feed for drawing the tape across the light aperture and then into an inspection field.

It is still another object of the present invention to provide an improved cabinet including an optical system for effecting front projection.

It is still another object of the present invention to provide an improved cabinet for a page projector associated with a severing mechanism for severing sections of the tape after it is printed.

It is still another object of the present invention to provide an improved page printer including tape pulling and rewinding devices so arranged that the tape may be drawn across the light aperture of a projector for projection and subsequently drawn into an inspection field at which inspection field the tap may be unwound from the rewind device for inspection and subsequently rewound without in any way interrupting the printer projection or tape puller.

It is still another object of the present invention to provide an improved page printer including a cabinet having guides for directing the path of movement of the tape from a projection field to an inspection field and thereupon to a rewind reel from which rewind reel the tape may be unwound for inspection without interfering with the printer projection or tape puller and the tape subsequently automatically rewound onto the rewind reel.

These and other features, capabilities and advantages of the invention will appear from the subjoined detail description of specific embodiments thereof illustrated in the accompanying drawings in which

Figure 1 is a perspective of an improved cabinet and mirror housing associated therewith made according to one embodiment of the present invention;

Fig. 2 is a section on the line 2—2 of Fig. 1;

Fig. 3 is an enlarged fragmental section of a portion of the optical system;

Fig. 4 is an enlarged fragmental section showing a part of the tape pulling mechanism;

Fig. 5 is an enlarged fragmental section on the line 5—5 of Fig. 4;

Fig. 6 is a fragmental perspective of a part of the tape pulling mechanism;

Fig. 7 is a fragmental front elevation partly in section of a tension device associated with the tape pulling mechanism;

Fig. 8 is a fragmental front elevation of another embodiment of the present invention;

Fig. 9 is a section on the line 9—9 of Fig. 8;

Fig. 10 is an enlarged fragmental section of a tape severing device which may be associated with the embodiment illustrated in Fig. 1; and

Fig. 11 is a fragmental front elevation of the severing mechanism shown in Fig. 10.

In the embodiment shown in Figs. 1 to 7 inclusive, there is provided a cabinet 1 having a rear wall 2, side walls 3, interrupted front walls 4 and 5 fixed to one another. The front walls 4 and 5 are spaced from one another to receive a door 6 which, see Fig. 2, has a flange 7 at its lower end to engage the inner face of the wall portion 5 and a suitable lock or latch 8 at the upper end to cooperate with the lower inner face of the wall portion 4. To facilitate removing the door 6, there is provided the recess 9 for engagement by the hand of the operator.

In the present instance, the cabinet is preferably provided with a platform 10 on which is mounted the printer 11 to which the tape T passes from the roll 12 mounted on the spindle 13 journaled in the bracket 14 supported on the base 15 of the cabinet. On the base 15 and in the compartment formed between it and the platform 10, there may be located various adjuncts for the projection machine lamp, such as the lamp relays contained in the housing 16 as an instance.

In engagement with the tape T and extending upwardly from the base 15, there is preferably provided the resilient wire 17 acting as a whisker to apply tension on the tape and form slack in the same between the roll 12 and printer 11. The printer 11 is provided with the usual printing mechanism and line feed device not shown in detail and is of the type in which after a line is printed the tape is fed upwardly a line space at a time. After the tape leaves the ticker, it passes up between the guide rollers 18 and 18' to the mouth of the lamp housing formed as a recess between the inclined mirror 19 supported on

the inclined wall 20 and the inclined wall 21 on which the cut condenser 22 rests.

As the tape enters this recess, it passes the light aperture 23 adjacent to the cut condenser 22 and then passes upwardly parallel to and along the rear wall 24 of the lamp housing through a recess formed in the bracket 25 of the objective lens unit casing 26 and then passes up to the fixed guide roller 27 mounted in the cheek plates 28 extending parallel to one another and supporting the upper ends of the rods 29 and 30.

The rods 29 and 30 are secured at their lower ends to the bracing bars 31 extending from the edges of the rear wall 2. The cheek plates 28 are supported by the crosspiece 32 extending across the back of the cheek plates 28 and secured at its ends to the side walls 3 of the cabinet 1.

From the guide roller 27, the tape T passes under the roller 33 formed at the ends of the levers 34 secured to the shaft 35 which is journaled in the cheek plates 28. From the roller 33, the tape passes up over the idler roller 36 and then down under the roller 37 rotatably mounted on the rod 38 fixed at its ends to the arms 39 and 40 extending down from the arms 41 and 42 secured at their upper ends to the inner faces of the cheek plates 28. On the rod 38, there are pivotally mounted the arms 43 and 44 connected at their upper ends to the rod 45 having journaled thereon the pressure rollers 46 and 47 for engagement with the tape in order to press the tape into firm engagement with the feed roller 48 when the tape pulling action occurs.

The pressure of the rollers 46 and 47 is produced by the torsion springs 49 and 50 connected at one end to the collars 51 and 52 fixed to the rod 38 and wound around the rod 38 and connected at their other ends to the lower ends of the arms 43 and 44. The tape pulling roller 48 in the present instance is indicated as composed of a cylinder provided with a cap 53 containing a conical recess to receive the conical end 54 of the pivoting pin 55 mounted in the bearing 56 secured to the lower end of the arm 42 and the other end of the roller 48 is conformed to receive the inner shoulder 57 of the disc 58 fixed to the shaft 59 journaled in the bearing 60 located at the lower end of the arm 41. The outer end of the shaft 59 is journaled in the lower end of the arm 61 extending down from the crosspiece 32. On the shaft 59, there is fixed the gear 62 in mesh with the gear 63, see Fig. 6, rotatably mounted on the shaft 64 journaled in the arm 61. The gear 63 is fixed to the toothed wheel 65 in the present instance provided with four teeth 66, which toothed wheel 65 is in turn in frictional engagement with the hub 67 of the sheave 68 connected by the belt 69 with the sheave 70 on the shaft 71 journaled in the casing 72 and drivingly connected with the shaft of the motor 73 secured to the side wall 3.

For frictionally maintaining the hub 67 of the sheave 68 in driving engagement with the toothed wheel 66, there is provided the compression spring 74 tensed between the disc 75 and the side of the sheave 68.

From the foregoing, it will appear that as it is here intended, the motor by continuously operating would continuously draw the tape upward from the printer 11 or tend to draw it upward unless the actuation of the gear 63 were interrupted. In order intermittently to interrupt the actuation of the gear 63 when the tape is at rest in the printer, there is provided the pawl 76 slidably mounted on the pin 7 and pivotally connected at one end to the arm 78 fixed to the shaft 35.

In the present instance, the pawl 76 is provided with a slot 79 through which the pin 77 extends. The pawl 76 is intended normally to extend in the path of movement of the teeth 66 to interfere with the rotation of the gear 63 with the sheave 68. This obstruction position will occur when the arms 34 are raised due to the take-up of the slack in the tape T and in consequent raising of the roller 33. With the line space feed of the printer 11, however, the roller 33 due to gravity will take-up the feed so effected and permit the arms 34 to descend and thereby withdraw the pawl 76 out of the path of movement of the teeth 66 and permit the gear 63 to be frictionally driven with the sheave 68. The moment that the slack is again taken up, however, and the arms 34 raised, they will again thrust the pawl 76 into the path of movement of the teeth 66 to obstruct the further rotation of the gear 63 and consequently the further rotation of the gear 62 and tape pulling roller 48.

From the tape pulling roller 48, see particularly Fig. 5, the tape is ejected onto the platform 80 extending from the lower face of the orifice 81 in the front wall portion 4. From the platform 80, the tape T passes down over the downwardly curved lip 82 to the front of the door 6, the inspection location where the tape can be inspected by the trader, attendant or the like.

For the purpose of effecting a projection of images produced from the characters on the tape, the mechanism now to be described is provided.

The inclined walls 20 and 21 to either side of the mouth through which the tape T passes are part of the lamp housing 83. In the present instance, the lamp housing 83 is provided with an inclined mirror 84 formed at the bottom thereof to receive light rays directed downwardly by the lamp 85 with the aid of the reflector 86 and condensing lenses 87 and 88.

The light rays so received by the inclined mirror 84 are directed outwardly through the cut condenser 22 through the tape T at the light aperture 23 onto the mirror 19 and then upwardly through the objective lens unit in the casing 26 up through the opening 89 in the upper wall 90 of the cabinet 1. In order to effect front projection as illustrated in Fig. 2, there is preferably provided a mirror housing 91 containing an inclined mirror 92 in the path of the light rays directed through the opening 89 to intercept the same and direct them onto a screen 93. The lamp housing in the present instance is provided with an extension 94 connected to and in communication with a chimney 95 extending upwardly therefrom and in the present instance terminating in the opening 96 formed in the wall 90 of the cabinet 1. The chimney 95 is adapted to slide up through the opening 96 when the lamp housing is raised, it being slidably mounted on the rods 29 and 30, the sides of the lamp housing in the present instance being provided with the collars 97 on one side thereof in slidable engagement with the rod 29 and provided with the collars 98 on the other side thereof in slidable engagement with the rod 30.

If it is desired to sever the tape T from time to time as it is ejected through the opening 81, the severing arrangement illustrated in Figs. 10 and 11 may be provided. It will then only be necessary to equip the wall portion 4, as an instance the wall portion 99 with a pivotally

mounted knife pivoted at 101 to one side of the frame 102 of the opening 103. The knife 100 is preferably normally positioned to clear the opening 103 to permit the discharge of the tape T therethrough by means of the spring 104. Preferably also the raised position of the knife 100 is limited by the stop 105. When it is desired to sever a strip, it is only necessary to press the knife 100 downward so that its inclined edge 106 cooperates with the shearing shoulder 107 of the opening 108 formed in the platform 109.

If, on the other hand, it is desired to equip the machine illustrated in the embodiment of Fig. 1 with a rewind reel, the embodiment illustrated in Figs. 8 and 9 may be used.

Here, the upper wall of the cabinet 1 as an instance, the wall 110 may be provided with a rewind reel 111 secured to the shaft 112 journaled in the brackets 113 mounted on the wall 110. The shaft 112 has fixed thereon a sheave 114 connected by a spring belt 115 with a sheave 116 fixed to the sheave 117 which takes the place of the sheave 68 in Fig. 6 rotatably mounted on the shaft 118 similar to shaft 64 in Fig. 6 and connected in the same manner as the arrangement shown in Fig. 6 to the tape pulling roller 119. The movement of the tape pulling roller 120 is controlled by the movement of the roller 120 responsive to the slack in the tape T similar to the slack take-up roller 33 of the embodiment illustrated in Fig. 1.

In the embodiment of Fig. 8, an auxiliary slack take-up is provided, to wit the roller 121 at the end of the arms 122 normally urged upwardly by a torsion spring on the shaft not shown and engaging the tape after it leaves the light aperture and before it passes to the roller 120. In this embodiment, the tape is maintained in engagement with the tape pulling roller 119 by the pressure roller 123 pressing the tape upwardly against the roller 119 to effect the discharge of the tape outwardly onto the platform 124 from which it passes between the two guide rollers 125 and 126 below and above the opening in the wall portion 127 from which the tape T passes upwardly along the wall portion 127 to and over the upper end thereof where it passes under the tensioning roller 128 formed at the end of the arms 129 from which the tape passes onto the reel 111, the roller 128 contributing to effect a compact tight windup.

In this embodiment, it will be seen that the tape may be unwound from the reel 111 into the dash and dot line position shown in Fig. 9 to facilitate inspection of an extended area of tape already wound up, without affecting the tape in engagement with the tape pulling roller 119. It will also be apparent that as soon as the tape T is then released, the reel 111 due to the sheave 116 will again take up the loop.

It is obvious that various changes and modifications may be made to the details of construction without departing from the general spirit of the invention as set forth in the appended claims.

I claim:

1. The combination with a cabinet having a top wall having an opening extending along the rear end thereof and a laterally disposed chimney orifice forwardly of said opening, a front upper wall extending down from said top wall and having a tape discharge orifice therein, a tape pulling mechanism supported in the upper front portion of the cabinet in communication with said tape discharge opening, a support in the lower portion of said cabinet, and a panel supplementing said front upper wall to close the remaining front of the cabinet but removable to afford access to the interior of said cabinet, of a page printer mounted on said support with the tape extending upwardly therefrom in a vertical direction to said tape pulling mechanism to feed the same from said printer through said tape discharge orifice, vertically extending slideways in the front portion of said cabinet, a projector unit slidable on said slideways from a position directly above said printer to an upper position for the purpose of gaining access to the printer when said panel is removed, said projector unit including a lamp housing positioned in the front portion of said cabinet and having a chimney upwardly slidable through the chimney orifice in said top wall, and an optical system including elements to direct light horizontally through the vertically extending tape and then upwardly through said opening.

2. The combination with a cabinet including a top wall having an opening extending along the rear end thereof and a chimney orifice disposed forwardly of said opening, a front upper wall extending down from said top wall and having a tape discharge orifice therein, a tape pulling mechanism supported in the upper front portion of said cabinet and in communication with said tape discharge orifice, and a support in the lower portion of said cabinet, of a page printer mounted on said support with the tape extending vertically upward therefrom to said tape pulling mechanism to be fed by the latter through said tape discharge orifice, vertically extending slideways in the front portion of said cabinet, and a projector unit slidable on said slideways upwardly away from said printer to afford access thereto, said projector unit including a lamp housing positioned in the front portion of said cabinet and having a chimney extending upwardly to said chimney orifice and slidable through the same when said projector is moved upwardly away from said printer, said projector unit also having an optical system including elements to direct light rays horizontally through a portion of the vertically extending tape and then upwardly through said opening.

3. The combination with a cabinet including a top wall having an opening extending along the rear end thereof and a chimney orifice disposed forwardly of said opening, a front upper wall extending down from said top wall and having a tape discharge orifice therein, a tape pulling mechanism supported in the upper front portion of said cabinet and in communication with said tape discharge orifice, and a support in the lower portion of said cabinet, of a page printer mounted on said support with the tape extending vertically upwardly therefrom to said tape pulling mechanism to be fed by the latter through said tape discharge orifice, vertically extending slideways in the front portion of said cabinet, a projector unit slidable on said slideways upwardly away from said printer to afford access thereto, said projector unit including a lamp housing positioned in the front portion of said cabinet and having a chimney extending upwardly to said chimney orifice and slidable through the same when said projector is moved upwardly away from said printer, said projector unit also having an optical system including elements to direct light rays horizontally through a portion of the vertically extending tape and then upwardly through said opening, and a reflector above said cabinet for receiving the image im-

pressed light rays emerging from said opening to direct them onto a screen.

4. The combination with a cabinet including a top wall having an opening extending along the rear end thereof and a chimney orifice disposed forwardly of said opening, a front upper wall extending down from said top wall and having a tape discharge orifice therein, a tape pulling mechanism supported in the upper front portion of said cabinet and in communication with said tape discharge orifice, and a support in the lower portion of said cabinet, of a page printer mounted on said support with the tape extending vertically upwardly therefrom to said tape pulling mechanism to be fed by the latter through said tape discharge orifice, vertically extending slideways in the front portion of said cabinet, a projector unit slidable on said slideways upwardly away from said printer to afford access thereto, said projector unit including a lamp housing positioned in the front portion of said cabinet and having a chimney extending upwardly to said chimney orifice and slidable through the same when said projector is moved upwardly away from said printer, said projector unit also having an optical system including elements to direct light rays horizontally through a portion of the vertically extending tape and then upwardly through said opening, and a rewind reel mounted on the front portion of said top wall to rewind the tape as it is discharged through said discharge orifice.

5. The combination with a cabinet including a top wall having an opening extending along the rear end thereof and a chimney orifice disposed forwardly of said opening, a front upper wall extending down from said top wall and having a tape discharge orifice therein, a tape pulling mechanism supported in the upper front portion of said cabinet and in communication with said tape discharge orifice, and a support in the lower portion of said cabinet, of a page printer mounted on said support with the tape extending vertically upwardly therefrom to said tape pulling mechanism to be fed by the latter through said tape discharge orifice, vertically extending slideways in the front portion of said cabinet, a projector unit slidable on said slideways upwardly away from said printer to afford access thereto, said projector unit including a lamp housing positioned in the front portion of said cabinet and having a chimney extending upwardly to said chimney orifice and slidable through the same when said projector is moved upwardly away from said printer, said projector unit also having an optical system including elements to direct light rays horizontally through a portion of the vertically extending tape and then upwardly through said opening, a rewind reel mounted on the front portion of said top wall to rewind the tape as it is discharged through said discharge orifice, and actuating means for drivingly connecting said rewind reel with said tape pulling mechanism.

6. The combination with a cabinet including a top wall having an opening extending along the rear end thereof and a chimney orifice disposed forwardly of said opening, a front upper wall extending down from said top wall and having a tape discharge orifice therein, a tape pulling mechanism supported in the upper front portion of said cabinet and in communication with said tape discharge orifice, and a support in the lower portion of said cabinet, of a page printer mounted on said support with the tape extending vertically upwardly therefrom to said tape pulling mechanism to be fed by the latter through said tape discharge orifice, vertically extending slideways in the front portion of said cabinet, a projector unit slidable on said slideways upwardly away from said printer to afford access thereto, said projector unit including a lamp housing positioned in the front portion of said cabinet and having a chimney extending upwardly to said chimney orifice and slidable through the same when said projector is moved upwardly away from said printer, said projector unit also having an optical system including elements to direct light rays horizontally through a portion of the vertically extending tape and then upwardly through said opening, and an elongated knife pivotally mounted on the outer face of said upper front wall adjacent said tape discharge orifice, and means including a spring for normally maintaining said knife clear of said orifice to permit the ready discharge of the tape through said orifice, said knife being operable when depressed to sever the tape discharging through said orifice.

7. The combination with a cabinet including a top wall having an opening extending along the rear end thereof and a chimney orifice disposed forwardly of said opening, a front upper wall extending down from said top wall and having a tape discharge orifice adjacent the lower end thereof, a tape pulling mechainsm supported in the upper front portion of said cabinet and in communication with said tape discharge orifice, and a support in the lower portion of said cabinet, of a page printer mounted on said support with the tape extending vertically upwardly therefrom to said tape pulling mechanism to be fed by the latter through said tape discharge orifice, vertically extending slideways in the front portion of said cabinet, a projector unit slidable on said slideways upwardly away from said printer to afford access thereto, said projector unit including a lamp housing positioned in the front portion of said cabinet and having a chimney extending upwardly to said chimney orifice and slidable through the same when said projector is moved upwardly away from said printer, said projector unit also having an optical system including elements to direct light rays horizontally through a portion of the vertically extending tape and then upwardly through said opening, and a tape advancing device mounted on the front portion of said top wall for advancing the tape discharged from said discharge opening across said front upper wall.

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