Nov. 19, 1940. D. F. NEWMAN 2,221,922

TAPE-CONTROLLING ARRANGEMENT

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Fig. 1.

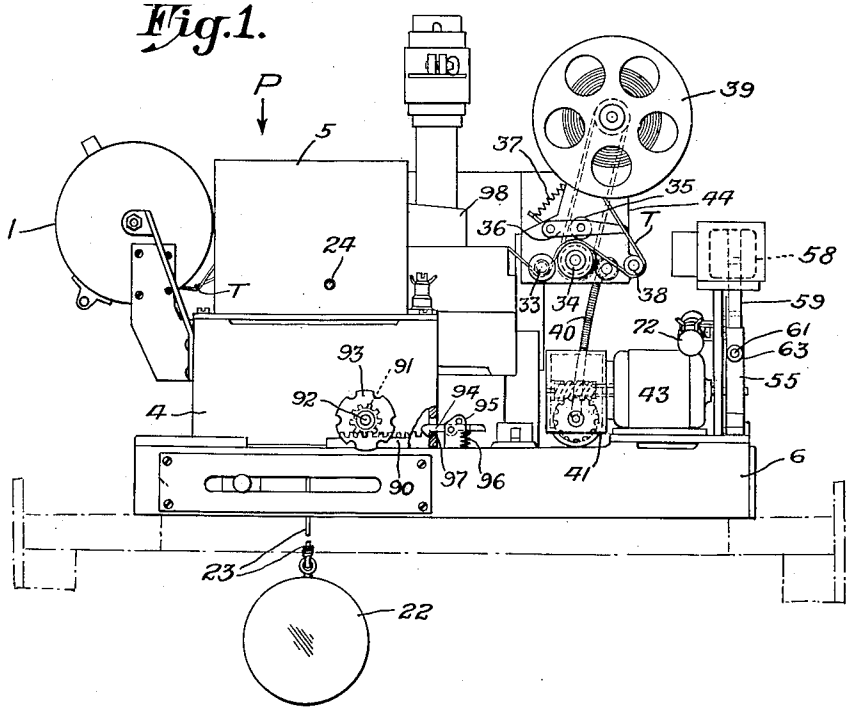

Fig. 2.

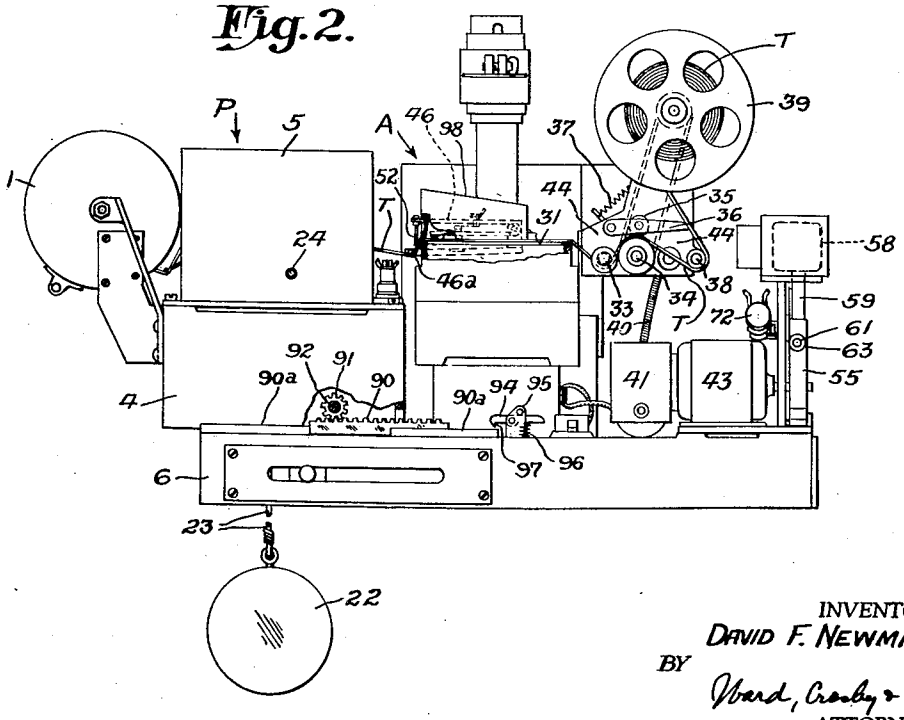

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Fig. 3.

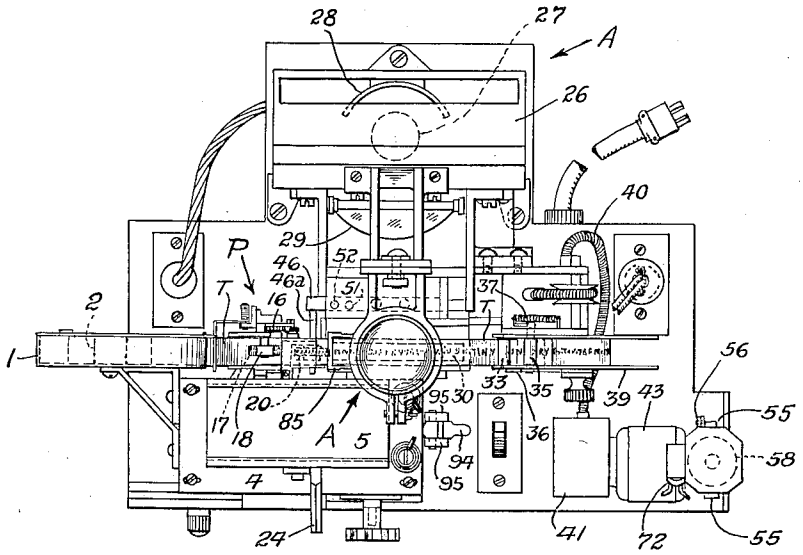

Fig. 4.

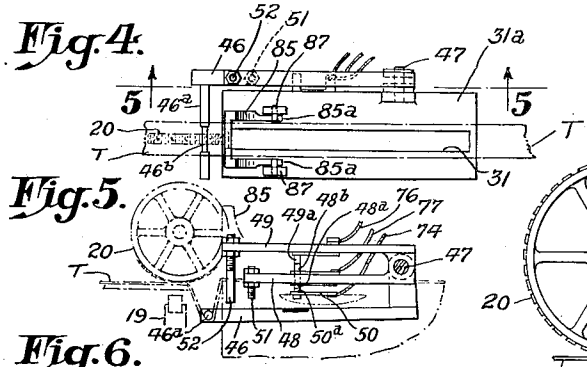

Fig. 5.

Fig. 6.

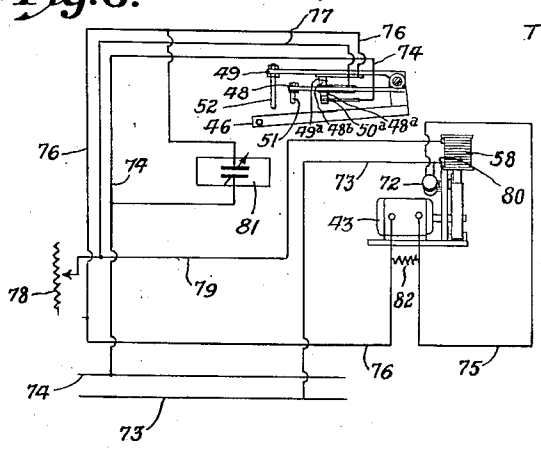

Fig. 7.

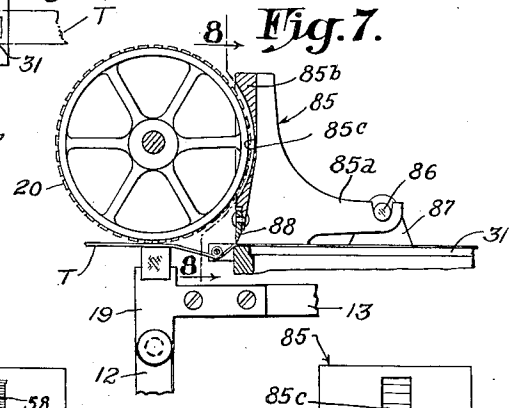

Fig. 8.

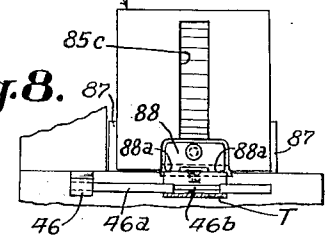

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Fig. 9.

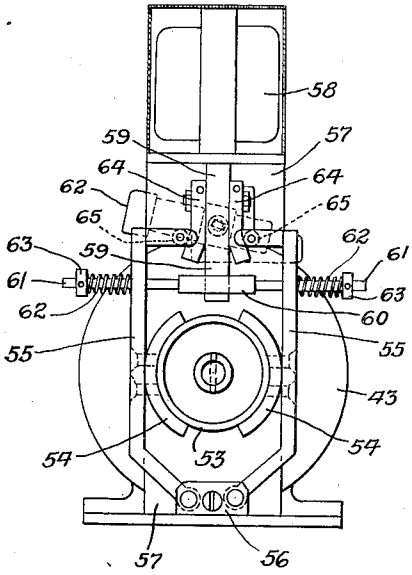


Fig. 11.

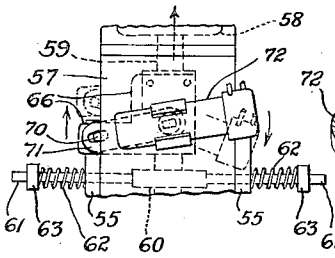


Fig. 12.

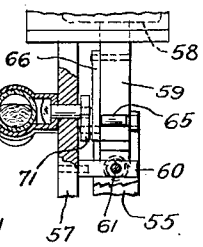
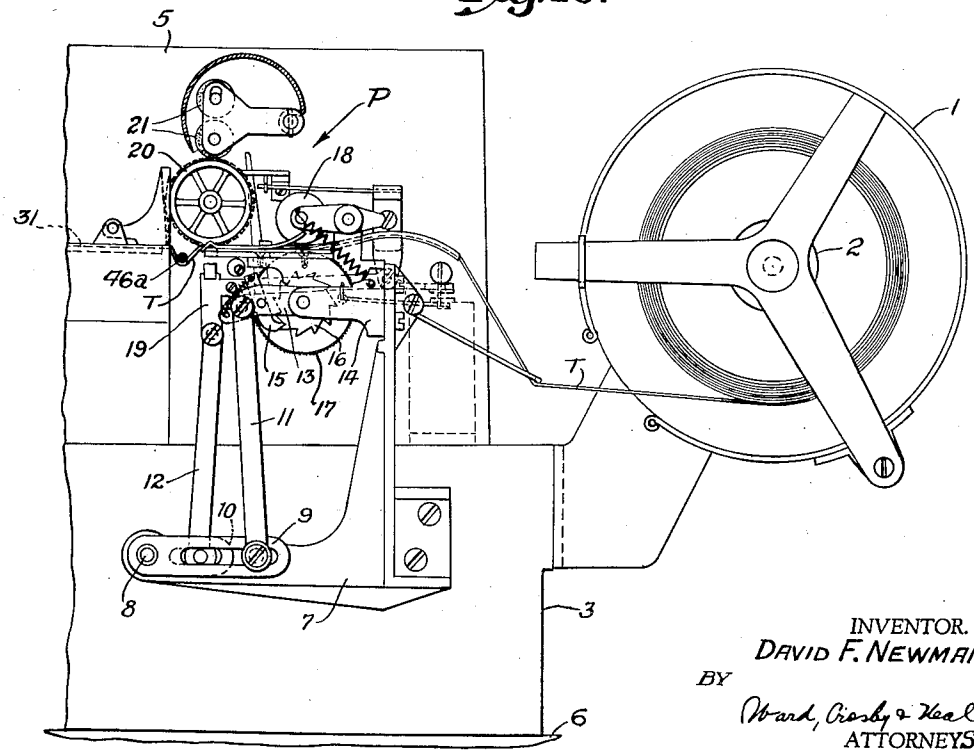


Fig. 10.



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Patented Nov. 19, 1940 2,221,922

UNITED STATES PATENT OFFICE

2,221,922

TAPE-CONTROLLING ARRANGEMENT

David F. Newman, Rockville Centre, N. Y., assignor to Trans-Lux Corporation, New York, N. Y., a corporation of Delaware

Application February 7, 1938, Serial No. 189,042

8 Claims. (Cl. 178—42)

My invention relates to arrangements for controlling a character-bearing tape for movement through a projection field.

My invention has particular reference to a combined printing-projecting arrangement wherein the projection device may be positioned much closer to the printing device than has been customary with respect to prior art arrangements of this general character.

My invention has further reference to features of construction by virtue of which a combined device of the character described may be operated in an advantageous manner.

Various other objects and advantages of my invention will become apparent from the following description.

My invention resides in the tape-controlling arrangements, combinations and improvements of the character hereinafter described and claimed.

For an understanding of my invention and for an illustration of one of the forms thereof, reference is to be had to the accompanying drawings, in which:

Figure 1 is an elevational view of a tape-controlling arrangement as constructed in accordance with my invention;

Fig. 2 is an elevational view corresponding generally with Fig. 1 but showing some of the parts in different positions;

Fig. 3 is a plan view of the arrangement shown in Fig. 1;

Fig. 4 is a plan view showing a motor-controlling arrangement;

Fig. 5 is an elevational view taken on the line 5—5 of Fig. 4 looking in the direction of the arrows;

Fig. 6 is a diagrammatic view showing an electric circuit as arranged in accordance with my invention;

Fig. 7 is an enlarged elevational view, partly in section, showing a feature of the invention;

Fig. 8 is a vertical sectional view, partly in elevation and is taken on the line 8—8 of Fig. 7 looking in the direction of the arrows;

Fig. 9 is an elevational view showing a brake mechanism;

Fig. 10 is an elevational view showing operating parts of the printing device;

Fig. 11 is an elevational view showing a mercury switch arrangement; and

Fig. 12 is a transverse elevational view, partly in section, of the mercury switch arrangement shown in Fig. 11.

Referring to the drawings, P represents a suitable printing device such, for example, as a ticker mechanism of the type utilizable for printing two spaced rows of characters lengthwise on a narrow tape T or, as shown, of the type using a tape having a width of 5/8" and known in Great Britain under the designation "The Exchange Telegraph Co. Ltd.," by which a single row of characters are printed lengthwise on the tape which is opaque if desired although, in the form of the invention herein illustrated, said tape T is of the transparent or translucent type and, therefore, adapted for "through" projection.

As herein shown although not necessarily, the ticker mechanism P comprises a housing 1 for a reel 2 utilizable as a support for a roll of the tape, the housing 1 being carried by an arm which is secured to a wall 3 of the lower housing 4 of said ticker mechanism, the housing last named supporting an upper housing 5, and both housings being carried by a suitable base 6.

Referring to Fig. 10, the wall 3 is shown as carrying a bracket 7 which forms a support for a shaft 8 having projecting therefrom a pair of oscillatory arms 9, 10 to which are pivoted the respective links 11, 12. Pivoted to the upper end of the link 11 is a member 13 which is pivotally supported by an arm 14 projecting from the aforesaid bracket 7, the member 13 carrying a pawl 15 which coacts with a ratchet wheel 16 rotatable with a tape-feeding wheel 17 having a serrated peripheral surface with which is coactable a spring biased roller 18. The upper end of the link 12 is pivoted to one end of a pivoted platen bar 19 utilizable as well understood in the art for thrusting the tape T into engagement with a rotatable type wheel 20 having coactable therewith the inking rollers 21.

As well understood in the art, a printing device of the character herein described is remotely controlled so as to position the typing wheel 20 in printing position, to thrust the platen bar 19 toward said typing wheel 20, and to operate the serrated wheel 17 so as to feed the tape T from right to left, Fig. 10.

As shown in Figs. 1 and 2, a heavy weight 22 is suspended on a cable 23, this cable leading to the operating mechanism of the printing device and providing power for operating the same. A shaft 24, when actuated by a suitable handle, not shown, is utilizable for elevating the weight 22. It will be noted that this handle actuating mechanism is at the side of the printing device opposite the printing wheel and associated mechanism.

After the tape T leaves the ticker mechanism P, it is drawn through a projection device A

whereby images of the tape characters are projected onto any suitable screen, not shown. This projection device A may be of any suitable character and, by way of example, is shown herein as comprising a housing **26** adapted to contain a projection lamp **27**, its reflector **28** and one or more condensing lenses **29**, one of which is shown in Fig. 3. In the example shown, the projecting light beam passes horizontally from the projection lamp **27** and engages a mirror **30** or other suitable light-reflector, said mirror **30** causing the projecting light beam to pass upwardly through a condensing lens and then through the projection field which, as herein illustrated although not necessarily, is defined by a rectangular aperture **31** formed in the top plate **31***a* of a supplementary housing disposed at the front of the aforesaid housing **26**.

The aforesaid tape T may be pulled or drawn through the projection field **31** by an arrangement of any suitable character. Thus, for example and as herein shown, said tape T may be passed beneath a roll **33** or other guiding surface, this roll being disposed below the horizontal plane of the projection field. Thereafter, the tape T passes over a pulling roll **34**, the tape being held in engagement with the upper surface of said pulling roll **34** by an idler roll **35** mounted on a lever **36** which is biased against the roll **34** by a spring **37**. After the tape passes beyond the pulling roll **34**, it may be deflected by an idler roll **38**, or other guiding surface, and then passed upwardly so as to be wound upon a suitable reel **39**.

The aforesaid pulling roll **34** may be operated in any suitable manner. Thus, for example, the operating shaft for said pulling roll **34** may be geared to a counter shaft to which is connected one end of a flexible shaft **40** which, at its other end, is connected to suitable gear mechanism disposed in a gear box **41**, said gear mechanism being connected to the armature shaft of an electrical motor **43**.

As herein shown, a support **44** carries the above described rolls **33**, **34** and **38**, the reel **39** and the various associated parts. This support **44** may be of any suitable character and it may be mounted in any suitable manner. Thus, if desired, said support **44** may be secured in suitable manner to a part associated with the housing **26**.

The reel **39** may be operated in any suitable manner such, for example, as is well known in the art. Thus, the motor **43** may furnish the power for driving the reel **39**, the latter, preferably, being rotated by a conventional spring belt of the endless type, the latter engaging pulleys carried, respectively, by the shaft of the reel **39** and the shaft of the pulling roll **34**.

As shown in Fig. 3, the projection device A is spaced from the printing device P in such manner that a section of the tape T constantly extends between these two devices and, as hereinafter described, forms a tape loop having more or less length or extent. Adapted to engage and to be controlled in position by this tape loop is a movable member **46**, Figs. 3, 4 and 5, which comprises a lateral section **46***a* adapted directly to engage the tape T, said section **46***a* being cut away as indicated at **46***b*, Fig. 4, so as to straddle the single row of characters on the tape T and avoid smudging of the ink forming said tape characters. In the event that there are two rows of characters extending longitudinally of the tape T, the aforesaid lateral section **46***a* may be provided with an offset section which engages the tape between said rows of characters.

Suitably supported, for example, by the rear wall of the aforesaid supplementary housing is a laterally extending member **47** which forms a support on which the member **46** is mounted for free oscillatory movement. The member **47** also supports two other members **48**, **49** both of which are freely oscillatory the same as the member **46**. The member **48**, on opposite sides thereof, has the respective contact members **48***a*, **48***b* secured thereto. The member **49**, on the lower surface thereof, has secured thereto a contact member **49***a* which is coactable with the contact member **48***b*. The above described contact member **48***a* is coactable with a contact member **50***a* secured to a member **50** which is suitably mounted in fixed position such, for example, as by means which secures it to the aforesaid housing.

The members **48**, **49** carry the respective downwardly extending stems **51**, **52** which, preferably, are adjustably mounted as shown. When the member **46** is in a normal lower position, the stem **52** is spaced closer thereto than is the stem **51**.

Referring particularly to Fig. 9, the armature shaft of the motor **43** is shown as carrying a drum **53** with which is coactable a pair of brake shoes **54** carried by the respective arms **55** which are pivoted to a lug **56** projecting upwardly from the base upon which said motor **43** rests. Upstanding from and secured to the base last noted is a plate **57** which carries an electromagnetic winding **58** having a depending armature **59** slidable in a guide member **60** carried by and projecting from the aforesaid plate **57**. Secured to and extending in opposite directions from said guide member **60** are a pair of rods **61** each of which extends through a hole formed in the adjacent arm **55**. As shown, each rod **61** carries a coiled spring **62** which is confined between a collar **63** secured to said rod **61** and the adjacent arm **55**. Accordingly, it results that the springs **62** bias the respective arms **55** toward each other whereby the brake shoes **54** are held in engagement with the brake drum **53**.

Secured to the opposite respective sides of the armature **59** are the blocks **64** each of which comprises an outwardly inclined surface coactable, respectively, with rollers **65**, **65** carried by the respective upper and inwardly extending ends of the arms **55**.

As shown in Figs. 11 and 12, the armature **59** has secured thereto a plate **66** which, at one end thereof, carries a pin **70** which is engageable in an elongated slot of a member **71** which is secured to and movable with a mercury switch **72** suitably mounted for oscillatory movement on the aforesaid plate **57**.

Extending from a suitable source of current, not shown, are a pair of conductors **73** and **74**, the conductor **73** leading to one terminal of the aforesaid mercury switch **72**, the other terminal of which is connected by a conductor **75** which leads to and is connected to one terminal of the motor **43**. The conductor **74** leads to and is connected to the aforesaid member **50** and its contact member **50***a*. Connected to the member **49** and its contact member **49***a* is a conductor **76** which leads to and is connected to the other terminal of the aforesaid motor **43**. Connected to the member **48** and its contact member **48***a*, **48***b* is a conductor **77** which includes a resistance unit **78** preferably of the variable type, said conductor **77**, beyond the resistance unit **78**, being

connected to the aforesaid conductor 76. Connected to the conductor 77, between the contact members 48a, 48b on the one hand and the resistance unit 78 on the other hand is a conductor 79 which leads to and is connected to one terminal of the aforesaid electromagnetic winding 58, the other terminal of which has secured thereto a conductor 80 which leads to and is connected to the aforesaid conductor 73. As shown in Fig. 6, a suitable variable condenser 81 may be connected across the conductors 74 and 76. Likewise, a suitable resistance unit 82 may be connected across the terminals of the motor 43.

In operation, the printing device P, the projection device A, and the tape pulling mechanism are suitably grouped with respect to each other, as indicated in Fig. 3, so as to form a straight-line path for the tape T which issues from said printing device P in flatwise relation with the inked characters thereon facing upwardly and, while maintained in this relation, is drawn through the projection field 31 of said projection device A, and then wound upon the reel 39.

In connection with the described movement of the tape through said projection field, it will be noted that a suitable device such, for example, as a J-spring or, as shown, a weight 85 is disposed at the entrance to said projection field, said weight 85 engaging the tape so as to prevent tape pulsations set up by the printing device from reaching the projection field. As shown more particularly in Figs. 7 and 8, the weight 85 is illustrated as having spaced web sections 85a disposed adjacent opposite sides of the projection field, these web sections 85a being detachably pivoted on the respective pins 86 which extend laterally from the fixed upstanding lugs 87. At its forward edge, the weight 85 comprises a transverse web section 85b which is provided with a lower recess as at 85c for the reception of a loosely pivoted member 88 having side edges 88a adapted to engage the opposite, respective sides of the tape T, these side edges 88a being separated by a recess through which the inked surface of the tape T travels.

During those periods when the printing device P is non-operative, the tape loop at the entrance to the projection field 31 is at its minimum length and, as a result, the member 46, 46a is in its uppermost position. When thus positioned, the member 46 is in engagement with the stems 51, 52 whereby the members 48, 49 are held in their uppermost positions so that all of the contact members 49a, 48b, 48a, and 50a are open. It results, therefore, that the circuit of the motor 43 is open and, therefore, the tape remains stationary. Further, at this time, the circuit of the electromagnet 58 is open and, accordingly, it results that the armature 59 therefor is in the lower position shown in Fig. 9. When said armature 59 is thus positioned, the springs 62 effectively hold the brake shoes 54 in clamping relation with respect to the brake drum 53.

If the printing device P starts to operate while the motor 43 and electromagnet 58 are deenergized as described above, the tape loop at the entrance to the projection field 31 starts to increase in length and, when sufficiently increased in length, the member 46, 46a moves to a lower position with the result that the contact member 48a engages the fixed contact member 50a whereby a circuit is completed through the motor 43 as follows: From one side of the source of current by way of the conductor 74, member 50, contact member 50a, contact member 48a, member 48, conductor 77, including the resistance unit 78, conductor 76, the winding of motor 43, conductor 75, mercury switch 72 and thence to the other terminal of the source of current by way of the conductor 73. Simultaneously with the completion of the foregoing circuit, a circuit is completed through the electromagnet 58 which is in parallel circuit with respect to the motor 43. Thus, the circuit through the electromagnet 58 extends from the conductor 77 by way of the conductor 79, the winding of electromagnet 58 and thence by way of conductor 80 to the conductor 73.

As a result of the simultaneous energization of the respective circuits for the motor 43 and the electromagnet 58, it results that the armature 59 of the electromagnet 58 is drawn upwardly, Fig. 9, whereby the blocks 64 swing the respective arms 55 outwardly against the force of the springs 62. When thus swung outwardly, the brake shoes 54 release their gripping engagement upon the brake drum 53 and, when thus released, the motor 43 is free to and immediately commences operating in its normal manner whereby the roll 34 is rotated in a clockwise direction, Fig. 1, to draw the tape T through the projection field. At the same time, the reel 39 is similarly rotated so that the tape is wound thereupon. As the tape thus passes through the projection field, the objective lens forms images of those tape characters in the projection field at any given time, these images being displayed upon the projection screen.

In the event that the speed of the motor 43 as thus energized is insufficient to draw the tape from the aforesaid tape loop as fast as the tape is delivered to said loop by the printing device P, the member 46, 46a descends a greater extent than as hereinbefore described. During initial further downward movement of the member 46, the stem 52 moves therewith but, eventually, the contact member 49a—which is movable with the member 49 and the stem 52—engages the contact member 48b which previously had moved to a stationary position. In so doing the resistance unit 78 is eliminated from the operating circuit of the motor 43 with consequent establishment of a new motor circuit. This new circuit for said motor 43 extends from one terminal of the source of current by way of the conductor 74, member 50, contact member 50a, contact member 48a, contact member 48b, contact member 49a, conductor 76, the winding of motor 43, conductor 75, mercury switch 72, and thence to the other terminal of the source of current by way of the conductor 73. With the resistance unit 78 thus eliminated from its circuit, the motor 43 speeds up and draws the tape from the aforesaid tape loop at a rate faster than the rate at which tape is delivered thereto by the printing device P.

The establishment of the new operating circuit for the motor 43 as described above has no effect on the electromagnet 58. This is necessarily true because the previously established circuit therefor remains energized even though the resistance unit 68 is eliminated from the motor circuit.

When operation of the printing device P is discontinued, the motor 43 continues to operate until the tape loop is shortened to such extent that the member 46, 46a has been moved to its uppermost position. At this time, as previously stated, the operating circuits for the motor 43 and for the electromagnet 58 are opened.

Therefore, at this time, the motor 43 is stationary and the brake shoes 54 are in clamping engagement with respect to the drum 53 on the armature thereof.

The motor control arrangement including the circuits and brake features as herein described is utilizable particularly, although not necessarily, with a variable speed motor, such as a direct current motor having a series field winding. With such an arrangement, it becomes practical to position the printing device P and the projection device A in such close relation with respect to each other, Figs. 1 and 3, that the length of the tape loop between these two devices is much shorter than exists in prior art projection arrangements of the general character herein described. Thus, in actual practice, it has been demonstrated that the tape between the printing zone and the entrance to the projection field has a length of approximately 1 inch when the tape-drawing motor 43 is not operating and a length of approximately 1¾ inches when said motor 43 is operating. It shall be understood, however, that my invention is not to be limited to the exact tape loop lengths just specified.

It follows, therefore, in accordance with my invention, that the controlling tape loop is substantially shorter at all times than is the corresponding tape loop of commercial devices as at present used. This is highly advantageous. In this connection and as well understood in the art, it is noted that operation of printing mechanisms of the character herein referred to often ceases, for one reason or another, for a few seconds or for greater intervals of time. Each time that this happens, there is a length of tape between the printer mechanism and the projector which bears a number of characters and the images of these characters are not projected until operation of the tape-drawing motor is again initiated in response to renewed operation of said printer mechanism. The delayed projection of these character images may result disadvantageously by reason of the fact that they may convey important information. In accordance with my invention, by reason of the short tape loop which continuously exists between the printer mechanism and the projector, the chance that there may be a delay in the projection of character images conveying important information is greatly reduced. This is highly advantageous and desirable.

Referring to Figs. 7 and 8, I have illustrated the above described transverse web section 85b of the weight 85 as formed with a slot 85c which receives the periphery of the wheel 20 as the latter rotates during the printing operation. This is advantageous because decreasing the length of the loop for the advantageous result noted above.

Referring to Figs. 1 and 2, the above described base 6, on the upper surface thereof, carries a plurality of spaced tracks 90 disposed in parallel relation with respect to the path of the tape T through the projection field, said tracks 90 being provided with upwardly facing rack teeth with each of which a gear wheel 91 is adapted to mesh, the gear wheels 91 being secured to and rotatable with a shaft 92 mounted in bearings in the lower housing 4, the shaft 92 on its outer end carrying a hand wheel 93. The lower housing 4 is freely slidable on the base 6 and the movement thereof is guided by the aforesaid tracks 90 and other suitable guide members 90a. Obviously, rotation of the hand wheel 93 in the proper direction causes the entire printing device P to be moved either toward or from the projection device A. Accordingly, when said printing device P is disposed in proper operative relation with respect to the projection device A as shown in Fig. 1, it follows that the hand wheel 93 may be rotated in a counter-clockwise direction, Fig. 1, while the roller 18 is held elevated, to move said printing device P to the position shown in Fig. 2. When in the position last named, the printing device P may readily be serviced, adjustments may be made with ease, etc.

As shown in Figs. 1 and 2, the wall of the lower housing 4 toward the right may be apertured for the reception of the operative end of a lever 94 pivoted on spaced lugs 95 upstanding from the base 6, this lever 94 being suitably biased into latching position by a spring 96. When it is desired to move the printing device P to servicing position, the lever 94 may readily be released by swinging the same in a clockwise direction, Fig. 1. In as simple a manner, said printing device P may be latched in operative position as shown in Fig. 1, a stop surface 97, Figs. 1 and 2 defining the position last noted.

The herein described circuit arrangement operates in a highly practical manner for the intended purpose. As will be understood from the description hereinbefore given, the mercury switch 72 moves from the full-line to the broken-line position thereof and vice versa, Fig. 11, under control of the armature 59. Further, the arrangement is such that the circuit through the mercury switch 72 is open when the armature 59 is in its lower position, Fig. 9, and closed when said armature 59 is in its upper position.

It results, therefore, that the mercury switch 72 exercises a control on the circuit of the motor 43 which is supplementary to the control exercised by the contact members 58a, 48a, 48b and 49a. Thus, when the armature 59 is in its lower position, the circuit through the motor 43 is open. Therefore, if the electromagnet 58 should burn out while the tape-pulling means is operating under control of the motor 43, the armature 59 would move to lower position and (1) apply the brake shoes 54 to the drum 53, and (2) open the circuit of said motor 43. The mercury switch 72 and the control exercised thereby, then, constitutes a means of protecting the motor 43 in case the electromagnet 58 should burn out and apply the brake shoes 54.

As clearly appears from Figs. 1 and 3, the housings 4 and 5 in part at least are disposed in front of the projection field 31. These housings contain the mechanism for operating the printing device and the grouping thereof as set forth with respect to the projection field constitutes an advantageous feature of my invention.

As shown in Fig. 2, the switching mechanism which comprises the members 46, 48, 49 and associated parts is disposed at the rear of the projection field and extends longitudinally thereof. Preferably, as shown in said Fig. 2, this switching mechanism is disposed within a supplementary casing 98 which should be detachably related to its supporting surfaces.

The herein described printing device P may be either of the constant speed or variable speed type. As stated, the motor 43 may be of the variable speed type. Experience has demonstrated that, when using such a variable speed motor, the two-speed control mechanism in combination with the brake device gives satisfactory results. That is, a tape loop of the specified

desirable minimum lengths may be employed and, even so, there is little or no chance that the tape will be broken, torn, or improperly pulled through the printer.

It shall be understood that my invention is not to be limited to a control such as is imposed by a member **46**, **46***a*, or equivalent, which rides upon the tape. As well, there may be utilized suction control such, for example, as of the general character disclosed in Curtis Patent No. 2,028,146.

It shall also be understood that movement of the tape through the projection field may be effected otherwise than as herein described. Thus, in lieu of a tape-pulling arrangement at the exit end of the projection field, there may be utilized a pair of tape-moving rollers of the character disclosed in my pending application Serial No. 37,501, filed August 23, 1935.

While the invention has been described with respect to a certain particular preferred example which gives satisfactory results, it will be understood by those skilled in the art after understanding the invention, that various changes and modifications may be made without departing from the spirit and scope of the invention and it is intended therefore in the appended claims to cover all such changes and modifications.

What is claimed as new and desired to be secured by Letters Patent is:

1. In combination, a motor for drawing a character-bearing tape through a projection field after passage thereof from a printing device, means for controlling the operation of said motor, said means comprising a pivoted member extending longitudinally along said projection field and adapted to be controlled by a loop in said tape, a pair of movable members disposed above said pivoted member and extending longitudinally along said projection field, means whereby said pivoted member, upon elevation thereof, engages said movable members in succession, and switch contacts associated with said movable members for controlling the circuit of said motor.

2. In combination, a motor for drawing a character-bearing tape through a projection field after passage thereof from a printing device, means for controlling the operation of said motor, said means comprising a pivoted member extending longitudinally along said projection field and adapted to be controlled by a loop in said tape, a pair of movable members disposed above said pivoted member and extending longitudinally along said projection field, said pivoted member and said movable members being pivoted on the same axis, said movable members having stems of different lengths secured thereto respectively, said stems extending toward said pivoted member whereby they are engaged in succession by said pivoted member upon elevation of the latter, and switch contacts associated with said movable members for controlling the circuit of said motor.

3. In an arrangement of the character described, a projector housing, a printing device at one side of said projector housing, said printing device comprising means for feeding a tape along substantially a horizontal path to the printing position, and means for drawing said tape horizontally through a projection field at the top of said projector housing, said printing device comprising a housing structure positioned in part at least at the side of and in front of said projector housing.

4. In an arrangement of the character described, a horizontal base, a printing device and a projection device mounted on said base in side-by-side relation, said printing device comprising means for feeding a tape along substantially a horizontal path to the printing position, means for drawing said tape horizontally through the projection field of said projection device, and means for moving said printing device along said horizontal base either toward or from said projection field, said means controlling said printing device for movement along a straight horizontal path longitudinally alined with said projection field.

5. In an arrangement of the character described, a horizontal base, a printing device and a projection device mounted on said base in side-by-side relation, said printing device comprising means for feeding a tape along substantially a horizontal path to the printing position, means for drawing said tape horizontally through the projection field of said projection device, horizontal track means associated with said base in parallel relation with the length of the projection field of said projection device for movement therealong of said printing device, means for moving said printing device either toward or from said projection device, and means for retaining said printing device in operative position.

6. In combination, a printing device from which a character-bearing tape extends to and through a projection field, a motor for drawing the tape through said projection field, means whereby a loop in said tape controls the operation of said motor, a brake mechanism cooperative with said motor, means whereby said tape loop causes said brake mechanism to discontinue the operation of said motor in an instantaneous manner, switching means included in the circuit of said motor, and means whereby said switching means is controlled in accordance with the position of said brake mechanism.

7. In combination, a printing device from which a character-bearing tape extends to and through a projection field, a motor for drawing the tape through said projection field, means for changing the speed of said motor, means whereby a loop in said tape controls said speed-changing means to thereby cause the tape to be drawn through said projection field at different rates of speed, a brake mechanism cooperative with said motor, means whereby said tape loop causes said brake mechanism to discontinue the operation of said motor in an instantaneous manner, switching means included in the circuit of said motor, and means whereby said switching means is controlled in accordance with the position of said brake mechanism.

8. In combination, a motor for drawing a character-bearing tape through a projection field after passage thereof from a printing device, means for controlling the operation of said motor, said means comprising a pivoted member extending longitudinally along said projection field and adapted to be controlled by a loop in said tape, a pair of movable members disposed adjacent said pivoted member and extending longitudinally along said projection field, means whereby said pivoted member, when changed in position by said tape, actuates said movable members in succession, and switch contacts associated with said movable members for controlling the circuit of said motor.

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