Sept. 26, 1939. A. D. EITZEN 2,173,830

STOCK QUOTATION PROJECTING MACHINE

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Fig. 1

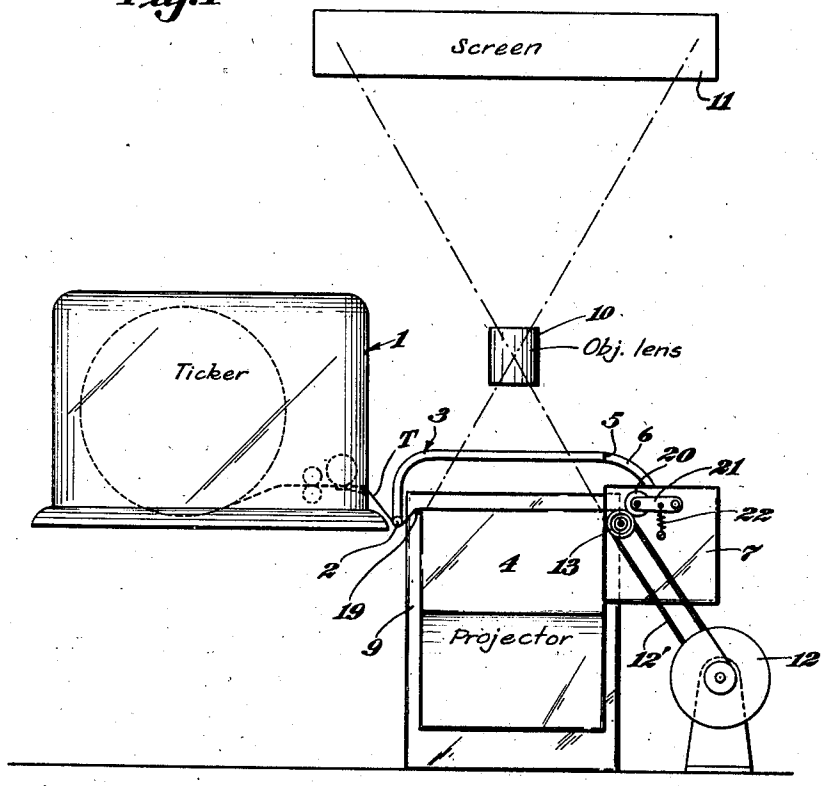


Fig. 2

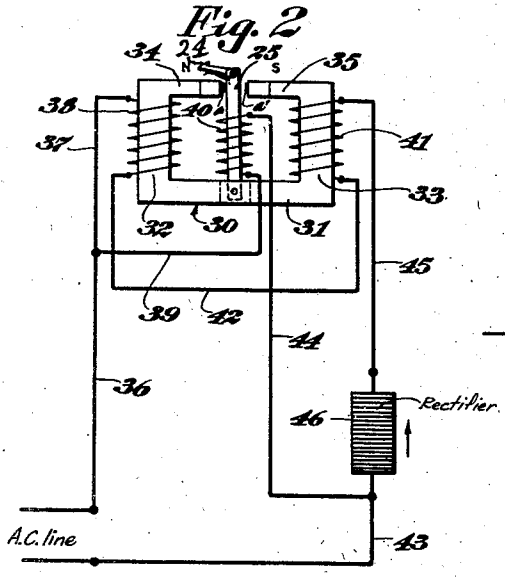
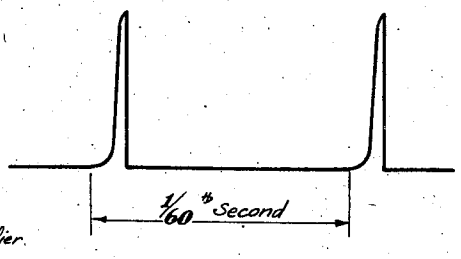


Fig. 3



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Fig. 4

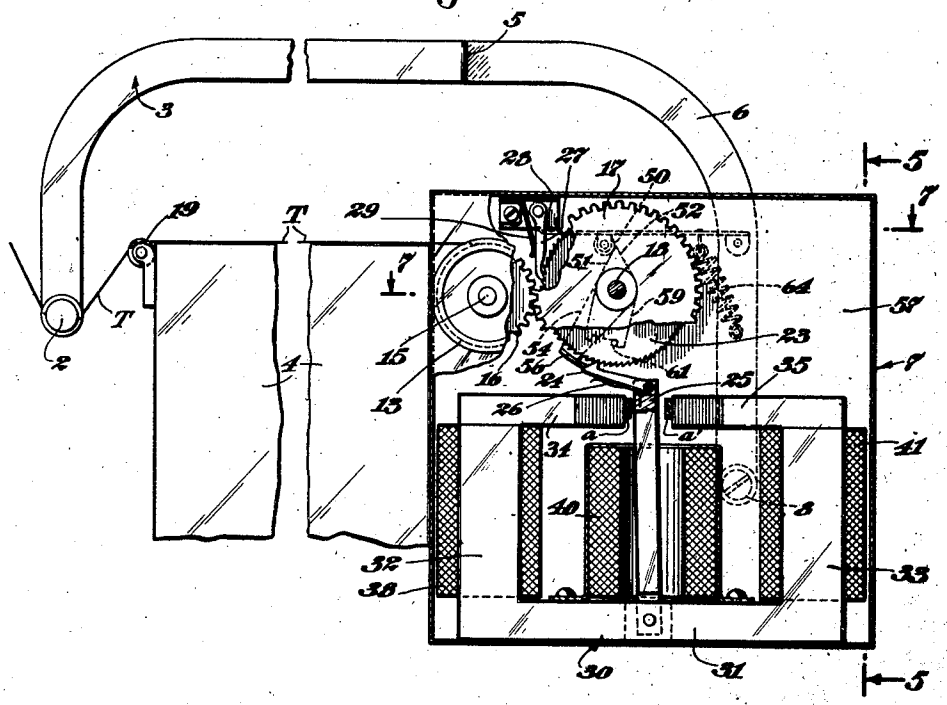


Fig. 5

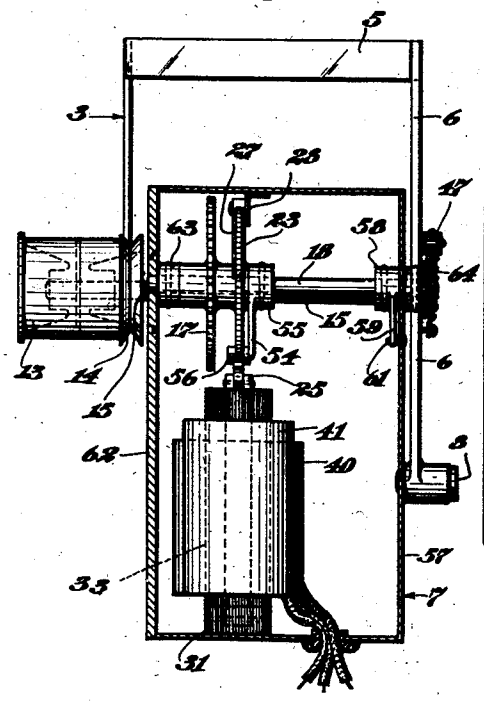
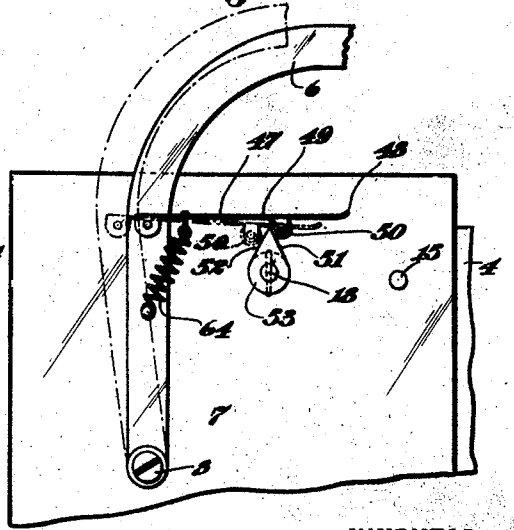


Fig. 6



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STOCK QUOTATION PROJECTING MACHINE

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Fig. 7

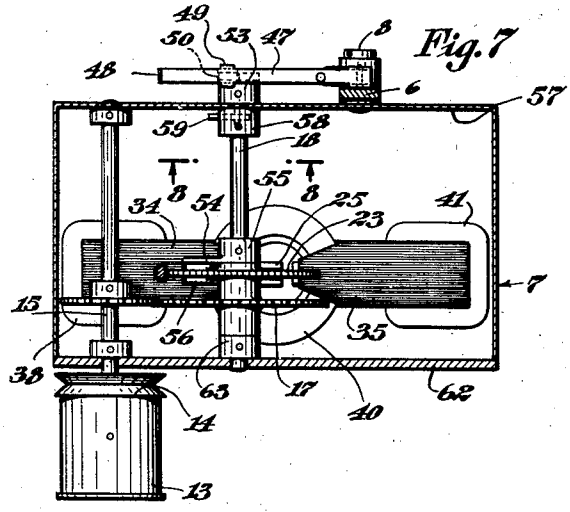


Fig. 8

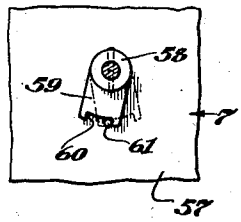


Fig. 9

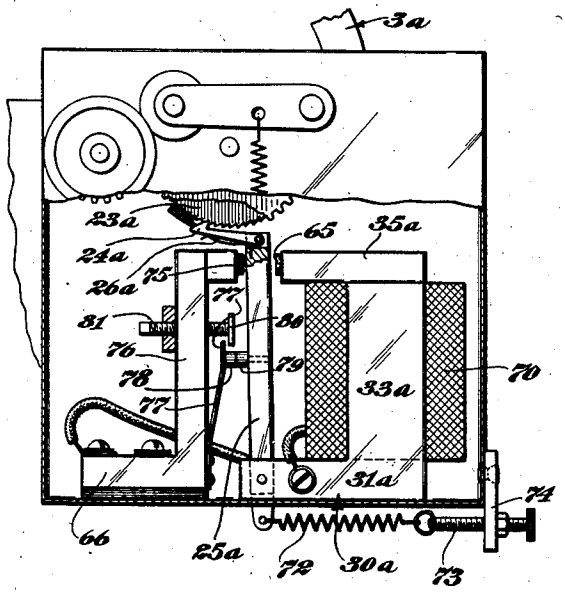


Fig. 10

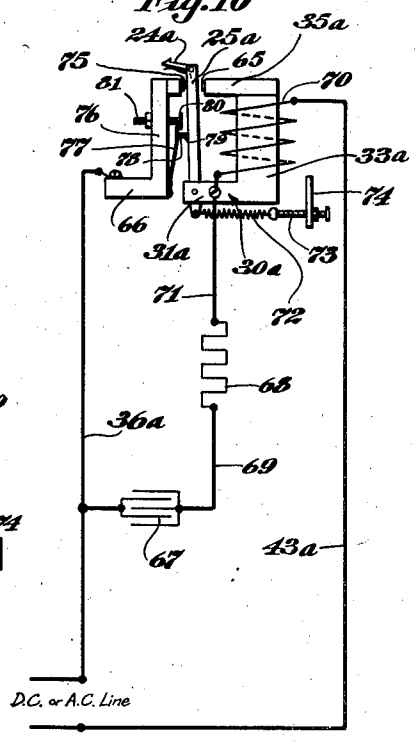
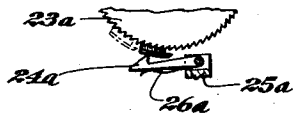


Fig. 9a



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Fig. 11

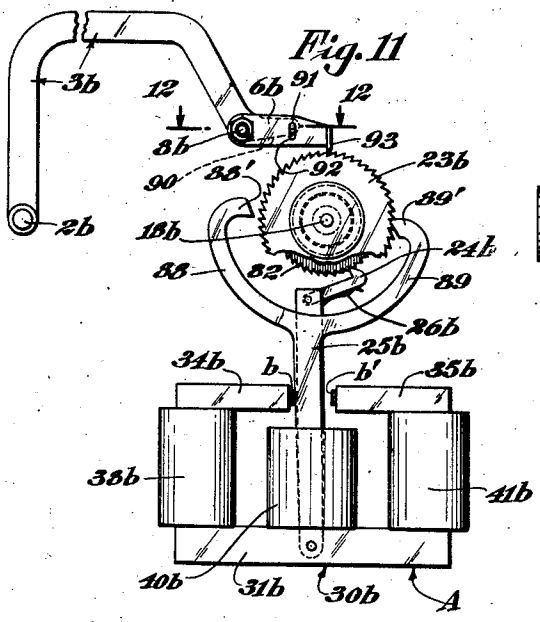


Fig. 13

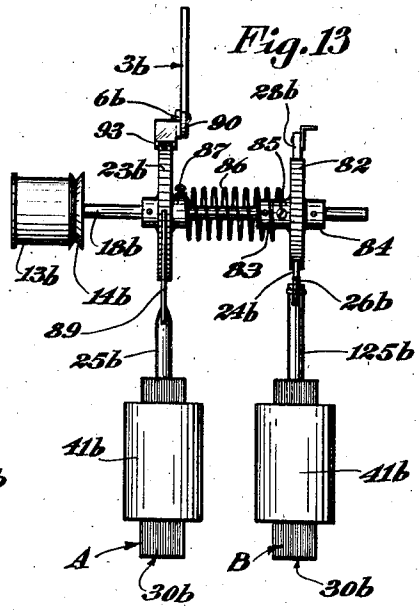


Fig. 12

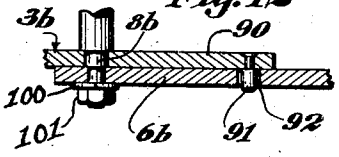


Fig. 14

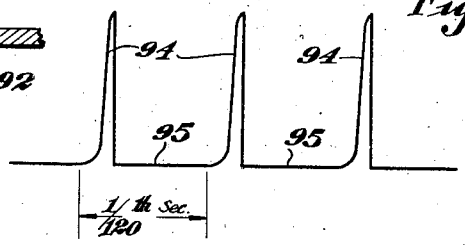
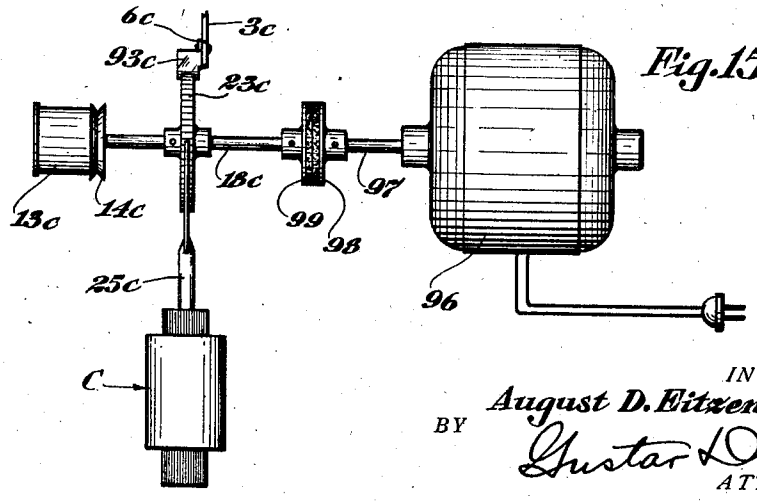


Fig. 15



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UNITED STATES PATENT OFFICE

2,173,830

STOCK QUOTATION PROJECTING MACHINE

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Application August 19, 1933, Serial No. 685,873
Renewed June 11, 1938

18 Claims. (Cl. 271—2.3)

This invention relates to stock quotation projecting machines in general and more especially to an improved, intermittent tape feed for a stock quotation projecting machine.

Among the objects of the present invention, it is aimed to provide an improved, intermittent tape feed for a stock quotation projecting machine in which the tape is advanced in small increments and at rates of speed where the eye of the average observer will not be offended in order to produce the illusion of a smooth, uniformly, moving tape.

It is still another object of the present invention to provide an improved, intermittent tape feed for a stock quotation projecting machine associated with a control device responsive to deflections in the tape corresponding to the supply of the tape to the projecting machine by an intermittently operating ticker or the like to effect the operation of the tape feed in order to advance the tape in small, fast moving increments to produce the illusion of a smooth, uniformly moving tape.

It is still another object of the present invention to provide a tape control device for an intermittent tape drawing mechanism, which control device will simultaneously iron out the vibrations transmitted to the tape by a ticker and respond to deflections in the tape corresponding to the intermittent feed of the tape to the projecting machine by an intermittently operating ticker or the like to effect the operation of the intermittent tape drawing mechanism.

Specifically, it is still a further object of the present invention to provide an intermittent tape drawing mechanism for a stock quotation projecting machine having a polarized relay for supplying the motive force to cause the tape to be advanced in small, fast moving increments to produce the illusion of a smooth, uniformly moving tape.

It is still another object of the present invention to provide an improved intermittent tape drawing mechanism associated with a relay, the electric energy of which relay may be supplied either by an alternate or direct current source of supply.

It is still another object of the present invention to provide an improved structure for effecting the intermittent drawing of the tape of a stock quotation projecting machine in small, fast moving increments in order to produce the illusion of a smooth, uniformly moving image on the screen of a stock quotation projecting machine.

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

Figure 1 is a front elevation diagrammatically showing a stock quotation projecting machine equipped according to one embodiment of the present invention;

Fig. 2 is a wiring diagram of the embodiment illustrated in Fig. 1;

Fig. 3 is a chart illustrative of the tape velocity against time operation of the embodiment illustrated in Fig. 1;

Fig. 4 is an enlarged fragmental detail partly in section of the tape drawing mechanism of the embodiment of Fig. 1;

Fig. 5 is a section on the line 5—5 of Fig. 4;

Fig. 6 is an enlarged fragmental detail showing the reverse side of the tape control lever illustrated in Fig. 4;

Fig. 7 is a section on the line 7—7 of Fig. 4;

Fig. 8 is a section on the line 8—8 of Fig. 7;

Fig. 9 is an enlarged fragmental detail partly in section of the tape feed actuating mechanism of another embodiment;

Fig. 9a is a fragmental detail showing another position of a portion of the mechanism illustrated in Fig. 9;

Fig. 10 is a wiring diagram of the embodiment illustrated in Fig. 9;

Fig. 11 is an enlarged detail partly broken away of the tape feed actuating mechanism of still another embodiment;

Fig. 12 is a section on the line 12—12 of Fig. 11;

Fig. 13 is an end view of the embodiment illustrated in Fig. 11;

Fig. 14 is a chart illustrative of the tape velocity against time operation of the embodiment illustrated in Fig. 11; and

Fig. 15 is an enlarged detail, part being broken away, of a tape feed actuating mechanism of still another embodiment.

In the embodiment illustrated in Figs. 1 to 8 inclusive, there is shown a ticker 1 in the present instance of the high speed type, from which the tape T is intermittently discharged. From the ticker the tape T passes under the finger 2 of the lever 3 extending over the light aperture of the extension 4 and having a bend 5 from which the rear end 6 of the lever 3 passes down to the housing 7 and it is there pivoted at its lower end by the screw 8. The extension 4 extends to one side of the lamp housing 9 containing a lamp from which the light rays are directed to pass up through the light aperture

at the upper end of the extension 4, in turn to pass through the tape T, clearing the lever 3, to pass through the objective lens 10 and then be deflected onto the screen 11 by suitable deflecting means. The housing 7 in the present instance, is connected to, and extends from, the extension 4. Below the housing 7 there is provided a suitable rewind reel 12 onto which the tape is finally wound after being fed thereto by the tape pulling roller 13. The rewind reel 12 is preferably provided with a suitable sheave, not shown, which is connected by the spring belt 12' with the sheave 14, in the present instance, fixedly associated with the tape pulling roller 13. The tape pulling roller 13 and sheave 14 are preferably as shown mounted on the shaft 15 which is journaled in the housing 7 and has mounted thereon a gear 16 in mesh with the gear 17 rotatably mounted on the shaft 18 also journaled in the housing 7.

From the foregoing it will appear that the tape, after leaving the finger or the roller 2 at the end of the lever 3 passes over the idler 19 mounted at the entrance end of the light aperture of the extension 4, and after passing over the light aperture engages the tape pulling roller 13 so positioned that the upper levels of the roller 19 and tape pulling roller 13 will maintain the tape T just clear of the light aperture and in close proximity thereto. For maintaining the tape in frictional tape drawing engagement with the pulling roller 13, there is provided the pressure roller 20 journaled at the end of the link 21, which link is provided with the spring 22 to resiliently maintain the pressure roller 20 in engagement with the tape T and to drivingly press the tape T into engagement with the tape pulling roller 13.

The motive device for actuating the tape pulling roller 13 will now be described.

On the shaft 18 there is rotatably mounted the ratchet wheel 23 the teeth of which are engaged by the head of the ratchet 24 pivotally connected at the upper end of the armature 25. The ratchet 24 is maintained in resilient engagement with the teeth of the ratchet wheel 23 by the flat spring 26 secured to the armature 25 and positioned to engage the ratchet 24. The teeth of the ratchet wheel 23 are also engaged by the pawl 27 which is pivotally connected to the bracket 28 secured to the housing 7 and resiliently maintained in engagement with the teeth of the ratchet wheel 23 by the flat spring 29 secured to the bracket 28 and positioned to engage the pawl 27 and press it into engagement with the teeth of the ratchet wheel 23. The armature 25 forms part of a polarized relay which is continuously vibrating to actuate the ratchet 24 to and fro in turn to actuate the ratchet wheel 23 and thereby to impart a rotative impulse or rather a series of successive fast moving rotative impulses to the tape pulling roller 13. The ratchet 24 will of course, in the present embodiment, actuate the ratchet wheel 23 only when it is moving in one direction, the pawl 27 anchoring the ratchet wheel 23 against a return movement when the ratchet 24 is returned. When the current used is alternating current, as is the case with this embodiment, each rotative impulse will consume about one sixtieth of a second as indicated in the chart illustrated in Fig. 3. The polarized relay of which the armature 25 forms a part (see particularly the wiring diagram of Fig. 2), consists essentially of an interrupted rectangular shaped core 30 having a connecting portion 31 to which the armature 25 is pivotally connected at its lower end and also has two legs 32 and 33 at the ends of said connecting piece 31 extending upwardly and terminating in the inwardly extending portions 34 and 35, the ends of which form the north and south poles respectively. The free ends of the poles 34 and 35 in the present instance are provided with the buffers *a* and *a'* to cushion the blows of the armature 25 during its vibration.

With an alternating current, (see the wiring diagram in Fig. 2), the main lead 36 is connected by the conductor 37 with the winding 38 of the leg 32 and by the conductor 39 with the winding 40 of the armature 25. The winding 38 in turn is connected to the winding 41 of the leg 33 by the conductor 42, and the winding 40 is in turn connected to the main lead 43 by the conductor 44, while the winding 41 is in turn connected by the conductor 45 with the rectifier 46 which rectifier is connected to the main lead 43. When the winding 40 has alternate current excitation and the rectifier 46 cooperates with the source of alternating current and the windings 38 and 41 to effect a magnetic circuit of fixed polarity at the poles 34 and 35 the armature 25 pivotally mounted as shown will cooperate with the poles 34 and 35 to be alternately repelled and attracted in the well known manner.

The cooperation of the lever 3 with the armature 25 will now be described. The portion 6 of the lever 3 has pivotally connected thereto the arm or finger 47 provided with an upwardly bent free end 48 and a downwardly extending journal 49 for the roller 50 which is maintained in resilient engagement with either face 51 or 52 of the cam 53 fixed to the shaft 18. The shaft 18 in turn has fixed to it the arm 54 extending down from its hub 55 pinned to the shaft 18 within the housing 7 to one side of the ratchet wheel 23. The arm 54 has formed at its free end the stripping plate 56.

The organization is specifically as follows: the cam 53 is fixed to the shaft 18 adjacent the outer face of the wall 57 of the housing 7. On the inner face of the wall 57 there is fixed to the shaft 18 a limiting device consisting of a hub 58 pinned to the shaft 18 and having a downwardly extending arm 59 provided with a recess 60 at its extreme outer face to receive the pin 61 extending from the wall 57 of the housing 7. The hub 55 of the stripping plate 56 is fixed to the shaft adjacent to and in engagement with the boss of the ratchet wheel 23 which has a common hub with the gear 17 fixed to rotate with the ratchet wheel 23, but both gear 17 and ratchet wheel 23 being freely rotatable relative to the shaft 18. The hub of the gear 17 in turn abuts against the collar 63 fixed to the shaft 18 and disposed between the hub of the gear 17 and the inner face of the wall 62 of the housing 7 whereby the several parts are properly positioned relative to one another on the shaft 18.

The coil spring 64 resiliently maintains the roller 50 in engagement with either face 51 or 52 of the cam 53.

From the foregoing, it will thus be seen that when the loop in the tape T adjacent the finger 2 is dissipated, it will raise the finger 2 of the lever 3 in turn to move the roller 50 (see Fig. 4), to clear the face 51 and thereupon to snap over on the face 52 thereby to rock the cam 53 so that the left end of the arm 59 will engage the pin 61 when the stripper 56 also pinned to the shaft 18 will be rocked with the arm 59 to en-

gage the head of the ratchet 24 to strip it or free it from engagement with the ratchet 23. Thereupon of course the continued vibration of the armature 25 will be ineffective to actuate the ratchet wheel 23 and the ratchet wheel 23 will thus, as a result of its interconnecting parts, be maintained at rest.

However, when the ticker again operates and discharges tape to form a loop, deflection or slack under the finger 2, the descent of the finger 2 of the lever 3 will cause the roller 50 to be moved to the other face 51 of the cam 53, due to the fact that the arm 6 will swing to the right, see Fig. 6, about pivot 8 and thereby move the finger 47 and roller 50 with it to the right, and due to the tension in the spring 64, snap the cam 53 so that the right lower end of the arm 59 will engage the pin 61, thereby in turn to rock the stripping plate 56 to release the ratchet 24 into position again to be pressed into engagement with the ratchet wheel 23 by the spring 26. It will be noted however, that the stripping plate 56 will not entirely clear the inclined face of the head of the ratchet 24 whereby the stripping plate will, when out of stripping position, be prepared effectively to engage the head of the ratchet 24 to initiate the stripping action and in addition limit the movement of the ratchet 24 when engaging the ratchet wheel 23 so that the movement charted in Fig. 3 can be effectively produced, that is a high speed actuation effected throughout the movement of the ratchet wheel and a zero period of rest be had both before and after engagement of the ratchet wheel 23 by the ratchet 24, in other words to effect a slight hammer blow without the preceding drag on the next succeeding tooth of the ratchet wheel 23.

In the embodiment shown in Figs. 9, 9a and 10, there is illustrated a motivating device for an intermittent tape feed actuator which can be operated either by alternating or by direct current. Here, see particularly the wiring diagram of Fig. 10, ratchet 24a is pivotally connected to the upper end of the armature 25a which is pivotally connected to the horizontal extension 31a of the core 30a which has a vertically extending leg 33a having a horizontally extending portion 35a at its upper end, the free end of which forms one of the poles of the magnet. On the free end of the portion 35a there is formed a buffer 65 to cushion the blow of the armature 25a when it is attracted by the pole piece 35a.

The L-shaped conductor 66 is disposed adjacent to the armature 25a as shown.

The main lead 36a in the present instance, is connected to the conductor 66 and also to the condenser 67 which is connected to the resistance 68 by the conductor 69 which resistance 68 in turn is connected to the winding 70 of the leg 33a by the conductor 71 which winding 70 in turn is connected to the other main lead 43a.

The lower end of the armature 25a in the present instance, is connected by the coil spring 72 which is connected to the swivel screw 73 adjustably mounted in the bracket 74. When the current to the winding 70 is interrupted to liberate the armature 25a, it will be actuated by the spring 72 to strike the buffer 75 at the free end of the upper horizontal extension of the conductor 66. The vertical leg 76 of the conductor 66 has extending upwardly along its outer face the flat conductive spring 77, having formed on its free end a contact 78 adapted to engage the contact 79 on the side of the armature 25a when the spring 72 urges the armature 25a away from the buffer 65 and into engagement with the buffer 75, thereby to establish a circuit, see Fig. 10, from a suitable source of current through the conductors 36a and 66, contact spring 77, contacts 78 and 79, armature 25a, horizontal extension 31a, winding 70 and conductor 43a.

In order to effect the quick get-away of the armature 25a and thereby augment its speed, the upper free end of the flat spring 77 is limited in its outward movement by the abutment 80 formed on the screw 81 adjustably mounted in the vertically extending leg 76 of the conductor 66.

The remaining structural details of the parts cooperating with the ratchet wheel 23a may be the same as disclosed in the embodiment illustrated in Fig. 1.

The condenser 67 and resistance 68 are of course provided to reduce the heat and quench the spark formed at the contacts 78 and 79 cooperating with the armature 25a.

In Figs. 11, 12 and 13 there is illustrated an embodiment by which at least 120 feed impulses per second may be imparted to the ratchet wheel 23b fixed to impart corresponding feed impulses to the tape pulling roller 13b and sheave 14b. Here, there is provided a shaft 18b to which the ratchet wheel 23b, roller 13b and sheave 14b are fixed. A second ratchet wheel 82 is freely rotatable on the shaft 18b and is positioned by the collars 83 and 84 fixed to the shaft 18b to either side of the hub of the ratchet wheel 82. The hub 85 of the ratchet wheel 82 is connected by a coil spring 86 with the hub 87 of the ratchet wheel 23b, the coil spring 86 being coiled around the shaft 18b between the two ratchet wheels 23b and 82.

The ratchet wheel 23b and thereby the shaft 18b are arranged to be rotatably actuated by the coil spring 86, in which case the ratchet wheel 23b forms part of an escapement mechanism and the ratchet wheel 82 forms part of the tensing or winding mechanism for the spring 86.

Here there are provided two substantially identical polarized relays A and B similar to the polarized relay illustrated in Fig. 4 which are adapted to be operated by alternating current. Each of these relays A and B has an interrupted rectangular core 30b having the lower horizontally extending connecting piece 31b, two legs extending vertically upward from the ends of the connecting piece 31b and enclosed in the windings 39b and 41b respectively and has two inwardly extending horizontal portions 34b and 35b at their upper ends provided with buffers b and b' at their free armature engaging ends.

The armatures of these relays A and B however, differ. The armature 25b of the relay A is pivotally connected at its lower end to the connecting piece 31b and extends upwardly through the winding 40b and has at its upper end two escapement arms in tong formation, to wit, the arms 88 and 89 being tooth-formed at their ends 88' and 89' alternately to engage the teeth of the ratchet wheel 23b thereby to permit the ratchet wheel 23b when otherwise liberated to advance one step at a time.

The armature 125b of the relay B similarly is pivotally connected to its connecting piece 31b and passes up through its winding 40b but at its upper end has pivotally connected thereto a ratchet 24b which has its head resiliently main-

tained in engagement with the ratchet 82 by the flat spring 26b. In the present embodiment there is not provided a stripping device such as illustrated in the embodiment of Fig. 4 but instead thereof arrest of the ratchet wheel 23b and therefor of the shaft 18b is effected by direct engagement of the free end of the short arm portion 6b of the split lever 3b. The split lever 3b has a tape engaging finger or roller 2b which responds to deflections in the tape in turn to actuate the lever 3b about its pivot point 8b. The short integral arm portion 90 of the lever 3b, see particularly Figs. 11 and 12, has a pin 91 extending into and travelling in the slot 92 of the arm portion 6b, also pivoted on the pivot point 8b. The arm 6b is retarded by the spring washer 100 held in frictional engagement with the shoulder 8b by the nut 101 to effect a lag whereby several printing impulses of the ticker are ordinarily required to form a sufficient loop before the arm 6b will release the ratchet wheel 23b. The free end of the arm portion 6b is provided with a toothed portion 93, see Fig. 11, to engage the teeth of the ratchet wheel 23b when the loop is dissipated, thereby to anchor this ratchet wheel 23b against rotation by the spring 86, in which position the fingers 88' and 89' of the armature 25b will merely idle into and out of engagement with the ratchet wheel 23b without any movement of the ratchet wheel 23b. However, when the finger 2b descends with a deflection in the tape and thereby raises the arm portion 6b out of engagement with the teeth of the ratchet wheel 23b, the spring 86 will immediately be liberated to rotate the ratchet wheel 23b one tooth at a time corresponding to the intermittent release of the ratchet wheel 23b by the armature 25b.

In order to cooperate with the ratchet 24b of the armature 125b there is provided the pawl 28b similarly resiliently pressed into engagement with the teeth of the ratchet wheel 82 to lock it against movement when not actuated by the ratchet 24b.

By means of the actuating means shown in Fig. 11, the movement of the tape when plotted will assume the curve shown in Fig. 14 having a rapid fast moving period denoted by the curve portions 94 and along zero periods of rest denoted by the curve portions 95 which will succeed one another at a speed when moving of about one hundred and twenty movements to the second where the movement period will consequently not exceed in duration one-one hundred and twentieth of a second.

In the embodiment illustrated in Fig. 15, there will be associated with the polarized relay C the same escapement mechanism as is associated with the polarized relay B in Fig. 11, but instead of the coil spring 86, there will be provided a continuously driven electric motor 96 having a motor shaft 97 equipped with a slip clutch member 98 adapted to cooperate with the slip clutch member 99 and the shaft 18c of the tape pulling roller 13c and sheave 14c, in which case, when the split lever 3c liberates the ratchet wheel 23c, the motor 96 through the slip clutch members 98 and 99 will impart intermittent rotative impulses to the ratchet wheel 23c as the same is intermittently released by the armature 25c substantially identical in construction to the armature 25b, and in turn when the split lever 3c is actuated by dissipation the loop in the tape by the stopping of the ticker, the ratchet wheel 23c will be locked by the tooth 93c of the arm portion 6c.

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

I claim:

1. A device for feeding tape across the light aperture of a stock quotation projecting machine as it is intermittently supplied thereto, having a tape drawing roller, a ratchet wheel fixed to rotate with said tape drawing roller, a positive ratchet for imparting a step by step actuation to said ratchet wheel, a vibrating device for imparting a succession of fast moving positive vibratory impulses to said ratchet, and means including a stripper in engagement with the tape and responsive to deflections in the tape for disabling said ratchet when the supply of tape is arrested.

2. A device for feeding tape across the light aperture of a stock quotation projecting machine as it is intermittently supplied thereto, having a tape drawing roller, a ratchet wheel fixed to rotate with said tape drawing roller, a ratchet for imparting a positive step by step actuation to said ratchet wheel, a vibrating device for imparting a succession of fast moving positive vibratory impulses to said ratchet, means operatively associated with said ratchet and in engagement with the tape to be responsive to deflections in the tape for obstructing the actuation of said ratchet wheel by said ratchet when the supply of tape is interrupted, means for anchoring said ratchet wheel and therewith said tape drawing roller against movement when not actuated by said ratchet, and means for limiting the individual movements of said ratchet to successive predetermined short fast moving increments spaced from one another by comparatively long zero periods of rest.

3. A device for feeding tape across the light aperture of a stock quotation projecting machine as it is intermittently supplied thereto, having a tape drawing roller, a polarized relay including a vibrating armature, a ratchet wheel fixed to rotate with said tape drawing roller, a ratchet operatively associated with said armature for imparting a positive step by step actuation to said ratchet wheel, and means including a stripper in engagement with the tape and responsive to deflections in the tape for disabling said ratchet when the supply of tape is arrested.

4. A device for feeding tape across the light aperture of a stock quotation projecting machine as it is intermittently supplied thereto, having a tape drawing roller, a ratchet wheel fixed to rotate with said tape drawing roller, a ratchet for imparting a step by step actuation to said ratchet wheel, a vibrating device for imparting a succession of fast moving vibratory impulses to said ratchet, a pawl for anchoring said ratchet wheel when not actuated by said ratchet and yieldable to permit movement by said ratchet, a stripper adapted to obstruct the engagement of said ratchet wheel by said ratchet, and a lever responsive to deflections in the tape operatively associated with said stripper to actuate said stripper into obstructing position when the supply of tape to said light aperture is interrupted.

5. A device for feeding tape across the light aperture of a stock quotation projecting machine as it is intermittently supplied thereto, having a tape drawing roller, a ratchet wheel fixed to rotate with said tape drawing roller, a ratchet for imparting a step by step actuation to said ratchet wheel, a vibrating device for imparting

a succession of fast moving vibratory impulses to said ratchet, a stripper adapted to obstruct the engagement of said ratchet wheel by said ratchet, and a lever responsive to deflections in the tape operatively associated with said stripper to actuate said stripper into obstructing position when the supply of tape to said light aperture is interrupted.

6. A device for feeding tape across the light aperture of a stock quotation projecting machine as it is intermittently supplied thereto, having a tape drawing roller, a ratchet wheel fixed to rotate with said tape drawing roller, a ratchet for imparting a step by step actuation to said ratchet wheel, a vibrating device for imparting a succession of fast moving vibratory impulses to said ratchet, a stripper adapted to obstruct the engagement of said ratchet wheel by said ratchet, a lever responsive to deflections in the tape, a two-faced cam operatively associated with said stripper, and a cam roller resiliently mounted on said lever and engaging one of the faces of said cam to anchor said stripper in ratchet obstructing position when the supply of tape to the light aperture is interrupted thereby to actuate said lever and engaging the other face of said cam to permit engagement of said ratchet wheel by said ratchet when the tape supply is resumed.

7. A device for feeding tape across the light aperture of a stock quotation projecting machine as it is intermittently supplied thereto, having a tape drawing roller, a ratchet wheel fixed to rotate with said tape drawing roller, a ratchet for imparting a step by step actuation to said ratchet wheel, a vibrating device for imparting a succession of fast moving vibratory impulses to said ratchet, a stripper adapted to obstruct the engagement of said ratchet wheel by said ratchet, a lever responsive to deflections in the tape, a two-faced cam operatively associated with said stripper, and a cam roller resiliently mounted on said lever and engaging one of the faces of said cam to anchor said stripper in ratchet obstructing position when the supply of tape to the light aperture is interrupted thereby to actuate said lever and engaging the other face of said cam to limit the movement of said ratchet to effect short fast moving rotative impulses to said ratchet wheel with comparatively long zero periods of rest between successive rotative impulses.

8. A device for feeding tape across the light aperture of a stock quotation projecting machine as it is supplied thereto, comprising a tape drawing roller, a ratchet wheel operatively connected to impart a positive rotative impulse to said roller, an armature pivotally connected at one end, a ratchet pivotally connected to the free end of said armature, a spring for yieldably maintaining said ratchet in engagement with the teeth of said ratchet wheel, a magnetic system for vibrating said armature in turn to enable said ratchet to impart positive rotative impulses to said ratchet wheel through said ratchet, and means including a stripper in engagement with the tape and responsive to deflections in the tape for disabling said ratchet when the supply of tape is arrested.

9. A tape drawing device comprising a tape drawing roller, an actuator for positively actuating said roller, an armature pivotally connected at one end, a ratchet pivotally connected to the other end of said armature, a spring for urging said ratchet into engagement with said actuator, a mechanism including a magnet for vibrating said armature in turn to enable said ratchet to impart a succession of positive advancing impulses to said actuator through said ratchet, and means including a stripper in engagement with the tape and responsive to deflections in the tape for disabling said ratchet when the supply of tape is arrested.

10. The combination with a support, of a device for feeding tape across said support responsive to deflections in the tape as it is intermittently supplied thereto, having a positive tape drawing means including a roller, a vibrating device including means for imparting a succession of fast moving positive rotative impulses to the tape drawing means, means operatively associated with said vibrating device and in engagement with the tape to be responsive to deflections in the tape for interrupting the transmission of such rotative impulses to said tape drawing means by said vibrating device when the supply of tape is interrupted and means including a continuously closed electric circuit operatively connected with said vibrating device for continuously operating said vibrating device.

11. The combination with a support, of a device for feeding tape across said support responsive to deflections in the tape as it is intermittently supplied thereto, having a tape advancing device, a ratchet wheel fixed to move with said advancing device, a ratchet for imparting a step by step actuation to said ratchet wheel, a constantly reciprocating vibrating device for imparting a succession of fast moving vibratory impulses to said ratchet, and means operatively associated with said vibrating device and in engagement with the tape to respond to deflections in the tape to obstruct the actuation of said ratchet wheel by said ratchet when the supply of tape is interrupted.

12. The combination with a support, of a device for feeding tape across said support responsive to deflections in the tape as it is intermittently supplied thereto, having a tape advancing device, a polarized relay including a vibrating armature, means for intermittently connecting said armature with said advancing device to actuate the same, and means operatively associated with said latter means and in engagement with the tape to respond to deflections in the tape to obstruct said connecting means and thereby interrupt the actuation of said advancing device by said relay.

13. The combination with a support, of a device for advancing tape across said support including a tape advancer, an actuator including an intermittently moving device for controlling the actuation of said tape advancer, said tape advancer being operatively connected to said intermittently moving device to move intermittently therewith, means comprising an electric circuit including an electromagnet for effecting a uniform repetitious actuation of said intermittently moving device, and connecting means operatively associated with said intermittently moving device and in engagement with the tape to be responsive to deflections in the tape for interrupting the repetitious actuation of said intermittently moving device, the electric circuit for said electromagnet being established and uninterrupted both when said repetitious actuation is effected and when it is interrupted and said connecting means being ineffective to interrupt said electric circuit.

14. The combination with a support, of a device for advancing tape across said support including a tape advancer, an actuator including an intermittently moving device for controlling the actu-

ation of said tape advancer, said tape advancer being operatively connected to said intermittently moving device to move intermittently therewith, means comprising an electric circuit including an electromagnet for effecting a uniform repetitious actuation of said intermittently moving device, and a lever operatively associated with said intermittently moving device and in engagement with the tape to be responsive to deflections in the tape for interrupting the repetitious actuation of said intermittently moving device, the electric circuit for said electromagnet being established and uninterrupted both when said repetitious actuation is effected and when it is interrupted and said lever being ineffective to interrupt said electric circuit.

15. The combination with a support, of a device for advancing tape across said support including a tape advancer, an actuator including an intermittently movable device for controlling the actuation of said tape advancer, said tape advancer being operatively connected to said intermittently movable device to move intermittently therewith, means including an electric circuit including an electromagnet for actuating said intermittently movable device, and connecting means operatively associated with said intermittently movable device and in engagement with the tape to be responsive to deflections in the tape for interrupting the actuation of said intermittently movable device, the electric circuit for said electromagnet being established and uninterrupted both when said actuation is effective and when it is interrupted and said connecting means being ineffective to interrupt said electric circuit.

16. The combination with a support, of a device for advancing tape across said support including a tape advancer, an actuator including an intermittently movable device for controlling the actuation of said tape advancer, said tape advancer being operatively connected to said intermittently movable device to move intermittently therewith, means including an electric circuit including an electromagnet for actuating said intermittently movable device, and a lever operatively associated with said intermittently movable device and in engagement with the tape to be responsive to deflections in the tape for interrupting the actuation of said intermittently movable device, the electric circuit for said electromagnet being established and uninterrupted both when said actuation is effective and when it is interrupted and said lever being ineffective to interrupt said electric circuit.

17. A tape drawing device comprising a tape drawing roller, a rotatable actuator for said roller, means for imparting a rotative impulse to said actuator, an escapement for intermittently arresting said actuator, said escapement comprising an armature having arresters operatively associated alternately to arrest said actuator, means including a magnetic system for vibrating said armature, and a mechanism responsive to deflections in the tape to effect the anchoring of said actuator against movement when the supply of tape is interrupted without interrupting the actuation of said escapement.

18. A tape drawing device comprising a tape drawing roller, a rotatable actuator for said roller, means for imparting a rotative impulse to said actuator, an escapement for intermittently arresting said actuator, said escapement comprising an armature having arresters operatively associated alternately to arrest said actuator, means including a magnetic system for vibrating said armature, and a mechanism responsive to deflections in the tape to engage and anchor said actuator against movement when the supply of tape is interrupted without interrupting the actuation of said escapement.

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