

No. 697,426.

Patented Apr. 15, 1902.

H. ABBOTT.
CALCULAGRAPH.

(Application filed May 23, 1900.)

(No Model.)

3 Sheets—Sheet 1.

Fig. 1.

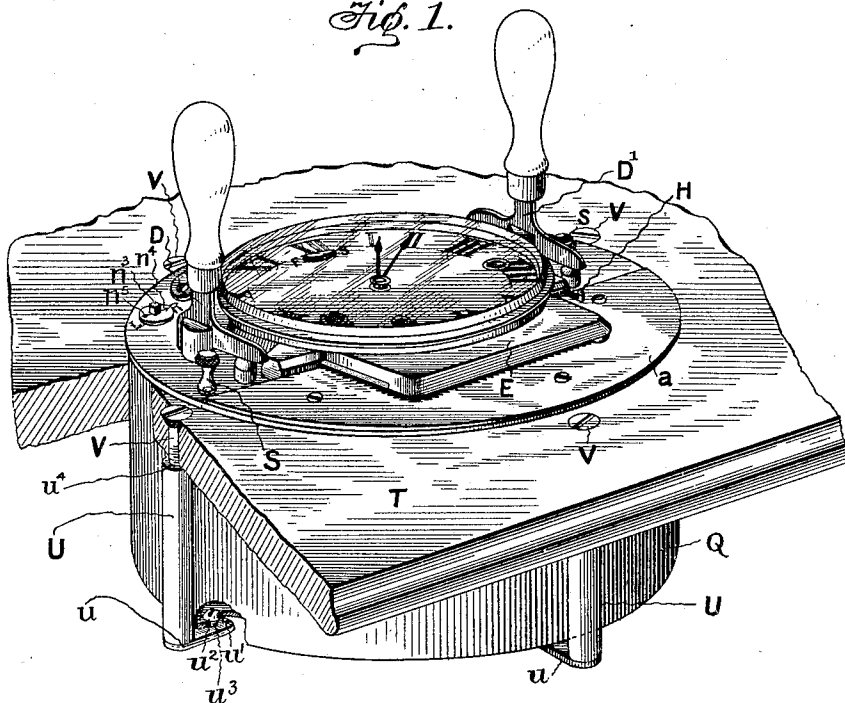
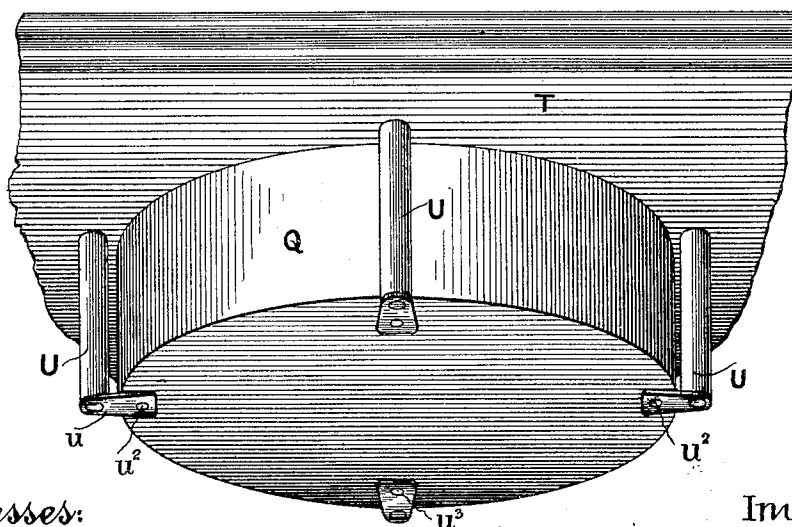


Fig. 2.



Witnesses:

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Inventor:

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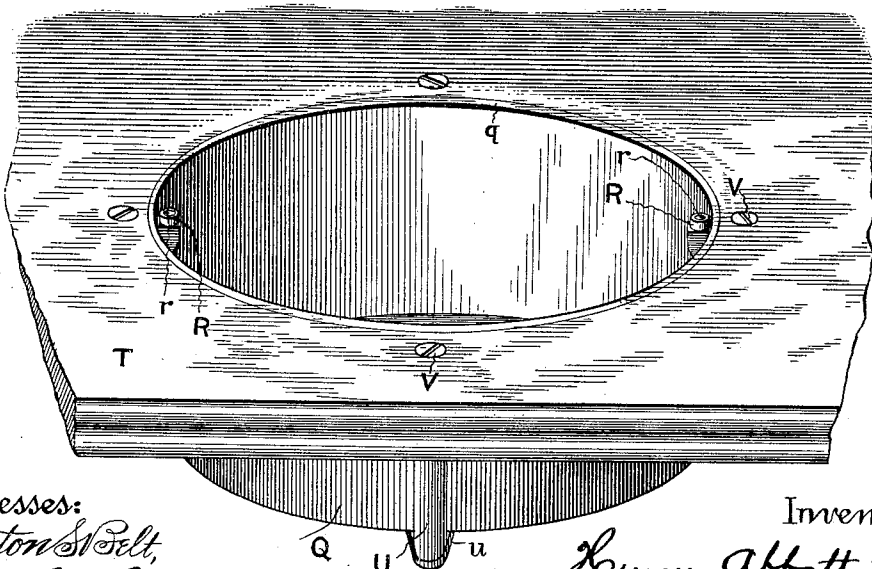
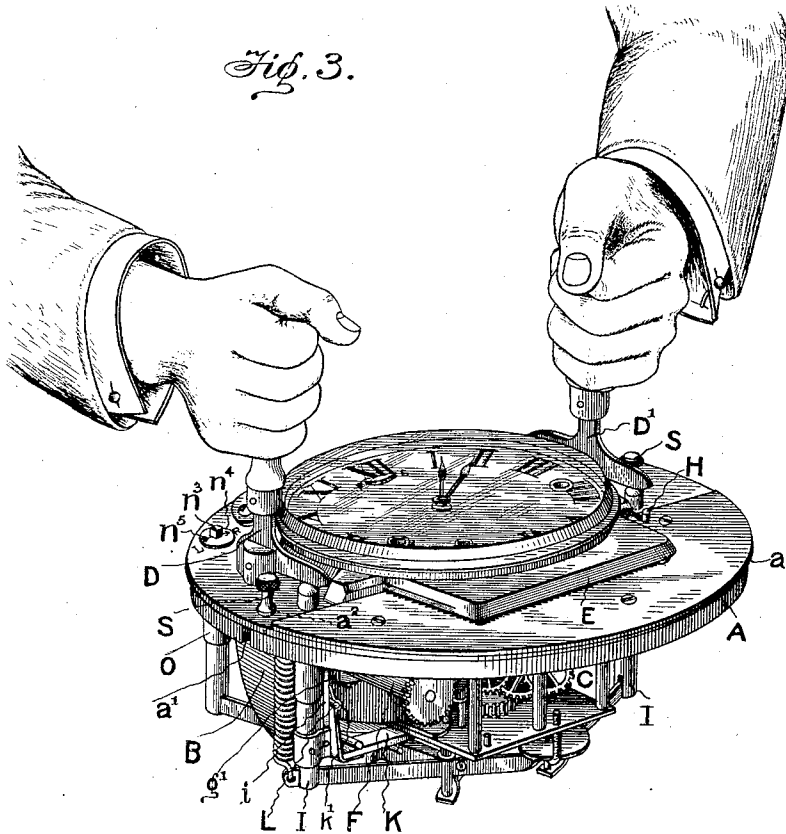
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3 Sheets—Sheet 2.

Fig. 3.



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3 Sheets—Sheet 3.

Fig. 4.

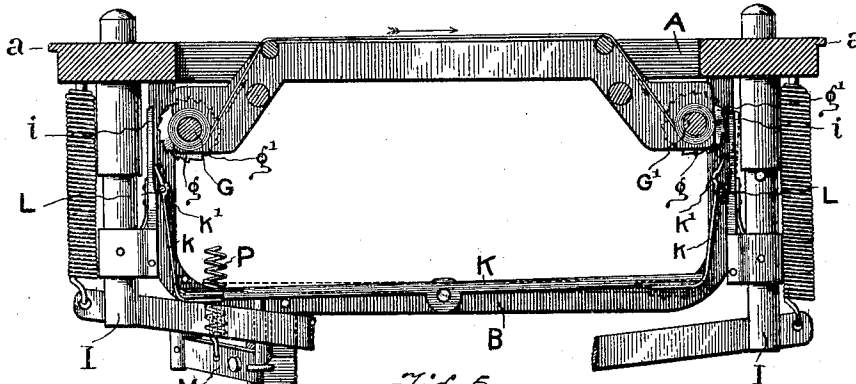


Fig. 5.

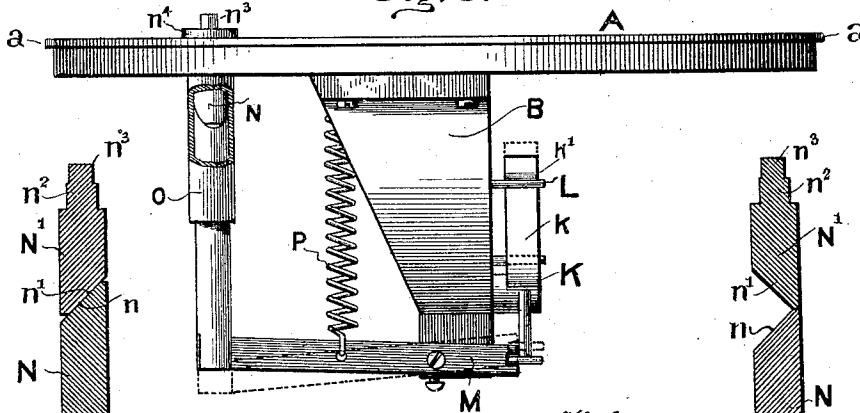


Fig. 8.

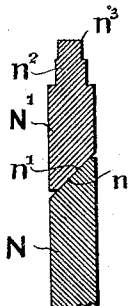


Fig. 6.

Fig. 7.

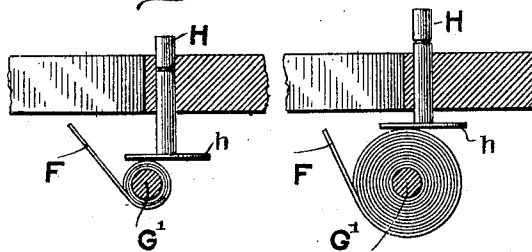
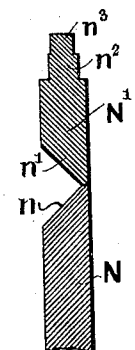


Fig. 9.



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UNITED STATES PATENT OFFICE.

HENRY ABBOTT, OF NEW YORK, N. Y., ASSIGNOR TO CALCULAGRAPH COMPANY, OF NEW YORK, N. Y., AND EAST ORANGE, NEW JERSEY, A CORPORATION OF NEW JERSEY.

CALCULAGRAPH.

SPECIFICATION forming part of Letters Patent No. 697,426, dated April 15, 1902.

Application filed May 23, 1900. Serial No. 17,670. (No model.)

To all whom it may concern:

Be it known that I, HENRY ABBOTT, of New York city, in the county of New York, and in the State of New York, have invented certain new and useful Improvements in Calculagraphs; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, in which—

Figure 1 is a perspective view of my machine when arranged within the operating-table. Fig. 2 is a like view of the same from below the table. Fig. 3 is a perspective view of said machine removed from its casing. Fig. 4 is a front elevation of the mechanism employed for feeding and reversing the longitudinal movements of the ink-ribbon and for indicating the position of such ribbon. Fig. 5 is a side elevation of the same. Figs. 6 and 7 are enlarged front elevations of the mechanism for indicating the position of the ink-ribbon and show the practical extremes of motion; and Figs. 8 and 9 are detail views in section of the device for changing the direction of movement of the ink-ribbon, said figures showing, respectively, the two positions of said device.

Letters of like name and kind refer to like parts in each of the figures.

The object of my invention is to increase the efficiency and ease of operation of an apparatus for which Letters Patent No. 583,320 were issued to me upon the 25th day of May, 1897, and such invention consists in the parts and their combination with each other and with the other portions of the apparatus, substantially as hereinafter specified.

In the carrying of my invention into practice I employ a plate A, from which extends downward and across a yoke B, that in combination with said plate constitutes the frame of the apparatus and furnishes a support for most of the operative mechanism. Such mechanism consists generally of a time-train C, which rotates one or more circular printing surfaces or type that have their faces substantially flush with the upper face of said plate and by mechanism which is actuated by two levers D and D', that are pivoted upon

and project upward from the plate A, are adapted to be moved upward and to impinge upon a platen E. Between the platen E and the said printing surfaces or type is interposed an inked ribbon F, which rests upon the latter, so that when a card is interposed between said platen and type and the latter are raised by the movement of its operating-lever D there will be printed upon the card an impression of the face of such type, all in the usual manner.

The inked ribbon F is wound upon two spools G and G', which are journaled beneath the plate A and arranged to be alternately rotated step by step, so as to wind said ribbon upon one spool and from the other spool and present a freshly-inked surface to the type at each printing operation of each lever D and D'; but as the ribbon-feeding devices and spools are concealed by the plate A it is necessary that means be provided whereby the longitudinal position of such ribbon may be always known to the operator, so as to prevent it from being wound wholly upon one spool and detached from the other spool. The result sought is secured by fitting loosely within an opening in the plate A a stud H, which extends vertically downward and at its lower end is provided with a flat head h, that extends over and rests upon the inked ribbon F at the upper side of the spool G', whereby as said ribbon is wound upon or unwound from such spool its increased or decreased diameter will cause said stud to project more or less above the face of the plate A. By giving to said stud such length as to cause it to project but slightly above said plate when said spool G' is nearly empty and to project above such plate until a peripheral mark appears in sight when said spool is full the operator is enabled to know by a glance at said stud the position of said inked ribbon and when it is necessary to reverse the action of its feeding mechanism.

It will be seen that the ribbon-indicator is applicable to type-writers or to any mechanisms where an inked ribbon is employed.

In order that the ribbon-spools G and G' may be given a step-by-step rotation, each is

provided upon one end with a ratchet-wheel g , which is engaged when desired by a spring-pressed pawl i , that is carried by a contiguous arbor I, which arbor is given a longitudinally-vertical movement by the action of one of the levers D or D', so that at each downward movement of said arbor said pawl trips over one of the teeth g' of such ratchet-wheel and upon the return upward movement engages with such tooth and gives to said spool a partial rotation.

It is necessary that but one of the ribbon-spool-actuating pawls should operate at a time and that when one spool has been filled its pawl should be thrown out of action and that of the other empty spool should be simultaneously thrown into action. For such purpose there is pivoted centrally upon the yoke B a bar K, which extends horizontally in each direction and at each end is provided with an upwardly-extending spring-finger k , that by the oscillation of said bar is adapted to be moved vertically in opposite directions and when at the lower limit of such movements will engage with and press the contiguous pawl i out of engagement with its ratchet-wheel. When by the oscillation of the bar K one of the fingers k is moved into contact with and forces out of action the contiguous pawl i , the opposite finger is moved out of contact with its pawl and the latter immediately engages with its ratchet-wheel and is in position to operate the same.

A short distance below the upper end of each spring-finger k is a transverse groove or notch k' , formed by an outward bend of the metal, which when said finger is moved to the lower limit of its motion coincides with a pin L, that is secured horizontally to a stationary portion of the frame in a line with the face of said finger, and when thus in coincidence permits the upper end of the latter to spring outward, so as to press the pawl i out from engagement with its ratchet-wheel and also to lock the shifting mechanism in place. When said mechanism is again operated to change the movement of the ribbon in its upward movement, said finger has its upper end forced inward away from the pawl by the disengagement of its notch from said pin, and thus leaves said pawl free to again engage with its ratchet-wheel.

The shifting bar K is moved to the limits of its motion by means of a lever M, which is pivoted between its ends to a part of the frame and has its inner end loosely connected with one end of said shifting bar, a bar N, that passes vertically downward through the plate A and within a cylindrical housing O, with its lower forked end engaging with and resting upon the outer end of such lever, and a spiral spring P, which extends between the latter and said plate A and operates to hold the outer end of said lever with a yielding pressure upward within the forked end of said bar. As thus constructed a downward pressure upon the bar N will, through the

lever M, cause the shifting bar K to assume the position shown by the dotted line in Fig. 4, so as to throw the left-hand pawl i out of action, while upon releasing the pressure upon said bar the spring P will restore said parts to the positions shown by the full lines of said figure and operate to place the left-hand pawl i into action and move the right-hand pawl out of action.

The vertical longitudinal adjustment of the bar N is effected by providing its upper end with a bevel n , and journaling immediately above the same within the housing O a short bar N', which has its lower end n' correspondingly beveled in an opposite direction, so that by a half-rotation of such bar N' its beveled end will operate to press said bar N to the lower limit of its longitudinal motion, as shown by Fig. 9, while upon a second half-rotation of said bar N' the bevel-faces n and n' will coincide and permit said bar N to be moved upward to the position shown in Fig. 8. The upper journal end n^2 of said bar N' is provided with a squared portion n^3 , which extends above the plate A and is adapted to receive a key for the purpose of turning said bar.

A disk n^4 is secured upon and rotates with the upper end of the bar N', immediately above the plate A, and is provided with a suitable mark, preferably in the form of an arrow n^5 , which indicates the direction in which the inked ribbon is being fed. The beveled ends of the bars N and N' are cut away at right angles to their longitudinal axes, so that when said bars are placed in the position shown in Fig. 9 said cut-away parts will engage and operate to lock said parts in such relative position until released therefrom by the partial rotation of said bar N', when by the operation of the beveled faces n and n' and the spring P said bars will be placed in the relative positions seen in Fig. 8.

The mechanism described is contained within a cylindrical casing Q, which at its lower end is permanently closed and at its upper open end is adapted to receive the plate A. A peripheral horizontally-projecting flange a upon said plate extending over and resting upon the upper edge q of said casing insures the relative vertical positions of said parts. In order that the mechanism and casing may be locked together and yet be readily separable when desired, two cylindrical lugs R and R are secured vertically at opposite sides to the inner face of said casing Q and extend to or near the upper edge of the same, and within the upper end of each is provided an axial threaded opening r . The plate A is provided within its lower face with recesses a' and a' , which coincide with and fit over the upper ends of the lugs R and R and operate as guides to insure the relative positions of said parts when placing the operative mechanism within the casing. From each recess a' an axially-located opening a^2 extends upward through said plate A and permits of the insertion from above of a screw S into the

threaded opening r of the contiguous lug R, which screw in combination with the opposite screw S operates to securely lock said plate and casing together.

5 The device is adapted for use upon a table or pedestal, in which event it is secured by means of screws passing downward through the bottom of the case; but it is generally more convenient for use if inserted within the
10 table T with its plate A flush with the face thereof, as shown in Fig. 1. To facilitate such attachment, there are provided at three or more equidistant points around the casing Q cylindrical pillars U and U', each of which
15 is provided at its lower end with a lug u , that extends horizontally inward beneath said casing and is secured thereto by means of dowel-pins u' and u'' , which project from said lug into the bottom of said casing, and a screw
20 u^2 , that passes from above downward through such casing-bottom into a suitably-threaded opening u^3 in said lug. The upper end of each pillar U terminates at a point with reference to the upper edge of the casing Q equal
25 to the thickness of the table-top T, within which it is to be placed, so that when said casing has been inserted from below into a corresponding opening in said table-top until the ends of said pillars bear against the
30 under side of the latter the position of the casing will cause the plate A to be flush with or slightly above the upper surface of said table. To secure the casing Q firmly in place, it is only necessary to pass a screw V downward through the table T into an axial
35 threaded opening u^4 , provided within each pillar U.

It will be seen that the construction shown by which the operative mechanism and casing and the casing and table are combined
40 permits such parts to be easily and quickly separated from or combined with each other as occasion may require by those possessing slight knowledge of mechanical constructions or skill in their use.

45 Having thus described my invention, what I claim is—

1. In combination with feed-reversing mechanism, a printing-ribbon, means for operating
50 said mechanism to reverse the direction of feed of the ribbon, a frame or casing, an indicator on the exterior of the latter to show the direction of feed, and a second indicator on the exterior of the frame or casing to show
55 when to reverse the feed, substantially as and for the purpose described.

2. In combination with an inked printing-ribbon, mechanism for moving such ribbon in opposite directions, mechanism for reversing
60 the direction of movement of the ribbon, a frame, or casing, a rotatable operating-bar for the reversing mechanism, mounted in the frame or casing, and a bar movable by said rotatable bar and transmitting the motion
65 thereof to the reversing mechanism, said bars having coacting cam-faces, substantially as and for the purpose described.

3. In combination with an inked printing-ribbon, mechanism for moving such ribbon in opposite directions, a lever for reversing
70 the direction of movement of said ribbon, a longitudinally-movable bar, connections between the latter and said lever, and a rotatable bar, said bars having coacting cam-faces whereby the rotation of one controls
75 the longitudinal movement of the other, substantially as and for the purpose described.

4. In combination with the feed-reversing mechanism of an inked ribbon used for printing purposes, a longitudinally-movable bar
80 and a rotatable bar which are contained within a suitable housing and have their contiguous ends oppositely beveled, means for holding the former, with a yielding pressure at the inner limit of its motion, and means
85 for giving to the latter a partial rotation, substantially as and for the purpose specified.

5. In a printing mechanism in which ink is supplied by a ribbon that is automatically moved longitudinally, in either direction, by
90 the rotation of spools, a reversing mechanism consisting of a longitudinally-movable bar having one end pivoted to or upon a lever and its opposite end provided with a beveled section, a rotatable bar that is journaled in
95 a line, axially, with said longitudinally-movable bar and provided at its contiguous end with a beveled section, a spring that operates to hold said longitudinally-movable bar, with a yielding pressure, at the inner limit
100 of its movement, means for operating said rotatable bar, and means for connecting said lever with devices for reversing the rotary movements of the ribbon-spools, whereby a half-revolution of said rotatable bar will op-
105 erate to press said longitudinally-movable bar to the limit of its outer motion and cause said inked ribbon to be fed in one direction; while a second half-rotation of said rotatable bar, will permit said longitudinally-movable
110 bar to be returned to its normal position, so as to reverse the feed of said inked ribbon, substantially as shown.

6. In a printing mechanism in which ink is supplied by a longitudinally-movable inked
115 ribbon that is simultaneously and alternately wound upon and from two spools, a device which bears upon the ribbon as wound upon one of such spools and, by the increase or decrease of the diameter of such wound portion,
120 indicates the longitudinal position of said ribbon, substantially as and for the purpose set forth.

7. In a printing mechanism in which ink is supplied by a longitudinally-movable inked
125 ribbon that is located between the printing surface and platen, a pair of spools upon which the ribbon is alternately wound, a stud which is arranged vertically over one of the ribbon-spools with its inner end in contact
130 with the ribbon wound thereon and its outer end extending through a stationary portion of the mechanism, whereby the quantity of ribbon wound upon said spool will be indi-

cated by the relative positions of the outer end of said stud, substantially as and for the purpose shown and described.

5 8. In combination with an inked printing-ribbon, mechanism for moving such ribbon in opposite directions means for reversing the direction of movement of the ribbon, and a ribbon-actuated indicator to indicate when its movement should be reversed, substan-
10 tially as and for the purpose specified.

9. In combination with an inked printing-ribbon, mechanism for moving such ribbon in opposite directions, means for reversing

the direction of movement of the ribbon, a ribbon-actuated indicator to indicate when its movement should be reversed, and a direction-indicator for the reversing mechanism, substantially as and for the purpose specified.

In testimony that I claim the foregoing I have hereunto set my hand this 11th day of May, 1900.

HENRY ABBOTT.

Witnesses:

EDWIN A. CURRIER,
EARLE T. CONNET.