June 3, 1930. A. E. LONG 1,761,529

RIBBON SHIFT MECHANISM

Filed May 31, 1929 3 Sheets-Sheet 1

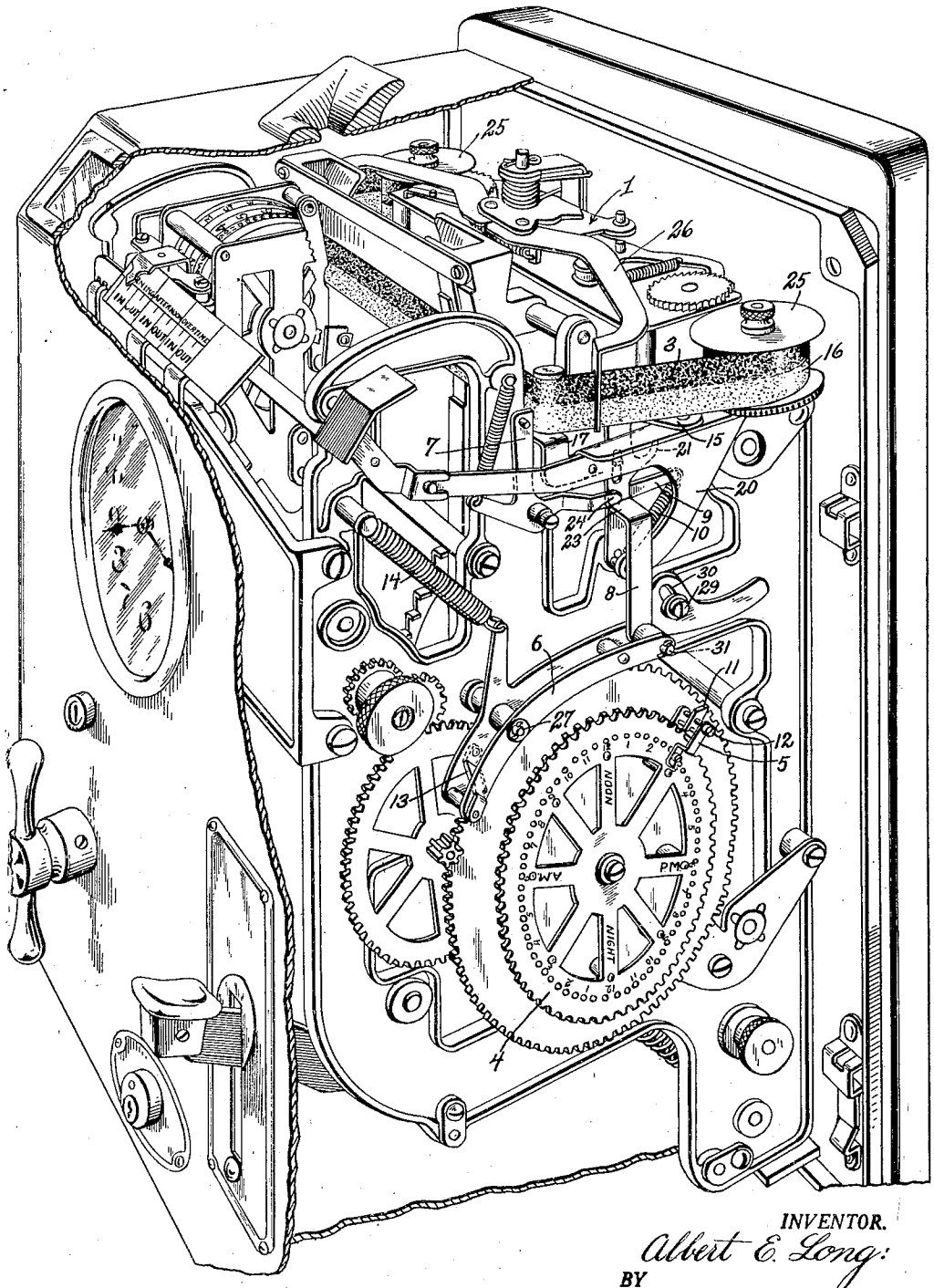


Fig. 1.

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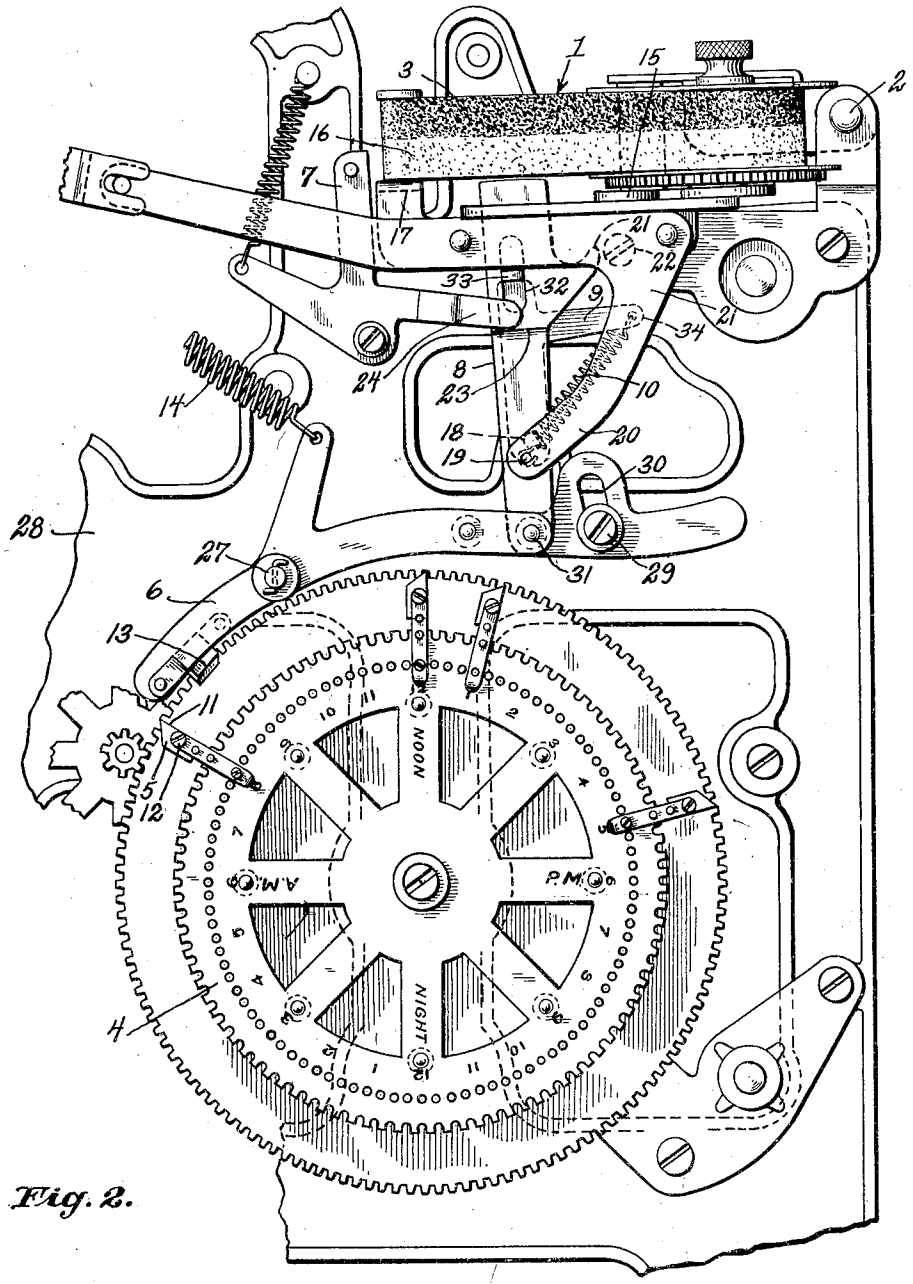


Fig. 2.

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Fig. 3.

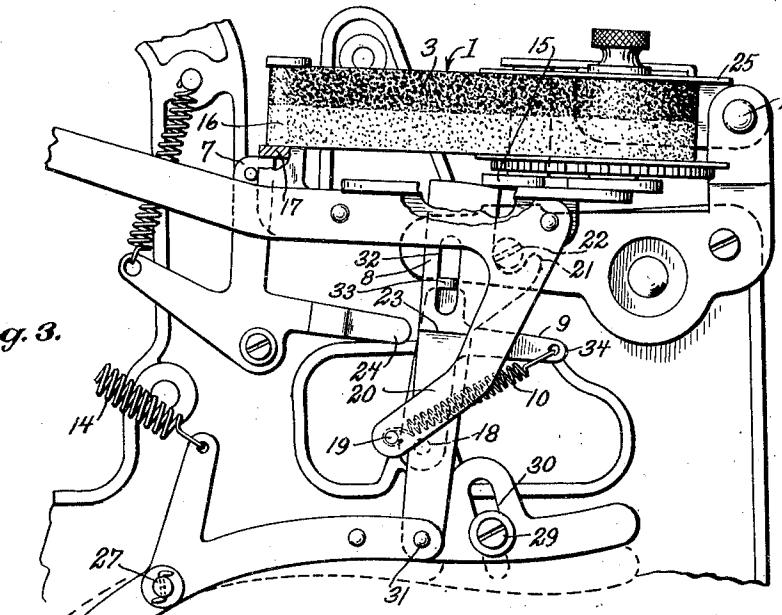
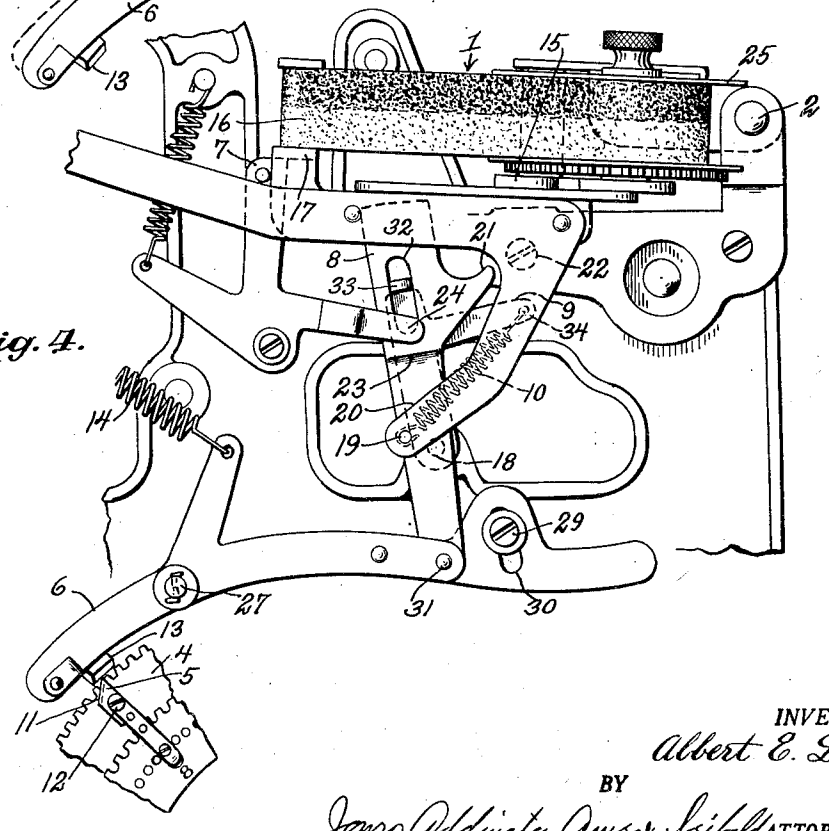


Fig. 4.



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UNITED STATES PATENT OFFICE

ALBERT E. LONG, OF CHICAGO, ILLINOIS, ASSIGNOR TO STROMBERG ELECTRIC COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF MAINE

RIBBON-SHIFT MECHANISM

Application filed May 31, 1929. Serial No. 367,532.

My invention relates to ribbon shift mechanism for time recorders and the like.

One of the objects of my invention is to provide improved means whereby the time of shift for changing color may be controlled easily and accurately.

Further objects will appear from the description and claims.

In the drawings, in which an embodiment of my invention is shown—

Figure 1 is a perspective view of the time recorder provided with my improved ribbon shift;

Fig. 2 is a side elevation of the ribbon shift control showing the ribbon carriage lowered and the control dog raised;

Fig. 3 is a side elevation showing the ribbon carriage latched in its uppermost position and with the control dog raised; and

Fig. 4 is a view showing the ribbon carriage latched in its raised position and with the control dog lowered.

Referring to the drawings in detail the time recorder construction shown therein comprises a ribbon feed mechanism 1 shiftable up and down about a transverse horizontal axis 2 to bring different colors of the ribbon 3 into effective position and means for controlling the shifting of this mechanism comprising a time-controlled wheel 4, a trip device 5 adjustably mounted on this wheel, an oscillatable member 6 caused to oscillate back and forth by said trip member 5 during the revolution of this wheel, and means whereby one complete oscillation of said oscillatable member 6 back and forth will cause the ribbon feed mechanism to be moved from lowered to raised position and whereby a succeeding complete oscillation of said oscillatable member will cause said feed mechanism to be moved from raised to lowered position, said means comprising a latch 7 for holding said feed mechanism 1 in raised position, a swinging dog 8 movable up and down and pivotally mounted on said oscillatable member 6, and means for controlling the movement of said dog so that on one upward movement it engages said feed mechanism to raise it and cause it to be latched in raised position and on its succeeding upward movement it engages said latch 7 to release it to permit the feed mechanism 1 to return to lower position, said control means comprising a pivotally mounted dog-shifting member 9 for shifting said dog 8 back and forth, a spring 10 shiftable back and forth past the dead center of said dog-shifting member 9 for shifting it from one position to another, and means controlled by the movement of the ribbon feed mechanism for shifting the spring back and forth past said dead center, said trip device comprising a member 11 shiftable back and forth to vary the time of operation, and a screw 12 extending substantially parallel to the axis of the wheel 4 for controlling the position of said adjustable member 11.

Before describing the construction in detail, I will briefly outline the operation. The wheel 4, carrying the trip device 5, travels counterclockwise as viewed in Figs. 1 and 2. Each trip member 11 as it passes underneath the inclined follower 13 of the oscillatable member 6 will first cause this follower 13 to be gradually raised and will then release it suddenly and permit the follower 13 to drop under the action of the coiled tension spring 14. This causes first a slow downward movement of the swinging dog 8 and a quick upward movement of this dog upon the release of the follower 13. The effect of this down and up movement of the dog 8 depends upon the position of the dog-shifting member 9. If at the beginning of this movement of the dog-shifting member 9 is in the position shown in Fig. 2, the spring 10 will be acting in a direction to tend to cause the upper end of the dog 8 to move to the right as shown in Fig. 2 so that, when the dog is moved down far enough, its upper edge will snap underneath the lifting plate 15 on the ribbon feed mechanism 1. When the follower 13 is released by the trip 11 the spring 14 causes the dog 8 to be raised and to lift the ribbon feed mechanism to bring the lower color 16 on the ribbon into operative relation. When the ribbon-feed mechanism is lifted high enough the spring latch 7 snaps underneath the cross bar 17 of the ribbon feed

mechanism and holds it in its raised position as shown in Fig. 3.

On the upward movement of the carriage the spring 10 has been shifted past the dead center 18 of the dog-shifting member 9 because of the fact that the end of the spring 10 is secured at 19 to an arm 20 mounted on the rockable ribbon feed mechanism. The spring 10 is, therefore, now in a position in which it tends to pull the dog-shifting member 9 to the left as shown in Fig. 3, but this tendency to movement is prevented because of the retaining finger 21 on the swinging dog 8 which, in its upper position, engages a fixed pin 22 on the framework.

When the next trip member 11 comes into operative relation with the follower 13 the follower 13 is again slowly raised and suddenly dropped. This slow raising and sudden dropping causes a slow lowering and quick raising of the dog 8. As the dog 8 is being slowly lowered it reaches a point at which it will be released from the retaining pin 22 whereupon the dog-shifting spring 10 will act to move the dog to the position shown in Fig. 4 in which the offset shoulder portion 23 of the dog will lie underneath the arm 24 of the latch 7. When the follower 13 is released and the dog 8 snaps up, this offset shoulder 23 on the dog will lift the arm 24 of the latch 7 and move it out from underneath the cross bar 17 of the ribbon-feed framework permitting this frame to drop by gravity back to the position shown in Fig. 2.

The dropping of the ribbon feed frame will shift the spring 10 back again past the dead center of the dog-shifting member 9 as shown in Fig. 2 so that the tendency of this spring will then be such as to urge the dog-shifting member 9 in a direction to hold the upper end of the dog toward the right.

It will thus be seen that each of the trip members 11 as it passes underneath the follower 13 will cause the dog 8 to move downward slowly and be released for quick upward movement and that one trip member will cause the ribbon feed mechanism to be moved from lowered to raised position and that a succeeding trip member will cause the ribbon feed mechanism to be moved from raised to lowered position.

Coming now to a more detailed description of the structure, the ribbon feed mechanism itself may be of any usual or suitable type having spools 25 on which the ribbon is wound back and forth and having suitable reversing mechanism 26 for controlling the direction of travel of the ribbon. The rate of travel of the time-controlled wheel 4 may be controlled by means of any suitable time-controlled mechanism. The wheel may be provided with indicia to denote the time of the wheel with respect to the follower 13 so that if it is desired to operate the ribbon shift at any desired time all that it is necessary to do is to place one of the trip members 11 at the place indicated on the time-controlled wheel 4. Thus, the change in color may be effected at any desired time.

In order to effect a minute and accurate adjustment of the trip device 11, this is mounted in such a manner that it may be shifted longitudinally of the axis of the wheel 4 by means of an adjusting screw 12, the follower 13 being placed at an incline with respect to the line of movement of the trip device 11 so that adjustment of the trip device 11 by means of the screws 12 will result in a difference in time of the action of the follower 13. In practice, the adjustment is such that a single turn of the screw 12 will effect a minute's difference in the time of operation of the trip device 13.

The oscillatable member 6 on which the follower 13 is mounted is pivotally mounted at 27 on the frame 28 and is limited and guided in its movement by means of a screw 29 extending through an arcuate slot 30 in the oscillatable member 6. The dog 8 is pivotally mounted on the oscillatable member 6 at 31 and is provided with a slot 32 to receive a lug 33 on the dog-shifting member 9 to provide an operative connection therewith. The dog-shifting member 9 is pivotally mounted at 18 and is provided with a laterally extending arm 34 to provide a connection for the shifting spring 10.

While I have shown but one form of my invention, various forms will be obvious to those skilled in the art and consequently this invention is to be limited only by the scope of the appended claims and the prior art.

I claim:

1. In a time recorder, ribbon positioning mechanism, shiftable up and down about a transverse horizontal axis, to bring different colors of the ribbon into effective position, and means for controlling the shifting of said mechanism comprising a time-controlled wheel, a trip device mounted on said wheel, an oscillatable member caused to oscillate back and forth by said trip member during the revolution of said wheel, and means whereby one complete oscillation of said oscillatable member back and forth will cause said positioning mechanism to be moved from lowered to raised position and whereby a succeeding complete oscillation of said oscillatable member will cause said positioning mechanism to be moved from raised to lowered position, said means comprising a latch for holding said positioning mechanism in raised position, a swinging dog movable up and down and pivotally mounted on said oscillatable member, and means for controlling the movement of said dog so that on one upward movement it engages said positioning mechanism to raise it and cause it to be latched in raised position and on its succeeding upward movement it engages said

latch to release it to permit the positioning mechanism to return to lower position, said control means comprising a pivotally mounted dog-shifting member for shifting said dog back and forth, a spring shiftable back and forth past the dead center of said dog-shifting member for shifting it from one position to another, and means controlled by the movement of the ribbon positioning mechanism for shifting the spring back and forth past said dead center, said trip device comprising a member shiftable back and forth to vary the time of operation, and a screw extending substantially parallel to the axis of said wheel for controlling the position of said adjustable member.

2. In a time recorder, ribbon positioning mechanism shiftable to bring different colors of the ribbon into effective position, and means for controlling the shifting of said mechanism comprising a time-controlled wheel, a trip device adjustably mounted on said wheel, an oscillatable member caused to oscillate back and forth by said trip member during the revolution of said wheel, and means whereby one complete oscillation of said oscillatable member back and forth will cause said positioning mechanism to be moved from lowered to raised position and whereby a succeeding complete oscillation of said oscillatable member will cause said positioning mechanism to be moved from raised to lowered position.

3. In a time recorder, ribbon positioning mechanism shiftable to bring different colors of the ribbon into effective position, and means for controlling the shifting of said mechanism comprising a time-controlled wheel, a trip device adjustably mounted on said wheel, an oscillatable member caused to oscillate back and forth by said trip member during the revolution of said wheel, and means whereby one complete oscillation of said oscillatable member back and forth will cause said positioning mechanism to be moved from lowered to raised position and whereby a succeeding complete oscillation of said oscillatable member will cause said positioning mechanism to be moved from raised to lowered position, said means comprising a latch for holding said positioning mechanism in raised position, a swinging dog movable up and down and pivotally mounted on said oscillatable member, and means for controlling the movement of said dog so that on one upward movement it engages said positioning mechanism to raise it and cause it to be latched in raised position and on its succeeding upward movement it engages said latch to release it to permit the positioning mechanism to return to lower position.

4. In a time recorder, ribbon positioning mechanism shiftable to bring different colors of the ribbon into effective position, and means for controlling the shifting of said mechanism comprising a time-controlled wheel, a trip device adjustably mounted on said wheel, an oscillatable member caused to oscillate back and forth by said trip member during the revolution of said wheel, and means whereby one complete oscillation of said oscillatable member back and forth will cause said positioning mechanism to be moved from lowered to raised position and whereby a succeeding complete oscillation of said oscillatable member will cause said positioning mechanism to be moved from raised to lowered position, said means comprising a latch for holding said positioning mechanism in raised position, a swinging dog movable up and down and pivotally mounted on said oscillatable member, and means for controlling the movement of said dog so that on one upward movement it engages said positioning mechanism to raise it and cause it to be latched in raised position and on its succeeding upward movement it engages said latch to release it to permit the positioning mechanism to return to lower position, said control means comprising a pivotally mounted dog shifting member for shifting said dog back and forth, a spring shiftable back and forth past the dead center of said dog shifting member for shifting it from one position to another, and means controlled by the movement of the ribbon positioning mechanism for shifting the spring back and forth past said dead center.

5. In a time recorder, ribbon positioning mechanism shiftable to bring different colors of the ribbon into effective position, and means for controlling the shifting of said mechanism comprising a time-controlled wheel, a trip device adjustably mounted on said wheel, an oscillatable member caused to oscillate back and forth by said trip member during the revolution of said wheel, and means whereby one complete oscillation of said oscillatable member back and forth will cause said positioning mechanism to be moved from lowered to raised position and whereby a succeeding complete oscillation of said oscillatable member will cause said positioning mechanism to be moved from raised to lowered position, said means comprising a latch for holding said positioning mechanism in raised position, a swinging dog movable up and down and pivotally mounted on said oscillatable member, and means for controlling the movement of said dog so that on one upward movement it engages said positioning mechanism to raise it and cause it to be latched in raised position and on its succeeding upward movement it engages said latch to release it to permit the positioning mechanism to return to lower position, said control means comprising a pivotally mounted dog-shifting member for shifting said dog back and forth, a spring shiftable back and forth past the dead center of said dog-shifting

member for shifting it from one position to another, and means controlled by the movement of the ribbon positioning mechanism for shifting the spring back and forth past said dead center, said trip device comprising a member shiftable back and forth to vary the time of operation.

6. In a time recorder, ribbon positioning mechanism shiftable to bring different colors of the ribbon into effective position, and means for controlling the shifting of said mechanism comprising a time-controlled wheel, a trip device adjustably mounted on said wheel, said trip device comprising a member shiftable back and forth to vary the time of operation, and a screw extending substantially parallel to the axis of said wheel for controlling the position of said adjustable member.

7. In a time recorder, ribbon positioning mechanism shiftable to bring different colors of the ribbon into effective position, and means for controlling the shifting of said mechanism comprising a time-controlled wheel, a trip device adjustably mounted on said wheel, said trip device comprising a member shiftable back and forth to vary the time of operation and mounted for movement on said wheel longitudinally of the axis thereof.

8. In a time recorder, ribbon positioning mechanism shiftable to bring different colors of the ribbon into effective position, and means for controlling the shifting of said mechanism comprising a time-controlled wheel, a trip device adjustably mounted on said wheel, said trip device comprising a member shiftable back and forth to vary the time of operation and mounted for movement on said wheel longitudinally of the axis thereof, and a screw for shifting said member.

9. In a time recorder, ribbon positioning mechanism shiftable to bring different colors of the ribbon into effective position, and means for controlling the shifting of said mechanism comprising a time-controlled wheel, a trip device adjustably mounted on said wheel, said trip device comprising a member shiftable back and forth to vary the time of operation and mounted for movement on said wheel longitudinally of the axis thereof, and a screw having its axis extending longitudinally of the axis of said wheel for shifting said member.

10. In a time recorder, a ribbon positioning mechanism shiftable to bring different colors of the ribbon into effective position, and means for controlling the shifting of said mechanism comprising a time-controlled wheel, a member actuated thereby, and means for changing the time of shift comprising a cam member having a cam edge extending obliquely of the axis of the wheel and mounted on said actuated member, and cam means mounted for movement on said wheel longitudinally of the axis of the wheel for cooperation with said oblique cam edge to vary the time relation between the wheel and actuated member.

11. In a time recorder, a ribbon positioning mechanism shiftable to bring different colors of the ribbon into effective position and means for controlling the shifting of said mechanism comprising a time-controlled wheel, a cam member secured to said wheel, a lever provided with a cam edge cooperating with said cam member and extending obliquely to the axis of the wheel and a screw for moving said cam member to change its position in relation to said oblique edge.

12. In a time recorder, ribbon positioning mechanism shiftable to bring different colors of the ribbon into effective position, and means for controlling the movement of said carriage comprising a time-controlled wheel, a lever actuated thereby, and adjusting means for effecting a micrometer adjustment in the time relation between said wheel and lever comprising a shiftable cam member and a screw for shifting said cam member.

In witness whereof, I have hereunto subscribed my name.

ALBERT E. LONG.