

R. S. BLAIR.
TIME RECORDER.
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1,010,575.

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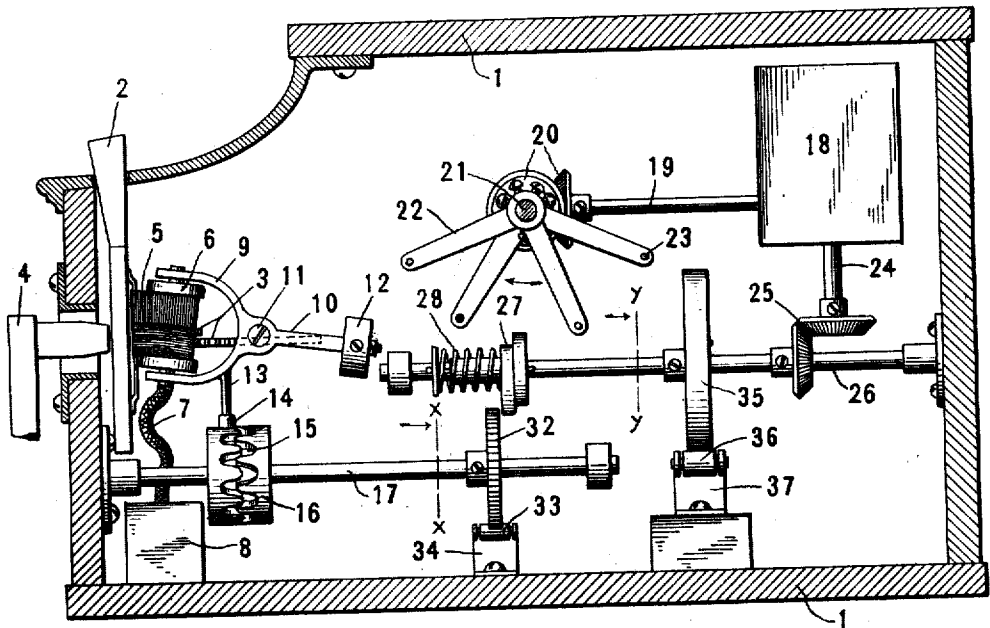


Fig- 1-

Fig- 2-

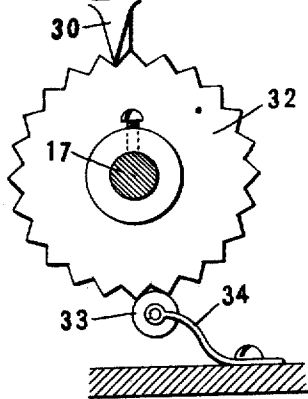


Fig- 3-

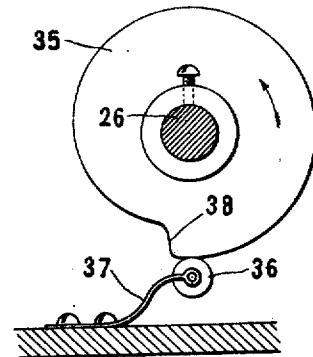
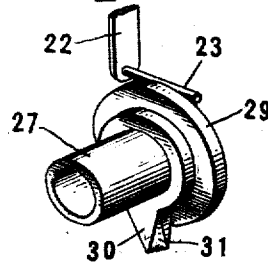


Fig- 4-



WITNESSES

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ROBERT S. BLAIR, OF NEW ROCHELLE, NEW YORK, ASSIGNOR TO INTERNATIONAL TIME RECORDING COMPANY OF NEW YORK, OF ENDICOTT, NEW YORK, A CORPORATION OF NEW YORK.

TIME-RECORDER.

1,010,575.

Specification of Letters Patent.

Patented Dec. 5, 1911.

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To all whom it may concern:

Be it known that I, ROBERT S. BLAIR, a citizen of the United States, residing at New Rochelle, in the county of Westchester and State of New York, have invented certain new and useful Improvements in Time-Recorders, of which the following is a full, clear, and exact description, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to recording mechanism and with regard to the more specific features thereof to workmen's time recorders.

One of the objects thereof is to provide an efficient, practical and purely automatic time recorder in which the early departure or tardy arrival of a workman will be evidenced by a distinguishing characteristic of the record he forms at such times.

Another object is to provide simple and automatic means in connection with the mounting and shifting of a laterally shiftable multi-colored ribbon.

Another object is to provide means in connection with a time recorder of the above type whereby power is economized.

Another object is to provide means in connection with a time recorder of the type first mentioned for insuring accuracy of action.

Another object is to provide time recording means of the first mentioned type in which the construction is simple and inexpensive and the action reliable and substantially proof against tampering.

Other objects will be in part obvious and in part pointed out hereinafter.

The invention accordingly consists in the features of construction, combinations of elements and arrangements of parts which will be exemplified in the construction hereinafter set forth, and the scope of the application of which will be indicated in the following claims.

In the accompanying drawing wherein is shown one of the various possible embodiments of my invention, Figure 1 is a sectional elevation thereof, certain parts being omitted and others diagrammatically shown in order to render the construction more clear. Fig. 2 is a sectional view taken substantially along the line $x-x$ of Fig. 1 and showing the parts upon a larger scale. Fig. 3 is a similar view taken along the line $y-y$

of Fig. 1. Fig. 4 is a detail perspective view of parts shown in Fig. 1.

Similar reference characters refer to similar parts throughout the several views of the drawing.

As tending to render certain features of this invention more readily understood it may here be noted that in connection with workmen's time recorders and more particularly in connection with instruments of this type in which the deficiencies of the workmen are clearly shown, it is of prime importance that the same be proof against tampering by the user on account of the desire of the workmen to avoid making record of irregularities in their hours of labor. If a distinguishing characteristic is to be imparted to those records made within the hours of labor by mechanism, this mechanism should be in condition to form a record of this character during the entire working periods and be otherwise proof against tampering and then however the impression is gained from the recording mechanism it is found to be of the desired character. In this manner the mechanism is purely automatic and thus more reliable in action.

The above and other advantages are attained in constructions of the nature of that hereinafter described.

Referring now to the accompanying drawing, there is shown at 1 a casing of any desired type in which is mounted the card receiver 2 and printing wheels 3, these parts being so positioned as upon a record card being inserted in receiver 2 and forced toward the same as by the platen diagrammatically shown at 4 to form a record thereon. The action of these elements is well known and their precise construction, adjustments, connections, etc., are omitted as the same do not in themselves embody the present invention.

Mounted between the type wheel 3 and card receiver 2 is a two colored ribbon 5 the same being wound upon the ribbon spools 6 which are connected by the flexible cable 7 with mechanism 8 for feeding the ribbon in a longitudinal direction. This mechanism may be of the well known type and actuated by manually operated means or otherwise.

Ribbon spools 6 are mounted in the forked

ends 9 of levers 10 which are pivoted as at 11 and provided with an adjustable counterweight 12. It will be understood that one of these levers 10 is provided for each 5 spool 6 and that the same are connected so as to swing together about the pivotal axis 11.

Formed upon one of the levers 10 is an arm 13 provided with a roller 14, resting 10 within a sinuous groove 15 in a cylindrical cam 16. This cam is mounted upon the shaft 17 and as the same is rotated it will be noted that the arm 13 is oscillated and hence the ribbon 5 reciprocated so as to 15 bring first one color and then the other in operative relation with the type wheels 3. In this manner the ribbon is shifted to change the portion in operative relation to the type wheels and as this result might be 20 gained in various ways it is to be understood that the unqualified term "shifting" in certain of the following claims is intended to denote merely a relative movement with respect to the type wheels.

Considering now the means of actuation of the shaft 17, there is shown at 18 clock 25 work of any desired form from which a shaft 19 drives as by the bevel gears 20 the shaft 21 upon which are adjustably set the 30 arms 22. These arms are each provided with laterally extending pins 23 and the mechanism is so geared as to bring about a complete revolution of shaft 21 each 24 35 hours. Also leading from clock work 18 is a shaft 24 driving by bevel gears 25 a shaft 26 having mounted thereon a slidable collar 27 keyed to the shaft and provided with a 40 spring 28 normally urging it in a predetermined direction along the shaft. This collar as best shown in Fig. 4 of the drawing 45 comprises an annular shoulder 29 and a projecting arm 30 offset with respect to the shoulder and having its edge beveled as shown at 31 for a purpose hereinafter described.

Mounted upon shaft 17 adjacent to collar 27, but normally out of operative relation thereto is a star wheel 32 held in a predetermined position by the jockey roller 33 50 urged against it as by the flat spring 34. Mounted upon shaft 26 is a cam 35 co-acting with roller 36 upwardly urged by the spring 37, as best shown in Fig. 3 of the drawing. This cam is of such conformation as during 55 a large portion of its rotation to compress or distort spring 37 and during the remainder of its revolution to be acted upon by the spring in such manner as to tend to drive it in its direction of rotation.

The operation of the above described embodiment of this invention is substantially 60 as follows. Shaft 26 is driven at such a rate as to cause arm 30 to rotate in a predetermined period of time, as fifteen minutes. Normally arm 30 is rotated without affect-

ing any of the remaining parts of the instrument, but as the time approaches at which the ribbon is to be shifted, as at the beginning or end of a period of labor, the 70 arms 22 are so set as to bring the pins 23 against shoulder 29 and to move the collar 27 laterally against force of the spring 28 and bring arm 30 into the plane of the star wheel 32. This is preferably done at two or three minutes before the movement of the 75 ribbon is desired, but considerable latitude may be used in this respect thus doing away with the necessity for fine adjustment of the arms 22. The arm 30 is so positioned as precisely upon the moment at which ribbon 80 is to be shifted to bring it into engagement with star wheel 32 and move the same throughout one notch which action by the driving of the cam 16 swings the ribbon 5 so as to bring another color into operative 85 position. The pin 23 in the course of its movement slips past shoulder 29 compressing the spring 28 to such an extent as may be required for this purpose and the collar 27 snaps back into its normal position. This 90 is repeated at such times as it is desired to shift the ribbon. The arm 30 being beveled at 31 is adapted to enter between the teeth of the star wheel 32 irrespective of their position. The function of cam 35 is to assist 95 arm 30 in shifting the ribbon and this cam is so positioned as to bring its abruptly inclined portion 38 in operative relation to the roller 36 as the arm engages the star wheel and thus to assist the same in moving the 100 mechanism which it drives.

It may here be noted that the term "clock actuated" is used throughout the following 105 claims in a broad sense to denote any part which is driven by an automobile mechanism parts of which are moved at a predetermined rate of speed and by "actuate" as is used throughout the following claims is 110 meant to actually move or supply the energy by which the position or condition of the actuated means is changed.

It will thus be seen that there is provided an instrument in which the several objects of this invention are achieved and the above 115 and other advantages are present. The construction is simple and inexpensive, the action is accurate and efficient and the entire instrument is proof against tampering in any form. The ribbon moreover although so 120 mounted as to be moved by the expenditure of a minimum amount of power is stable, steadily driven or fed and is positively held in its shifted position in such manner as to be proof against any attempt to move the 125 same other than by the proper mechanism at the proper time.

As many changes could be made in the above construction and many apparently 130 widely different embodiments of this invention be made without departing from the

scope thereof, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

5 Having described my invention, what I claim as new and desire to secure by Letters Patent is:

1. In a workman's time recorder, in combination, means adapted to form impressions upon a record receiving member, means adapted to bring a record receiving member into operative relation thereto, record-changing means adapted to impart a distinguishing characteristic to certain classes of said impressions, and clock actuated means adapted to actuate said record-changing means to impart a distinguishing characteristic to records made within the working hours whereby the energy for actuating said record-changing means is derived from the clock.

2. In a workman's time recorder, in combination, means adapted to form impressions upon a record receiving member, means adapted to bring a record receiving member into operative relation thereto, a multi-colored printing ribbon mounted adjacent said first means and adapted to be shifted to change the color of the impression made thereby, and clock actuated means adapted to shift said ribbon whereby the energy for shifting the ribbon is derived from the clock.

3. In a workman's time recorder, in combination, means adapted to form impressions upon a record receiving member, means adapted to bring a record receiving member into operative relation thereto, record-changing means adapted to impart a distinguishing characteristic to certain classes of said impressions, and clock actuated means adapted to actuate said record-changing means to impart a distinguishing characteristic to records made within the working hours, whereby the energy for actuating said record-changing means is derived from the clock, said clock actuated means comprising two clock actuated members, one of which moves said record-changing means and the other of which controls broadly the time of action of the first of said members.

4. In a workman's time recorder, in combination, means adapted to form impressions upon a record receiving member, means adapted to bring a record receiving member into operative relation thereto, record-changing means adapted to impart a distinguishing characteristic to certain classes of said impressions, and clock actuated means adapted to actuate said record-changing means to impart a distinguishing characteristic to records made within the working hours, whereby the energy for actuating said record changing means is derived from the clock, said clock actuated means comprising

a slow moving and a fast moving member, the relatively fast moving member being adapted to actuate said record-changing means and the slow moving member being adapted to control broadly the time of action of said fast moving member.

5. In a workman's time recorder, in combination, means adapted to form impressions upon a record receiving member, means adapted to bring a record receiving member into operative relation thereto, a multi-colored printing ribbon mounted adjacent said first means and adapted to be shifted to change the color of the impression made thereby, and clock actuated means adapted to shift said ribbon, whereby the energy for shifting said ribbon is derived from the clock, said last mentioned means comprising a fast moving member adapted to shift said ribbon and a relatively slow moving member controlling broadly the time of action of said fast moving member.

6. In a workman's time recorder, in combination, means adapted to form impressions upon a record receiving member, means adapted to bring a record receiving member into operative relation thereto, a multi-colored ribbon in operative relation to said record forming means and adapted upon being shifted laterally to change the color of the impressions formed thereby, clock actuated means adapted to shift said ribbon to change the color, whereby the energy for shifting said ribbon is derived from the clock, and clock actuated means adapted to repeat a cycle of motions and having portions controlling broadly the time of action of said shifting means, said portions of said controlling means being moved at a slower rate than the rate of lateral movement of the ribbon.

7. In a workman's time recorder, in combination, means adapted to form impressions upon a record receiving member, means adapted to bring a record receiving member into operative relation thereto, a multi-colored ribbon in operative relation to said record forming means and adapted upon being shifted laterally to change the color of the impressions formed thereby, clock actuated means adapted to shift said ribbon to change the color, whereby the energy for shifting said ribbon is derived from the clock, and clock actuated means adapted to repeat a cycle of motions and having portions controlling broadly the time of action of said shifting means, said portions of said controlling means being moved at a slower rate than the rate of lateral movement of the ribbon and being positioned to cause the shifting of said ribbon at the opening and terminal points of the periods of labor whereby the records formed in working hours are made in a distinctive color.

8. In a workman's time recorder, in combination, means adapted to form impressions upon a record receiving member, means adapted to bring a record receiving member into operative relation thereto, a multi-colored ribbon mounted adjacent said record forming means and adapted upon being shifted to change the color of the record formed thereby, and clock actuated means adapted to shift said ribbon at the opening and terminal points of the periods of labor and automatically repeat its action each day, whereby records formed within the working hours are made in a distinctive color and whereby the energy for shifting said ribbon is derived from the clock.

9. In a workman's time recorder, in combination, means adapted to form impressions upon a record receiving member, means adapted to bring a record receiving member into operative relation thereto, a multi-colored printing ribbon mounted adjacent said first means and adapted to be shifted to change the color of the impression made thereby, clock actuated means adapted to shift said ribbon, whereby the energy for shifting said ribbon is derived from the clock, and a casing inclosing said ribbon and ribbon shifting mechanism whereby the same is inaccessible to the workmen.

10. In a workman's time recorder, in combination, means adapted to form impressions upon a record receiving member, means adapted to bring a record receiving member into operative relation thereto, a multi-colored ribbon mounted adjacent said record forming means and adapted upon being shifted to change the color of the record formed thereby, clock actuated means adapted to shift said ribbon at the opening and terminal points of the periods of labor and automatically repeat its action each day, whereby records formed within the working hours are made in a distinctive color, and whereby the energy for shifting said ribbon is derived from the clock, and a casing inclosing said ribbon and ribbon shifting mechanism whereby the same is inaccessible to the workmen.

11. In a workman's time recorder, in combination, means adapted to form impressions upon a record receiving member, means adapted to bring a record receiving member into operative relation thereto, a multi-colored printing ribbon mounted adjacent said first means and adapted to be shifted to change the color of the impression made thereby, clock actuated means adapted to shift said ribbon, whereby the energy for shifting said ribbon is derived from the clock, and means adapted positively to hold said ribbon in each position.

12. In a workman's time recorder, in combination, means adapted to form impressions upon a record receiving member,

means adapted to bring a record receiving member into operative relation thereto, a multi-colored ribbon in operative relation to said record forming means and adapted upon being shifted laterally to change the color of the impressions formed thereby, clock actuated means adapted to shift said ribbon to change the color, whereby the energy for shifting said ribbon is derived from the clock, clock actuated means adapted to repeat a cycle of motions and having portions controlling broadly the time of action of said shifting means, said portions of said controlling means being moved at a slower rate than the rate of lateral movement of the ribbon and being positioned to cause the shifting of said ribbon at the opening and terminal points of the periods of labor whereby the records formed in working hours are made in a distinctive color, and means adapted positively to hold said ribbon in each position.

13. In a workman's time recorder, in combination, means adapted to form impressions upon a record receiving member, means adapted to bring a record receiving member into operative relation thereto, a multi-colored printing ribbon mounted adjacent said first means and adapted to be shifted to change the color of the impression made thereby, clock actuated means adapted to shift said ribbon, whereby the energy for shifting said ribbon is derived from the clock, and means comprising an auxiliary spring adapted to tend to shift said ribbon.

14. In a workman's time recorder, in combination, means adapted to form impressions upon a record receiving member, means adapted to bring a record receiving member into operative relation thereto, a multi-colored printing ribbon mounted adjacent said first means and adapted to be shifted to change the color of the impression made thereby, clock actuated means adapted to shift said ribbon, whereby the energy for shifting said ribbon is derived from the clock, and means comprising an auxiliary spring automatically compressed and released by clock work adapted to tend to shift said ribbon.

15. In a workman's time recorder, in combination, means adapted to form impressions upon a record receiving member, means adapted to bring a record receiving member into operative relation thereto, a multi-colored ribbon in operative relation to said record forming means and adapted upon being shifted laterally to change the color of the impressions formed thereby, clock actuated means adapted to shift said ribbon to change the color, whereby the energy for shifting said ribbon is derived from the clock, clock actuated means adapted to repeat a cycle of motions and having portions

controlling broadly the time of action of said shifting means, said portions of said controlling means being moved at a slower rate than the rate of lateral movement of the ribbon and being positioned to cause the shifting of said ribbon at the opening and terminal points of the periods of labor whereby the records formed in working hours are made in a distinctive color, and means comprising an auxiliary spring automatically compressed and released by clock work adapted to tend to shift said ribbon.

16. In a workman's time recorder, in combination, means adapted to form impressions upon a record receiving member, means adapted to bring a record receiving member into operative relation thereto, a multi-colored printing ribbon mounted adjacent said record forming member and adapted upon being shifted laterally to change the color of the impression formed thereby, means adapted to shift said ribbon, clock controlled means controlling the time of shifting of said ribbon, and an auxiliary spring adapted to aid in shifting said ribbon.

17. In a workman's time recorder, in combination, means adapted to form impressions upon a record receiving member, means adapted to bring a record receiving member into operative relation thereto, a multi-colored printing ribbon mounted adjacent said record forming member and adapted upon being shifted laterally to change the color of the impression formed thereby, means adapted to shift said ribbon, clock controlled means controlling the time of shifting of said ribbon, and an auxiliary spring adapted to aid in shifting said ribbon, said auxiliary spring being automatically compressed and released by clock work.

18. In a time recorder, in combination, a time-printing member, a multi-colored printing ribbon adapted to co-act therewith, means adapted to feed the same longitudinally, said ribbon being mounted to move laterally with respect to its direction of travel to change the color of its portion in operative position, and a flexible connection between said ribbon and said feeding means.

19. In a time recorder, in combination, a time-printing member, a multi-colored printing ribbon adapted to co-act therewith, means adapted to feed the same longitudinally, said ribbon being mounted to move laterally with respect to its direction of travel to change the color of the portion thereof in operative position, and means adapted to neutralize the force of gravity upon said ribbon.

20. In a time recorder, in combination, a time-printing member, a multi-colored printing ribbon adapted to co-act therewith, means adapted to feed the same longitudinally, said ribbon being mounted to move

laterally with respect to its direction of travel to change the color of its portion in operative position, a flexible connection between said ribbon and said feeding means, and means adapted to neutralize the force of gravity upon said ribbon.

21. In a time recorder, in combination, a time-printing member, a multi-colored printing ribbon adapted to co-act therewith, means adapted to feed the same longitudinally, said ribbon being mounted to swing laterally about an axis to change the color of the portion thereof in operative position, and means adapted to swing said ribbon.

22. In a time recorder, in combination, a time-printing member, a multi-colored printing ribbon adapted to co-act therewith, means adapted to feed the same longitudinally, said ribbon being mounted to swing laterally about an axis to change the color of the portion thereof in operative position, means adapted to swing said ribbon, and means adapted to neutralize the force of gravity upon said ribbon.

23. In a time recorder, in combination, a time-printing member, a multi-colored printing ribbon adapted to co-act therewith and mounted upon spools, pivotally mounted means having positioned thereon said spools and adapted upon swinging to move said ribbon laterally to change the color of the portion thereof in operative position, and a counterbalance upon said pivotally mounted means adapted to neutralize the force of gravity upon said ribbon.

24. In a time recorder, in combination, a time-printing mechanism, a multi-colored printing ribbon adapted to coact therewith and mounted upon spools, pivotally mounted means having positioned thereon said spools and adapted upon swinging to move said ribbon laterally to change the color of the portion thereby in operative position, a counterbalance upon said pivotally mounted means adapted to neutralize the force of gravity upon said ribbon, feeding means, and a flexible connection between one of said spools and said feeding means.

25. In a workman's time recorder, in combination, means adapted to form impressions upon a record receiving member, means adapted to bring a record receiving member into operative relation thereto, a multi-colored printing ribbon mounted adjacent said first means and adapted to be shifted to change the color of the impression made thereby, and clock actuated means adapted to shift said ribbon, whereby the energy for shifting said ribbon is derived from the clock, ribbon feeding means, and a flexible connection between said feeding means and said ribbon.

26. In a workman's time recorder, in combination, means adapted to form impressions upon a record receiving member, means

adapted to bring a record receiving member into operative relation thereto, a multi-colored printing ribbon mounted adjacent said first means and adapted to be shifted
 5 to change the color of the impression made thereby, clock actuated means adapted to shift said ribbon, whereby the energy for shifting said ribbon is derived from the clock, said ribbon being pivotally mounted
 10 to swing laterally and provided with counterbalancing means.

27. In a workman's time recorder, in combination, means adapted to form impressions upon a record receiving member, means
 15 adapted to bring a record receiving member into operative relation thereto, a multi-colored printing ribbon mounted adjacent said record forming means and adapted upon being moved laterally to change the
 20 color of the record formed thereby, clock work, a member rotated by clock work means adapted upon said member being set in a predetermined condition to cause the same to shift said ribbon laterally, whereby the
 25 energy for shifting said ribbon is derived from the clock, and means driven by said clock work at a relatively slow rate adapted at predetermined times to set said faster moving member in said condition.

28. In a workman's time recorder, in combination, record forming means, means
 30 adapted to bring a record receiving member into operative relation thereto, a multi-colored printing ribbon, pivotally mounted
 35 means upon which said printing ribbon is mounted adapted upon swinging to change the color of the ribbon in operative relation to said record forming means, a cylindrical member provided with a sinuous groove,
 40 means connected with said pivotally mounted means and entering said groove, whereby said pivotally mounted means are oscillated as said cylindrical member is turned, and clock driven means adapted to rotate said
 45 cylindrical member at the opening and terminal points of the periods of labor, whereby the records formed within the hours of labor are made in a distinctive color and whereby the energy for shifting said ribbon
 50 is derived from the clock.

29. In a workman's time recorder, in combination, means adapted to form impressions upon a record-receiving member, means adapted to bring the record receiving mem-

ber into operative relation thereto, record-
 55 changing means adapted to impart a distinguishing characteristic to certain classes of impressions, and clock-actuated means adapted to actuate said record-changing
 60 means to impart a distinguishing characteristic to records made within working hours whereby the energy for actuating said record-changing means is derived from the clock, said clock-actuated means comprising
 65 two clock-actuated members driven at different rates of speed, one of which moves said record-changing means and the other of which controls broadly the time of action of the first of said members.

30. In a workman's time recorder, in combination, means adapted to form impressions upon a record-receiving member, means
 70 adapted to bring a record-receiving member into operative relation thereto, a multi-colored printing ribbon mounted adjacent
 75 said record-forming means and adapted upon being moved laterally to change the color of the record formed thereby, clock work, a member driven by clock work, means adapted upon said member being set in a
 80 predetermined condition to cause the same to shift said ribbon laterally whereby the energy for shifting said ribbon is derived from the clock, and means driven by said clock at a different rate adapted at pre-
 85 determined times to set said first clock-driven member in said condition.

31. In a workman's time recorder, in combination, record-forming means, means
 90 adapted to bring a record-receiving member into operative relation thereto, a multi-colored printing ribbon, pivotally mounted means upon which said printing ribbon is mounted adapted upon swinging to change
 95 the color of the ribbon in operative relation to said record forming means, a cylindrical member provided with a sinuous groove, means connected to said pivotally mounted means and with said groove whereby said
 100 pivotally mounted means are oscillated as said cylindrical member is turned, and means adapted to turn said cylindrical member.

In testimony whereof I affix my signature, in the presence of two witnesses.

ROBERT S. BLAIR.

Witnesses:

J. GLYDE RIPLEY,
 M. C. KIRK.