

No. 649,590.

Patented May 15, 1900.

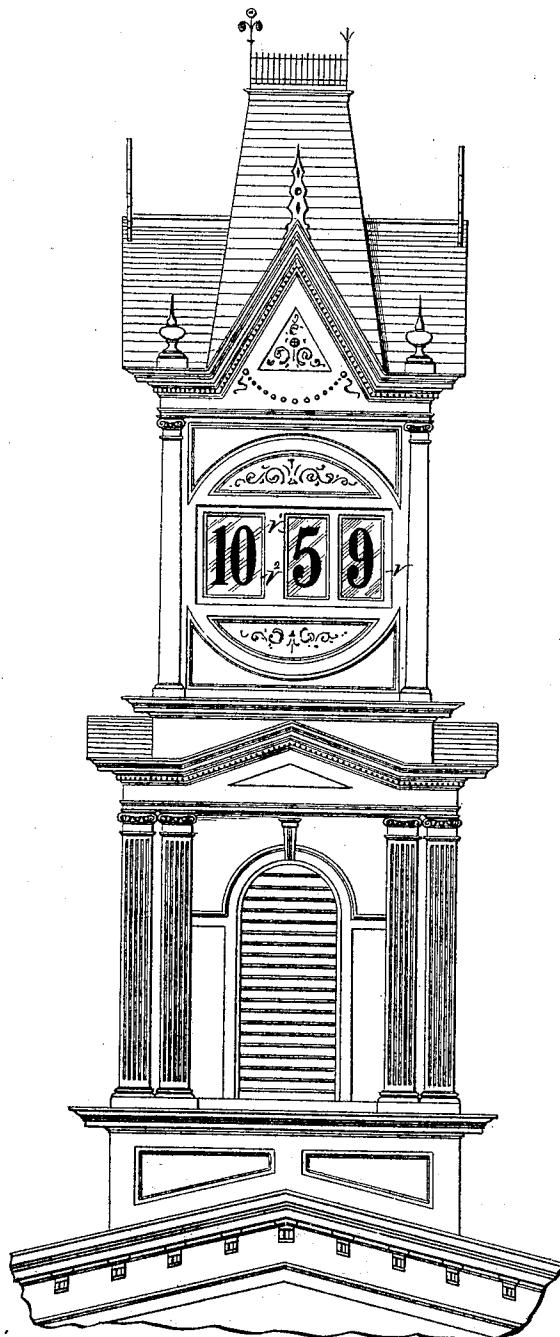
S. P. THRASHER.  
TIME INDICATING DEVICE.

(Application filed Mar. 16, 1897.)

(No Model.)

4 Sheets—Sheet 1.

Fig. 1



Witnesses:

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No. 649,590.

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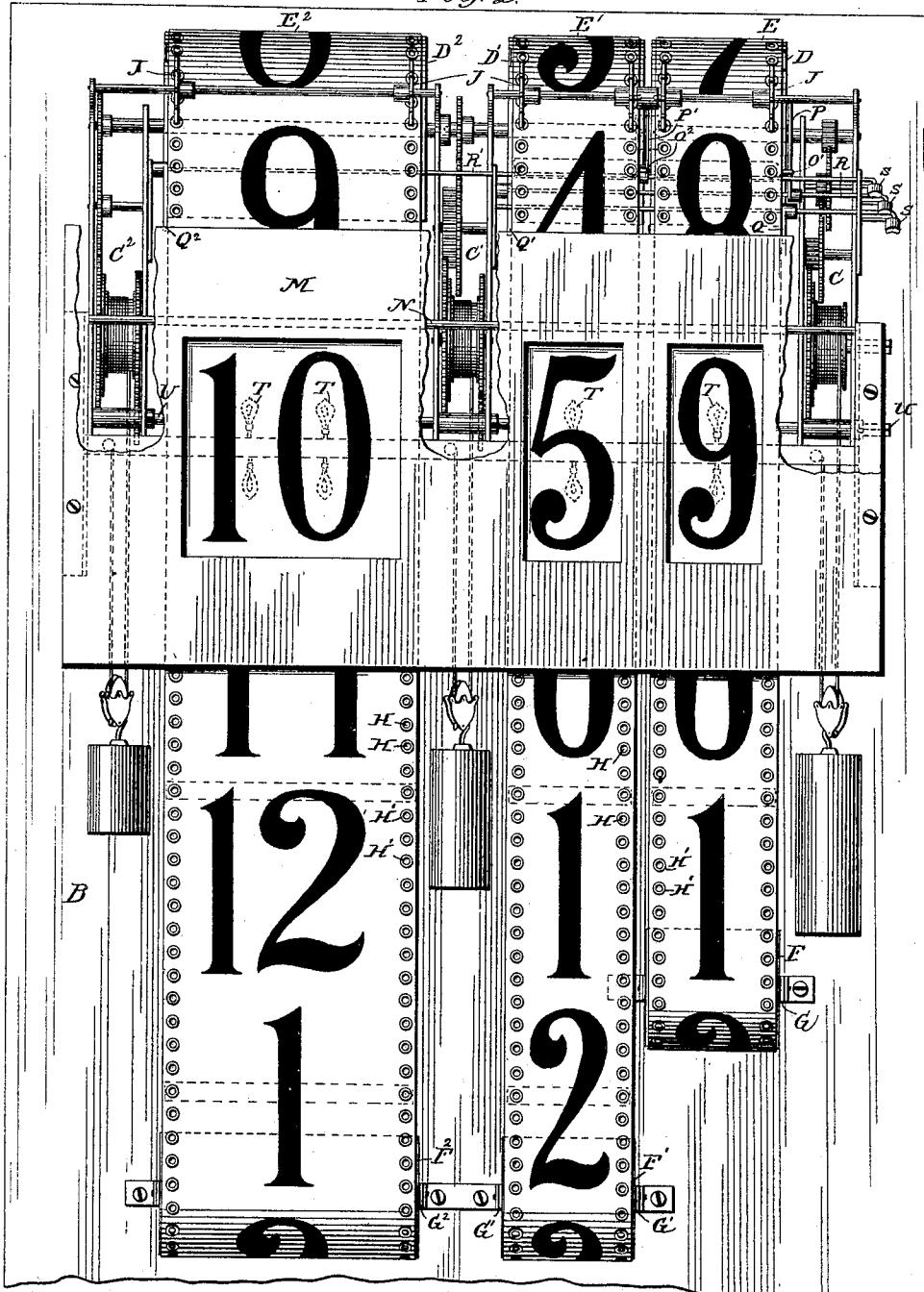
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(No Model.)

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Fig. 2.



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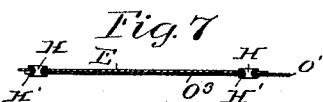
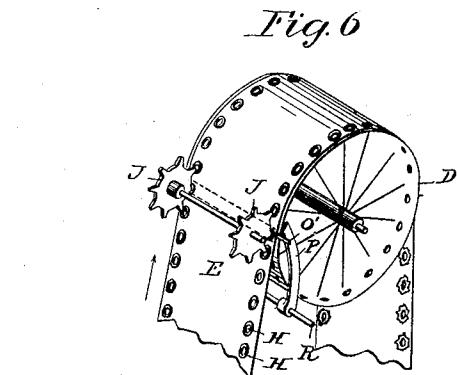
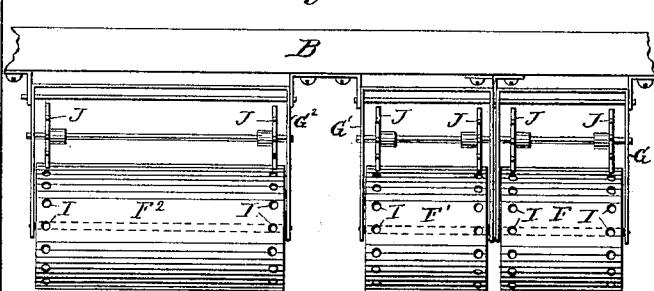
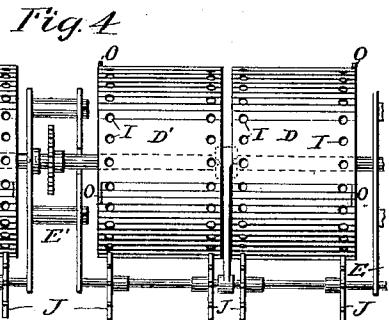
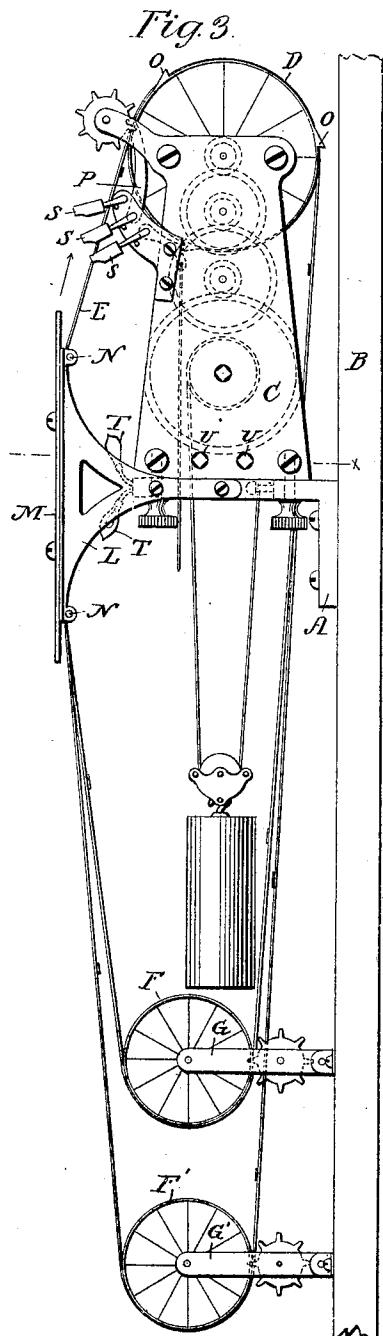
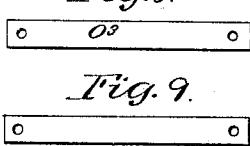


Fig. 8.



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Fig. 9.

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Fig. 10.

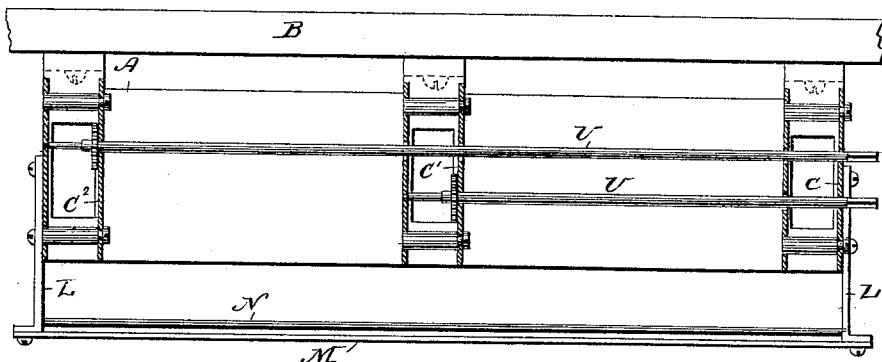
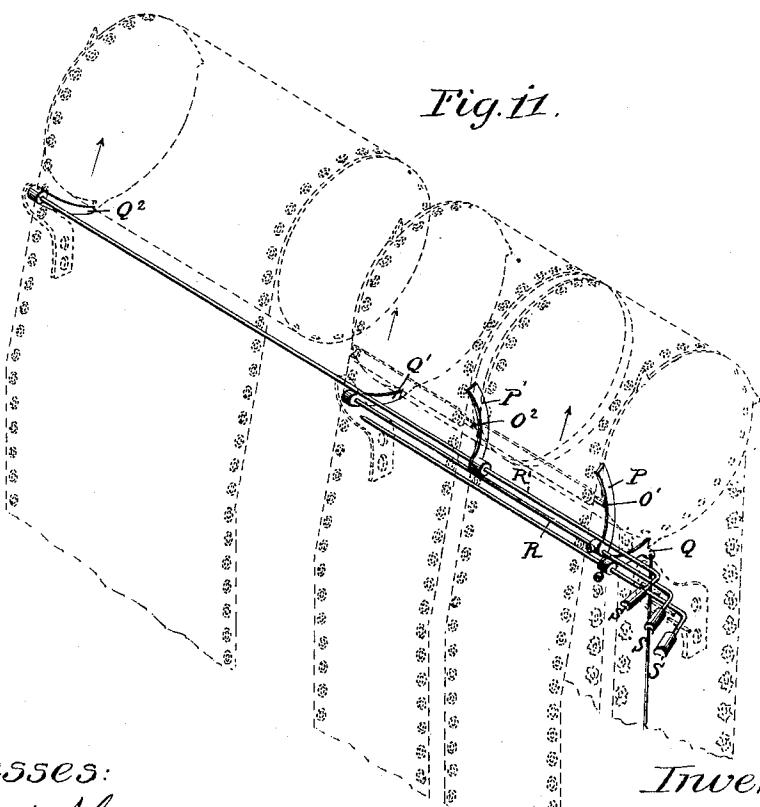


Fig. 11.



Witnesses:

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# UNITED STATES PATENT OFFICE.

SAMUEL P. THRASHER, OF NEW HAVEN, CONNECTICUT.

## TIME-INDICATING DEVICE.

SPECIFICATION forming part of Letters Patent No. 649,590, dated May 15, 1900.

Application filed March 16, 1897. Serial No. 627,868. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL P. THRASHER, a citizen of the United States, and a resident of New Haven, in the county of New Haven 5 and State of Connecticut, have invented certain new and useful Improvements in Time-Indicating Devices, of which the following is a specification.

My invention relates to time-indicating devices, and is especially adapted to indicate time by figures arranged upon ribbons carried upon rotating drums or spools and is particularly adapted for use in towers or other places where it is necessary to show time so 15 as to be read at a long distance day or night; and it consists in the construction and relative arrangement of the parts, as hereinafter described, and pointed out in the claims, reference being had to the accompanying drawings, in which like letters indicate like parts throughout the several figures.

Figure 1 shows the preferred embodiment of my device as it appears when applied to a tower. Fig. 2 is a front elevation showing 25 my device with portions of the plate or mat over the figures broken away. Fig. 3 is a side view of the same. Fig. 4 is a detached plan view of the carrying-rolls with their sprockets and shafts and showing sprocket-30 perforations in the drums. Fig. 5 is a plan view of the perforated idle rolls with their sprocket-shafts and frames in which they are journaled and showing method of attaching the frames to the backboard of the movement. 35 Fig. 6 is a perspective view of one of the carrying-drums, showing the ribbon and trip-bar attached to it, with its projecting finger in engagement with one of the trip-releasing dogs or levers. Fig. 7 is a sectional view 40 showing my method of fastening the trip-bars to the ribbons. Fig. 8 is a detached view of one of the trip-bars and its trip-finger. Fig. 9 is a detached view of one of the stiffening-bars which I apply to the ribbons. Fig. 10 45 is a sectional view in plan on line X X of Fig. 3, showing the winding-shafts and their winding-wheels and the front plate or mat arranged in front of the figures, with its supporting-arms attached to the supporting-bracket of 50 my device. Fig. 11 is a perspective view showing the pawls, their shafts, their weight-

ed ends, and the carrying-drums with their ratchet-teeth, also showing on two of the ribbons a trip bar and finger about to engage their respective releasing-dogs.

55

In the above preferred embodiment, A is a supporting-bracket secured to a board or suitable standard B. Arranged on this plate are the movements C C' C<sup>2</sup>, made, preferably, with plates and pillars similar to frames of ordinary clock-movements and suitably fastened in their respective positions upon the supporting-bracket A, as shown. These frames are made, preferably, alike and are arranged in a straight line and serve in part to support 60 rotating drums D D' D<sup>2</sup>, which are driven, respectively, by power-trains arranged, respectively, within their frames, as shown.

In the present invention one of my distinctive improvements consists in providing 70 the carrying-drums D D' D<sup>2</sup> with ribbons E E' E<sup>2</sup> or endless belts, which are carried on the drums D D' D<sup>2</sup> and provided with figures arranged thereon, as shown in Fig. 2, by means of which large figures may be employed in 75 properly indicating the time of day without the employment of large drums, whereby the depth of space required to contain the mechanism may be greatly reduced, which is particularly desirable in timepieces of large dimensions, and especially desirable when 80 adapting the device to towers or recesses in buildings.

Idle drums F F' F<sup>2</sup>, journaled in frames G G' G<sup>2</sup>, secured to the backboard B, are employed to give tension to their respective ribbons.

85

To insure the positive carrying of the ribbons upon their respective drums D D' D<sup>2</sup> and the proper direction and position in which the 90 ribbons throughout their whole length shall at all times travel with special relation to their carrying and idle drums, I have provided sprocket mechanism in connection with the drums, which I will now explain.

95

I have provided the carrying and idle drums of each ribbon with a series of perforations I in their rims, and preferably approximately near their outer edges, the perforations being uniformly laid out and adapted to receive the 100 teeth of sprocket-wheels J J J, suitably mounted on their respective shafts and ar-

ranged and adapted to mesh into the perforations of their respective drums, as clearly shown in Figs. 4 and 5.

Corresponding to the perforations in the drums are perforations H H H in the ribbons, which are preferably provided with eyelets H' H', secured therein, and when the drums are in operation the teeth of the sprocket-wheels pass through these perforations in entering the perforations of the drums, as shown in Figs. 2 and 6.

It will be seen by the means just described that the ribbons will be prevented from slipping lengthwise or laterally on the carrying-drums and will also be made, by means of the sprocket mechanism, to travel in a straight line over the carrying and idle drums. It will be further seen that by means of this sprocket mechanism applied to both sets of drums the ribbons will be practically prevented from becoming narrower from use, since the sprocket engagement therewith at both edges will necessarily preserve the original and true width even in using ribbons of the lightest weight.

Secured to the supporting-bracket A are forward-extending arms L L, (see Figs. 3 and 10,) which support the perforated plate or mat M, through which the figures on the ribbons are exposed. This plate, as represented in Fig. 3, is arranged substantially in front of a perpendicular line with the front faces of the carrying and idle drums and is provided with guide-rods N N, suitably secured to the back side of the plate and in close proximity thereto, over which the ribbons pass under a slight lateral tension toward the front, which is effected by the arrangement of the plate and its guide-rods slightly to the front, as just described. These guide-rods may be made of glass tubes, or small rolls might be employed in their stead when it is desired to reduce the friction upon the ribbons to a minimum. This lateral tension of the ribbons at this point is calculated to secure evenness of surface to the parts of the ribbons exposed through the openings at all times and approximately close to and at uniform distance from the plate. At the same time this construction and arrangement causes the inner side of the ribbons only in passing over the said guides to bear against the same and insures the front side of the ribbons or the figures thereon against becoming marred by contact with any engaging surface. Another advantage derived from bringing this part of my mechanism to the front, as described, is due to the fact that the figures and plate through which they are exposed may in many instances be brought approximately closer to the front of the case or its inclosure, particularly when set up in a tower where that portion of the structure which is arranged to expose the time on my device consists of thin siding supported above and below by framework.

The figures on the ribbon E represent the units of minutes, the figures on the ribbon

E' represent the tens of minutes, and the figures on the ribbon E<sup>2</sup> represent the hours.

In the present instance, while using carrying-drums of the same size, I am enabled, by making the ribbon carrying the units of minutes proportionately shorter than the others, as shown in Figs. 2 and 3, to make the divisions for the respective sets of figures on the ribbons of equal length and to provide the drums with stopping mechanism arranged in relation to the periphery thereof according to the said divisions on the ribbons, said stopping mechanism forming, substantially, the same number of equal divisions of the said respective drums. For instance, supposing the drums here shown each to be six feet in circumference and to be provided, respectively, with three stops, as shown, at each release the ribbon of each of the carrying-drums will be carried forward two feet, owing to one-third of a revolution made by the drums, and the size of the figures displayed will be approximately two feet in length. I have provided these carrying-drums with points or teeth O O, extending outward beyond their rims to engage the stop-pawl and to effect the release of the ten-minute and hour drums, and I have arranged the ribbons of the units-of-minutes and ten-minute drums with the trip-fingers O' and O<sup>2</sup> instead of the count-perforations.

The employment of the stop teeth or points just described renders it practicable to provide the drums with rims of less width while showing figures of the same size, and by adjusting the engaging pawls slightly above the rims frictional contact therewith is at all times obviated.

In the present device the tripping-fingers of the ten-minute and hour drums are borne upon the ribbons of the units-of-minutes and ten-minute drums, respectively, and consist of fingers extending laterally beyond the ribbons. These fingers are formed, preferably, on the end of strips of flat sheet-steel bars (shown in Fig. 8) having perforations through which eyelets H' H' pass in fastening them to the ribbons, as shown in Fig. 7, and when in contact with their releasing-pawls are firmly held in their proper position by means of the teeth of the sprocket-wheels entering their perforations at this point, as shown in part by dotted lines in Fig. 6. Similar pieces, with the finger omitted, (shown in Fig. 9,) I may attach also to the ribbons as stiffeners to aid in preserving the uniform width and even surface of the same throughout their entire length, as represented in Figs. 2 and 3.

When the device is in operation, (see Fig. 11,) the units-of-minutes drum is released each minute by dislodging the stop-pawl Q, electrically or otherwise, in the manner explained in my application filed March 15, 1897, 130 and once in ten minutes the trip-finger O', borne on the units-of-minutes drum, engages at the proper time the releasing-pawl P, slightly depressing the same and imparting

sufficient rotary movement to its shaft R to dislodge the stop-pawl Q' from behind one of the stop-notches of the ten-minute drum, and in like manner one of the two trip-fingers 5 borne on the ten-minute ribbon engages the releasing part, in this embodiment a pawl P', attached to the shaft R', and imparts sufficient rotary movement thereto to dislodge the pawl Q<sup>2</sup> and release the hour-drum D<sup>2</sup>.

10 I have provided the pawl-shafts with weighted arms S S S to serve the double purpose of rendering the upward movement of their respective pawls automatic and also facilitate the operation of setting the device, which is 15 accomplished by raising any one of them as occasion may require.

Arranged within the ribbons is a series of electric lights T T, by means of which the figures may be transparently seen at night. 20 The employment of ribbons instead of drums to display the figures facilitates arranging the lights directly in the rear of the figures, as shown.

25 The ribbons on the ten-minute drum and the hour-drum are arranged sufficiently far apart to allow the weight operating the ten-minute drum to pass between and below the ribbons.

30 U U are elongated winding-arbors extending from the movements C C' C<sup>2</sup> to the side of the device.

Referring now to Fig. 1, in which I have represented a tower as equipped with my time-indicating device, I will explain the construction and arrangement of that part of the same 35 through which the figures denoting the time are displayed or exposed. V V' V<sup>2</sup> are sash provided, preferably, with glass and arranged in front of their respective figures and adapted 40 to slide upward or to be otherwise removed when desired, as in the case of cleaning or repairing the same, without displacing or removing the time mechanism or any part thereof. I have provided a single sash for the 45 hour-figures and constructed of larger size and accordingly with a large glass or light, and have arranged smaller sash in front of the ten-minute and units-of-minutes figures. By providing the device with the several 50 glazed sash, as described, and adapting the same in size with relation to the area of their respective figures or numerals I am enabled in the construction of the device on a large scale to provide lights or glass in front of the 55 figures of the smallest practicable area and to use correspondingly-smaller sash and frames.

It is evident that various changes in the

construction and relative arrangement of the parts herein shown and described might be made and yet be within the spirit and scope 60 of my invention, and I do not wish to be understood as in any way limiting myself to the construction and arrangement of the several parts hereinbefore described and set forth; but,

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

1. In a time-indicating device in combination, a perforated drum, a numeral-carrying belt, a strengthening-plate running across said belt, said strengthening-plate having a perforation which registers with the perforations in said belt, driving mechanism for said belt including a projection adapted to enter 75 said perforation in said belt to move the same, a trip mechanism embracing a pawl, and a projection on said strengthening-plate adapted to engage said pawl to move the same.

2. In a time-indicating device in combination, a plurality of independently-rotating drums, independent numeral-carrying belts on said drums, a ratchet on each drum and independent pawls engaging said ratchets, a releasing-arm for the pawl which engages one 85 of said drums, and means carried by the belt on the other drum for engaging said releasing-arm to release said pawl.

3. In a time-indicating device in combination, a plurality of independently-rotating 90 drums, independent numeral-carrying belts on said drums, a ratchet on each drum and independent pawls engaging said ratchets, a releasing-arm having a curved face for the pawl which engages one of said drums, and means 95 carried by the belt on the other drum for engaging said curved face of said releasing-arm to release said pawl.

4. In a time-indicating device in combination, a plurality of independently-rotating 100 drums, independent numeral-belts on said drums, a ratchet connected with each drum and independent pawls engaging said ratchets, a releasing part for the pawl which engages one of said drums and means carried 105 by the belt on the other drum for engaging said releasing part to release said pawl.

Signed at New Haven, in the county of New Haven and State of Connecticut, this 15th day of March, A. D. 1897.

SAMUEL P. THRASHER.

Witnesses:

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W. S. TUCKER.