(No Model.) 7 Sheets—Sheet 1.

J. DEY.

WORKMAN'S TIME RECORDER.

No. 524,102. Patented Aug. 7, 1894.

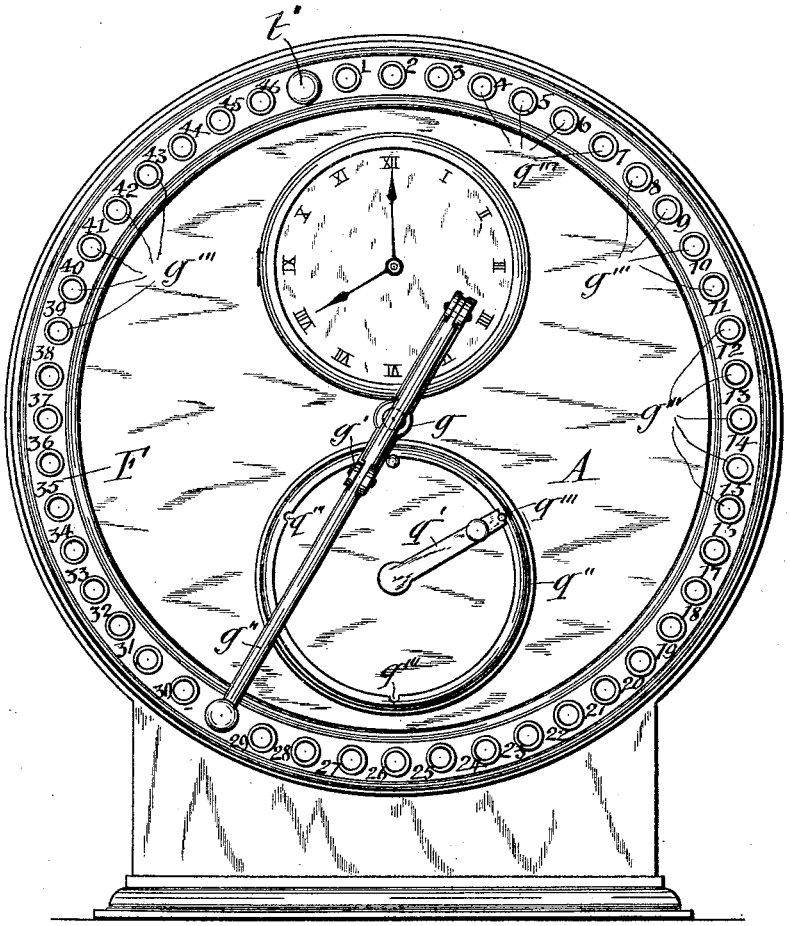

Fig 1

WITNESSES:
C. L. Bendixon
J. J. Saaby

INVENTOR:
John Dey
By Duell, Lasser & Duell
his ATTORNEYS.

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(No Model.) 7 Sheets—Sheet 2.

J. DEY.

WORKMAN'S TIME RECORDER.

No. 524,102. Patented Aug. 7, 1894.

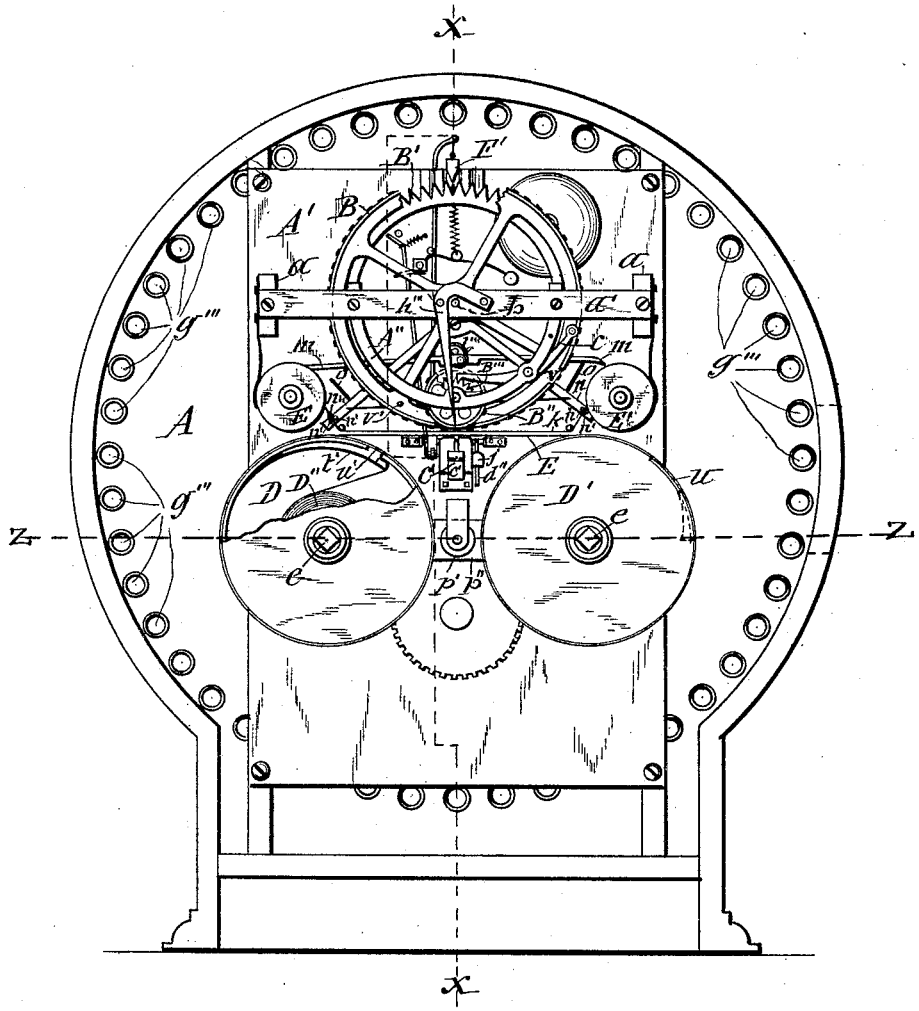

Fig. 2.

WITNESSES:

C. L. Bendixon

J. J. Saass

INVENTOR:

John Dey

By Dodd, Laass & Dodd

his ATTORNEYS.

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(No Model.) 7 Sheets—Sheet 3.

J. DEY.

WORKMAN'S TIME RECORDER.

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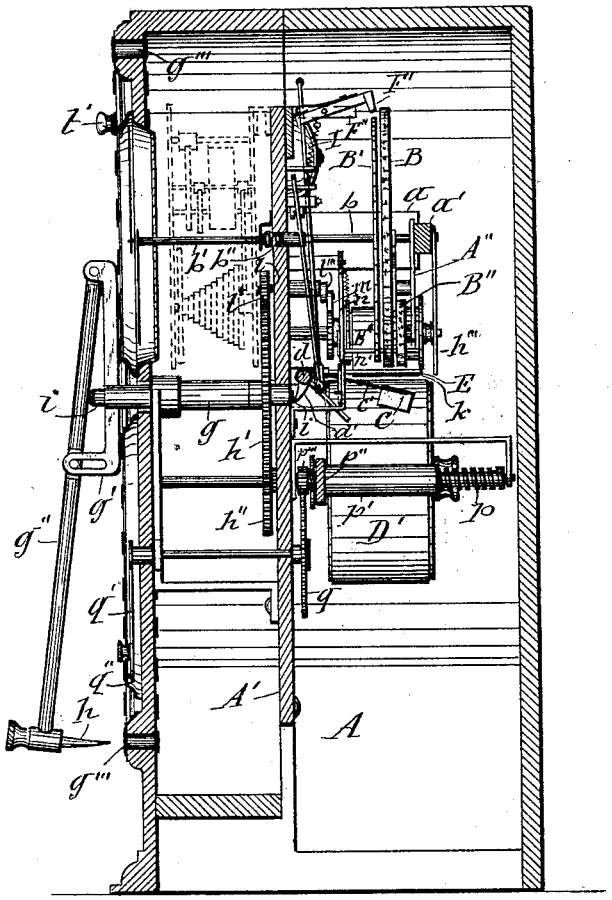

Fig. 3

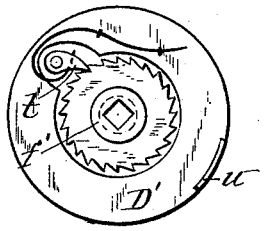

Fig. 12

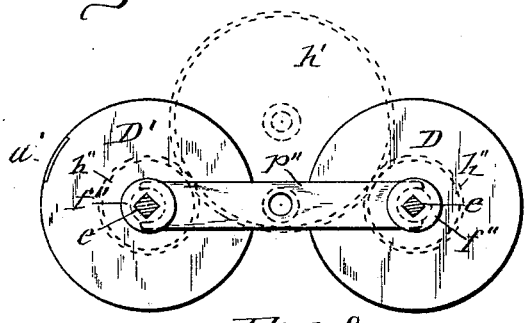

Fig. 8

WITNESSES:

C. L. Bendixon

J. J. Laass

INVENTOR

John Dey

By Duell, Laass & Duell

his ATTORNEYS.

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(No Model.) 7 Sheets—Sheet 4.

J. DEY.

WORKMAN'S TIME RECORDER.

No. 524,102. Patented Aug. 7, 1894.

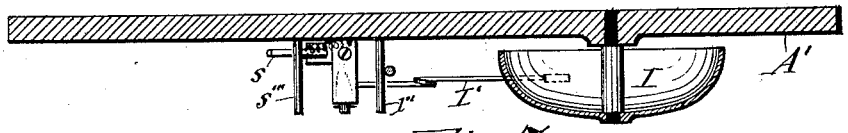

Fig. 7

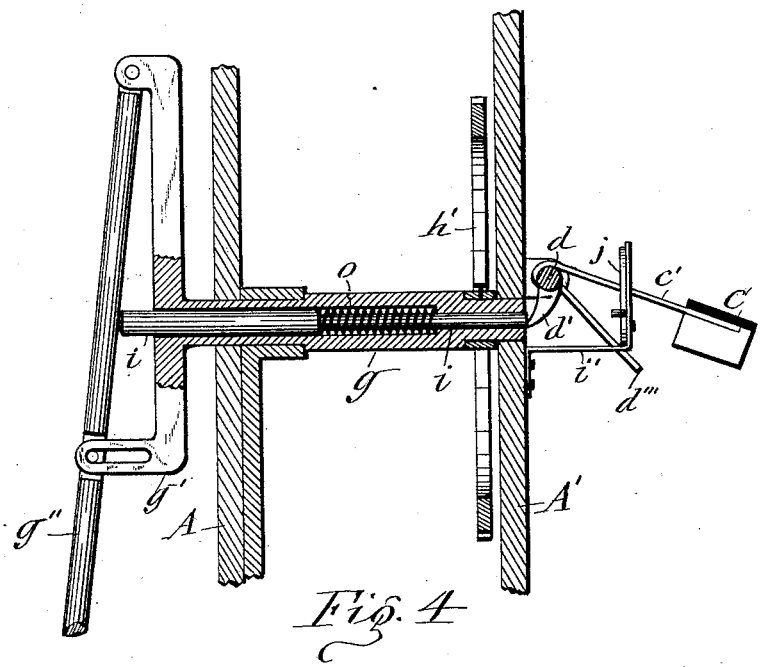

Fig. 4

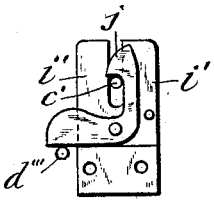

Fig. 9

WITNESSES:

E. L. Bendixon

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J. DEY.

WORKMAN'S TIME RECORDER.

No. 524,102. Patented Aug. 7, 1894.

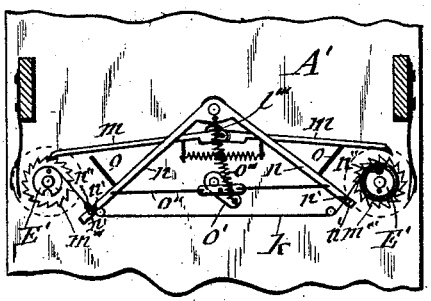

Fig. 5

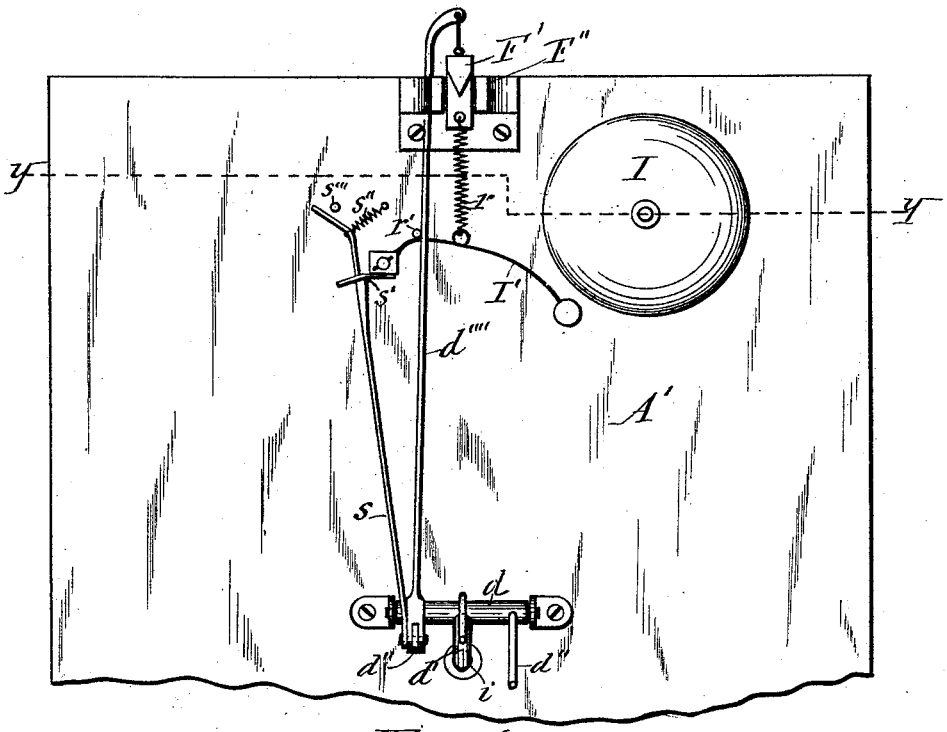

Fig. 6

WITNESSES:

C. L. Bendixon

J. J. Saass

INVENTOR:

John Dey

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his ATTORNEYS.

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J. DEY.

WORKMAN'S TIME RECORDER.

No. 524,102. Patented Aug. 7, 1894.

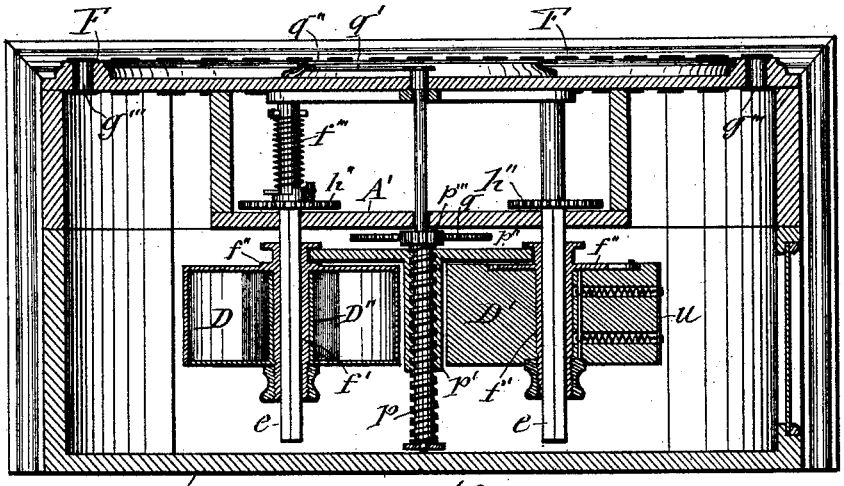

Fig. 10

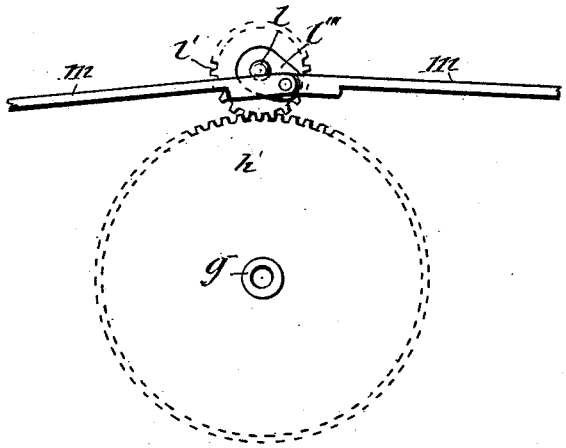

Fig. 11

WITNESSES:
C. L. Bendixon
J. J. Saass

INVENTOR:
John Dey
By Wells, Laass & Bond
his ATTORNEYS.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

(No Model.) 7 Sheets—Sheet 7.

J. DEY.

WORKMAN'S TIME RECORDER.

No. 524,102. Patented Aug. 7, 1894.

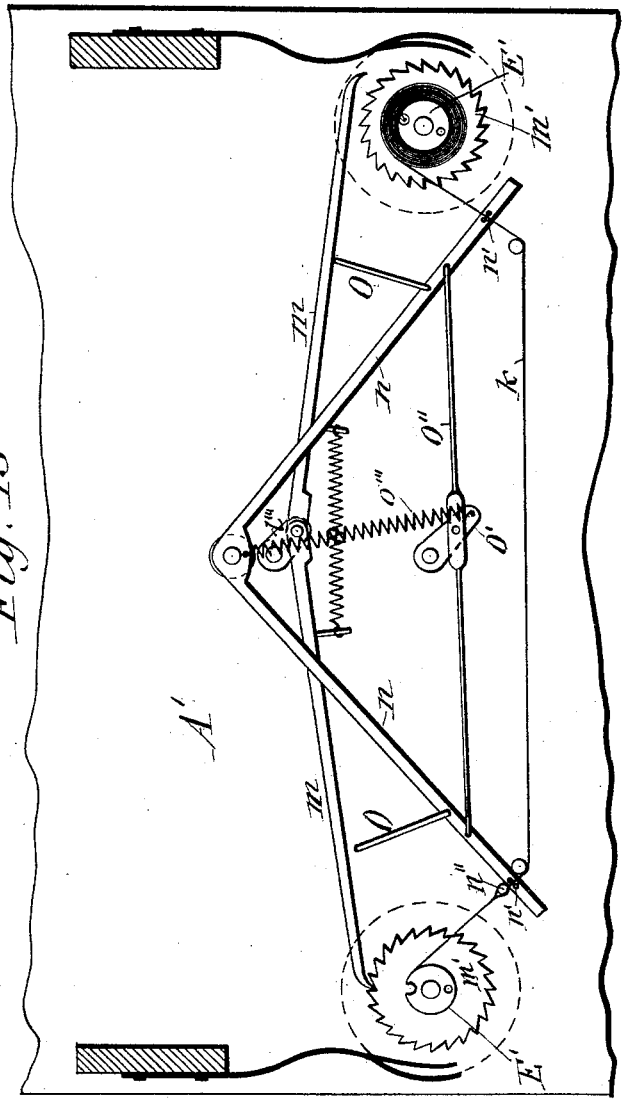

Fig. 13.

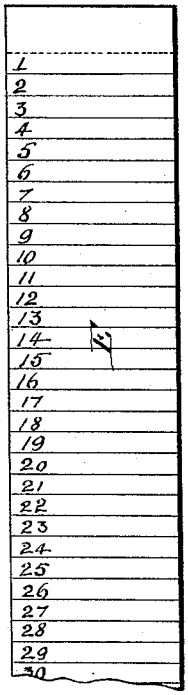

Fig. 14.

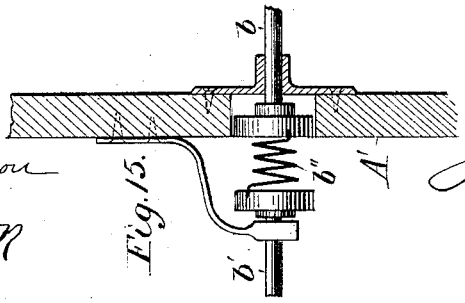

Fig. 15.

WITNESSES:

C. L. Bendixon

C. E. Tomlinson

INVENTOR:

John Dey

By Wendell, Laass & Bundle

his ATTORNEYS.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

JOHN DEY, OF SYRACUSE, NEW YORK.

WORKMAN'S TIME-RECORDER.

SPECIFICATION forming part of Letters Patent No. 524,102, dated August 7, 1894.

Application filed November 11, 1892. Serial No. 451,602. (No model.)

To all whom it may concern:

Be it known that I, JOHN DEY, a subject of the Queen of Great Britain, and a resident of Syracuse, in the county of Onondaga, in the State of New York, have invented new and useful Improvements in Workmen's Time-Recorders, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

This invention relates to the class of time recorders which are employed in factories and other establishments having numerous employés which are required to record their times of entering and leaving the establishment. And the invention pertains more particularly to the style of workman's time recorder shown in the United States patent to Alexander Dey, No. 411,586, dated September 24, 1889.

The invention consists in an improved reorganization of the recording mechanism and means for operating the same, all as hereinafter fully described and summed up in the claims.

In the annexed drawings, Figure 1 is a front view of my improved time recorder. Fig. 2 is a rear view of the same with the rear wall of the inclosing case removed. Fig. 3 is a vertical transverse section on line *x*, *x*, in Fig. 2. Fig. 4 is an enlarged longitudinal section of the hollow main shaft with the inclosed plunger by which the impression receiving band is moved longitudinally to bring it into its requisite position between the platen and type-wheel, and the platen is actuated to make the impression on the said band. Fig. 5 is a detail view of the mechanism for moving the carbon-ribbon. Fig. 6 is a detail view of the means for sounding the alarm bell. Fig. 7 is a horizontal transverse section on line *y*, *y*, Fig. 6. Fig. 8 is a diagrammatic view showing the means for transmitting rotary motion to the rollers which carry the impression receiving band. Fig. 9 is an enlarged detail view of the means for imparting a spring action to the platen. Fig. 10 is a horizontal transverse section on line *z z*, in Fig. 2. Fig. 11 is a diagrammatic view of the mechanism for transmitting motion from the hollow main shaft to the pawls which actuate the spools carrying the carbon ribbon. Fig. 12 is an end view of the roller by which the impression band is adjusted. Fig. 13 is an enlarged face view of the mechanism for moving the carbon ribbon. Fig. 14 is a detached plan view of the impression receiving band, and Fig. 15 is an enlarged side view of the spring connection of the minute-hand spindle and type-wheel shaft.

Similar letters of reference indicate corresponding parts.

A— represents the inclosing case of the time recorder. In the front portion of this case is located the clock-mechanism which may be of any suitable and well known construction. Immediately back of this clock-mechanism is a stout metal plate —A'— secured firmly in a vertical position. From this plate project rearward two arms —*a*—*a*—, to which is fastened a horizontal cross-bar —*a'*. In this cross-bar is pivoted one end of a shaft —*b*—, the opposite end of which is mounted in a suitable bearing on the plate —A'— and is connected to the end of the minute-spindle —*b'*— by a suitable spring —*b''*— as more clearly shown in Fig. 15 of the drawings, which spring is of sufficient tension to cause the shaft to rotate with the spindle and yet yield sufficiently to allow the shaft to be temporarily detained from motion without arresting the motion of the spindle —*b'*— for the purpose hereinafter explained.

To the shaft —*b*— is rigidly secured the type-wheel —B— and notched wheel —B'. Said type wheel has the numbers from 0 to 60 projecting from the periphery thereof and uniformly distributed around the same and is designed to print the minutes of the time of recording. On a yoke —A''— fastened to the aforesaid cross-bar —*a'*— is pivoted a second type-wheel which is the hour-printing wheel —B''— having the numbers from 1 to 12 projecting from its periphery. This latter wheel receives one-twelfth of a revolution at the end of each complete revolution of the wheel —B. This may be effected by mechanism similar to that shown in the patent to Alexander Dey hereinbefore referred to, and it consists of the lever —*c*— pivoted at the central portion of its length to the yoke —A''— and having one end engaging a ratchet-wheel —B'''— fixed to the side of the hour-wheel and its opposite end sliding on an annular flange on the side of the minute-

wheel or type-wheel —B— which flange has a notch —*v*— which allows the lever —*c*— to rock and thereby release the ratchet-wheel. A lug —*v'*— on the minute wheel then enters between two of the teeth of the ratchet-wheel and causes the same to turn one-twelfth part of a revolution. There are twelve teeth on the ratchet-wheel, hence twelve revolutions of the type-wheel —B— impart one complete revolution to the hour-wheel. Facing the said type-wheel and hour-wheel and preferably arranged directly under them is the vertically movable platen —C— which is attached to the free end of a spring-arm —*c'*— fastened to a rock-shaft —*d*— pivoted to the plate —A'. Said platen receiving its vertically oscillatory motion by the mechanism under control of the operator as hereinafter described. At opposite sides of the platen are two rollers —D— and —D'— mounted on revoluble shafts —*e*—*e*— which are parallel with the axis of the type-wheel.

An impression receiving band or ribbon —E— is wound upon and secured at opposite ends to the rollers. For this purpose I prefer to provide the roller —D'— with a spring-clasp —*u*. The other roller —D— I prefer to form of a hollow drum provided with a transverse slot —*u'*— in its periphery, and to the interior of said drum and concentric therewith is fastened a spool —D''— as hereinafter described. The band —E— is fastened at one end to said spool and passes thence through the slot of the drum to the roller —D'— where the opposite end is fastened by the clasp —*u*.

The rollers —D—D'— are made to revolve with their shafts by the latter being square in cross-section and upon these shafts are mounted sleeves —*f'*— also squared internally and cylindrical externally and screw-threaded on their rear end-portions and provided with fixed collars —*f''*—*f''*— a proper distance from the screw-threaded portions to receive between them the rollers —D—D'— which are mounted on said sleeves. The hollow roller or drum is of metal and fastened directly to the roller —*f''*— and inside of said drum is the spool —D''— loosely mounted on the sleeve and fixed to a cap which covers the open rear end of the drum and is held in position by a nut on the screw-threaded end of the sleeve. To the inner periphery of the drum is fastened one end of a spring-plate —*t'*— which lies with its free end across the slot —*u'*. The band —E— passes from the spool over the end of the spring plate and back through the slot —*u*— and is thereby clamped in the drum. The said rollers are rotated in unison so as to cause one roller to wind up the impression band —E— as fast as said band is unwound from the other roller, and this is effected at will of the operator by the following mechanism:

Horizontally through the case —A— passes a hollow shaft —*g*— which is journaled in suitable bearings inside of the case and protrudes through the front thereof where it has affixed to it a crank —*g'*— to which is pivoted a lever —*g''*—, one end of which extends across the end of the shaft and the other end extends to a dial —F— which is concentric to the shaft —*g*— and is marked with consecutive numbers distributed uniformly around the dial, and opposite each of said numbers is a perforation —*g'''*— in the front plate of the case. A pin —*h*— projecting from the free end of the lever —*g''*— is adapted to enter into any one of the perforations at a time. The inner end of the hollow shaft —*g*— has fastened to it a gear-wheel —*h'*— which meshes with pinions —*h''*— —*h''*— mounted on the shafts —*e*—*e*— of the rollers —D—D'. Hence by turning the hollow shaft rotary motion is imparted to the said pinions. One of the pinions —*h''*— is mounted loosely on its shaft —*e*— and connected to it by a spiral spring —*f'''*— which exerts a strain on the shaft in opposite direction from that of the shaft of the collar and thereby maintains the impression band —E— constantly taut between the rollers. The impression band —E— has printed upon it lengthwise thereof a row of numbers corresponding to those on the dial —F— which latter serves as an index by which to determine the degree of rotation to be imparted to the lever —*g''*— to bring the impression-receiving band into its requisite position in relation to the time-printing wheels to print the time opposite the proper number on the band. The said band is so adjusted on the rollers as to bring 0 directly over the platen when the pin —*h*— of the lever —*g''*— is inserted in the perforation directly opposite 0 of the dial. For this purpose I fasten a ratchet-wheel to the sleeve —*f'*— of the solid roller —D'— and pivot to said roller, a pawl —*t*— which engages said ratchet-wheel as shown in Fig. 12 and causes the same to rotate with the sleeve. In adjusting the band —E— as aforesaid it is drawn out of the hollow roller or drum and wound upon the roller —D— which is effected without turning its sleeve and shaft with it. In order to accomplish this adjustment more accurately I attach to the cross bar —*a'*— a pointer —*h'''*— as shown in Fig. 2 of the drawings, said pointer being set directly over the platen.

The platen receives its vertical oscillatory motion toward and from the type-wheel by means of a plunger —*i*— extending through the hollow shaft —*g*— and bearing with its inner end on a cam or a short lever-arm —*d'*— affixed to the rock-shaft —*d*—, the outer end of the plunger bears against the lever —*g''*— and is forced outward or toward said lever by means of a coil spring O bearing at opposite ends on shoulders formed on the interior of the hollow shaft and exterior of the plunger as shown in Fig. 4 of the drawings. In pushing the free end of the

lever toward the dial at the same time of entering the pin in the perforation of said dial, the plunger is forced inward and by means of the cam or lever-arm —*d'*— throws the platen toward the type-wheel. In order to obtain a more effective stroke of the said platen I pivot a latch —*j*— to a bracket —*i'*— fastened to the rear of the plate —A'— as shown in Figs. 4 and 9 of the drawings. Said latch comes in contact with the spring-arm —*c'*— of the platen in its movement toward the type-wheel and subjects said spring-arm to considerable strain toward the latter part of the inward movement of the plunger. A tripping finger *d'''* fixed to the rock-shaft —*d*— strikes the latch during the latter part of the movement of the plunger and thereby releases the spring arm —*c'*— from the latch. The platen then receives the spring action of the spring-arm.

In order to hold the type-wheel stationary during the period of printing, I employ a detent —F'— which engages the notched-wheel —B'— similar to that shown in the patent to Alexander Dey hereinbefore mentioned. Said detent is pivoted to a bracket —F''— fastened to the top portion of the plate —A'— and is thrown into engagement with the said notched-wheel simultaneously with the movement of the platen toward the type-wheel by means of an arm —*d''*— fixed to the rock-shaft —*d*—, and a rod —*d''''*— connecting said arm with the detent in front of the pivot thereof, as shown in Fig. 6 of the drawings.

k— represents the carbon ribbon which passes between the type-wheel and impression band —E— and is wound upon and secured at opposite ends to spools —E'. This ribbon is made to move automatically longitudinally by the following mechanism: In a bearing fixed to the plate —A'— is journaled a short horizontal shaft —*l*. To one end of this shaft is fastened a pinion —*l'*— which meshes with the gear-wheel —*h'*— fastened to the hollow shaft —*g*—, shown more plainly in Fig. 11 of the drawings, said shaft being turned by the operator turning the recording lever —*g''*.

To the opposite end of the short shaft is fastened a crank —*l'''*—, to which are pivotally connected the pawls —*m*—*m*— which extend in opposite directions from the crank and are adapted to engage ratchet-wheels —*m'''*— which are fastened to the sides of the spools —E'— and have their teeth set in opposite directions for reversing the motion of said spools. Only one of these pawls at a time is allowed to operate its respective ratchet-wheel, and the alternate actions of the two pawls is controlled by means of the yoke —*n*— which is pivoted to a stud-pin fastened to the plate —A'— and is extended toward the two spools —E'—E'— where it has attached to it the upwardly extending arms —O—O—.

To each end of the yoke is attached a guide —*n'*— through which the ribbon, *k*, passes. To each end portion of the said ribbon is fastened a stop —*n''*— of such a size or shape as to prevent it from passing through the guide —*n'*—. The encounter of said stop with the guide on one end of the yoke during the travel of the ribbon causes the yoke to tilt on its pivot and lift by means of the arm —O— at the opposite end of the yoke, the pawl —*m*— thereat out of engagement with the ratchet-wheel, and at the same time allow the other pawl —*m*— to drop into engagement with its ratchet-wheel. Hence when the carbon ribbon has been unwound from the spool to its limit, the travel of said ribbon is reversed by the aforesaid mechanism, which is more clearly shown in Fig. 13 of the drawings.

In order to sustain the yoke in its two extreme positions I pivot to a sleeve on the plate —A'— a crank —*o'*— and connect said crank by a rod —*o''*— with the two ends of the yoke, the tilting of which latter swings the crank from one side of a vertically pendent position to the opposite side thereof. A spring —*o'''*— connects the free end of the aforesaid crank with the center of the yoke and by the tension of the said spring the yoke is carried beyond its dead center and the crank is retained in the aforesaid position.

The described time recorder is operated in the following manner: The persons required to use the recorder are distinguished from each other by a different number assigned exclusively to each person. The person entering or leaving the place of business turns the lever —*g''*— to a position to allow him or her to insert the pin —*h*— into the perforation —*g'''*— directly opposite the number by which said person is identified. The turning of said lever turns the rollers —D—D'— so as to carry directly over the platen —C—, that portion of the impression band —E— on which is printed the aforesaid number. Then by pushing the lever —*g''*— toward the dial sufficiently to cause the pin to enter the aforesaid perforation, the plunger —*i*— is caused to throw the platen up against the under side of the impression band —E— and by impinging the same, it receives the impression from the type-wheels —B— and —B''— which print the time upon the band by means of the intervening carbon-ribbon —*k*—. As soon as the operator releases the lever —*g''*—, it is restored to its normal position by the action of the spring —*o*— forcing the plunger —*i*— outward. A stop —*l'*— on the dial prevents the lever —*g''*— from making more than a complete revolution in either direction, thus obviating the danger of disrupting the impression receiving band.

In order to allow the times of entering and leaving the establishment or place of business to be printed in lines across the sheet opposite the respective numbers I mount the rollers —D—D'— movable longitudinally on

their shafts and thus allow different portions of the width of the impression band to be brought under the type-wheel. For adjusting the said rollers in their requisite positions I employ a screw-shaft —*p*— which is parallel with the axes of the rollers and pivoted to suitable bearings secured to the interior of the case and to the back plate —A'. On the said screw is mounted a nut —*p'*— to which is connected a cross bar or yoke —*p''*— engaging circumferential grooves in the collars —*f''*— on the ends of the sleeves —*f'*—, as shown in Fig. 10 of the drawings. Said nut may be of the form of a sleeve provided with a lug engaging the screw. To the said screw, adjacent to the plate —A'—, is fastened a pinion —*p'''*— which meshes with the gear-wheel —*q*— fastened to a shaft which passes through the front of the case and is mounted on suitable bearings inside of the case. To the outer end of said shaft is fastened a crank —*q'*—. By turning said crank the screw-shaft receives rotary motion which moves the nut and thereby shifts the rollers —D—D'— longitudinally on their shafts.

To retain the crank in its required position I form the same of a spring-plate which carries its free end normally from the front of the case, to which latter I fasten a ring —*q''*— arranged concentric to the axis of the crank and provided with an inwardly projecting circumferential flange underneath or back of which the free end of the crank passes. A lug projects from the crank and enters one of the notches —*q'''*— in the flange, thereby retaining the crank in its required position.

In connection with the recording mechanism I prefer to employ an alarm mechanism which announces the act of each recording, said alarm mechanism consisting of a gong or bell —I— secured to the back plate —A'—, the bell hammer —I'— being pivoted on a post projecting from the plate —A'— and being forced toward the bell by means of a spiral spring —*r*— connecting the bell-hammer preferably to the forward end of the detent.

A stop —*r'*— fastened to the plate —A'— is in such a position as to sustain the bell-hammer a short distance from the bell. Said bell is sounded automatically in the operation of recording the time by means of the following devices: To the arm —*d''*— of the rock-shaft —*d*— is connected the lower end of a vertical rod —*s*— which is provided with a shoulder —*s'*— by which it engages a rearward projection of the bell hammer —I'— and is drawn toward the same by means of a spring —*s''*—, by means of which it is caused to engage said projection in the upward thrust of the rod, and thus force the bell-hammer away from the bell. The upper end of said rod is bent away from the bell hammer and engages a stop *s'''* fixed to the back-plate —A'— so that during the latter part of the upward movement of the rod it is thrown out of engagement with the bell-hammer which is then caused to strike the bell by means of the spiral spring —*r*. Said alarm-mechanism is more clearly shown in Fig. 6 of the drawings.

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

1. A workman's time recorder comprising time-printing wheels, a band movable longitudinally in either direction in proximity to said printing-wheels and having a longitudinal row of consecutive numbers marked upon it, a manually operated lever controlling the movement of said band, and an index traversed by said lever and numbered to correspond to the band, and a platen actuated by said lever and pressing the band into contact with the time-printing wheels as set forth.

2. In combination with the clock-mechanism and time-printing wheels receiving rotary motion from said mechanism, a platen movable to and from said printing-wheels, rollers geared to rotate in unison, an impression-receiving band carried on said rollers, and having printed upon it a row of consecutive numbers distributed lengthwise of the band, a manually controlled shaft transmitting rotary motion to said rollers, a dial having an annulus of consecutive numbers concentric to the axis of said shaft and corresponding to the numbers on the aforesaid band, and a lever on the shaft moving over the dial and determining the degree of rotation of the shaft and of the aforesaid rollers and thereby placing the band in position to receive the impression of the time-printing wheels opposite a number corresponding to the number indicated on the dial by the aforesaid lever, and a plunger actuating the platen as set forth.

3. In combination with the type-wheel, a rock-shaft, a plunger engaging the crank of said shaft, a hand-lever actuating said plunger, a spring-arm attached to the rock-shaft, a platen on said arm, a latch arresting said platen-arm in its movement toward the type-wheel, and a tripping-finger extending from the rock-shaft and throwing the latch out of its aforesaid engagement whereby the platen receives the spring action of its supporting arm, as set forth.

4. In combination with the type-wheel, a rock shaft provided with a crank, a plunger engaging said crank, a hand-lever actuating said plunger, an arm extending from the rock-shaft, a platen attached to said arm, a lever extending from the rock-shaft, a rod extending from said lever and provided with a shoulder, a spring actuated bell-hammer in the path of the aforesaid shoulder, to be moved from the bell thereby, a spring drawing the shouldered rod toward the bell-hammer, a cam throwing said rod out of engagement with the bell-hammer, and a bell receiving the stroke of the hammer as set forth.

5. In combination with the clock-mechanism and minute-hand spindle, a type-wheel rotating with said spindle, a platen facing said type-wheel, revoluble shafts at opposite

sides of the platen, rollers mounted on said shafts and rotating with the same, an impression-receiving band wound upon and secured at opposite ends to said rollers and having a row of consecutive numbers distributed over the length of the band, gear-wheels on the shafts of said rollers, a shaft parallel with the axes of the rollers, a gear on said shaft transmitting motion to the gears of the rollers, a crank on the outer end of the latter shaft, and a dial concentric to said shaft and having an annular row of numbers corresponding to those on the impression receiving band, and a stop on said dial arresting the movement of the crank at each complete revolution in either direction as set forth.

6. In combination with the clock-mechanism and minute-hand spindle, a type-wheel and a notched wheel both yieldingly connected to and rotating with said spindle, a detent normally out of engagement with the notched wheel, a platen carried movably toward and from the type-wheel, revoluble shafts at opposite sides of the platen, rollers on said shafts and rotating with the same, an impression receiving band wound upon and secured at opposite ends to said rollers, gear-wheels on the shafts of the rollers, a hollow shaft parallel with the axes of the rollers, a gear on the latter shaft meshing with the gears of the rollers, a plunger in the hollow shaft actuating the platen and detent, a crank fixed to the outer end of said shaft, a lever pivoted to said crank and bearing on the outer end of the plunger, and a spring forcing the plunger outward as set forth.

7. In combination with the clock mechanism and minute-hand spindle, a type-wheel yieldingly connected to and rotating with said spindle, a platen supported movably toward and from the type-wheel, revoluble shafts at opposite sides of the platen, rollers on said shafts and rotating with the same, an impression receiving band wound upon and secured at opposite ends to said rollers and having a longitudinal row of consecutive numbers printed upon it, gears attached to said shafts, a hollow shaft parallel with the axes of the rollers, a gear on the latter shaft meshing with those of the rollers, a plunger in the hollow shaft actuating the platen, a crank fixed to the outer end of the hollow shaft, a lever pivoted to the crank and bearing on the end of the plunger, a spring forcing the plunger outward, a dial concentric to the hollow shaft and having an annular row of perforations numbered to correspond to those on the impression receiving band, and a pin projecting from the aforesaid lever and adapted to enter into the perforations, as set forth.

8. In combination with the type-wheel and platen, shafts at opposite sides of the platen and parallel with the axis of the type-wheel, rollers mounted on said shafts movable longitudinally, and an impression receiving band wound at opposite ends upon said rollers and passing between the platen and type-wheel as set forth.

9. In combination with the type-wheel and platen, shafts at opposite sides of the platen and parallel with the axis of the type-wheel, rollers mounted on said shafts movable longitudinally, an impression-receiving band wound upon and secured at opposite ends to said rollers, a revoluble screw-shaft parallel with the shafts of the rollers, and a nut on said shaft engaging the rollers to move the same longitudinally on their shafts by the rotation of the screw-shaft as set forth.

10. In combination with the type-wheel and platen, shafts at opposite sides of the platen and parallel with the axis of the type-wheel, rollers mounted movable longitudinally on said shafts, an impression receiving band wound upon and secured at opposite ends to said rollers, a revoluble screw-shaft parallel with the shafts of the rollers, a nut on said shaft engaging the rollers to move the same longitudinally on their shafts, a pinion fixed to the screw-shaft, a shaft parallel with the screw-shaft, and provided with a gear wheel meshing with the aforesaid pinion, and a hand crank on said shaft as and for the purpose set forth.

11. In combination with the type-wheel, platen, and impression receiving band passing between said wheel and platen, two pivoted spools respectively at opposite sides of the point of printing, a carbon ribbon wound upon and fastened at opposite ends to said spools, ratchet-wheels on the spools, a pivoted crank-arm between the spools, pawls pivoted to the crank-arm and adapted to engage the aforesaid ratchet-wheels, a yoke pivoted between the spools and extending with its free ends toward the same, guides on said ends of the yoke receiving the carbon ribbon through them, arms on the yoke adapted to lift the pawls one at a time out of engagement, an arm pivoted in a pendent position beneath the pivot of the yoke, a rod pivoted to said arm and connected to opposite ends of the yoke, a spring connecting the free end of said arm to the center of the yoke, and stops attached to the end-portions of the carbon-ribbons engaging the guides on opposite ends of the yoke during the travel of the ribbon and thereby tilting the yoke which by its aforesaid arms throws one pawl out of and the other pawl into operative position as set forth.

12. In combination with the type-wheel and platen, revoluble shafts at opposite sides of the platen and parallel with the axis of the type-wheel, an impression receiving band wound upon and secured at its ends to said rollers, pinions fixed to the shafts, spools at opposite sides of the type-wheels and having the carbon-ribbon wound upon them, ratchet-wheels on said spools, a horizontal shaft pivoted between the spools, a crank fixed to one end of said shaft, pawls connected to said crank and engaging the ratchet-wheels of the

spools, a pinion fixed to the opposite end of said shaft, a horizontal shaft protruding at the front of the case, and gear wheels meshing respectively with the pinions of the roller-shafts and of the crank-shaft to simultaneously turn the rollers and spools as set forth.

13. In combination with the type-wheel and platen, shafts at opposite sides of the platen, rollers secured to said shafts, an impression band secured to said rollers, a pinion fixed to one of said shafts, a pinion mounted loosely on the other shaft, a spring connecting the latter pinion to its shaft, and a revoluble gear engaging said pinions as set forth.

14. In combination with the roller —D′—, the drum —D— provided with the slot —*u*′—, the spring-plate —*t*′— fastened at one end to the interior of the drum and lying with its free end across the aforesaid slot, the spool D″ pivoted in the drum, and the band —E— connected at one end to the spool and passing over the end of the spring-plate and back through the slot of the drum, and connected at the opposite end to the aforesaid roller as set forth.

In testimony whereof I have hereunto signed my name this 31st day of October, 1892.

JOHN DEY. [L. S.]

Witnesses:
H. M. SEAMANS,
J. J. LAASS.