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Patented Feb. 9, 1909.

3 SHEETS—SHEET 1.



AUTOGRAPH TIME RECORDER.

Patented Feb. 9, 1909.

3 SHEETS—SHEET 2.

Witnesses:

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Wayne Felber

Invenkors

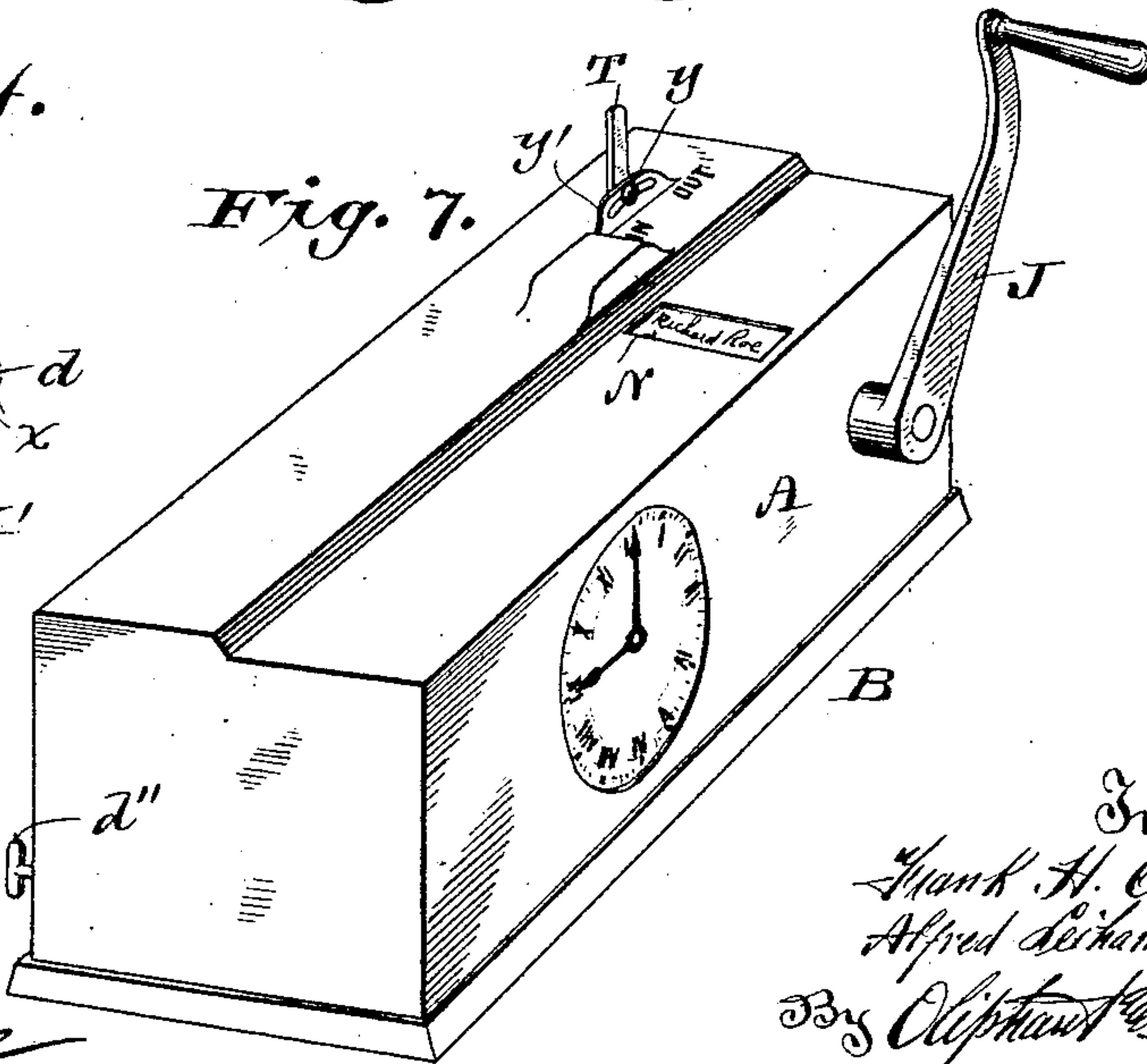
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3 SHEETS—SHEET 3.



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UNITED STATES PATENT OFFICE.

FRANK H. COTTRILL AND ALFRED LEIHAMMER, OF MILWAUKEE, WISCONSIN.

AUTOGRAPH TIME-RECORDER.

No. 912,230.

Specification of Letters Patent.

Patented Feb. 9, 1909.

Application filed April 24, 1907. Serial No. 369,980.

To all whom it may concern:

Be it known that we, FRANK H. COTTRILL and ALFRED LEIHAMMER, citizens of the United States, and residents of Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented certain new and useful Improvements in Autograph Time-Recorders; and we do hereby declare that the following is a full, clear, and exact description thereof.

Our invention consists in certain peculiarities of construction and combination of parts as hereinafter described and claimed with reference to the accompanying drawings, its object being to provide simple and accurate autographic time recorders, the same being so arranged and constructed that parties signing their names upon an exposed portion of a paper tape, and thereafter moving the tape by a system of levers, will cause a registration of the exact time of signing, to be printed upon said tape opposite the signatures.

In the drawings: Figure 1 represents a longitudinal sectional view of a time-recorder embodying the features of our invention, the section being indicated by line 1—1 of Fig. 2; Fig. 2, a plan view of the same with a portion of the casing broken away to show portions of the printing and tape feed-mechanisms; Fig. 3, a cross-section of the recorder, as indicated by line 3—3 of Fig. 1; Fig. 4, a detail view of the printing lever actuating trip-cam; Figs. 5 and 6, enlarged detail fragmental views of the time-wheel transfer mechanism; Fig. 7, a perspective view of the time-recorder in its entirety; Fig. 8, is a detail view of a locking-mechanism, and Fig. 9, a plan view of a portion of the printing-wheels together with the "in-and-out" slide in its position of rest.

Referring by letter to the drawings, A indicates a casing fitted upon a base B, at one end of which is secured a well C for the reception of a paper tape D, that is fed therein from a roll E suitably mounted upon a spindle F at the opposite end of the recorder. The tape D travels over rollers *a*, *b*, which rollers support said tape directly under the top of the casing, the aforesaid tape is thereafter passed over a feed-roller G and is held against the feed-roller by a spring-pressed idle-roller H, from which point the tape is guided over a spindle *c* into the well. The feed-roller G is loosely mounted upon a shaft I having bearings in the sides of the

casing. One end of the shaft projects through said casing and has secured thereto a hand-lever J, which lever when rocked by the operator, first serves to impart motion to a printing-mechanism and thereafter to a paper feed-mechanism as hereinafter described.

The paper or tape-feed is accomplished by the following mechanism: A rock-arm K is secured to the shaft I, having a horizontal pin *d* extending in either direction from the upper end K' of the rock-arm, and a coil-spring *d'* secured to the opposite end. This spring is secured to a pin projecting from the casing and holds the rock-arm K against a stop-pin *e*, through which pin and spring the hand-lever is held in its forward or rest position. Said rock-arm K has pivoted thereto a pull-pawl L that engages a ratchet-wheel M, which is secured to the adjacent end of the feed-roller, there being a stop-pawl *f* pivoted to the casing and engaging the ratchet-wheel to prevent back-throw of the latter.

By the above described arrangement, the hand-lever can be rotated against the tension of spring *d'* until the rock-arm comes against a stop-pin *g*, this movement being sufficient to permit the pull-pawl L to engage a forward tooth in its ratchet, the hand-lever is then permitted to return to its starting position by the contraction of the coil-spring, which movement revolves the feed-roller G and moves the paper-tape the required distance, so that a signature thereon is cleared from a slot N in the top of the recorder-casing. The length of feed of the paper is in proportion to the width of the slot N in the top of the casing, which slot is provided for the purpose of exposing the paper so that individuals required to use the machine may sign their names upon the tape. The casing-top is slightly depressed lengthwise for a portion of its width over the tape, in order that the same may rest as close as possible to the underside of the top for convenience of persons when writing their signatures upon said tape.

A printing-wheel O is mounted upon a stud *h* of a bracket *i*, which bracket is secured to the side of the casing. The printing-wheel; which will be termed a minute-wheel in a series, carries peripheral type-bearing figures from 1 to 60, and also has a ratchet-toothed ring O' of less diameter. The teeth of the ring correspond in number

to the peripheral type of the wheel O, and are provided for engagement with a pawl P that is carried by a yoked-lever P', the tail of which is actuated by a cam-wheel Q that is driven by a clock-train (not shown) and so timed as to make one revolution per minute. The yoke-lever P' is loosely mounted upon the stud h which carries the minute-wheel, the free end of said lever being held against the periphery of the cam-wheel Q by means of a spring j that is connected to the aforesaid lever and a pin of the clock-train frame K' as shown. A spring-controlled click-pawl m is pivoted upon the clock-frame for engagement with the toothed-ring O', and serves to hold the same against overthrow when actuated by the yoke-lever mechanism. As shown, the periphery of cam-wheel Q is of gradual increasing diameter with an abrupt drop, and at the completion of each cycle thereof, a quick drop of the yoke-lever takes place caused through the action of its spring. This motion is transmitted to the minute-wheel, through the pawl P, and said wheel revolves 1/60 of a revolution, bringing a type to the printing-point, indicating the minute, in synchrony with the clock-train.

By the above described mechanism the minute-wheel is intermittently moved sixty times an hour, and changes instantly at the expiration of each minute. Should a printing operation be started simultaneous with the rotation of the minute-wheel, it would not effect the timing of same with relation to the clock, by reason of a locking-mechanism, which mechanism serves to hold the aforesaid wheel, until the printing operation has completed its retarded motion. The locking-mechanism consists of an arm n extending upward from the yoked-lever P' to a position directly under the printing-point. The end of the arm terminates in a rule jointed spring-controlled latch extension o, which is adapted to engage a tooth p upon a primary anvil p', if the latter is pressed downward as the yoke-lever starts to move the minute-wheel. In this case the said yoke-lever would be caught and held by the tooth p, in suspension under its spring-pressure, until the anvil had printed and returned sufficiently to free the latch-extension o, at which time the action of said yoke-lever would be completed and the minute-wheel turned thereby. If however the anvil should be down at the moment the latch-extension o is passing under the tooth p on its back-stroke, said latch would yield by reason of its spring-and-rule joint-connection without interfering with the operation.

When the minute-wheel has made a complete revolution, an internal tooth q thereof engages a twelve-tooth pinion p', which pinion constitutes a hub-portion of an hour-wheel Q', and revolves the same one space.

The hour-wheel is mounted upon a stud r, that is eccentric to and projects from a disk r', which forms part of the bracket i, and is connected thereto by a neck-portion s, as best shown in Fig. 3. The hour-wheel is also provided with peripheral type-characters from 1 to 12, which are moved to the printing-point in a manner as stated, and in synchrony with the clock. The said wheel upon its face farthest from the minute-wheel has a hub-extension with a single tooth s; which is provided for engagement with a twenty-four toothed internal gear of a ring R, which ring is revoluble upon the disk r', and carries twenty-four type-characters A. M. and P. M., alternately spaced around its periphery. These type-characters by reason of the gear-connection just described, are moved every twelve hours so that the change to A. M. or P. M. is made at the printing-point to designate whether the machine is being operated to register signatures in the morning, afternoon or evening. The wheel Q' and ring R, constitute part of the series of printing members and are provided with spring-dogs q', q'', respectively, which dogs snap in between the type-characters thereon and hold the wheels in their adjusted positions as best shown in Fig. 5, of the drawings.

In order that the paper-tape should designate the registration of parties going out of a place of business as well as entering, we have provided a reciprocative bar S, having the printing-characters "In" and "Out" upon its face. This bar is guided at one end by an arm extending from the neck-portion of bracket i, and at the opposite end by a rod S', which passes through a slot in the said bar. The bar is connected to a lever T that is fulcrumed upon a shaft T' said lever being held in its normal, or vertical position by a leaf-spring t. The upper end of the lever T projects through a slot in the top of the casing, and when at rest this lever holds the bar S to which it is connected in a central position so that the types thereon are equi-distant from the printing-point, as shown in Fig. 9 of the drawings. A curved finger U is secured to the shaft T' its position being such with relation to the lever T, that when the latter is at rest, the end of the finger is directly in the path of pin d of the rock-arm K, thus locking the actuating-mechanism of the machine until said finger is raised or lowered, which movement is obtained by moving the lever T either forward or backward.

By the above means it will be understood that parties using the machine are compelled to first unlock the same by moving the aforesaid lever T forward or backward, which movement will bring the types "In" or "Out" to the printing-point, the direction of motion coinciding with the type, being

indicated upon the face of the casing as shown in Fig. 7, of the drawings. Thus the operator will bring the desired type to the printing-point to indicate whether he is leaving or entering a place of business, a feature which is very desirable where employees are entering and leaving at various intervals of time.

In unlocking the machine it is only necessary to hold the lever T until the operating handle has been started, as the pin *d* will then either slide over or under the curved surface of the finger and hold the same together with the type-bar S in its adjusted position until said operating handle has returned to its normal position. This is accomplished by reason of the upper and lower faces of the finger being formed on different radial curves concentric with the arc described by said pin *d*, the said curves being struck with relation to the movement of the finger in either direction.

All of the type carrying members are located directly under and near one edge of the paper as shown, while the signatures are written upon the upper surface of the paper. The printing of the time, etc., however is arranged to be embossed through the paper so that it will appear upon the same side as the signatures. This is accomplished by placing a ribbon V between the anvil *p'* and the upper surface of the paper, so that when said anvil is forced down upon the thin paper, the pressure will be sufficient for the ribbon to cause an impression of the type to be legible upon the upper surface of the paper. The anvil is secured to the underside of the machine casing and held in suspension by a spring-strip *u*, in such a manner that when said anvil is struck by a quick acting hammer W, it will immediately rebound from contact with the ribbon and thus prevent smudging caused through motion of the paper thereunder. The hammer W extends over and rests upon the anvil *p'*, said hammer forming part of a lever W', which lever is fulcrumed on the rod S', and has a tail-portion that carries a pivoted gate-cam *v* arranged in the path of the pin *d* of the rock-arm K, as best shown in Fig. 4, of the drawings. The hammer-lever W' is held in its normal position against a stop-pin *w* by a coil-spring *w'*, and when the rock-arm K is actuated, its pin *d* engages the upper face of the gate-cam, causing said hammer to rise in opposition to the spring *w'*. When said pin *d*, in its forward movement, leaves the gate-cam the aforesaid hammer gives a blow to the anvil, the inertia of which causes the same to strike the ribbon and print. Upon the return-stroke of the rock-arm its pin passes under said gate-cam and lifts the same without disturbing the lever W', there being a stop *x* projecting from said lever upon which the aforesaid gate-cam rests.

In some instances it may be desirable, at stated intervals of time to lock the bar S against the tension of its spring, so that it will print either the word "In" or "Out" continuously, in which case we have provided lever T with a set-screw *y*, which travels in a slot of a detent *y'* projecting from the top of the casing, and by this means the said lever T may be set in either direction by tightening up the screw to prevent the aforesaid lever from returning to its normal position.

The printing ribbon is mounted upon a spool *z* and is carried over suitable guide-rollers above the paper-tape to a winding-spool *z'*, which spool is provided with a ratchet-wheel *a'*, that is engaged by a spring-catch *b'*, fast on the tail of the hammer-lever W'. By the above means the ribbon is fed intermittently with each stroke of said hammer-lever, and when the ribbon is to be rewound upon the spool *z* a trip *c'* that is pivoted to the casing, is pressed against the spring-catch *b'* to disengage the same from the ratchet-wheel. Said spool *z* is then wound in reverse direction, by means of a handle *d''*, which extends through the machine-casing and forms part of the aforesaid spool-spindle.

As shown in Fig. 7, of the drawings, the clock-mechanism is provided with the usual face and hands exposed for the convenience of the operators to show the exact time.

Having described the invention in detail, it will be seen that our recorder is so arranged that the paper-tape has intermittent feed, independent of the time-printing wheels, which wheels are moved by a minute-wheel having intermittent motion imparted thereto by a cam in connection with the clock-mechanism, it being obviously within the scope of our invention to vary the contour of the cam and its speed, if desired, provided the latter will produce an impulse to the yoke-lever at intervals of one minute. To complete an operation, an employee first writes his signature upon the paper tape, then pulls the lever T to designate whether he is going in or out, and then; in order that a registration of the time be obtained, the handle must be pulled forward, this motion causes the time to be printed opposite the said signature, and as the operating-handle is returned to its position of rest, through the spring connected thereto, the paper feed-mechanism will draw the paper tape forward sufficiently to clear the signature from the slot and bring a blank space under the same for the next signature. The loose end of the paper tape is fed into the well below and may be detached by the time-keeper who has access thereto.

To form a solid backing for the paper, when the operator is writing his signature thereon, a table N' is secured to the casing

directly under the slot N upon which the paper tape travels and is supported at this point.

We claim:

5 1. An autograph and time printing re-
corder provided with a slotted casing for
the exposure of a paper tape which tape is
adapted to pass thereunder, an inking ribbon
arranged parallel with the paper strip, be-
10 tween the paper and casing and to one edge
of said paper, a series of clock-controlled
time designating type-members below the
paper, a printing-lever having a hammer
disposed above the ribbon and in alinement
15 with the slot in the casing, a shaft, a rock-
arm secured to the shaft for engagement
with the printing-lever, a hand-lever secured
to said shaft exterior of the casing, a paper
feed roller loosely mounted upon the afore-
20 said shaft, a ratchet-wheel secured to the
feed-roller, and a pawl for engagement with
the ratchet-wheel carried by the rock-arm.

2. An autograph and time printing re-
corder provided with a slotted casing for the
25 exposure of a paper tape, which tape is
adapted to pass thereunder, an inking ribbon
arranged parallel with the paper strip, be-
tween the paper and casing and to one edge
of said paper, a series of clock-controlled
30 time designating type-members below the

paper, a printing-lever having a hammer dis-
posed above the ribbon and in alinement with
the slot in the casing, a shaft, a rock-arm
secured to the shaft for engagement with
the printing-lever, a hand lever secured to 35
said shaft exterior of the casing, a paper
feed roller loosely mounted upon the afore-
said shaft, a ratchet-wheel secured to the
feed-roller, a pawl for engagement with the
ratchet-wheel carried by the rock-arm, a type- 40
carrying member provided with type-char-
acters designating "In" and "Out" adjacent
to the time designating type-member, a man-
ually operative lever in connection with the
"In" and "Out" type-carrying member, a 45
spring in connection with the manually oper-
ative lever, whereby the "In" and "Out"
designations of said member are normally
held away from the printing point, and a
finger carried by said lever arranged to nor- 50
mally oppose the rock-arm.

In testimony that we claim the foregoing
we have hereunto set our hands at Milwaukee
in the county of Milwaukee and State of
Wisconsin in the presence of two witnesses. 55

FRANK H. COTTRILL.
ALFRED LEIHAMMER.

Witnesses:

GEORGE E. FLEISCHMANN,
WM. F. CARMICHAEL.