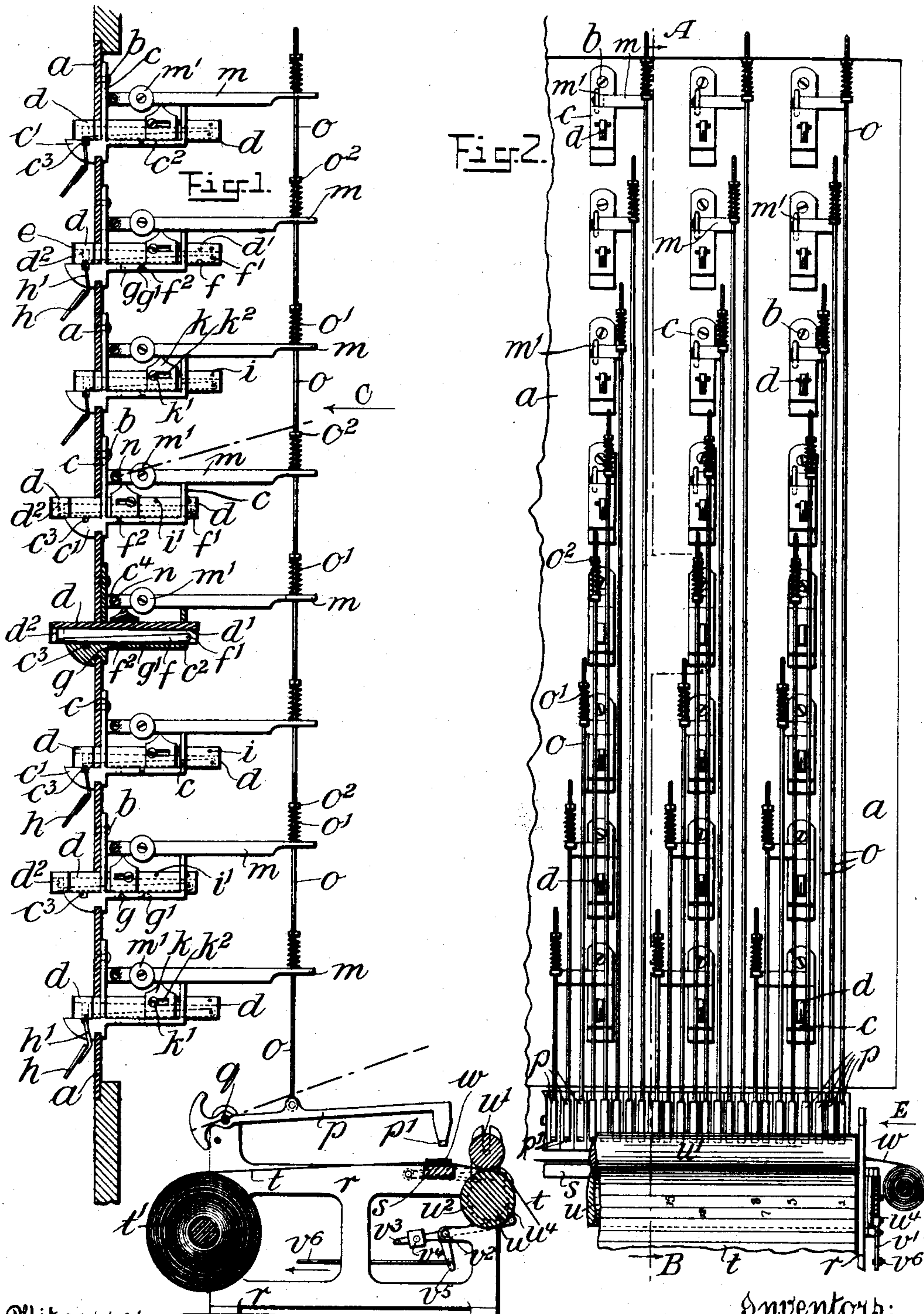


F. BROOK & J. S. GAUNT.
WORKMAN'S TIME RECORDER.

(No Model.)

(Application filed Aug. 13, 1900.)

2 Sheets—Sheet 1.



Witnesses:
Walter Allen
James M. Flier

Inventors:
Frank Brook and J. S. Gaunt
by Herbert W. Jenner,
Attorney.

UNITED STATES PATENT OFFICE.

FRANK BROOK AND JOSEPH SHAW GAUNT, OF HUDDERSFIELD, ENGLAND;
SAID BROOK ASSIGNOR TO SAID GAUNT.

WORKMAN'S TIME-RECORDER.

SPECIFICATION forming part of Letters Patent No. 682,133, dated September 3, 1901.

Application filed August 13, 1900. Serial No. 26,786. (No model.)

To all whom it may concern:

Be it known that we, FRANK BROOK and JOSEPH SHAW GAUNT, subjects of the Queen of Great Britain, residing at Huddersfield, in the county of York, England, have invented certain new and useful Improvements in Apparatus for Indicating or Recording the Times of Arrival and Departure of Work-People; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

Our invention relates to improvements in workmen's time-recording machines in which numbered checks are used as the medium whereby the times of arrival and departure of the employees are ascertained.

The object of the invention is to provide simple and reliable mechanism for securing a correct record of the times when work-people or employees enter upon their work and when they leave it.

Our invention consists in the new and novel construction and combination of parts actuated by the deposit or removal of numbered checks for recording on a chart or ribbon of paper in alinement with the times of day or selected period of time printed in the margin thereof the respective numbers of each individual employee, as hereinafter fully described.

In the accompanying drawings, illustrating our invention, Figure 1 is a transverse sectional elevation taken on line A B of Fig. 2 of our improved workmen's time-recording machine, the inclosing casing and controlling-clockwork being omitted. Fig. 2 is a rear elevation of Fig. 1 looking in the direction of arrow C, same figure. Fig. 3 is an enlarged side elevation of our improved actuating mechanism for each numbered check. Fig. 4 is a front elevation of Fig. 3 looking in the direction of arrow D, same figure. Fig. 5 is a plan or top view of Fig. 3. Fig. 6 is a part side elevation, similar to Fig. 3, showing an alternative device for actuating the tumbling-lever. Fig. 7 is a rear elevation. Fig. 8 is a side elevation of Fig. 7, and Fig. 9 is a perspective view showing a modification of our im-

proved mechanism for adoption when captive checks are employed in preference to and in lieu of loose checks. Fig. 10 is an enlarged elevation looking in the direction of arrow E, Fig. 2, of the ratchet gear and pawl and locking-detents deriving motion from a clock or time-measuring instrument for giving a step-by-step motion to the roll which traverses or draws the recording-ribbon of paper forward under the type-levers.

In the said drawings like letters of reference designate corresponding parts throughout.

Referring to the drawings, letter *a* denotes the upright or supporting check board or frame of our recording mechanism and consists, preferably, of a thin metal plate, though wood or other material may be used, if found desirable, said plate forming the largest portion of the front of a case or cabinet, (not shown,) which incloses the whole of the recording mechanism located behind the check-board *a*. In the casing above the check-board *a* is placed any ordinary description of clock usually employed in conjunction with workmen's time-recorders, the face of the clock being exposed at the front of the case, so that the time of day can be seen conveniently by the employees as they pass in front of the recorder. As controlling-clockwork is common to all time-recorders and as any of the systems now in vogue may be used in conjunction with our improved recording mechanism for imparting motion to the recording mechanism synchronously with the clock, either continuously or at stated selected periods of time, we have not considered it essential to show any clockwork or time-controlling mechanism on the drawings. The check-board *a* varies in size according as the number of work-people employed in the shop or work-place where it is used varies from a few running up to the hundreds; but when the number of work-people is inconveniently large for one recording-machine, two or more such machines are preferably placed at different stations to avoid crowding and delay in entering or leaving the workshop.

To the back of the check-board *a* and se-

cured thereto by screws *b* are a series of brackets *c*, spaced at short distances apart horizontally across the check-board and vertically from top to bottom thereof, each said bracket having on its front side and integral therewith a lug or projection *c'*, which passes through an opening in the check-board *a* and projects some distance from the front face thereof. The upper edges of the lugs *c'* are in alinement with the upper surfaces of the horizontal portions *c²* of the brackets *c*, and they are provided with recesses *c³* at a suitable distance from the check-board *a* to receive the eyelets or staples of the numbered checks when passed over the lugs *c'* and support said checks in suspension therefrom, the said lugs *c'*, with recesses *c³*, being really in substitution of ordinary forms of hooks, and thus modified in construction to suit our improved mechanism.

Resting on the horizontal portions *c²* of the brackets *c* and extending through openings in the vertical front and rear portions of said brackets are sliding bars or T-pieces *d*, the cross-heads of which are located at the front of the check-board and have soldered or brazed to their front ends thin metal plates *e*, each having a distinct number stamped, printed, or impressed thereon corresponding to the allotted number of each employee, who can thus readily find his own number at the front of the check-board. It is really immaterial whether the employees' numbers be affixed to the cross-heads of the T-pieces or sliding bars *d*, as described, or to the portions of the check-board immediately over said T-pieces *d* so long as each sliding T-piece *d* is plainly designated by its respective number. In the under side of each sliding T-piece or bar *d* is a longitudinal groove or recess *d'*, adapted to receive and allow for a suitable amount of play of a locking-lever *f*, pivoted at *f'* on a pin secured to the rear end of the sliding bar *d* and provided with a depending tooth or projection *f²*, which on being brought over one or other of two openings *g g'* in the bracket *c* drops into and registers in same and locks the lever *f*, and therefore the T-piece or bar *d*, at one or other of the extents of its endwise movement. The cross-head of the sliding T-piece or bar *d* is also provided with a groove or recess *d²* at right angles to the groove *d'* and of sufficient capacity to receive the staple *h'* of the numbered check *h*, the said staple being brazed or soldered to the back of the check and bent at an angle thereto to facilitate application of the checks to or removal of same from the hooks or recesses *c³*.

To prevent endwise movement of the sliding T-pieces or bars *d* beyond the limits assigned, stop-pieces *i i* are secured to the said sliding T-pieces or bars and project from the sides thereof, so as to engage with opposite sides of the vertical upturned rear ends of the brackets *c*, according as the sliding bars *d* are drawn out to the left or pushed in to

the right, as shown in Fig. 1. When the sliding bars *d* are drawn out to the left to their full extent, as determined by the stop-pieces *i*, the transverse grooves *d²* are fully exposed beyond the ends of the lugs *c'*, the rear sides of said grooves preferably being in alinement with the extremities of the lugs *c'* in order that when the staples or eyelets of the checks are placed against the curved ends of the said lugs they will be guided thereby directly into the grooves or recesses *d²*, and thus facilitate their attachment on the check-board. The limit of the inward sliding movement of the bars *d* as determined by the stop-pieces *i'* brings the grooves *d²* precisely over the recesses *c³*, this movement of the bars *d* inward to the right being effected by the engagement of the staples *h'* of the checks *h* with the grooves *d²* in said bars, which said staples on being presented over the said recesses *c³* are registered in same and the checks thereby suspended therein. Each sliding bar *d* is provided with a loose toe-piece or cam *k*, having a double inclined or curved surface, which is held on the bar *d* by a screw *k'*, screwed into the bar *d*. The said screw *k'* passes through a slot *k²* in the toe-piece *k*, and within the limits of this slot the toe-piece is free to slide on the bar *d* independently thereof.

Resting normally on the upturned rear ends of the brackets *c* are tumbling-levers *m*, pivoted at *n* to lugs *c⁴*, integral with the brackets *c*, and carrying small pulleys or rolls *m'*, mounted loosely on pins screwed into the levers *m* and adapted to be engaged by the double inclined surfaces of the toe-pieces *k* as the bars *d* are slid endwise to right or left for the purpose of elevating the said tumbling-levers. Through openings in the free ends of the levers *m* are passed wires or thin metal rods *o*, supported by spiral springs *o'*, confined between said levers and adjusting-nuts *o²*, screwed onto the threaded ends of the wires *o*, the lower ends of such wires being coupled to separate type-levers *p*, arranged side by side and fulcrumed on a cross-shaft *q*, journaled in bearings in the side frames *r*, of which one only is shown in the drawings. The tumbling-levers *m* are bent to right or left, as the case may be, to bring the ends of same central with the respective wires *o* and type-levers. The type-levers are made with depending heads at their free ends, and on the under sides of said heads are type-numerals *p'*, which correspond as to number with the number allotted to each respective actuating mechanism with which said levers are connected. Extending under the whole of the type-levers *p* below the free ends of same and secured at each end to the side frames *r* is a bar or pad *s*, forming a platen for the type on the said levers to strike against. Over the platen *s* is passed a ribbon of paper *t*, which is drawn off a supply-roll *t'* by a pair of rolls *u u'*, journaled in bearings in the side frames *r*, the roll *u* being driven intermittently from the controlling-clockwork and

the roll u' (which is mounted in self-adjusting bearings) resting on and being driven from roll u by frictional contact.

Secured on one end of the shaft or journal of roll u are two ratchet-wheels $u^2 u^3$, (shown clearly in Fig. 10,) having their teeth set in opposite directions. Engaging with a tooth on ratchet-wheel u^2 is a pawl u^4 , carried by the arm v' of a lever v , centered on a stud v^2 , secured to the rear side frame, the opposite arm v^3 of said lever carrying a weight or counterbalance v^4 to reinstate said lever in its normal position after each actuation thereof. To a third arm v^5 of the lever v is attached one end of a rod v^6 , which may be connected at its opposite end to the armature of an electromagnet or to a lever coupled to the controlling mechanism of the clockwork. This controlling mechanism may comprise a discharge-plate geared to the hour-wheel arbor of the clock, so as to make one complete revolution to every twenty-four revolutions of the hour-wheel of the clock, the face of the said discharge-wheel having any required number of pegs secured in holes therein and so disposed around same as to engage and liberate an escapement-train at any selected periods of time throughout each day, and thereby either complete an electric contact, so that the current will flow through the magnet and attract the armature, or transmit motion through a flexible shaft or other connections to the rod v^6 , whose movement either electrically or mechanically in the direction of the arrow rocks the lever v on its center, whereby the pawl u^4 is drawn downwardly, and being in engagement with a tooth of the ratchet-wheel u^2 rotates said ratchet-wheel, and therefore roll u , to the extent of one tooth, and the strip of paper t is thus drawn forward to a corresponding extent to present a fresh surface under the type-levers. In order to prevent movement of the ratchet-gear and roll u in either direction except when actuated by the pawl u^4 , a tooth v^7 is formed on the arm v' of lever v , which normally engages with a tooth of the ratchet-wheel u^3 and prevents rotary movement of the ratchet-gear in one direction, while a detent v^8 , pivoted on a stud v^9 and engaging with a tooth of ratchet u^2 , prevents movement in the contrary direction. When the lever v is actuated to give a partial rotation to the roll u , the tooth v^7 on arm v' of said lever is withdrawn from engagement with ratchet u^3 ; but as the pawl u^4 descends a locking-detent v^{10} , also pivoted on stud v^9 and normally resting on the upper end of said pawl u^4 , descends with it and brings a tooth thereon into engagement with the ratchet u^3 , whereby the ratchet-gear and roll u are constantly locked against abnormal movement in either direction without interfering in the least with the step-by-step movement imparted by pawl u^4 . An inking-ribbon w passes over the portion of the paper under the type-levers and may

be traversed intermittently by any suitable means from the clockwork.

The action of the mechanism for making a record is as follows: Each workman or employee is provided with a check h bearing the number allotted to him, and when this check is in his or her possession the sliding bar d bearing his or her number must necessarily be fully drawn out to the front or left hand and locked, as shown in three cases in Fig. 1. On entering the workshop the employee inserts the staple or eyelet h' of his or her check into the recess or groove d^2 on the head of the sliding bar d bearing his or her number, which said groove is fully exposed beyond the end of the lug c' , whose curved nose assists in guiding it into the groove. In thus inserting the staple h' into groove d^2 it engages the end of the respective locking-lever f and elevates it sufficiently to raise the tooth f^2 thereon clear of the opening g in bracket c and unlocks the said bar d , which is then pushed inward by sliding the check over lug c toward the check-board until the tooth f^2 on lever f comes over the second opening g' in the bracket, into which it immediately drops and again locks the sliding bar d , this time at the inward extent of its movement, as shown in the remaining cases in Fig. 1. On arriving at the end of its inward movement the groove d^2 is brought opposite the recess c^3 , into which the workman allows the staple of the check to drop and hang suspended therefrom. On leaving work the check is raised out of the recess c^3 to bring the staple h' into the groove d^2 , in doing which the locking-lever f is elevated and the tooth f^2 thereon raised clear of opening g' , whereupon the bar d is drawn out by sliding the check over lug c until the staple h' thereof is clear of the end of the said lug, the check thus being released for the employee to take away with him, and at the same time allowing the tooth f^2 on the locking-lever f to register on the opening g and lock the bar d in position for the next insertion of the check. In the inward and outward movement of the sliding bars d by the introduction and removal of the numbered checks the toe-pieces or cams k on said bars by the engagement of the screws k' with one end of the slots k^2 are carried under the rolls m' on the tumbling-levers m , which are thereby elevated, as indicated by broken line in one instance in Fig. 1 and shown in full line in Fig. 3, and by means of wires o elevate the type-levers p . Shortly after the apices of the toe-pieces or cams k have passed the centers of the rolls m' , as represented at Fig. 3, the weight of the tumbling-levers and connections, acting against the surfaces over which the rolls are then descending, causes the said toe-pieces to shoot forward in the direction of movement of the bars d to the extent of the slots k^2 , the rapidity of their movement allowing the tumbling-levers m to drop quickly, whereby the type-levers p in the impetus of their down-

ward fall compress the springs o' and strike the inking-ribbon w against the platen s with a sharp stroke, the springs o' immediately retracting the said type-levers clear of the inking-ribbon and reinstating them in their normal positions. The tension of the retracting-springs o' may be adjusted as required by the nuts o^2 .

In Fig. 6 we show an alternative device for actuating the tumbling-lever and giving a quick release after each elevation of the lever, this device comprising an arm or lever k , pivoted to the bracket c and engaging, according to the direction of movement of the sliding bar d , with one or other of two studs k^2 , secured to the said sliding bar, which turns the arm or lever k over on its center and brings it into contact with the roll m' , thereby elevating the tumbling-lever m , the arm or lever k falling quickly away from the roll m' after passing the dead-center of same, as in the case of the toe-piece or cam previously described, to give a sharp quick stroke to the type-lever.

In Figs. 7, 8, and 9 we show a modification of the actuating mechanisms as provided for captive checks. The checks h in this case are each permanently hinged to the outer end of a spindle d , supported in bearings in the bracket c , the inner end of said spindle having a disk x fast thereon, from which projects a pin or roll x' , which extends into and is adapted to engage with the extremities of a slot or recess x^2 , cut in the smaller radii of a cam or tappet x^3 , loosely mounted on the spindle d adjacent to the disk x . The numbered check h bears on the obverse side the word "Out" and on the reverse side the word "In," and on entering the workshop or leaving it the said check is turned by the workman to present the word "In" or the word "Out," as the case may be, and in doing this a half-turn is given to the spindle d and disk x , the stud or roll x' whereon engages with one end of the slot or recess in the cam x^3 and rotates it to a corresponding extent, the said cam riding under the tumbling-lever m and elevating it and the type-lever connected therewith, as in the manner already described, the cam x^3 , by reason of the slot or recess x^2 , falling quickly away from lever m after its longer radii has passed under it and being arrested by the engagement of the opposite end of the slot or recess with the roll x' on disk x , and therefore held in readiness for the next half-turn back again of the spindle d . A stop-piece y is secured to the spindle d and engages with the bracket c at each extremity of motion and holds the parts in their respective positions.

The ribbon on strip of paper or chart t is ruled transversely with lines spaced at short distances apart to divide the paper into a series of columns extending from edge to edge of the paper, at the head of each of which columns is printed the time of day that it will be brought by the controlling action of

the clockwork directly under the series of type-levers, so that as they are actuated within the period of time for which the column stands the numbers on the type-levers will be printed in said column. We prefer to arrange the type on the levers p at right angles thereto, so that the impressions obtained from same will be perpendicular when viewed from the longitudinal edge of the paper, somewhat as illustrated at Fig. 2, and render the reading of the numbers for the in and out periods of the day easy and expeditious. The type may be arranged to face either edge of the paper, according to the order of numbering of the actuating devices on the check-board.

Instead of the selected periods of time for recording the arrival and departure of work-people being printed beforehand on the margin of the paper strip t any ordinary arrangement of type-disks for printing the hours and minutes of the day may be applied conveniently for printing same on the paper opposite the type-levers as it is fed forward synchronously with the movement of the clockwork, the said type-disks being actuated from the clockwork as usual in time-recorders which print the exact times of arrival and departure of work-people on cards or sheets of record.

We claim as our invention—

1. In a workman's time-recorder, the combination, with a series of type-levers for printing the record, of a series of pivoted tumbling-levers, a series of wires connecting the type-levers with the tumbling-levers, a series of springs for raising the type-levers, and a series of operating-bars provided with tappet mechanisms for raising the tumbling-levers and permitting them to drop suddenly, substantially as set forth.

2. In a workman's time-recorder, the combination, with a pair of rolls for traversing the record-sheet, of two ratchet-toothed wheels u^2 and u^3 secured to one of the said rolls and having their teeth arranged in opposite directions, a pivoted operating-lever v having a tooth which engages with the wheel u^3 and having also a pawl u^4 which engages with the wheel u^2 , a pivoted check-pawl v^8 engaging constantly with the wheel u^2 , and a hooked stop-pawl v^{10} normally resting on the pawl u^4 and engaging with the wheel u^3 after the pawl u^4 commences to revolve the wheel u^2 , substantially as set forth.

3. In a workman's time-recorder, the combination, with a stationary supporting-bracket, of a slidable operating-bar, a tappet operated by the bar and movable to a limited extent longitudinally of it, a pivoted tumbling-lever operated by the said tappet, and record-printing mechanism actuated by the said lever, substantially as set forth.

4. In a workman's time-recorder, the combination, with a stationary supporting-bracket, of a slidable operating-bar, a tappet which rests on the said bracket and is pro-

vided with a longitudinal slot, a pin projecting from the bar and sliding in the said slot, a tumbling-lever operated by the said tappet, and record-printing mechanism actuated by the said lever, substantially as set forth.

5 5. In a workman's time-recorder, the combination, with a stationary supporting-bracket, of a slidable operating-bar provided with a detent which locks it to the bracket at the extremities of its travel, record-printing mechanism actuated by the said bar at each extremity of its travel, and a workman's time-check provided with a projection for releasing the detent and engaging with the said bar, substantially as set forth.

10 6. In a workman's time-recorder, the combination, with a stationary supporting-bracket provided with a projecting portion having a notch in its upper side, of a slidable operating-bar provided with a longitudinal

slot in its under side and a cross-slot in its front portion which registers with the notch in the bracket when the said bar is pushed back, a detent pivoted in the said longitudinal slot and projecting into the cross-slot and locking the bar to the bracket at the extremities of its travel, a workman's time-check provided with a projection for engaging with the cross-slot and notch, and record-printing mechanism actuated by the said bar at each extremity of its travel, substantially as set forth.

In testimony whereof we affix our signatures in presence of two witnesses.

FRANK BROOK.
JOSEPH SHAW GAUNT.

Witnesses:

ELDON ALFRED KING,
JOHN RICHMOND HARPHAM.