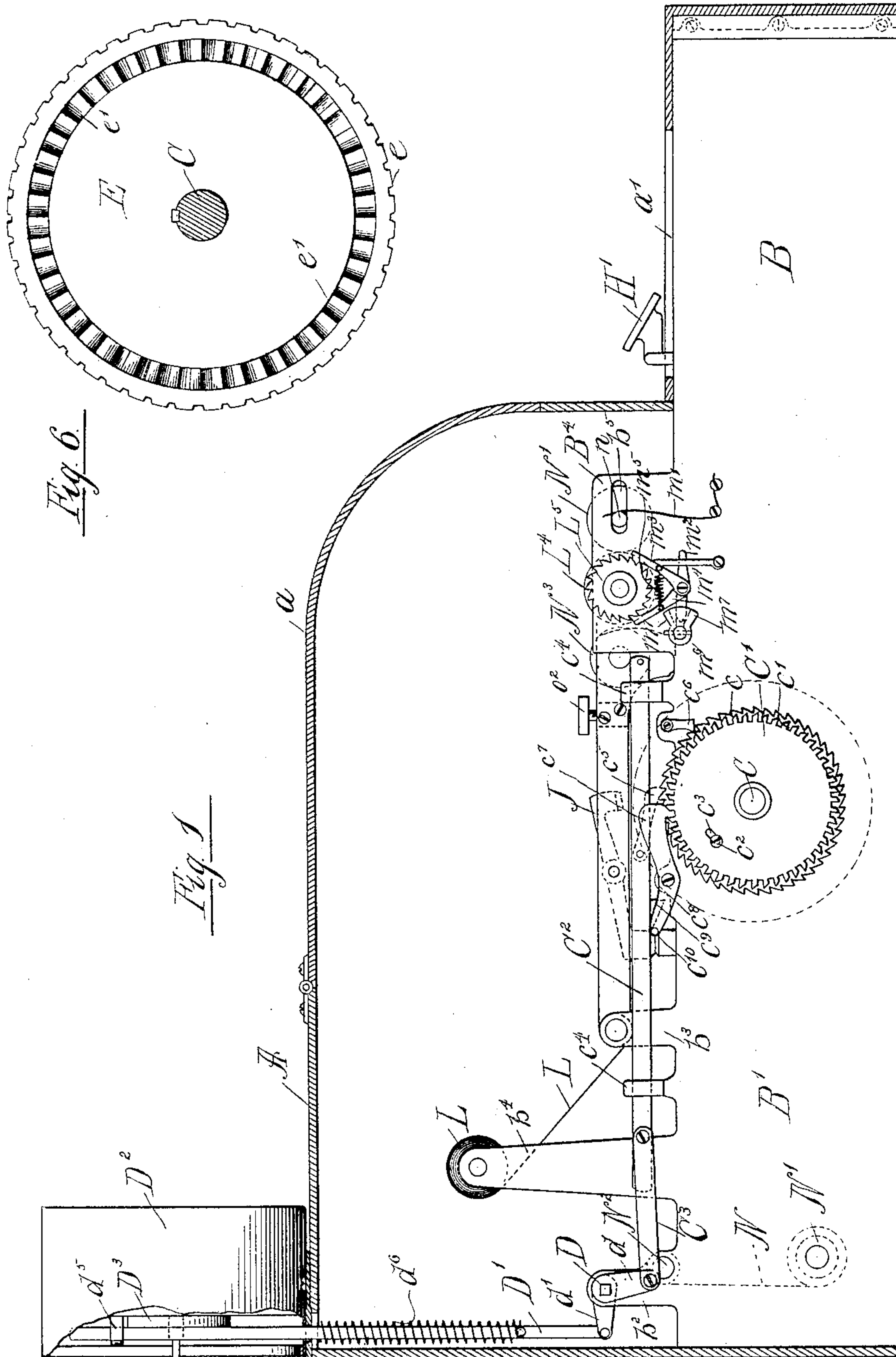


J. W. DEÜBNER.
WORKMAN'S TIME RECORDER.

No. 600,259.

Patented Mar. 8, 1898.



Witnesses

Clinton Hamlin
John W. Adams.

Inventor

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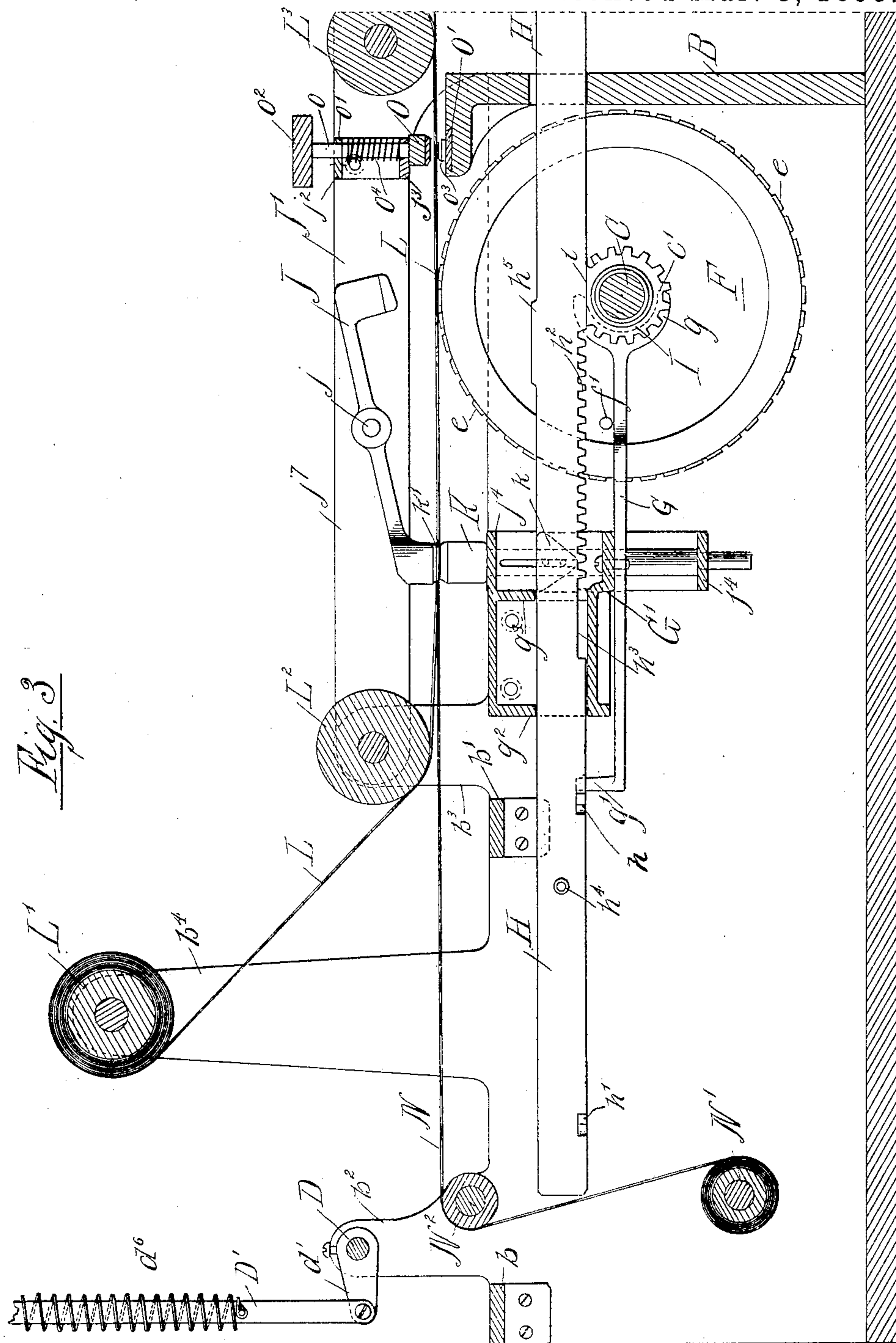
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9 Sheets—Sheet 3.

J. W. DEÜBNER.
WORKMAN'S TIME RECORDER.

No. 600,259.

Patented Mar. 8, 1898.



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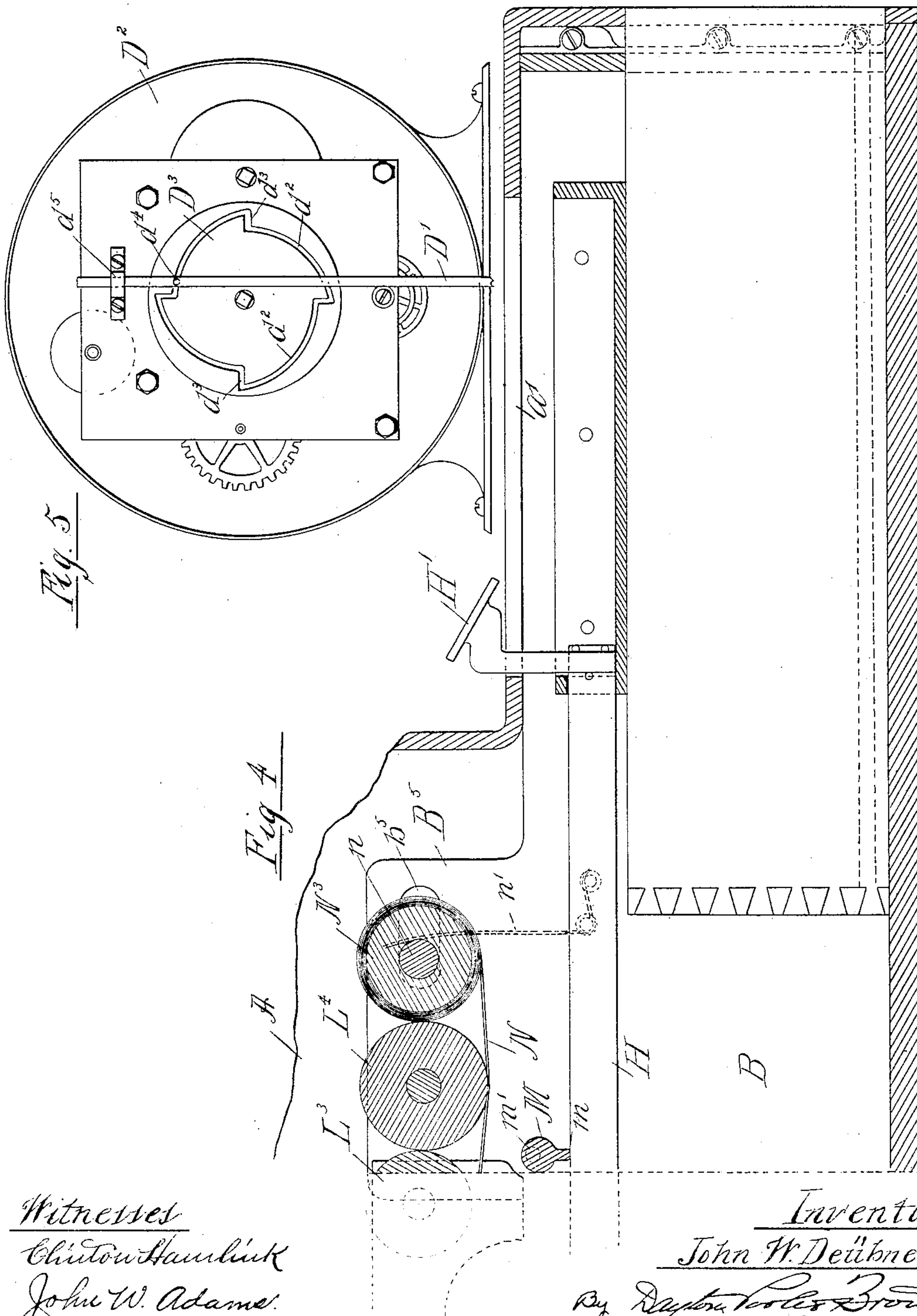
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J. W. DEÜBNER.
WORKMAN'S TIME RECORDER.

No. 600,259.

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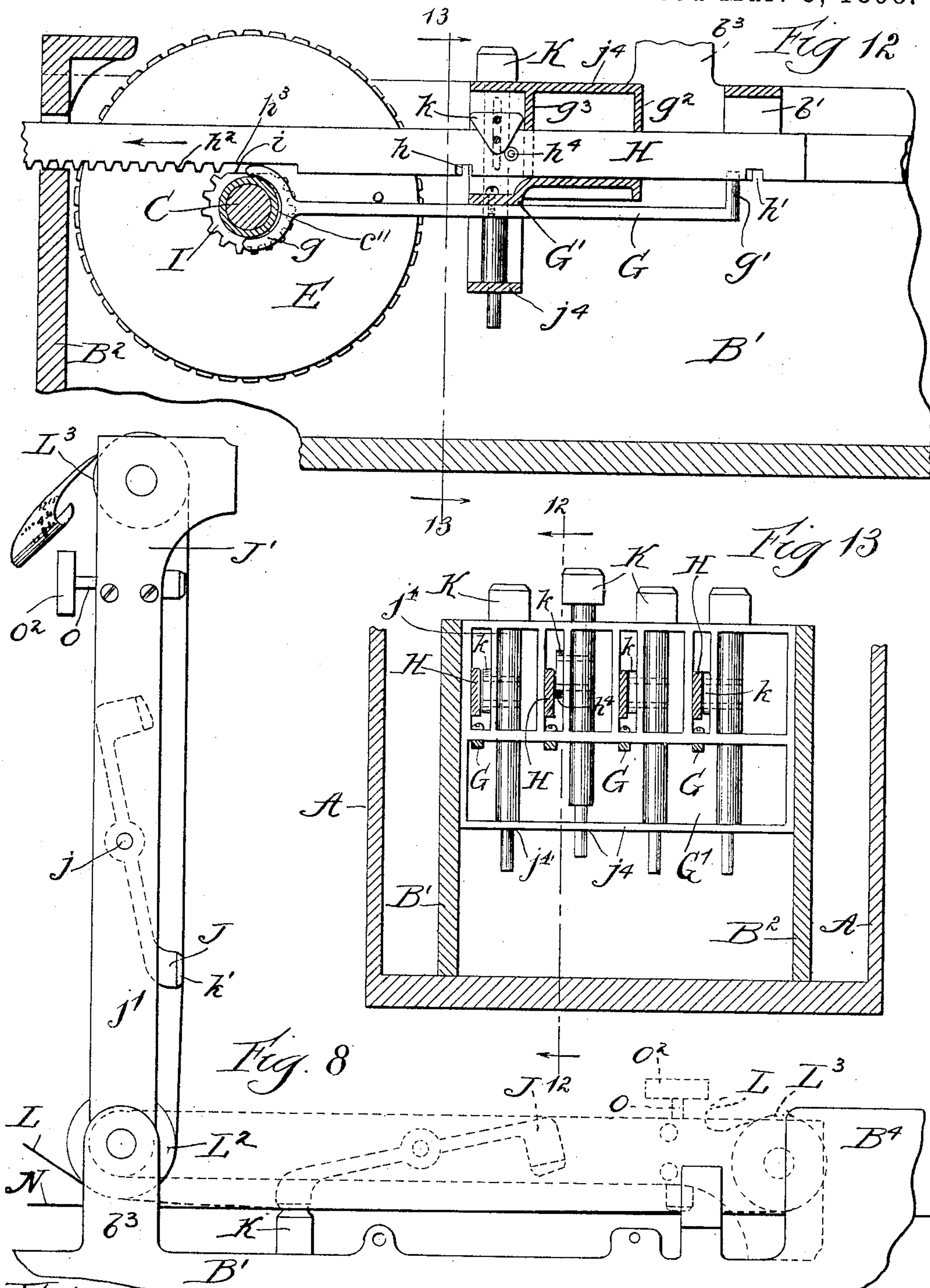
(No Model.)

9 Sheets—Sheet 5.

J. W. DEÜBNER.
WORKMAN'S TIME RECORDER.

No. 600,259.

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WORKMAN'S TIME RECORDER.

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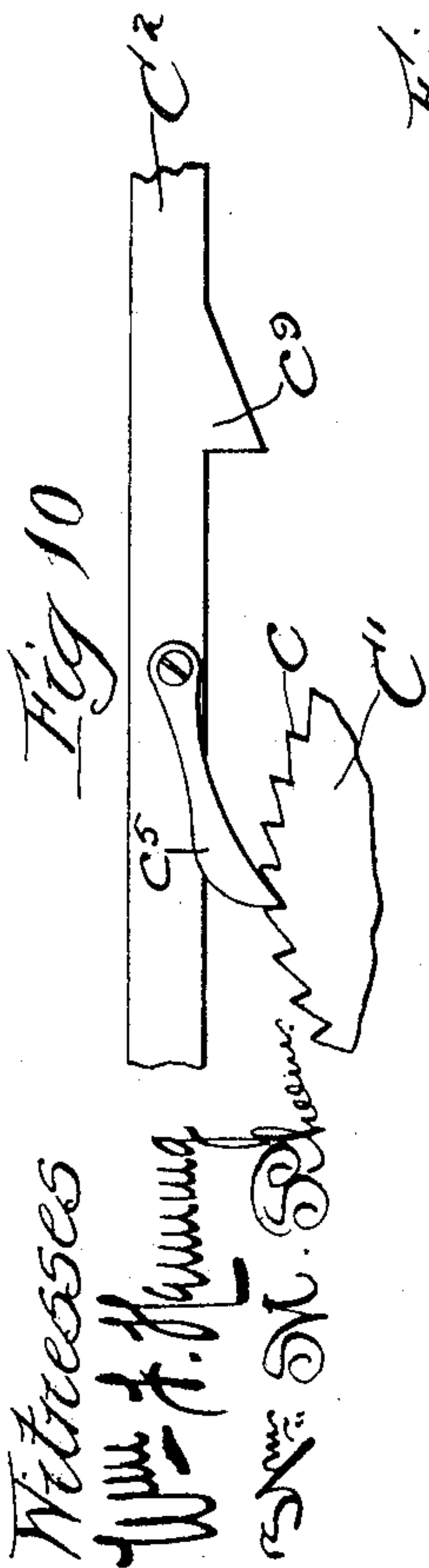
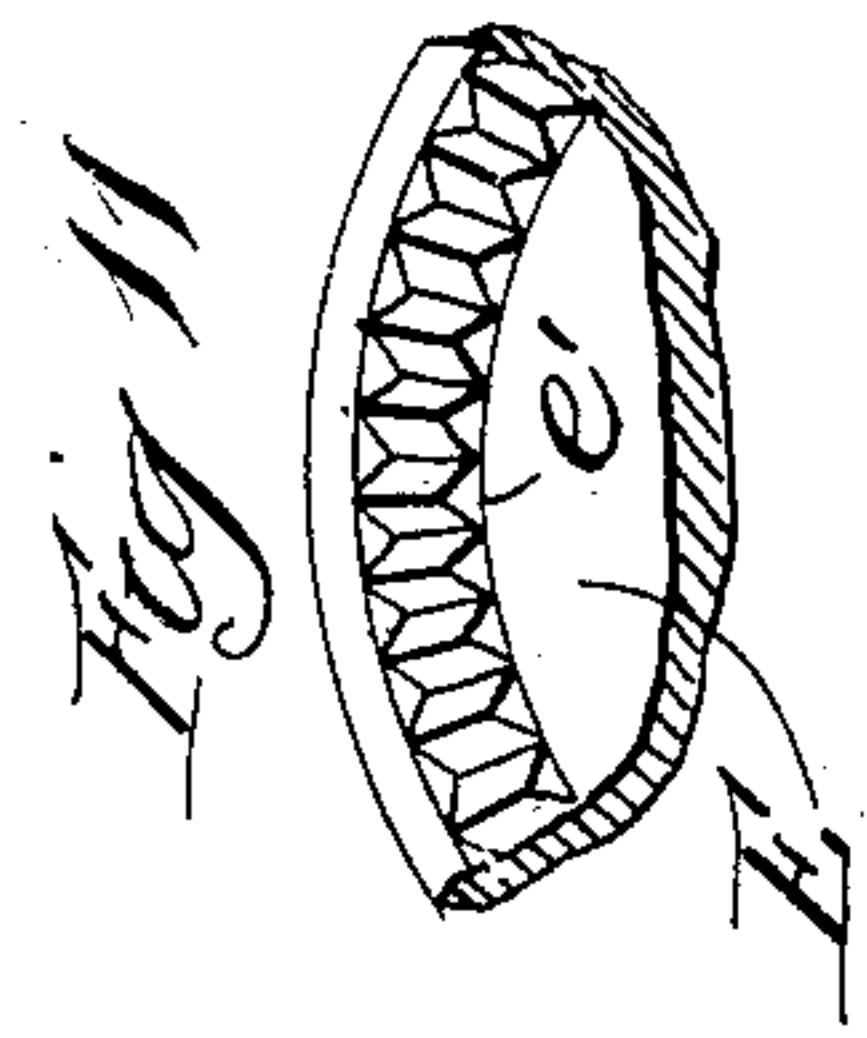
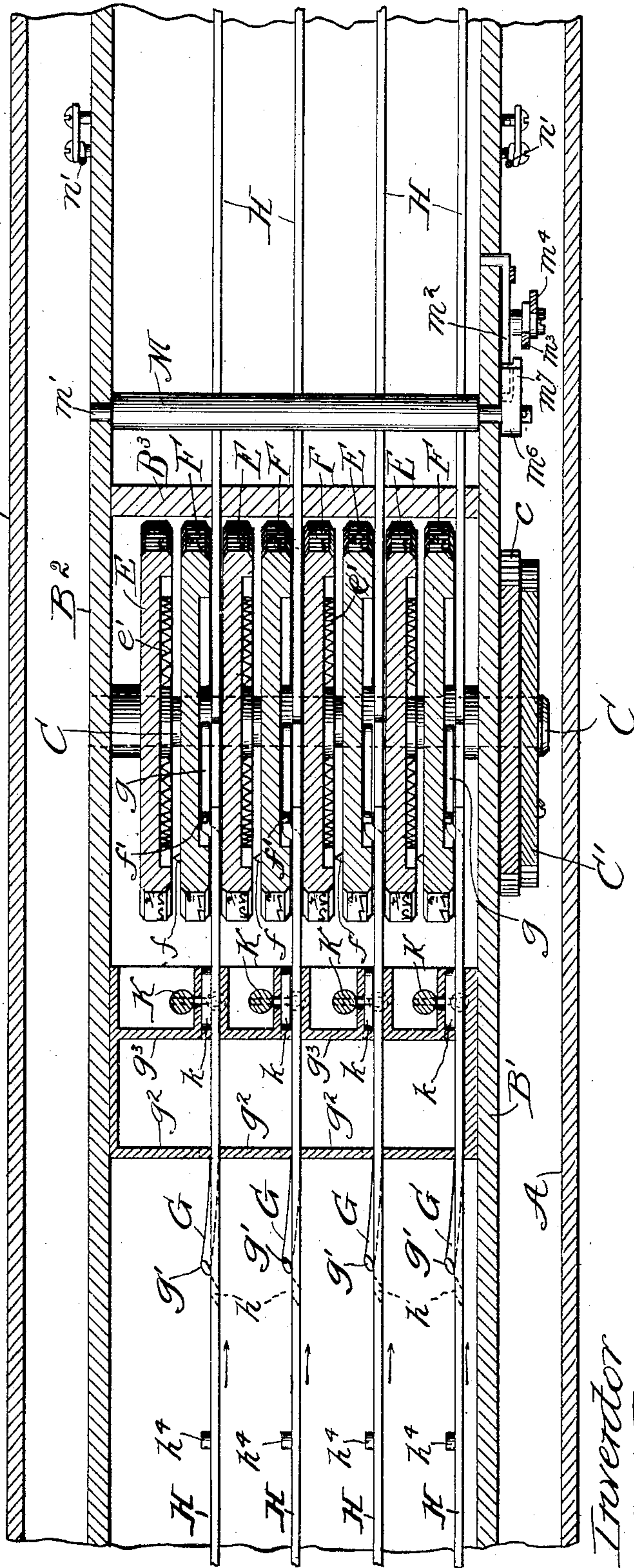


Fig. 9



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(No Model.)

9 Sheets—Sheet 7.

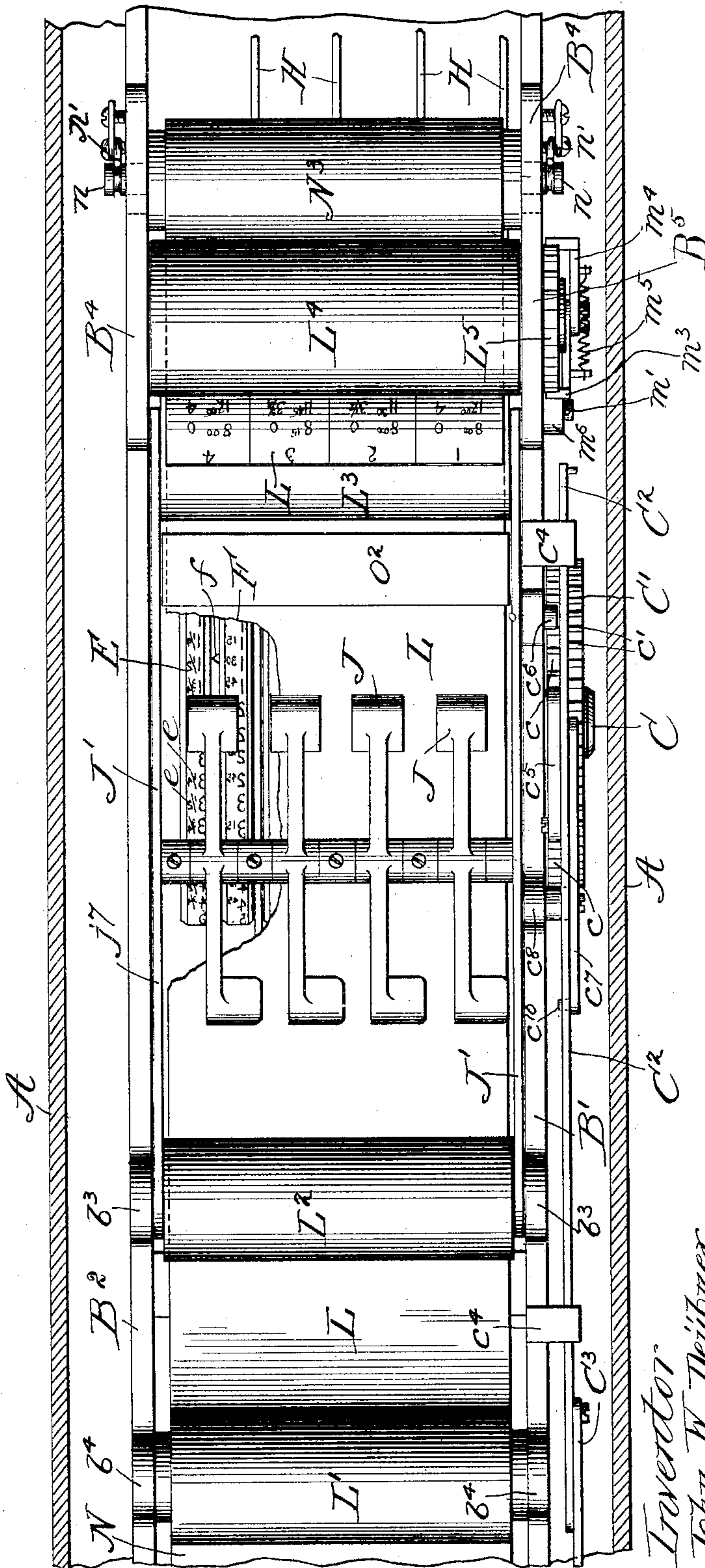
J. W. DEÜBNER.
WORKMAN'S TIME RECORDER.

No. 600,259.

Patented Mar. 8, 1898.

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Witnesses
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Jm. W. Shenn.



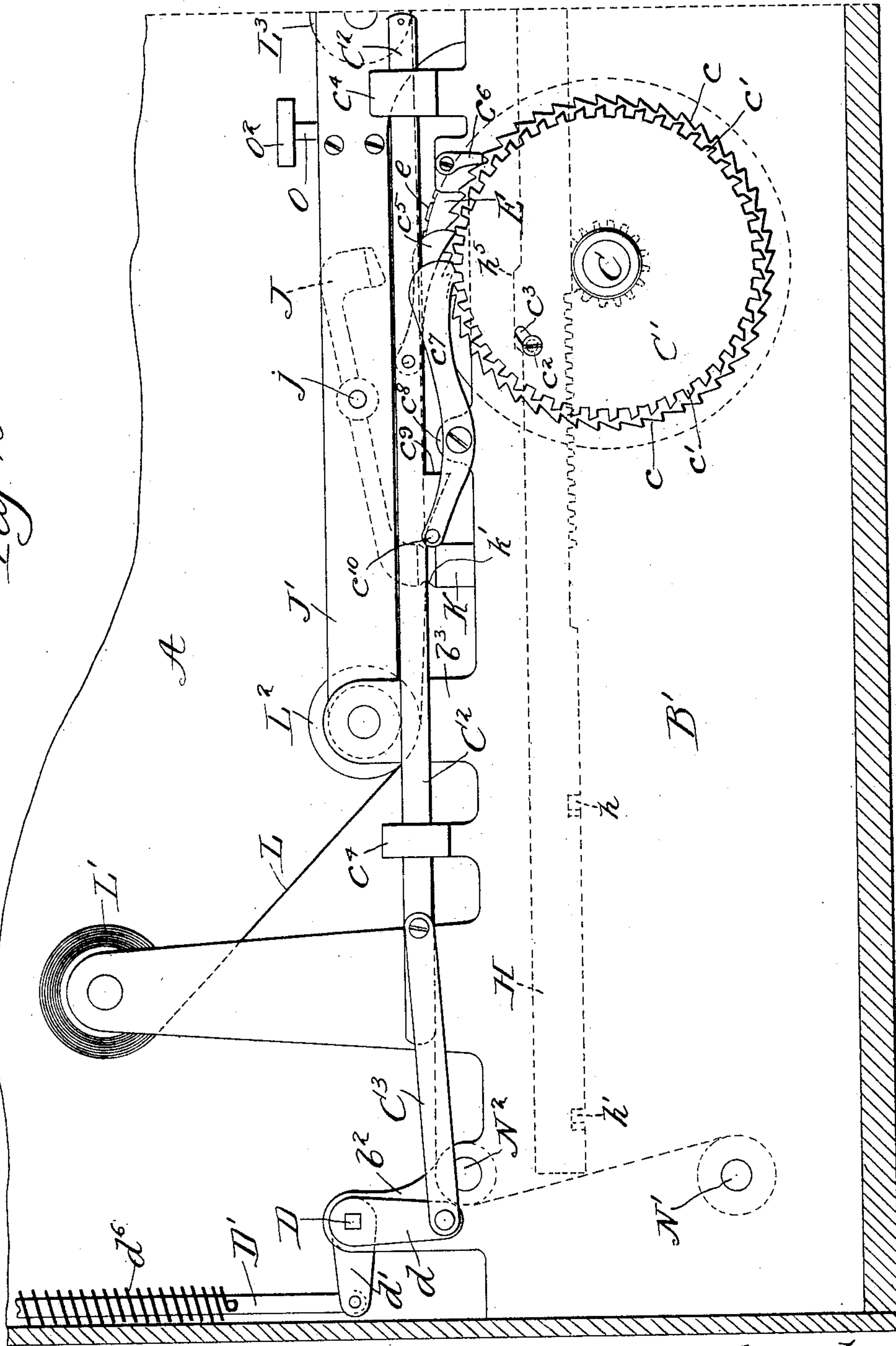
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J. W. DEÜBNER.
WORKMAN'S TIME RECORDER.

No. 600,259.

Patented Mar. 8, 1898.

Fig 15



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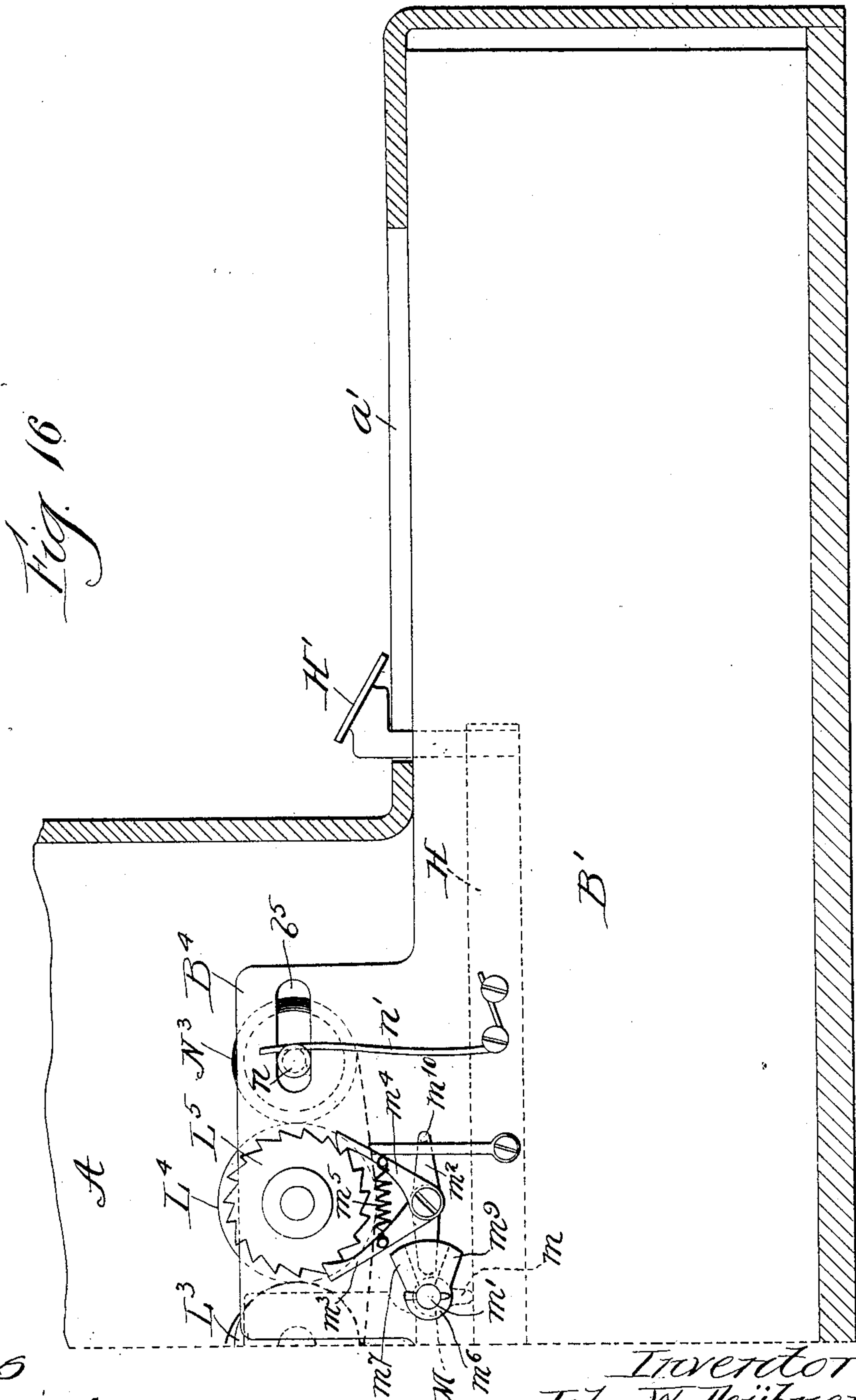
(No Model.)

9. Sheets—Sheet 9.

J. W. DEÜBNER.
WORKMAN'S TIME RECORDER.

No. 600,259.

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Inventor
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his Atty

UNITED STATES PATENT OFFICE.

JOHN W. DEÜBNER, OF CHICAGO, ILLINOIS, ASSIGNOR, BY DIRECT AND MESNE ASSIGNMENTS, TO THE CHICAGO TIME REGISTER COMPANY, OF SAME PLACE.

WORKMAN'S TIME-RECORDER.

SPECIFICATION forming part of Letters Patent No. 600,259, dated March 8, 1898.

Application filed May 3, 1895. Serial No. 547,997. (No model.)

To all whom it may concern:

Be it known that I, JOHN W. DEÜBNER, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Time-Recorders; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to an improved time-recording machine designed for use principally in factories and large establishments where it is necessary to record the time of the employees.

More specifically the invention pertains to an improved apparatus by which each workman has an individual recording device which by being operated at the beginning and end of any determined interval of time records the time of day when said interval commenced, the time of day when it terminated, and the total duration of said period of time in hours and fractions of hours.

The object of the invention is to produce a record of improved form and arrangement, facilitate the operation of recording, provide improved means of guarding against errors or inaccuracies, and provide an improved simple construction in a machine adapted to effectively carry out the above objects.

The invention consists in the several matters hereinafter described, and more particularly pointed out in the appended claims, and may be more readily understood by reference to the accompanying drawings, in which—

Figure 1 is a side elevation of a machine embodying my invention, the side casing being removed to expose the working parts of the machine. Fig. 2 is a top plan view of the machine with parts of the casing broken away to expose the mechanism beneath. Figs. 3 and 4 are enlarged vertical longitudinal sectional views taken on lines 3 3 4 4 of Fig. 2. Fig. 5 is a rear elevation of the clock mechanism, the back casing being removed to expose the operative parts. Fig. 6 is an inner face view of the fixed type-wheel. Fig. 7 is a view of a recording-sheet, showing the form of record produced by the machine.

Fig. 8 is a side elevation of a portion of the upper central part of the machine, (casing removed,) showing the swinging frame lifted up to permit inspection of the record. Fig. 9 is a horizontal sectional view taken on a level with the upper edges of the key-bars, including, however, the rocking bar M, overhanging said key-bars in full lines. Fig. 10 is a fragmentary view showing that part of the actuating-bar carrying the pawl, the cam projection which acts on the gravity-detent, and a portion of the ratchet-wheel which the pawl engages. Fig. 11 is a fragmentary perspective view of a part of one of the fixed type-wheels, showing particularly the V-shaped recesses thereof. Figs. 12 and 13 are longitudinal and transverse vertical sections, respectively, taken on lines 12 12 of Fig. 13 and 13 13 of Fig. 12, respectively, showing more particularly the arrangement of the key-bar, the cam-slots therein, the shipping-lever actuated thereby, and the arrangement of the parts whereby the plunger is actuated by the cam-stud carried by the key-bar. Fig. 14 is a top plan view of the interior mechanism of the machine, the end portions being broken off to reduce the length of the figure and a portion of the recording-sheet and inking-ribbon being broken out to expose the type-wheels beneath. Figs. 15 and 16 together constitute a full-length side elevation of the machine with the proximate side of the outer casing removed, some of the parts located behind or within the side frame-piece being indicated in dotted lines.

Described in general terms, a machine adapted to carry out my invention comprises as its main features two movable printing-forms or impressing devices, one provided with a series of characters representing the time of day and actuated by any suitable clock mechanism, so as to present at a proper printing-point at any time of day the proper printing characters corresponding to that time of day, the other normally stationary and provided with a series of printing characters to indicate any predetermined divisions of time arranged in progressive order from zero upward and adapted to be locked

to the first-mentioned movable form at any point of travel of the latter and to thereafter move with it.

The invention also comprises a recording-sheet arranged to receive impressions of the combined characters presented at any time by said forms, an impressing device for bringing the sheet into printing contact, and means for effecting the locking together and unlocking of the printing-forms and for returning the normally stationary form to zero at the end of each interval of time recorded.

Obviously these several features may be embodied in various forms, so as to satisfactorily accomplish their several purposes. I will herein describe a single operative form; but I do not desire to be limited thereto in the construction of the appended claims.

Referring to said drawings, A designates as a whole a suitable case within which is enclosed the principal mechanism of the machine. The box is provided with a hinged cover portion *a* at its top, which may be lifted up to afford access to the recording sheet and mechanism, and also with a series of slots *a'*, through which project a series of operating or key bars, as hereinafter described.

B designates as a whole an inner frame comprising side frame-pieces or castings *B'* *B*², a cross-partition *B*³, and cross-braces *b* *b'*.

C designates a main shaft journaled transversely in the side frames *B'* *B*².

C' indicates a ratchet-wheel mounted upon the shaft C adjacent to and outside of the frame-piece *B'* and provided with a double series of peripheral ratchets *c* *c'*. The two series of ratchets have an equal number of notches, and in order that one series may be adjusted with relation to the other the two series are formed on separate disks, which are adjustably secured together by a screw *c*², extending through a circumferential slot *c*³ in one disk and engaging a tapped hole in the other. One of said disks is keyed or otherwise fixed rigidly upon the shaft C.

C² indicates a reciprocating actuating-bar mounted to slide in bearings *c*⁴ *c*⁴ on the frame *B'*, so as to extend horizontally above the ratchet-wheel C', and carrying a pivoted gravity-pawl *c*⁵, which acts to turn the said ratchet-wheel a single notch at a time at each movement of the bar toward the front end of the machine.

*c*⁶ is a detent pivoted on the frame *B'* and acting to prevent the ratchet-wheel from being turned backward by the return movement of the bar C².

*c*⁷ indicates a gravity-detent engaging the series of ratchets *c'* in such manner as to positively limit the forward movement of the ratchet-wheel C' as a whole to a single notch upon each reciprocation of the actuating-lever. Said detent is pivoted upon a bracket *c*⁸, formed on the frame *B'*, and is actuated by an inclined cam projection *c*⁹, formed on the under side of the bar C², which engages a pin *c*¹⁰, projecting at right angles from the

tail end of the detent, and holds said pawl normally raised or free from the ratchet-wheel while the bar C² is in its rearward position. 70

The bar C² is actuated from a crank-arm *d*, secured upon the end of a transversely-arranged rock-shaft D, journaled in upright supports *b*² *b*², rising from the side frames *B'* *B*², the connection between the crank-arm 75 and sliding bar being afforded by means of a link C³.

The rock-shaft D is actuated by means of a bar D', connected with a second rigid crank-arm *d'* on the shaft D and extending from 80 thence to a clock mechanism indicated as a whole by D² and shown in the present instance as consisting of a clock of common construction mounted upon the top of the rear part of the case, the bar D' extending 85 up through a suitable aperture in the top wall of the case.

D³, Fig. 5, designates a cam-plate fixed upon the minute-hand spindle of the clock, said plate being provided with a circumferential 90 series of cam-grooves *d*², arranged spirally with reference to the axis of the plate and connected by radial cam-grooves *d*³. The bar D' is arranged to extend alongside of and approximately diametrically across said cam- 95 plate and is operatively connected with the latter by means of a cam stud or pin *d*⁴, projecting at right angles from the bar and engaging the cam-groove, the upper end of the bar being mounted to slide in a bearing *d*⁵, 100 which prevents lateral movement of the bar. Obviously when thus constructed and arranged the bar D' will be gradually raised and allowed to drop abruptly as the cam-plate is rotated and the rock-shaft thereby oscil- 105 lated to move the ratchet-wheel C' forward a notch as many times in an hour as there are spiral-groove sections and corresponding radial grooves. In the present instance four are shown, and the ratchet C' will therefore 110 be moved forward a notch once every quarter-hour or fifteen minutes. In order that the bar D' may be caused to drop promptly, it is shown as provided with a coiled compression-spring *d*⁶, which is arranged to aid 115 the gravity of said lever. It is to be noted in this connection that by reason of the contour of the cam-grooves, if for any reason the bar D' should be prevented from dropping, the clock mechanism will be stopped by the 120 engagement of the stud *d*⁴ with the outer side of the radial part of the cam-groove.

Next describing the printing devices proper, it is to be observed that the machine herein shown is adapted for recording the time of 125 but four workmen, but that in practice the machine will be provided with as many additional recording devices and corresponding keys as may be found desirable, such additional recording devices simply increasing the 130 width of the machine, but requiring no additional driving mechanism. Inasmuch as all of the individual printing mechanisms are alike, reference will be made herein to but a

single set, it being understood that the same description applies to any number of duplications.

E designates a type-wheel (best shown in Figs. 3 and 9) rigidly keyed upon the main shaft C at a point between the frames B' B², which is provided on its periphery with groups of printing characters *e*, indicating the time of day by quarter-hours from one o'clock to twelve, each group corresponding to a single notch of the ratchet-wheel C'.

F indicates a second type-wheel similar to and of the same diameter as the wheel E, mounted loosely upon the shaft C adjacent to the fixed wheel and adapted to be shifted out of or into engagement with said fixed wheel.

The wheel F is provided with a series of characters designating time by hours and quarter-hours, (the latter being indicated in the present instance in the form of fractions, so as to facilitate footing and to distinguish more clearly from the characters of the fixed wheel,) running from "0" to "12."

In order that the loose wheel may be locked, so as to move with the fixed wheel E, and at the same time the groups of characters be brought into register with each other in whatever relative position the two wheels happen to be when the loose one is shifted up to the other, the fixed wheel is provided in its proximate face with an annular series of V-shaped recesses *e'* (see detail Fig. 11) and the loose wheel with a conical stud or boss *f*, adapted to engage and fit within said recesses.

Means for shifting the loose wheel out of or into engagement with the fixed wheel are provided as follows: G indicates a shipping-lever (see Figs. 3, 9, and 12) having at one end a yoke *g*, engaged with an annular groove *c*¹¹, formed on the hub of the wheel F between the approximate faces of the gear I and said type-wheel F and extending rearwardly and pivoted midway of its length to the lower side of a support G', so as to oscillate in a horizontal plane. The shipping-lever is of spring metal and is provided with an upturned end portion *g'*, which normally rests against one side or the other of a sliding key-bar H, mounted to slide horizontally above the shipping-lever in suitable guides *g*² *g*³, formed in the support G'.

h *h'* indicate two cam-slots cut diagonally through the key-bar H at its lower side (see Fig. 12) at such points that one of them will be carried past the upturned end of the shipping-lever just before the key-bar H reaches the end of its throw in each direction. The said slots are of such size and depth as to permit the upturned end *g'* of the shipping-lever to pass therethrough, the latter being formed relatively thin in cross-section and arranged to stand in a diagonal vertical plane corresponding to that of the slots *h* *h'*, so as to facilitate the passage of the said end through the slots. The end *g'* of the resilient shipping-lever is arranged so as to tend to stand in a vertical plane between the two planes of

the opposite sides of the lever H when the loose wheel is shifted to either position, so that when said end is carried through to either side by the cam action of one of the slots it will bear against the side of the lever and enter the return-slot when the lever is shifted so as to permit it. The arrangement is such that the loose wheel will be shifted into engagement with the fixed wheel when the lever H is pulled out toward the front of the machine and disengaged therefrom when it is returned.

In order that the loose wheel F may be returned to zero each time after it has been disconnected from the fixed wheel, ready to commence the recording of a new interval of time, the hub of said shifting wheel is provided with a concentric gear I, adapted when the wheel F is shifted away from the other to intermesh with rack-teeth *h*² formed on the under side of the key-bar H. The gear I is flattened or has its teeth cut away at one side, as at *i*, so that when it has been returned to zero the flattened side will come opposite the rack-teeth, and thus allow the remaining part of the rack-teeth to be carried past without turning the wheel. This flattened portion *i* by engagement with the lower side of the key-bar H also serves the further purpose of preventing the loose wheel from being carried around by frictional engagement with the shaft C during the time it rests loosely upon said shaft.

In order that the loose wheel may be positively stopped when it reaches the zero-point, a stop or pin *f'* is arranged to project outwardly therefrom in position to engage with the upper side of the shipping-lever G.

In order that the gear I may be shifted beneath the rack in position to intermesh therewith without interference, the teeth are omitted for a short space, as at *h*³, at that part of the key-bar which will be opposite the gear when the bar is just starting rearward, and at which time the shifting of the gear into position to mesh occurs.

Next describing the mechanism by which an impression is taken upon a recording-sheet of the combination of characters presented at the printing-point at any time, J, Figs. 3, 8, and 14, designates an impressing-lever pivoted between its ends upon a cross-bar *j*, which is mounted between the two side members *j'* *j'* of a swinging frame J', pivoted at its rear end between two standards *b*³ *b*³, rising from the side frames B' B², respectively. The impressing device or lever J is actuated by means of a vertically-reciprocating plunger K, mounted adjacent to the key-bar to slide in suitable guides or bearings *j*⁴ *j*⁴ in the support G', which plunger engages with its upper end the rear end of said lever J and by lifting the latter forces its opposite end down upon the type-wheels. The plunger is provided on its side adjacent to the key-bar H with a V-shaped cam *k*, which is engaged and forced upward by a cam-stud *h*⁴, mounted

on the key-bar H, both in the forward and rearward movement of the latter. The under side of the contracting end of the lever J, against which the plunger K acts, is provided with a longitudinally-arranged knife-edged character or scoring device k' , which operates, in conjunction with the end of the plunger K, to score or rule the recording-sheet, as hereinafter described.

The forward end of the impression-lever is provided with a suitable yielding impression-surface, preferably of rubber, of such size as to impress the recording-sheet L upon the characters of any single group or combination presented at the printing-point by the two type-wheels locked together as described.

The recording-sheet L is preferably, although not necessarily, in the form of a strip or web wound into roll form, which roll is shown as mounted upon a suitable roller L', journaled in uprights b^4 b^4 , rising from the frames B' B².

From the roll L' the strip of paper is led beneath a guide-roller L², mounted at the rear end of the swinging frame J', thence between the pivoted impressing-lever and the type-wheels and up between a roller L³, mounted in the forward end of the frame J', and a rubber-surfaced driven feed-roller L⁴, journaled in supporting side plates B⁴ B⁵, extending upward from the respective side frames B' B².

Inasmuch as the machine is arranged to make a recording impression both when the key-bar is drawn forward and when it is pushed back, it is necessary that the recording-sheet be moved forward a step at each movement of the bar in either direction. It is desirable that the records made of the time at which the several workmen commenced work and when they ceased work be recorded in straight lines or rows extending transversely across the sheet. In order that this may be accomplished, it is necessary that the sheet-feeding devices be so arranged that the outward or forward movement of the key-bar first actuated will cause the sheet to feed forward a step, while the drawing out of any of the remaining bars will have no effect on the feeding mechanism, and similarly when the first workman pushes in his key-bar the sheet will be fed forward a step; but none of the succeeding bars will move the sheet when they are moved inward. Mechanism for thus feeding forward the recording-sheet is provided as follows:

M (see Figs. 4, 9, and 16) designates a rock-bar journaled transversely in the side frames B' B² a short distance above the key-bars H and provided throughout its length with a radial web or rib m , which normally depends in position to be engaged by a cam projection h^5 formed on the upper side of the key-bar H. The cam projection h^5 is so formed as to first oscillate the rock-bar M out of its path and thereafter pass beneath the same when the key-bar is shifted in either direction, and is of such length and so located with relation to

the stud h^4 , which actuates the impressing device, that the bar will be oscillated just before the impression is made in each case. In order that the pendent web m may more certainly resume a vertical position, so as to be reengaged by the return movement of the bar H, its journals m' are arranged eccentrically of the center of the bar, so that part of the weight of said bar aids to bring the web or flange to a vertically-depending position.

m^2 , Fig. 16, indicates an arm pivoted at one end m^{10} to the side supporting-plate B⁴, adjacent to the end of the bar M, and carrying between its ends two pivoted pawls m^3 m^4 , which extend upward at opposite sides of and are held in yielding engagement with a ratchet-wheel L⁵, secured upon the shaft of the driving-roller L⁴ by means of a coiled contractile spring m^5 . The engaging ends of said pawls m^3 m^4 are oppositely arranged, so that one of the pawls, m^3 , acts to rotate the roller L⁴ when the arm m^2 is oscillated on its pivot to lift the pair bodily upward, and the other, m^4 , acts to rotate the said roller L⁴ when the arm m^2 is oscillated to pull down the pawls.

m^6 indicates a segmental-shaped arm secured rigidly upon the rock-shaft M adjacent to the free end of the arm m^2 , which segmental arm m^6 is provided on its face adjacent to the arm m^2 with ribs m^7 m^7 , extending above and below the loose arm m^2 and adapted to engage and oscillate the latter when the rock-shaft is oscillated by the key-bar, as hereinbefore described, the space between said ribs being such as to permit the web m to return to a vertically-depending position after the arm m^2 has been oscillated up or down without moving the latter.

By means of the foregoing mechanism an intermittent forward motion is imparted to the driving-roller, which by reason of its frictional engagement with the recording-sheet feeds the latter forward step by step.

N designates an inking-ribbon having its supply end coiled about a revoluble roller N', mounted in the rear end of the box, trained from thence over a guide-roller N², directly above the roller N', between the recording-sheet and type-wheels, and then to an idle-roller N³, about which the latter is wound. The trunnions n of the idle-roller N³ are mounted in horizontal slots b^5 b^5 , so as to permit a bodily movement of the roller toward and away from the roller L⁴ to provide for the accumulation of the ribbon thereon, and said roller is held in yielding contact with the feed-roller by means of wire springs n' n' , secured to the plates B⁴ B⁵ and arranged to act on the projecting ends of the trunnions to force the roller toward the feed-roller.

O, Fig. 3, designates a transversely-arranged bar provided with vertical guide-studs o , which slide in suitable guide-apertures o' o' , formed in the cross-bar j^2 , and having a suitable handle o^2 mounted upon their upper ends, by means of which the bar may be depressed.

O' indicates a form mounted upon the cross-partition member B³, beneath the bar O and the recording-sheet and ribbon, in position to receive the pressure of the bar O, said form
 5 being provided with a numeral-type or other identifying character o³, arranged to register with each of the double columns of the recording-sheet, by means of which the several individual columns may be marked by a single
 10 impression at the time a new sheet is begun, or at such intervals as desired, and each individual workman's column thus provided with means of identification by which it may be distinguished even if separated from the
 15 sheet. The impressing-bar O is shown as normally held up by means of coiled springs o⁴, which are interposed between them.

The operation of a machine embodying my invention is as follows: The clock mechanism
 20 being in operation and the fixed type-wheel driven forward through a step-by-step movement at uniform intervals of time and the several key-levers being in their inward position, as shown in the drawings, each allotted to an individual workman, the first workman passing to his work—say in the forenoon—will pull out his individual key-bar.
 The first effect of the outward movement of said bar will be to bring the foremost slot h
 30 of said bar opposite the upturned end of the lever, which will enter the slot and by the cam action of the latter be passed through to the opposite side of the bar, thereby shifting the loose wheel up into locked contact with
 35 the fixed wheel, so as to thereafter rotate with the latter. The further movement of the key-bar will bring the cam projection thereon into contact with the web of the rock-bar, and thus through the medium of the pawl-and-
 40 ratchet mechanism move the feed-roller forward a step to present an unprinted portion opposite the printing-point. A further movement of the key-bar brings the cam-stud thereon into engagement with the cam of the plunger,
 45 which is thus raised to oscillate the impressing-lever and cause the two type-wheels to record the character presented by them at the printing-point at this time. Inasmuch as the loose wheel is always returned to zero
 50 by the preceding inward movement of the key-bar, the characters presented by this wheel will obviously be a zero, or naught, while those presented by the other wheel will indicate the time of day—as, for instance, if
 55 the workman recorded at eight o'clock his record-sheet would show "8:00.0." Before the key has fully reached the limit of its forward movement the upturned end of the shipping-lever will come opposite the second cam-
 60 slot of said bar, but owing to the direction of inclination of said slot it will be prevented from passing therethrough. Owing to the frictional resistance of the feed-roller and to the fact that the lost motion provided between the ribs m⁷ of the segmental arm m⁶,
 65 the pawl-carrying arm m² permits the web or flange to swing down to a vertical position

without causing said pawls to move the ratchet-wheel of the feed-roller, the pawls
 will remain in their uppermost position until 70
 the rock-bar is oscillated in the reverse direction by the cam projection of one of the key-levers, and the pawls thereby positively
 forced or drawn down. Obviously, therefore, after the first workman has recorded his time 75
 any number of succeeding key-bars may be drawn out without again moving the paper forward, and the succeeding pairs of type-wheels will therefore register in a straight
 row or line across the paper or recording- 80
 sheet. Meantime while the workmen are coming in the clock mechanism is running, and at every interval of fifteen minutes the fixed type-wheel presents a new set of characters at the printing-point. Assuming that 85
 the second workman comes in and records at any time before the quarter-hour is past, his record will be the same as that of the first to register. Assuming that the third man records more than fifteen minutes after the 90
 clock has last moved the wheels—as, for instance, if he registers at sixteen minutes past eight—his record will be "8:15.0." As the workmen quit work each proceeds to the machine and pushes back his individual key-bar 95
 to its normal innermost position. As the first one to quit pushes in his bar its first action is to oscillate the rock-shaft and force the paper forward a step; next, to raise the plunger and oscillate the impressing-lever to make the 100
 record, and immediately after this occurs the rearmost slot of the key-lever comes opposite the upturned end of the shipping-lever, the latter passes through, and the loose type-wheel is shifted over out of engagement with 105
 the fixed wheel and into position for its gear to intermesh with the rack-teeth of the key-bar. The continued backward movement of the key-bar turns the loose wheel back to zero, at which point it is stopped by the en- 110
 gagement of its stud with the shipping-lever.

It will be obvious from the foregoing description that the records of the time of the several workmen will usually be in transverse
 rows or lines, while the records of each indi- 115
 vidual for consecutive intervals of time will always be in double columns, one of which will show the times of day at which each recorded interval commenced and ended and
 the other showing simply the hours and frac- 120
 tions of hours worked. Obviously it will usually be desirable to record a number of days or even weeks upon a sheet before it is removed from the machine. When the sheet
 is taken from the machine, or at any desired 125
 time, each workman's total time may be ascertained with the greatest facility by simply footing the columns showing the hours worked. The making of the record in compact sheet form in the manner described is a 130
 great improvement over the prior art, in which the record has usually been produced either in the form of time-tickets for each interval or in the form of a continuous strip or rib-

bon, upon which the time of each workman was recorded, not in individual columns, but all together in one column, from which the time of any particular workman must be selected by means of identifying marks or numbers.

It is to be understood that the herein-described apparatus constitutes but one preferred means of performing my invention and that the same may be carried out in various other ways. It is also to be understood that the various details of construction of the apparatus described may be changed without departing from the spirit of the invention or the exercise of more than ordinary mechanical skill—as, for instance, the clock mechanism may be arranged to move the recording-wheels forward at shorter intervals apart, or the clock may be located within the case or differently connected with the recording mechanism. These and analogous changes I claim as being within the scope of my invention.

I claim as my invention—

1. A time-recording machine comprising a movable form bearing time-indicating characters, a clock mechanism having constant engagement with and actuating said form, a second backwardly and forwardly moving form also bearing time-indicating characters and located at one side of the movable form, locking means for detachably engaging the second form with and disengaging it from the clock mechanism and restoring means for moving backward the second form to its starting-point when disconnected from the clock mechanism.

2. A time-recording machine comprising a form bearing time-indicating characters, a clock mechanism having constant engagement with said form and moving it always in one direction, a second backwardly and forwardly moving form, also bearing time-indicating characters, manually-operated means for detachably engaging the second form with the clock mechanism, for releasing it from the same, and for moving said second form backwardly to its zero or starting point.

3. A time-recording machine comprising a movable printing-form, a clock mechanism having constant engagement with and actuating said form, a second, backwardly and forwardly moving form located at one side of the first form, means for detachably engaging the second form with and disengaging it from the clock mechanism, restoring means for moving the second form backwardly to its starting-point when released from the clock mechanism, an impression device acting at once against both forms, and manually-operated means, actuating said engaging, disengaging and restoring means, and said impression device.

4. A time-recording machine comprising a movable printing-form, a clock mechanism having constant engagement with and actuating said form, a second, backwardly and

forwardly moving form located at one side of the first form, means for detachably engaging it from the clock mechanism, restoring means for moving the second form backwardly to its starting-point when released from the clock mechanism, an impression device acting at once against both forms and a reciprocating member having operative connection with said engaging and disengaging means, and with the form-restoring means and with the impression device, said reciprocating member being contracted to operate the form-engaging means and impression device when moved in one direction, and to operate the form-disengaging means, the impression device and the form-restoring means when moved in the opposite direction.

5. A time-recording machine comprising a frame, a main shaft revolvably mounted therein, a ratchet-wheel non-rotatably mounted on the shaft, a clock mechanism acting on said ratchet-wheel to revolve it step by step, fast and loose type-wheels mounted upon said shaft, each having groups of printing characters spaced at corresponding intervals, means operating to lock the loose and fast wheels together and at the same time bring their groups of characters into register, and means for taking an impression of the combination of characters presented, substantially as set forth.

6. A time-recording machine comprising a frame, a main shaft mounted therein, a ratchet-wheel mounted on the shaft, a clock mechanism acting on said ratchet-wheel to revolve it step by step, fast and loose type-wheels mounted on said shaft, and means for shifting the loose wheel into and out of engagement with the fast wheel comprising a sliding bar arranged to extend transversely of the main shaft adjacent to said wheel, cam-surfaces on said bar, and a shipping-lever engaged with the loose wheel and arranged to be acted upon by the cam-surfaces of the sliding bar, substantially as set forth.

7. A time-recording machine, comprising a plurality of individual sets of printing-forms, each set comprising a form actuated by clock mechanism and provided with printing characters for denoting the time of day, and a second normally stationary form provided with a series of progressive characters, mechanism adapted to lock said forms together, mechanisms for effecting their release from each other, a recording-sheet arranged to receive impressions from each set of printing-forms, mechanism operated automatically at the locking together and also at the releasing from each other of the members of any set to effect an impression of said set, and mechanism operated automatically to move the recording-sheet each time an alternate locking together or unlocking of any set occurs, but arranged to remain inoperative when different sets are successively locked together or successively unlocked, substantially as set forth.

8. In a time-recording machine comprising a main driven shaft provided with fast and loose wheels, means for shifting the loose wheel into and out of connection with the fast wheel, comprising a shiftable bar arranged to extend transversely of the main shaft, and provided with cam-surfaces thereon, a pivoted shipping-lever, engaged at one end with the loose wheel and provided with a cam projection adapted to be engaged by the cam-surfaces of the shiftable bar, substantially as set forth.

9. In a time-recording machine comprising a main driven shaft provided with fast and loose type-wheels, means for shifting the loose wheel into and out of connection with the fast wheel comprising a shiftable bar arranged to extend transversely of the main shaft, two cam-slots arranged to extend diagonally through said bar, a shipping-lever pivotally mounted between its ends, engaged at one end with the loose wheel, and provided at its other with a cam projection adapted to engage said cam-slots, substantially as set forth.

10. In a time-recording machine, the combination of a recording-sheet, a plurality of printing devices, each provided with a key and each adapted to print upon said sheet upon the reciprocation of the key in either direction, and mechanism operating to feed forward said sheet upon each reciprocation of a key in a direction the reverse of that of the last preceding key, but not upon the actuation of succeeding keys in the same direction, substantially as set forth.

11. In a time-recording machine, a sheet-feeding mechanism comprising a feed-roller, a ratchet-wheel operatively connected with the feed-roller, a plurality of shiftable key-bars, a rock-shaft mounted transversely of and adjacent to said bars, a flange on the rock-shaft, cam projections on the bars adapted to engage and oscillate the rock-shaft in both directions, pawls mounted on said rock-shaft and arranged to act alternately on the ratchet-wheel of the feed-roller to turn it forward when the rock-shaft is oscillated in either direction, said pawls being connected with the rock-shaft by means permitting lost motion, whereby the pawls will remain in either position to which they are shifted until positively actuated in the opposite direction by the rock-bar, but the rock-bar is free to return to a position to be oscillated by the passage of each cam projection of the shiftable bars, substantially as described.

12. In a time-recording machine the combination of a main driven shaft, fast and loose type-wheels thereon, a recording-sheet, sheet-feeding mechanism, an impressing device and a shiftable key; said key being arranged to lock the loose wheel to the main shaft, actuate the sheet-feeding mechanism and operate the impressing device, when shifted in one direction, and to release the loose wheel, actuate the feed mechanism, and operate the

impressing device when shifted in the opposite direction, substantially as set forth.

13. In a time-recording machine the combination of a main driven shaft, fast and loose type-wheels thereon, a recording-sheet, sheet-feeding mechanism, an impressing device and a shiftable key; said key being arranged to lock the loose wheel to the main shaft, actuate the sheet-feeding mechanism and operate the impressing device, when shifted in one direction, and to release the loose wheel, return it to its starting-point, actuate the feed mechanism and operate the impressing device when shifted in the opposite direction, substantially as set forth.

14. A time-recording machine comprising a plurality of printing-forms arranged side by side, a plurality of backwardly and forwardly moving printing-forms arranged severally adjacent to the first-mentioned forms, a clock mechanism operatively connected with said first-mentioned forms and having constant engagement with the same, a plurality of separate locking devices for detachably engaging the second set of forms with, and disengaging them from, the clock mechanism, a plurality of separate restoring devices for moving backward the second set of forms to their starting-points, a continuous recording-sheet, of such width as to extend across all of the forms, a plurality of separate impression devices located at the side of the sheet opposite the forms and adapted to act separately on said forms, a sheet-actuating device for giving an intermittent advance movement to said sheet, and a plurality of manually-operated actuating devices giving movement severally to the engaging and disengaging devices, the restoring devices and the impression devices, and each of which is adapted to operate the sheet-actuating device.

15. A time-recording machine comprising a frame, a main shaft mounted thereon and provided with type-wheels and means for rotating said shaft intermittently, comprising a ratchet-wheel, a clock mechanism, a cam mounted on one of the shafts thereof, provided with a cam-groove consisting of a series of alternate spirally and radially arranged portions, a sliding bar provided with a cam-stud engaging said cam-groove, and a pawl, actuated by said sliding bar, acting on the ratchet-wheel, substantially as set forth.

16. A time-recording machine comprising a frame, a main shaft mounted thereon and provided with type-wheels and means for rotating said shaft intermittently, comprising a ratchet-wheel, a clock mechanism, a cam mounted on one of the shafts thereof, provided with a cam-groove consisting of a series of alternate spirally and radially arranged portions, a sliding bar provided with a cam-stud engaging said cam-groove, a pawl actuated by said sliding bar, acting on the ratchet-wheel and a detent arranged to prevent the

ratchet-wheel from backward movement, substantially as set forth.

17. A time-recording machine, comprising a printing-form, a recording-sheet and means for taking an impression on the recording-sheet, comprising a pivotally-mounted impressing-lever, a shiftable bar, a plunger mounted adjacent to said bar, and in position to oscillate the impressing-lever, and a cam on the bar adapted to actuate the plunger, substantially as set forth.

18. A time-recording machine, comprising a printing-form, a recording-sheet, and means for taking an impression on the recording-sheet, comprising a pivotally-mounted impressing-lever, a shiftable bar, a plunger mounted adjacent to said bar, and in position to oscillate the impressing-lever, and a cam on the bar adapted to actuate the plunger, when the latter is shifted in either direction, substantially as set forth.

19. A time-recording machine comprising a plurality of printing-forms arranged side by side, a clock mechanism having operative connection with said forms, a continuous record-sheet, rollers supporting said sheet adjacent to said forms, a plurality of impression-levers pivoted between their ends outside of the impression-sheet, and each having at one end a platen acting against an opposed form, and adapted for contact with the sheet at its opposite end, reciprocating, lever-actuating members located at the same side of the sheet with the forms, and acting through the sheet against the ends of the impression-levers to operate the latter, and manually-operated means for separately actuating said impression devices.

20. A mechanical movement for actuating a shipping-lever or the like, comprising a longitudinally-sliding bar, two cam-slots arranged to extend diagonally through said bar in substantially parallel planes, and a transversely-shiftable spring-pressed cam projection arranged adjacent to the bar and tending to stand in a plane within the two opposite sides of said sliding bar, whereby said cam projection will enter and pass through each of said cam-slots when the bar is reciprocated to carry the slots past the same, substantially as set forth.

21. A time-recording machine comprising a frame, a main shaft mounted thereon and provided with type-wheels and means for rotating said shaft intermittently, comprising a ratchet-wheel provided with two series of ratchets, a clock mechanism, a cam mounted on one of the shafts thereof, provided with a cam-groove consisting of a series of alternate spirally and radially arranged portions, a sliding bar provided with a cam-stud engaging said cam-groove, a pawl actuated by said sliding bar and acting to move the ratchet-wheel forward, a detent or stop also actuated by the sliding bar, arranged to engage the ratchet-wheel at the end of the forward movement of the sliding bar, whereby said wheel

is prevented from being carried by momentum beyond a proper point, and a detent arranged to prevent the ratchet-wheel from backward movement, substantially as set forth.

22. In a time-recording machine, the combination of a clock-actuated main shaft, a fast and a loose printing-wheel mounted thereon, means for locking said loose wheel so as to rotate with the shaft and mechanism for returning it to a uniform starting-point comprising a gear connected with said wheel and a rack-bar adapted to be thrown into and out of mesh with said gear.

23. In a time-recording machine, the combination of a clock-actuated main shaft, a fast and a loose printing-wheel mounted thereon, means for locking said loose wheel so as to rotate with the shaft and mechanism for returning it to a uniform starting-point comprising a gear-pinion mounted concentrically upon the hub of the loose wheel and having at one side of its perimeter a flattened portion devoid of gear-teeth and a rack-bar adapted to be thrown into and out of mesh with the gear-pinion and arranged to coact with the flattened portion of the gear to permit the bar to traverse the gear beyond the end of the rack and prevent the gear from rotating.

24. In a time-recording machine, the combination of a clock-actuated main shaft, a fast and a loose printing-wheel mounted thereon, means for shifting said loose wheel endwise upon the shaft into and out of engagement with the fast wheel and for returning it to a uniform starting-point comprising a gear-pinion mounted concentrically upon the hub of the loose wheel, a shiftable rack-bar provided with a rack adapted to intermesh with said gear, a shipping-lever pivotally mounted between its ends and having one end engaged with said loose wheel and adapted for engagement at its other end with cam-slots in the rack-bar, a circumferential series of recesses in one of said wheels and a stud upon the other adapted to engage said recesses when the loose wheel is shifted toward the other and a stop upon the loose wheel adapted for engagement with a relatively-movable part to arrest its rotation when it has been returned to its starting-point by the rack and pinion.

25. A time-recording machine comprising a plurality of printing-forms arranged side by side, a clock mechanism operatively connected with said forms, a record-sheet, impression devices for pressing the sheet against the forms, a sheet-actuating device and a plurality of manually-operated, actuating members, said sheet-actuating device embracing a moving part which remains normally in position to be acted upon and moved by either one of said actuating members when the latter is moved in either direction, said moving part being connected with the part which immediately engages the sheet by means afford-

ing lost motion between said parts, so that the sheet is actuated by the first member which is moved in a direction opposite that of the last moved member.

5 26. In a time-recorder, the combination with the main frame, a main shaft and a plurality of clock-actuated type-wheels mounted there-
 10 on, of a swinging frame mounted to overhang said type-wheels, a plurality of impressing-hammers, movably mounted in said swinging frame and adapted to coöperate with the type-
 15 wheels, and a continuous-web recording-sheet mounted upon rolls carried by the swinging frame and arranged to extend between the
 20 impressing-faces of the hammers and type-wheels.

27. In a time-recorder, the combination with the main frame, a main shaft and a plurality of clock-actuated type-wheels mounted there-
 25 on, of a swinging frame mounted to overhang said type-wheels, a plurality of impressing-hammers, movably mounted in said swinging frame and adapted to coöperate with the type-
 30 wheels, and a continuous-web recording-sheet mounted upon rolls carried by the swinging frame and arranged to extend between the
 35 impressing-faces of the hammers and type-wheels, feed mechanism for moving the re-
 40 cording-sheet, mounted in the main frame
 45 and driving connections between said feed mechanism and one of the rolls carried by the swinging frame, said feed mechanism be-
 50 ing arranged to move out of or into driving engagement with the driving connections as
 55 the swinging frame is swung out of or into operative positions, respectively.

mechanism and one of the rolls carried by the swinging frame.

28. In a time-recorder, the combination with the main frame, a main shaft and a plurality of clock-actuated type-wheels mounted there- 35
 on, of a swinging frame mounted to overhang said type-wheels, a plurality of impressing-hammers, movably mounted in said swinging frame and adapted to coöperate with the type-
 40 wheels, and a continuous-web recording-sheet mounted upon rolls carried by the swinging frame and arranged to extend between the
 45 impressing-faces of the hammers and type-wheels, feed mechanism for moving the re-
 50 cording-sheet, mounted in the main frame
 55 and driving connections between said feed mechanism and one of the rolls carried by the swinging frame, said feed mechanism be-
 60 ing arranged to move out of or into driving engagement with the driving connections as
 65 the swinging frame is swung out of or into operative positions, respectively.

In testimony that I claim the foregoing as my invention I affix my signature, in presence of two witnesses, this 30th day of April, 55
 A. D. 1895.

JOHN W. DEÜBNER.

Witnesses:

ALBERT H. GRAVES,
 HENRY W. CARTER.