N° 8513 A.D. 1894

Date of Application, 30th Apr., 1894

Complete Specification Left, 2nd Aug., 1894—Accepted, 9th Mar., 1895

PROVISIONAL SPECIFICATION.

Improvements in Apparatus for Checking and Recording Workmen's Time, and for other similar purposes.

I, WILLIAM WHITEHEAD, of 160, Princess Road, Moss Side, Manchester, in the County of Lancaster, Electrical Engineer, do hereby declare the nature of this invention to be as follows :—

This invention relates principally to improvements in that class of apparatus for checking and recording workmen's time and for other similar purposes for which I have obtained Letters Patent No. 21083 dated Dec. 3rd 1891, and in which a time stamp is employed, in connection with an intermittently moved strip of paper adapted to receive the impression of the stamp and the number or name of the workman, or other particulars, the type wheels of which stamp being operated by a secondary clock-work controlled by a primary clock or by a primary clock direct, whilst the stamp itself is moved against and from the paper strip through suitable means by the person using the apparatus.

The present invention has for its object to simplify the construction and render more positive and reliable the working of the various parts constituting the said apparatus and embodies, firstly, improved type wheels and mechanism for actuating the same; secondly, improved means for moving the paper strip; and lastly means for controlling the action of the secondary clock.

According to this invention the numbers and letters on the type wheels are not inverted as heretofore, but printed through the paper, the inking ribbon being above the said paper strip, and the type wheels raised against the latter, or the said ribbon may be dispensed with and the numbers or letters embossed through. This arrangement enables me to give the paper strip a straight course through the apparatus and the printed or embossed matter to face the operator. The said type wheels comprise a minute units wheel with numbers 0—9, a minute tens wheel with numbers 1—5 twice and two blank spaces, an hour wheel with numbers 1—12 and lastly a meridian wheel with six a.m.'s occupying one half and six p.m.'s occupying the other half of the periphery. The said type wheels are positioned in successive order, the minute units wheel being fixed upon a sleeve and the others mounted loosely thereon and the said sleeve loosely upon a spindle carried by the frame of the stamp. The minute units wheel has internally ten V recesses and secured to its side concentric with the said recesses, a ratchet wheel having ten teeth. Upon the sleeve of the minute units wheel is mounted loosely a four armed lever carrying a pawl under the influence of a spring which engages the said ratchet wheel and also a roller acting upon a locking lever to be described, which controls the latter. On the side of the minute units wheel near its periphery is a pin furnished with a roller which engages a ratchet wheel having twelve teeth, fixed upon a governing shaft positioned below the type wheels and mounted in the frame which carries the type wheels. Upon this shaft is also fixed a toothed wheel gearing into a wheel of equal diameter fixed to one side of the minute tens wheel and a cam disc having two recesses and two arms each furnished with a roller which act upon pins carried by a disc fixed into a cavity on the side of the hour type wheel and having on its periphery twelve V recesses and twelve pins or teeth. Upon the said governing shaft is fixed a second disc having one recess and one arm furnished with a roller which act upon twelve recesses and twelve pins of a disc fixed in a cavity to the side of the meridian wheel for the purpose of governing it. A third disc fixed upon

[*Price* 8*d*.]

the governing shaft has twelve V recesses which serve to lock the whole number of type wheels in position each time a change takes place. In connection with the last named V recessed disc and the minute units wheel is employed to rock upon a stud a locking lever each end of which is furnished with a roller, one being adapted to drop into the V recesses of the said third disc and the other to ride upon a disc fixed to the side of the minute units wheel having one recess only on its periphery into which the said roller drops the moment a change takes place in the position of the type wheels allowing the other roller to rise out of the V recess of the said third disc. Opposite to the said locking lever are employed to rock upon another stud three other locking levers one of which (the minute units wheel lever) carries at its free end one roller and the others (the hour and meridian wheel levers) having two rollers each, one being adapted to engage the V recesses in the side of its respective wheel and the other to ride upon the periphery of the governing shaft disc so as to keep the type wheels in their relative position.

If desirable the type wheel described may be increased in diameter so as to permit of having the whole of the days of a month on the periphery, in which case the numbers on the other wheels described would be doubled.

The paper strip is drawn by means of a pair of rollers from a roll mounted in the frame of the apparatus passing in a straight line over a recording plate and between a padded impression bar and the type wheels, onto a filling roller kept in contact by a spring with the said drawing rollers. One of the latter, the pressure roller, is mounted eccentrically and under the control of a lever whilst the other is covered with rubber and actuated by a ratchet wheel lever and pawl, another pawl being employed to prevent the said roller moving backwards. The said pawl lever is connected by a rod to a crank pin carried by one of the cams fixed upon the main shaft and which I raise and lower the type wheels.

Motion is imparted to the minute units type wheel from the magnet by means of a lever, one end of which is jointed to an arm on the said magnet and the other end to the main lever of the secondary clock. The latter consists of a minute wheel with sixty teeth fixed upon the minute hand spindle. The main lever is adapted to rock upon a stud and is furnished at one side of its fulcrum with a pawl under the influence of a spring, which pawl engages the said minute wheel and is limited in its stroke by abuting against a bar and thus prevented from overshooting. The said lever on the other side of its fulcrum is placed under the influence of a spring which brings it back to its normal position. On one of the frame studs of the secondary clock is employed loosely a pawl riding on the minute wheel and having a stud on its side upon which rests the spring end of the said main lever which when upon it retains the pawl in the teeth of the said wheel and thus prevents the same from unduly rotating. The said secondary clock comprises other wheels and pinions which convert the time from minutes to hours similar as in an ordinary clock.

Dated this 28th day of April 1894.

F. BOSSHARDT & Co.,
Agents to Applicant.

COMPLETE SPECIFICATION.

Improvements in Apparatus for Checking and Recording Workmen's Time, and for other similar purposes.

I, WILLIAM WHITEHEAD, of 160, Princess Road, Moss Side, Manchester, in the County of Lancaster, Electrical Engineer, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement :—

This invention relates principally to improvements in that class of apparatus for

checking and recording workmen's time and for other similar purposes for which I have obtained Letters Patent No. 21083 dated Dec. 3rd 1891, and in which a time stamp is employed in connection with an intermittently moved strip of paper adapted to receive the impression of the time stamp and the number or name of the workman, or other particulars, the type wheels of which stamp are operated by a secondary clockwork controlled by a primary clock or by a primary clock direct.

The present invention has for its object to simplify the construction and render more positive and reliable the working of the various parts constituting the said apparatus and embodies, firstly, improved type wheels and mechanism for actuating the same; secondly, means for moving the paper strip in a straight line or nearly so and facilitating the filing thereof; and, lastly, means for controlling the action of the secondary clock.

And in order that my invention may be more fully understood I have caused to be appended hereunto two sheets of drawings marked with letters of reference indicating like parts in the various figures.

Figs. 1 & 2, Sheet I, are respectively a side view and a front view partly in section, and Fig. 3 a back view with door removed of a complete apparatus for checking and recording workmen's time and for other similar purposes. Figs. 4 & 5 are respectively a side view and plan of a portion of the secondary clock, Fig. 6 is an end view of the time stamp, Fig. 7 shows the left side of the hour type wheel, Fig. 8 the left side of the minute tens wheel, Fig. 9 the right side of the minute units wheel, Fig. 10 the right side of the a.m. and p.m. wheel in connection with the respective discs and wheels, Fig. 11 shows the left side of the minute units wheel.

Figs. 12 & 13, Sheet II, are side views, Fig. 14 a plan, Fig. 15 a longitudinal section at line A—B of Fig. 14, and Fig. 16 an end view of a portion of Fig. 12, of the time stamp and accessory mechanism.

In carrying out my invention and referring to Figs. 1, 2 & 3, Sheet I, a is the casing of the apparatus formed with a recording slot a^1 and containing the secondary clock b, the counter c, the time stamp d its accessory mechanism and the signal bell c^1, f is the main shaft of the apparatus furnished with a handle f^1 by means of which and suitable connections hereinafter described, the time stamp d is raised and lowered, the counter c and signal bell c^1 are operated, and the inking ribbon e and the paper strip g moved intermittently. The counter c serves to indicate the number of turns of the handle f^1 and the bell c^1 as a check against improper use of the apparatus, giving a signal on every revolution of the main shaft f by a pin f^2 thereon depressing a spring blade c^2 having attached the bell hammer, whilst a pawl f^3 and ratchet f^4 prevents the handle f^1 being turned in the wrong direction and a spring stop c^3 confines its movement to one revolution.

The secondary clock b is controlled by a primary clock (not shown) which may be that of a works or other place as the case may be.

According to this invention the numbers and letters on the stamp d, *i.e.* on the type wheels d^1, d^2, d^3, d^4, see Fig. 6, are not inverted as heretofore but formed to print through the paper strip g, the inking ribbon e being above the paper strip g, see Fig. 15, Sheet II, and the said type wheels raised against the latter, or the ribbon e may be dispensed with and the numbers or letters embossed through the paper strip g. This arrangement enables me to give the paper strip g a straight course through the apparatus and the printed or embossed matter to face the operator. The inking ribbon e when employed is wound from one spool onto another f^7 by means of a pawl f^8 attached to one of the cam levers f^6 and engaging a ratchet wheel f^9 fixed upon the shaft f^{10} which carries also the spools f^7, the reversing of the ribbon e being effected by throwing the pawl f^8 out of gear and winding the ribbon from the full spool onto the empty one. The said type wheels comprise, see Figs. 6—11, a minute units wheel d^3 with numbers 0—9, a minute tens wheel d^2 with numbers 1—5 twice and two blank spaces, an hour wheel d^1 with numbers 1—12, and lastly a meridian wheel d^4 with

six a.m.'s occupying one half and six p.m.'s occupying the other half of the periphery. The said type wheels are positioned in successive order, the minute units wheel d^3 being fixed upon a sleeve h and the others d^1, d^2, d^4, mounted loosely thereon and the sleeve h loosely upon a spindle h^1 carried by the stamp frame i. The latter is formed of two cross shaped pieces suitably tied together and having projections i^4 adapted to slide in slots i^3 formed in the outer frame i and pivots i^2 engaging the eccentrics levers f^6 by means of which the stamp is raised and lowered. The minute units wheel d^3 has internally ten V recesses k, see Fig. 9, and secured to its side concentric with the said recesses, a ratchet wheel k^1 having ten teeth. Upon the sleeve h is mounted loosely a four armed lever l carrying a pawl l^1 under the influence of a spring which pawl engages the ratchet wheel k^1 and also a roller l^2 acting upon a locking lever s^3 to be described, which controls the latter. On the side of the minute units wheel d^3 near its periphery is a roller l^3 which engages a ratchet wheel n having twelve teeth and fixed upon a governing shaft n^1 positioned below the said type wheels and mounted in the stamp frame i. Upon this shaft is also fixed a toothed wheel o, see Fig. 8, gearing into a wheel o^1 of equal diameter fixed to one side of the minute tens wheel d^2 and a cam disc p, see Fig. 7, having two recesses p^1 and two arms p^2 each furnished with a roller p^3 which act upon twelve pins or teeth q carried by a disc q^1 fixed into a cavity on the side of the hour type wheel d^1 and having on its periphery twelve V recesses q^2. Upon the governing shaft n^1 is fixed a second disc p, see Fig. 10, having one recess p^1 and one arm p^2 furnished with a roller p^3 which act in conjunction with twelve recesses q^2 and twelve pins or teeth q on the disc q^1 fixed in a cavity to the side of the meridian wheel d^4 for the purpose of governing it. A third disc r fixed upon the governing shaft n^1 has twelve V recesses r^1 which serve to lock the whole of the said type wheels in position each time a change takes place. In connection with the disc r and the minute units wheel d^3 is employed to rock upon a stud n^2 a locking lever s each end of which is furnished with a roller s^1, s^2, respectively, see also Figs. 11 & 15, s^1 being adapted to drop into the V recesses r^1 of the disc r and the other s^2 to ride upon a disc p fixed to the side of the minute units wheel d^3 having one recess p^1 only on its periphery into which the roller s^2 drops the moment a change takes place in the position of the type wheels allowing the other roller s^1 to rise out of the V recess r^1 of the disc r. Opposite to the locking lever s are employed to rock upon another stud n^3 three other locking levers s^3, s^5, s^7, one of which (the minute units wheel lever s^3) carries at its free end one roller s^4 and the others (the hour and meridian wheel levers s^5, s^7,) two rollers s^6, s^6 each, one being adapted to engage the V recesses q^2 in the side of its respective type wheel and the other to ride upon the periphery of the governing shaft disc p so as to keep the type wheels locked in their relative position.

If desirable the type wheels described may be increased in diameter so as to permit of having the whole of the days of a month on the periphery, in which case the numbers on the other wheels described would be doubled as will be readily understood.

The paper strip g, see Fig. 15, Sheet II, is drawn by means of a pair of rollers g^1, g^2, from a roll g^3 mounted in the frame i^1 of the apparatus passing in a straight line over a recording plate a^2 and between a padded impression bar a^3 and the time stamp d onto a filing roller g^4 mounted in a lever g^5 kept in contact by a spring with the drawing roller g^2. The pressure roller g^1, is mounted eccentrically and under the control of a lever g^6, see Figs. 12 & 13, whilst the other g^2 is covered with rubber and actuated by a ratchet wheel g^7, see Fig. 13, and a pawl g^8 carried by a lever g^9 a stationary pawl g^{10} being employed to prevent the roller g^2 moving backwards. The pawl lever g^9 is connected by a rod g^{11} to a crank pin carried by one of the cams f^5, f^5, fixed upon the main shaft f and which raise and lower the time stamp d.

Motion is imparted to the minute units type wheel d^3 from the magnet t, see Figs. 9 & 15, by means of a lever t^1, one end of which is fixed to the armature t^2 and the other end by the link t^3 to the four armed lever l.

The secondary clock consists of a minute wheel b^1 with sixty teeth fixed upon the minute hand spindle (not shown). The main lever b^2 is adapted to rock upon a stud b^3 and is furnished at one side of its fulcrum with a pawl b^4 under the influence of a spring, which pawl engages the minute wheel b^1 and is limited in its stroke by abuting against a bar b^5 and thus prevented from overshooting. The lever b^2 on the other side of its fulcrum is placed under the influence of a spring b^6 which brings it back to its normal position. On one of the frame studs b^7 of the secondary clock is employed loosely a pawl b^8 riding on the minute wheel b^1 and having a stud b^9 on its side upon which rests the spring end of the main lever b^2 which when upon it retains the pawl b^4 in the teeth of the wheel b^1 and thus prevents the same from unduly rotating backwards. To ensure the pawl b^8 engaging the teeth of the minute wheel b^1 when required, a pin b^{11} is fixed on the spring end of the pawl lever b^2, which at the end of the downward movement of the pawl b^4 comes into contact with an extension b^{10} on the pawl b^8 thus making its action certain. The said secondary clock comprises other wheels and pinions which convert the time from minutes to hours as in an ordinary clock.

The counter c is operated by means of a rocking lever w pivoted to the outer frame i^1 one end of which bears against the cam lever f^6 through the action of a spring in the counter and the other end being connected to the counter c by means of a rod w^1, see Figs. 1 & 12. For the purpose of indicating when the roll of paper has been nearly exhausted springs m, m^1, are so placed that on the roll being nearly exhausted an extension m^2 on the tension lever m^3 comes into contact with the spring m, and brings the same against the spring m^1 thus closing the circuit and ringing an electric bell suitably placed.

The mechanical part of the apparatus is operated as follows :—

The workman or other person using the apparatus for the purpose of recording his time of arrival or departure writes or stamps his number or name as the case may be, or when used in signal-boxes, the signal-man records the particulars of the passing trains, or when used on ship-board the man on watch records the passing of other ships or points or other matter of interest, through the recording slot a^1 onto the strip of paper g below the same and afterwards imparts one turn to the handle f^1.

The first half of the revolution of the main shaft f removes the particulars from underneath the slot a^1 to the stamp d, by means of the feeding gear previously described, in the meantime positioning for action the upper ends of the locking lever v^6, which is furnished with an anti-friction bowl, on the intermediate lever v^3 also moving the rocking lever w and registering the number on the counter c.

The second half of the revolution of the main shaft f raises the stamp d by the eccentrics f^5 actuating the levers f^6 and causes an impression, rings the signal bell c^1 and finally unlocks the intermediate lever v^3 and brings all moving parts to their normal position.

The action of the type wheels in conjunction with the secondary clock b is as follows :—

In the primary clock (not shown) is an electric circuit closer. The electric circuit from a battery or other electric source is closed by the circuit closer of the primary clock at predetermined intervals, in the present instance every minute. The current passing round the electro-magnet t attracts the armature t^2 and the connections between the same and the four armed lever l of the minute units wheel d^3, sets the pawl l^1 back in position, as shown in Fig. 9, against the tension of spring v^5 through the intermediate lever v^3, shaft v, arm v^1 and link v^2, the backlash of the pawl l^1 being for the purpose of admitting of the unlocking of the minute units wheel locking lever s^3. This action has moved the secondary clock one minute. After the circuit has been broken by the primary clock the spring v^5 is free to act. Should however the apparatus be in use at the time of the current passing the following locking device will come into operation :—The lever v^{10} secured to the cam f^5 rotates (as indicated by dotted lines and arrow, Fig. 12,)

from underneath the curved arm v^9, the free end of which is bent inwardly and which is secured upon the rocking shaft v^8 placed under the influence of a straight spring v^7. The action of the spring v^7 then causes the shaft v^8 to partially turn and place the free end of the lever v^6 in position underneath the back end of the intermediate lever v^3 to prevent it moving downward until the stamping operation is completed. After completion of the same, the lever v^6 is moved from underneath the intermediate lever v^3 and the latter set free to act, owing to the lever v^{10} coming into contact with and moving the lever v^9 outwards and the latter turning back the shaft v^8. On the minute units wheel d^3 completing one revolution the roller l^3 comes in contact with the ratchet wheel n on the governing shaft n^1 carrying it one division, and thus the minute tens wheel d^2 through the spur wheels o, o^1, one division at the same time the rocking lever roller s^2 which rides on the disc p, see Fig. 11, falls into the recess p^1 which allows the other roller s^1 at the other end of the lever s to leave the recess r^1 in the disc r.

Every sixth movement of the minute tens wheel d^2 the hour wheel d^1 is moved one division by one of the arms p^2 on the disc p coming into contact with one of the pins q on the hour wheel d^1 at the same time the roller s^6 on the lever s^7 drops into recess p^1 on the disc p and a precisely similar roller s^6 on the opposite side of the lever s^7 drops out of one of the V recesses q^2 thus allowing the hour wheel to move one division whilst otherwise the hour wheel d^1 is locked in position. The meridian wheel d^4 is moved in an exactly similar manner except that it moves only one division in two hours, its disc p having only one arm p^2 and one recess p^1.

The time stamp and its mechanism described in connection with a clock and suitable casing can also be used for stamping the time of arrival and delivery of documents and the like onto the same.

Having now particularly described and ascertained the nature of this invention and in what manner the same is to be performed I declare that what I claim, is—

"In apparatus for checking and recording workmen's time and for other similar purposes."

1st. Forming the type wheels of the time stamp d with letters and numbers which face and print or emboss through the paper strip g and give the same a straight course through the apparatus, substantially as set forth.

2nd. The combination of the type wheels of the time stamp, consisting of a minute units wheel d^3 having numbers 0—9, a minute tens wheel d^2 having numbers 1—5 and one blank space twice, an hour wheel d^1 having numbers 1—12, the meridian wheel d^4 having six a.m.'s occupying one half and six p.m.'s the other half of the periphery, the minute units wheel d^3 being fixed on a sleeve h and the other type wheels rotating thereon loosely, substantially as set forth.

3rd. The minute units wheel d^3 having on one side a roller l^3, internal V recesses k, a ratchet wheel k^1, a lever l having reciprocal motion imparted from a magnet and furnished with a pawl l^1 and roller l^2 and on the other side a disc p having one recess p^1, in combination with a governing shaft n^1 carrying a ratchet wheel n, a spur wheel o in gear with a spur wheel o^1 on the minute tens wheel d^2, a disc p with two recesses p^1 and two arms p^2, a disc p with one recess p^1 and one arm p^2 and a locking disc r with twelve recesses r^1, the pawl l^1 being adapted to move the minute units wheel d^3 always one division, and the roller l^3 to move the ratchet wheel n one tooth at each revolution and carry with it the discs p, p, and spur wheel o, all substantially as set forth.

4th. In combination with the minute units wheel d^3 and lever l the locking lever s^3 having at its free end a roller s^4 adapted to engage the internal V recesses k and the roller l^2 on the lever l to press on the lever s^3 and to lock it in position until a change in the position of the type wheels of the time stamp d is to take place, all substantially as set forth.

5th. In combination with the hour type wheel d^1, the meridian wheel d^4 and their discs p, p, respectively, the locking levers s^7, s^5, each having two rollers s^6 one

being adapted to engage one of the V recesses q^2 and retain the type wheels d^1 & d^4 in position whilst riding on the periphery of the disc p and the other to engage the recess p^1 during the time the rollers p^3 of the arm p^2 comes into contact with one of the pins q on the hour type wheel d^1 and meridian wheel d^4 for the purpose of turning the same, substantially as set forth.

6th. In combination with the minute units wheel d^3 and the governing shaft locking wheel r, a double armed lever s, the roller s^2 of one arm being adapted to ride upon the periphery of the minute units wheel disc p, whilst the roller s^1 of the other arm engages one of the V recesses r^1 of the locking disc r and is allowed to leave the same when the other roller s^2 meets with and falls into the recess p^1 of the disc p for the purpose of unlocking the governing shaft n once during each revolution of the minute unit type wheel d^3, substantially as set forth.

7th. The combination of a paper strip delivery roller g^3, drawing rollers g^1, g^2, and a paper strip receiving roller g^4 so positioned and arranged that the paper strip g is moved by the rollers g^1, g^2, in a straight line or nearly so over the time stamp d and the roller g^4 serves as a file for the paper strip, substantially as set forth.

8th. In combination with the pawl lever b^2 of the minute wheel b^1 of the secondary clock, the back pawl b^3 controlled by the pawl lever b^2, substantially as and for the purpose set forth.

Dated this 1st day of August 1894.

F. BOSSHARDT & Co.,
4, Corporation Street, Manchester, Agents to Applicant.

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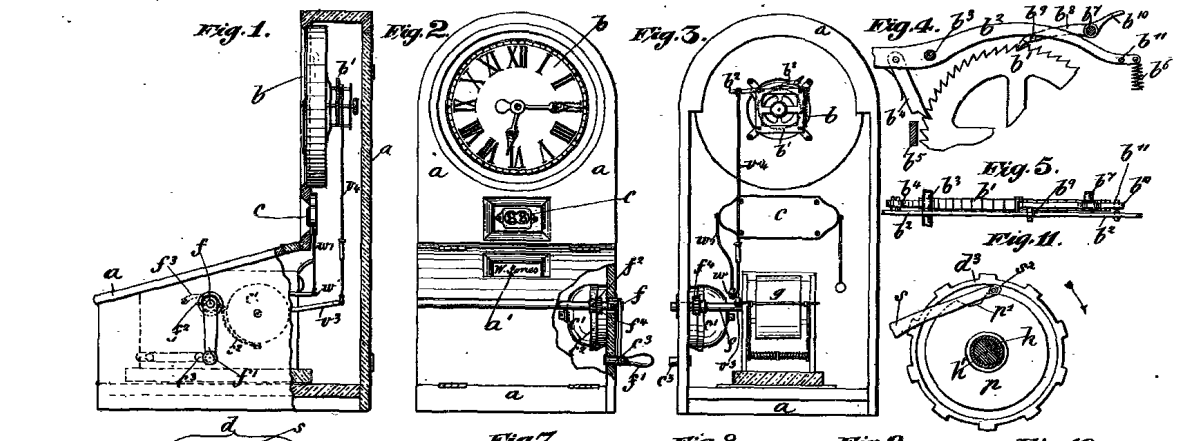
A.D. 1894. April 30. N°. 8513.

WHITEHEAD'S Complete Specification.

(2 SHEETS)
SHEET 1



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for Her Majesty's Stationery Office. 1895

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WHITEHEAD'S Complete Specification.

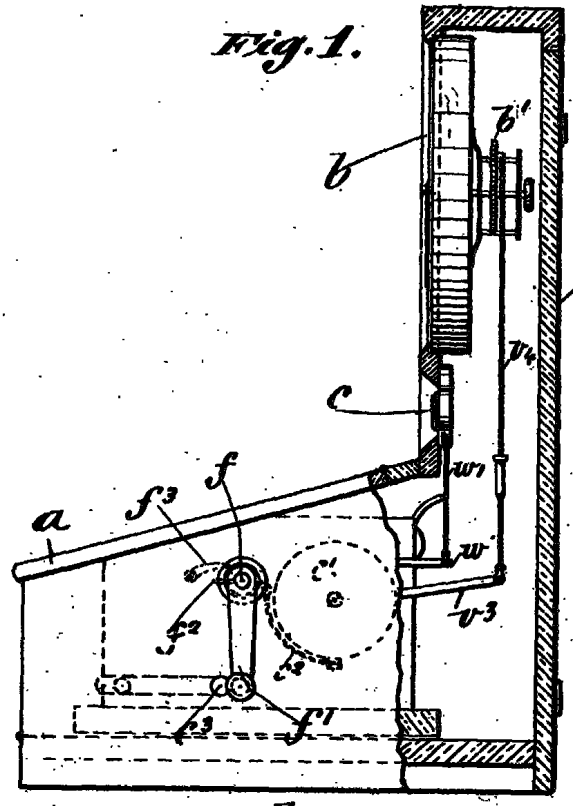

Fig. 1.

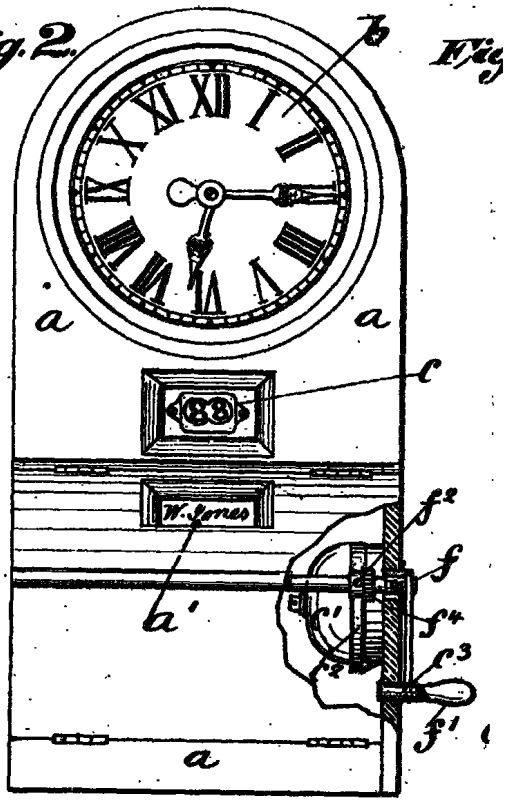

Fig. 2.

Fig.

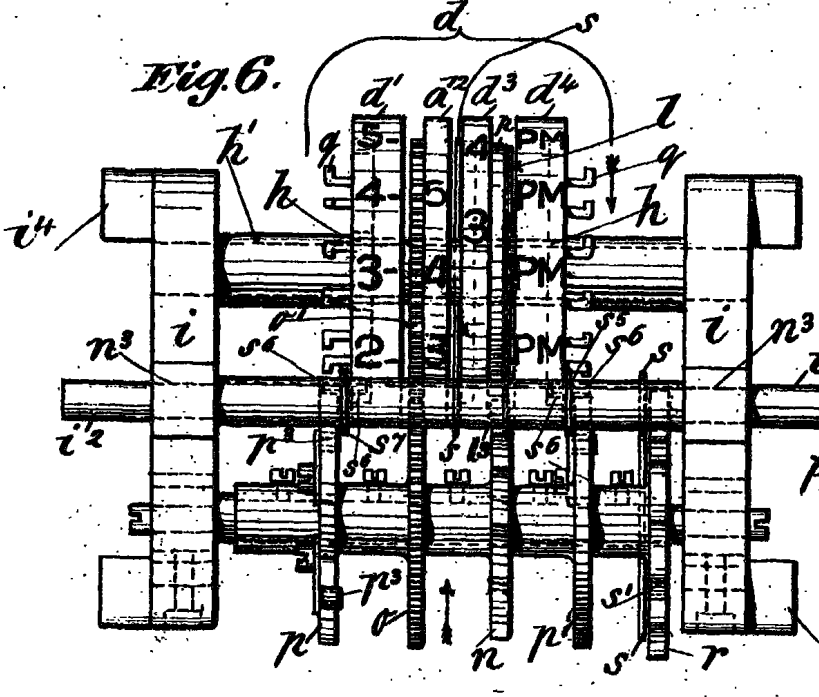

Fig. 6.

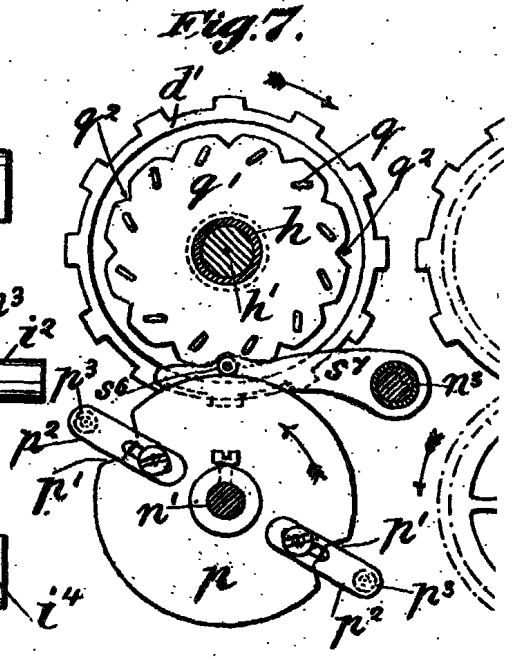

Fig. 7.

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Fig.3.

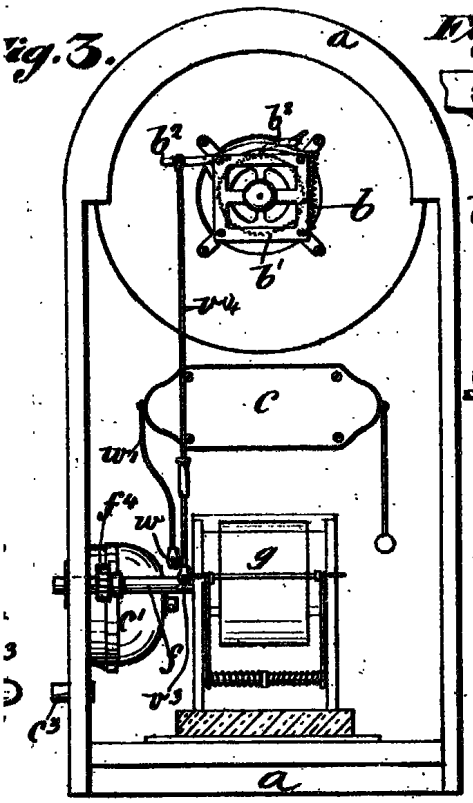


Fig.4.

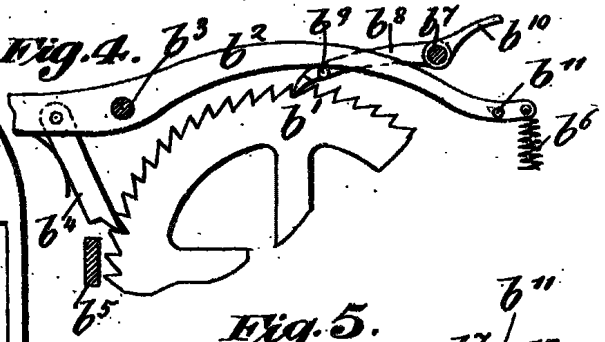


Fig.5.

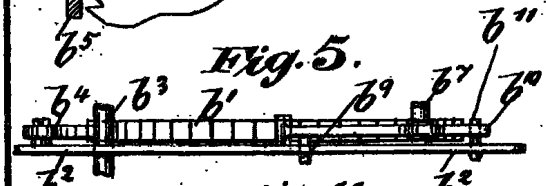


Fig.11.

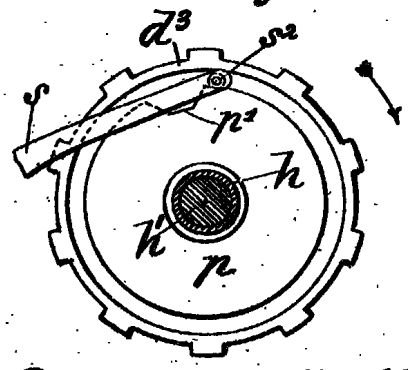


Fig.8.

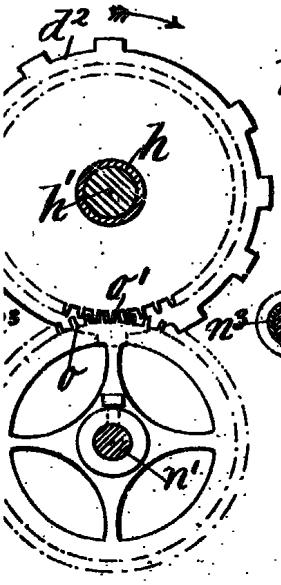


Fig.9.

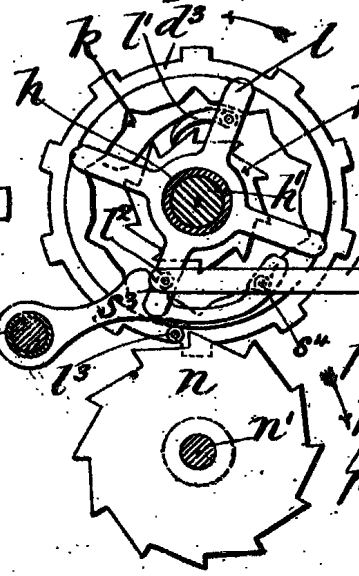
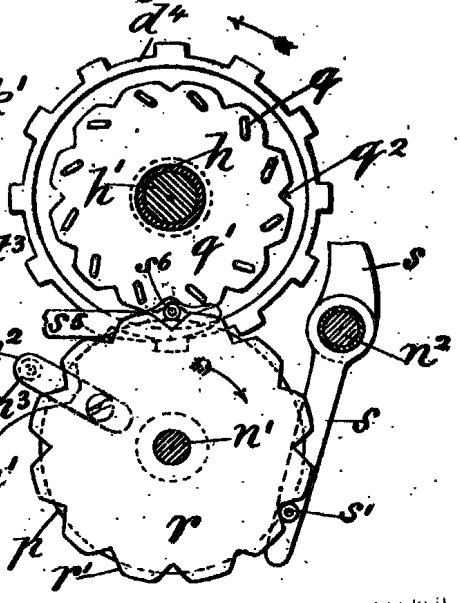


Fig.10.



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ce. 1895.

Fig. 16.

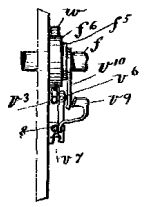

Fig. 12.

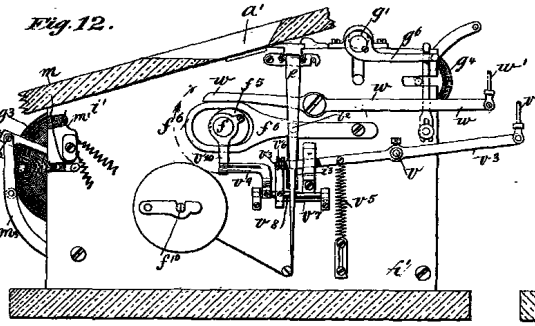

Fig. 13.

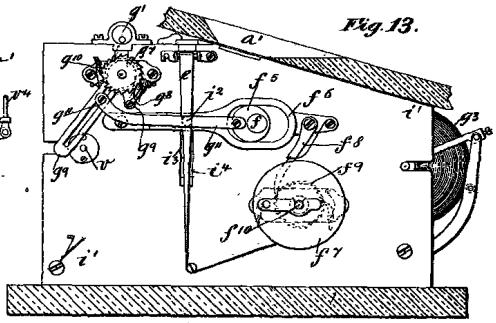

Fig. 14.

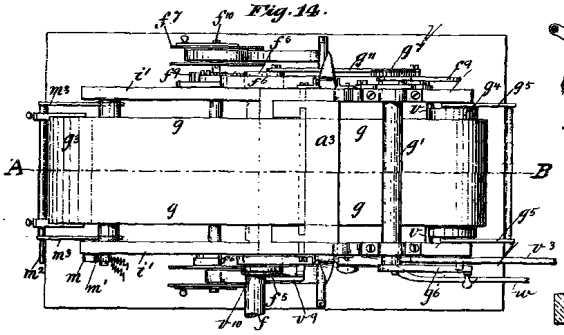

Fig. 15.

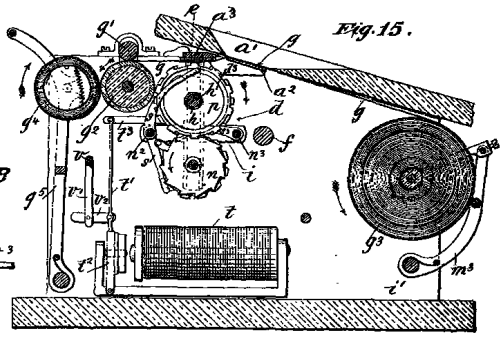

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Fig. 16.

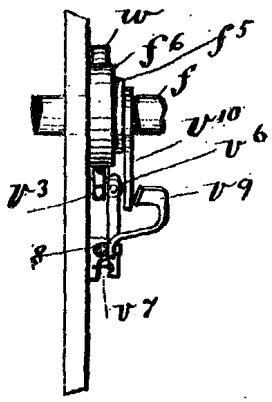

Fig. 12.

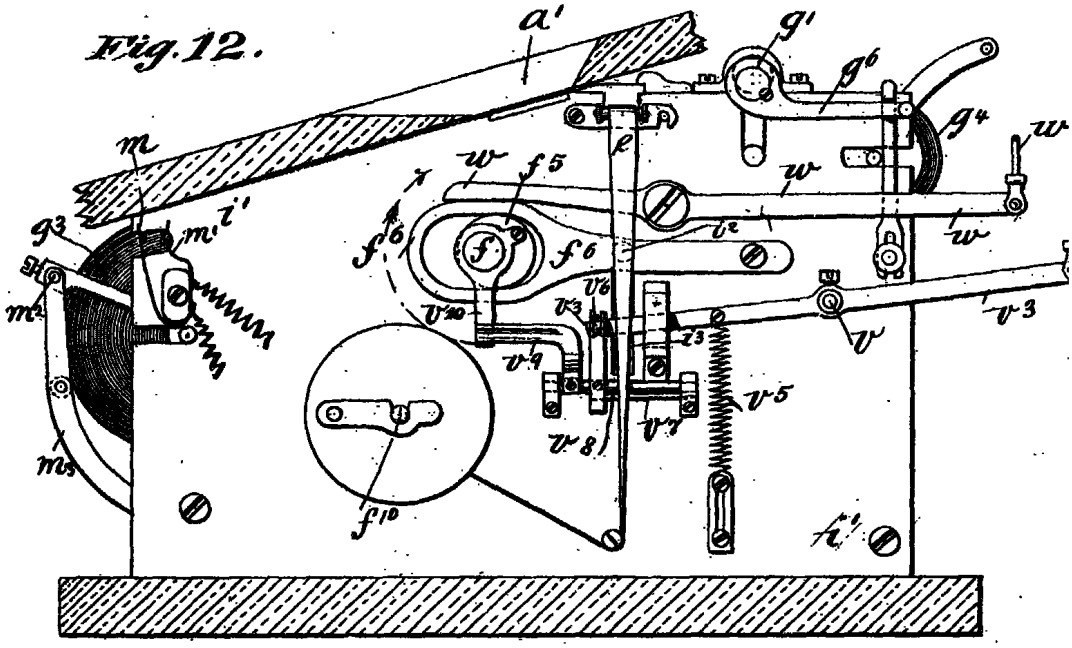

Fig. 14.

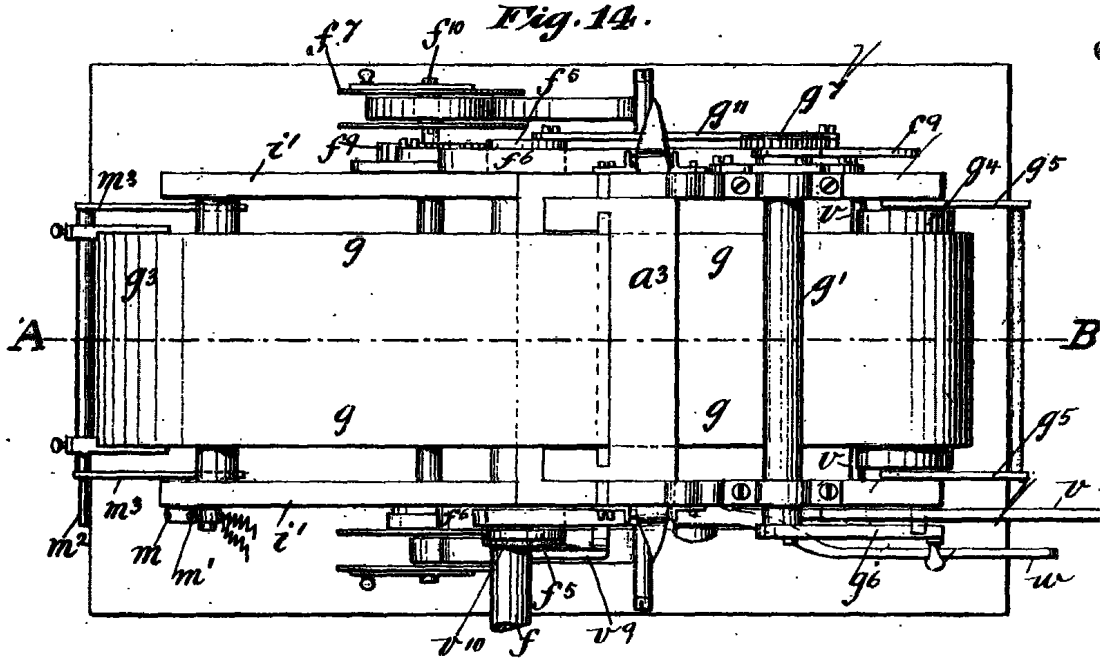

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Fig. 13.

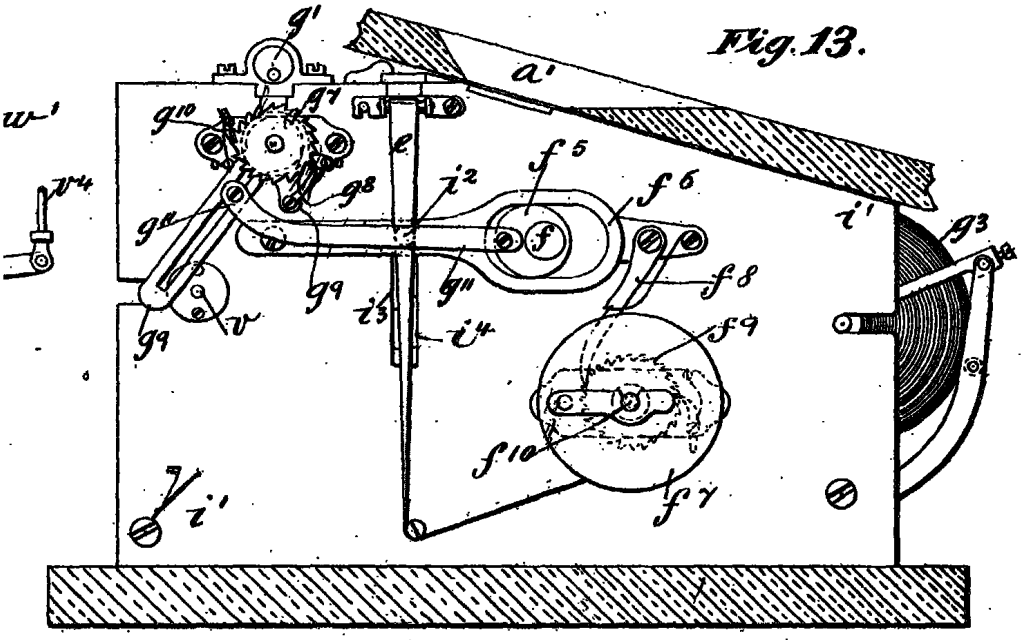
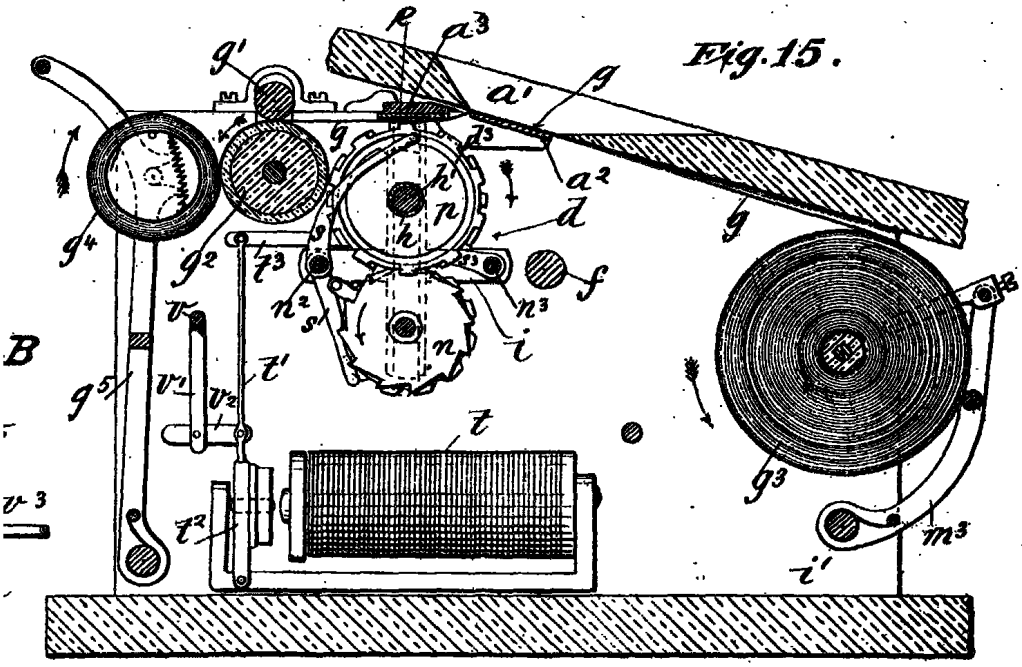


Fig. 15.



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AMENDED SPECIFICATION.

Print is in accordance with the Original Specification as it stands after Amendment (under Section 18 of the Patents, &c., Act, 1883), as allowed by the decision of the Comptroller General of the 27th day of March 1897.

N° 8513* A.D. 1894

Date of Application, 30th Apr., 1894

Complete Specification Left, 2nd Aug., 1894—Accepted, 9th Mar., 1895

PROVISIONAL SPECIFICATION.

Improvements in Apparatus for Checking and Recording Workmen's Time, and for other similar purposes.

WILLIAM WHITEHEAD, of 160, Princess Road, Moss Side, Manchester, in County of Lancaster, Electrical Engineer, do hereby declare the nature of this invention to be as follows :—

This invention relates principally to improvements in that class of apparatus for checking and recording workmen's time and for other similar purposes for which I obtained Letters Patent, No. 21083 dated Dec. 3rd 1891, and in which a time-clock is employed, in connection with an intermittently moved strip of paper adapted to receive the impression of the stamp and the number or name of the workman, or other particulars, the type wheels of which stamp being operated by a secondary clock-work controlled by a primary clock or by a primary clock direct, whilst the stamp itself is moved against and from the paper strip through suitable means by the person using the apparatus.

The present invention has for its object to simplify the construction and render more positive and reliable the working of the various parts constituting the said stamp and embodies, firstly, improved type wheels and mechanism for actuating the same; secondly, improved means for moving the paper strip; and lastly means for controlling the action of the secondary clock.

According to this invention the numbers and letters on the type wheels are not inked as heretofore, but printed through the paper, the inking ribbon being above the said paper strip, and the type wheels raised against the latter, or the said ribbon may be dispensed with and the numbers or letters embossed through. This arrangement enables me to give the paper strip a straight course through the apparatus and the printed or embossed matter to face the operator. The said type wheels comprise a minute units wheel with numbers 0—9, a minute tens wheel with numbers 1—5 twice and two blank spaces, an hour wheel with numbers 1—12 and lastly a meridian wheel with six a.m.'s occupying one half and six p.m.'s occupying the other half of the periphery. The said type wheels are positioned in successive order, the minute units wheel being fixed upon a sleeve and the others mounted loosely thereon and the said sleeve loosely upon a spindle carried by the frame of the stamp. The minute units wheel has internally ten V recesses and secured to its side concentric with the said sleeve, a ratchet wheel having ten teeth. Upon the sleeve of the minute units wheel is mounted loosely a four armed lever carrying a pawl under the influence of a spring

[*Price 8d.*]

which engages the said ratchet wheel and also a roller acting upon a locking lever be described, which controls the latter. On the side of the minute units wheel its periphery is a pin furnished with a roller which engages a ratchet wheel twelve teeth, fixed upon a governing shaft positioned below the type wheels mounted in the frame which carries the type wheels. Upon this shaft is fixed a toothed wheel gearing into a wheel of equal diameter fixed to one side the minute tens wheel and a cam disc having two recesses and two arms furnished with a roller which act upon pins carried by a disc fixed into a cavity the side of the hour type wheel and having on its periphery twelve V recesses twelve pins or teeth. Upon the said governing shaft is fixed a second disc having recess and one arm furnished with a roller which act upon twelve recesses and pins of a disc fixed in a cavity to the side of the meridian wheel for the purpose governing it. A third disc fixed upon the governing shaft has twelve V which serve to lock the whole number of type wheels in position each time a change takes place. In connection with the last named V recessed disc and the minute wheel is employed to rock upon a stud a locking lever each end of which is furnished with a roller, one being adapted to drop into the V recesses of the said third disc the other to ride upon a disc fixed to the side of the minute units wheel having one recess only on its periphery into which the said roller drops the moment change takes place in the position of the type wheels allowing the other roller rise out of the V recess of the said third disc. Opposite to the said locking lever employed to rock upon another stud three other locking levers one of which (the minute units wheel lever) carries at its free end one roller and the others (the and meridian wheel levers) having two rollers each, one being adapted to engage the V recesses in the side of its respective wheel and the other to ride upon periphery of the governing shaft disc so as to keep the type wheels in their position.

If desirable the type wheel described may be increased in diameter so as to permit of having the whole of the days of a month on the periphery, in which case numbers on the other wheels described would be doubled.

The paper strip is drawn by means of a pair of rollers from a roll mounted in frame of the apparatus passing in a straight line over a recording plate and between a padded impression bar and the type wheels, onto a filling roller kept in contact by spring with the said drawing rollers. One of the latter, the pressure roller, mounted eccentrically and under the control of a lever whilst the other is covered rubber and actuated by a ratchet wheel lever and pawl, another pawl being employed to prevent the said roller moving backwards. The said pawl lever is connected by a rod to a crank pin carried by one of the cams fixed upon the main shaft and which raise and lower the type wheels.

Motion is imparted to the minute units type wheel from the magnet by means of a lever, one end of which is jointed to an arm on the said magnet and the other end to the main lever of the secondary clock. The latter consists of a minute wheel with sixty teeth fixed upon the minute hand spindle. The main lever is adapted to rock upon a stud and is furnished at one side of its fulcrum with a pawl under the influence of a spring, which pawl engages the said minute wheel and is limited in its stroke by abuting against a bar and thus prevented from overshooting. The said lever on the other side of its fulcrum is placed under the influence of a spring which brings it back to its normal position. On one of the frame studs of the secondary clock is employed loosely a pawl riding on the minute wheel and having a stud on its side upon which rests the spring end of the said main lever which when upon it retains the pawl in the teeth of the said wheel and thus prevents the same from unduly rotating. The said secondary clock comprises other wheels and pinions which convert the time from minutes to hours similar as in an ordinary clock.

Dated this 28th day of April 1894.

F. BOSSHARDT & Co.,
Agents to Applicant.

COMPLETE SPECIFICATION (AMENDED).

Improvements in Apparatus for Checking and Recording Workmen's Time, and for other similar purposes.

I, WILLIAM WHITEHEAD, of 160, Princess Road, Moss Side, Manchester, in the County of Lancaster, Electrical Engineer, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement :—

This invention relates principally to improvements in that class of apparatus for checking and recording workmen's time and for other similar purposes for which I have obtained Letters Patent No. 21083 dated Dec. 3rd 1891, and in which a time stamp is employed in connection with an intermittently moved strip of paper adapted to receive the impression of the time stamp and the number or name of the workman, or other particulars, the type wheels of which stamp are operated by a secondary clockwork controlled by a primary clock or by a primary clock direct.

The present invention has for its object to simplify the construction and render more positive and reliable the working of the various parts constituting the said apparatus and embodies, firstly, improved type wheels and mechanism for actuating the same; secondly, means for moving the paper strip in a straight line or nearly so and facilitating the filing thereof; and, lastly, means for controlling the action of the secondary clock.

And in order that my invention may be more fully understood I have caused to be appended hereunto two sheets of drawings marked with letters of reference indicating like parts in the various figures.

Figs. 1 & 2, Sheet I, are respectively a side view and a front view partly in section, and Fig. 3 a back view with door removed of a complete apparatus for checking and recording workmen's time and for other similar purposes. Figs. 4 & 5 are respectively a side view and plan of a portion of the secondary clock, Fig. 6 is an end view of the time stamp, Fig. 7 shows the left side of the hour type wheel, Fig. 8 the left side of the minute tens wheel, Fig. 9 the right side of the minute units wheel, Fig. 10 the right side of the a.m. and p.m. wheel in connection with the respective discs and wheels, Fig. 11 shows the left side of the minute units wheel.

Figs. 12 & 13, Sheet II, are side views, Fig. 14 a plan, Fig. 15 a longitudinal section at line A—B of Fig. 14, and Fig. 16 an end view of a portion of Fig. 12, of the time stamp and accessory mechanism.

In carrying out my invention and referring to Figs. 1, 2 & 3, Sheet I, *a* is the casing of the apparatus formed with a recording slot a^1 and containing the secondary clock *b*, the counter *c*, the time stamp *d* its accessory mechanism and the signal bell c^1, *f* is the main shaft of the apparatus furnished with a handle f^1 by means of which and suitable connections hereinafter described, the time stamp *d* is raised and lowered, the counter *c* and signal bell c^1 are operated, and the inking ribbon *e* and the paper strip *g* moved intermittently. The counter *c* serves to indicate the number of turns of the handle f^1 and the bell c^1 as a check against improper use of the apparatus, giving a signal on every revolution of the main shaft *f* by a pin f^2 thereon depressing a spring blade c^2 having attached the bell hammer, whilst a pawl f^3 and ratchet f^4 prevents the handle f^1 being turned in the wrong direction and a spring stop e^3 confines its movement to one revolution.

The secondary clock *b* is controlled by a primary clock (not shown) which may be that of a works or other place as the case may be.

According to this invention the numbers and letters on the stamp *d*, *i.e.* on the type wheels d^1, d^2, d^3, d^4, see Fig. 6, are not inverted as heretofore but formed to

print through the paper strip g, the inking ribbon e being above the paper strip g, see Fig. 15, Sheet II, and the said type wheels raised against the latter, or the ribbon e may be dispensed with and the numbers or letters embossed through the paper strip g. This arrangement enables me to give the paper strip g a straight course through the apparatus and the printed or embossed matter to face the operator. The inking ribbon e when employed is wound from one spool onto another f^7 by means of a pawl f^8 attached to one of the cam levers f^6 and engaging a ratchet wheel f^9 fixed upon the shaft f^{10} which carries also the spools f^7, the reversing of the ribbon e being effected by throwing the pawl f^8 out of gear and winding the ribbon from the full spool onto the empty one. The said type wheels comprise, see Figs. 6—11, a minute units wheel d^3 with numbers 0—9, a minute tens wheel d^2 with numbers 1—5 twice and two blank spaces, an hour wheel d^1 with numbers 1—12, and lastly a meridian wheel d^4 with six a.m.'s occupying one half and 6 p.m.'s occupying the other half of the periphery. The said type wheels are positioned in successive order, the minute units wheel d^3 being fixed upon a sleeve h and the others d^1, d^2, d^4, mounted loosely thereon and the sleeve h loosely upon a spindle h^1 carried by the stamp frame i. The latter is formed of two cross shaped pieces suitably tied together and having projections i^4 adapted to slide in slots i^3 formed in the outer frame i and pivots i^2 engaging the eccentrics levers f^6 by means of which the stamp is raised and lowered. The minute units wheel d^3 has internally ten V recesses k, see Fig. 9, and secured to its side concentric with the said recesses, a ratchet wheel k^1 having ten teeth. Upon the sleeve h is mounted loosely a four armed lever l carrying a pawl l^1 under the influence of a spring which pawl engages the ratchet wheel k^1 and also a roller l^2 acting upon a locking lever s^3 to be described, which controls the latter. On the side of the minute units wheel d^3 near its periphery is a roller l^3 which engages a ratchet wheel n having twelve teeth and fixed upon a governing shaft n^1 positioned below the said type wheels and mounted in the stamp frame i. Upon this shaft is also fixed a toothed wheel o, see Fig. 8, gearing into a wheel o^1 of equal diameter fixed to one side of the minute tens wheel d^2 and a cam disc p, see Fig. 7, having two recesses p^1 and two arms p^2 each furnished with a roller p^3 which act upon twelve pins or teeth q carried by a disc q^1 fixed into a cavity on the side of the hour type wheel d^1 and having on its periphery twelve V recesses q^2. Upon the governing shaft n^1 is fixed a second disc p, see Fig. 10, having one recess p^1 and one arm p^2 furnished with a roller p^3 which act in conjunction with twelve recesses q^2 and twelve pins or teeth q on the disc q^1 fixed in a cavity to the side of the meridian wheel d^4 for the purpose of governing it. A third disc r fixed upon the governing shaft n^1 has twelve V recesses r^1 which serve to lock the whole of the said type wheels in position each time a change takes place. In connection with the disc r and the minute units wheel d^3 is employed to rock upon a stud n^2 a locking lever s each end of which is furnished with a roller s^1, s^2, respectively, see also Figs. 11 & 15, s^1 being adapted to drop into the V recesses r^1 of the disc r and the other s^2 to ride upon a disc p fixed to the side of the minute units wheel d^3 having one recess p^1 only on its periphery into which the roller s^2 drops the moment a change takes place in the position of the type wheels allowing the other roller s^1 to rise out of the V recess r^1 of the disc r. Opposite to the locking lever s are employed to rock upon another stud n^3 three other locking levers s^3, s^5, s^7, one of which (the minute units wheel lever s^3) carries at its free end one roller s^4 and the others (the hour and meridian wheel levers s^5, s^7,) two rollers s^6, s^6 each, one being adapted to engage the V recesses q^2 in the side of its respective type wheel and the other to ride upon the periphery of the governing shaft disc p so as to keep the type wheels locked in their relative position.

If desirable the type wheels described may be increased in diameter so as to permit of having the whole of the days of a month on the periphery, in which case the numbers on the other wheels described would be doubled as will be readily understood.

The paper strip g, see Fig. 15, Sheet II, is drawn by means of a pair of

rollers g^1, g^2, from a roll g^3 mounted in the frame i^1 of the apparatus passing in a straight line over a recording plate a^2 and between a padded impression bar a^3 and the time stamp d onto a filing roller g^4 mounted in a lever g^5 kept in contact by a spring with the drawing roller g^2. The pressure roller g^1, is mounted eccentrically and under the control of a lever g^6, see Figs. 12 & 13, whilst the other g^2 is covered with rubber and actuated by a ratchet wheel g^7, see Fig. 13, and a pawl g^8 carried by a lever g^9 a stationary pawl g^{10} being employed to prevent the roller g^2 moving backwards. The pawl lever g^9 is connected by a rod g^{11} to a crank pin carried by one of the cams f^5, f^5, fixed upon the main shaft f and which raise and lower the time stamp d.

Motion is imparted to the minute units type wheel d^3 from the magnet t, see Figs. 9 & 15, by means of a lever t^1, one end of which is fixed to the armature t^2 and the other end by the link t^3 to the four armed lever l.

The secondary clock consists of a minute wheel b^1 with sixty teeth fixed upon the minute hand spindle (not shown). The main lever b^2 is adapted to rock upon a stud b^3 and is furnished at one side of its fulcrum with a pawl b^4 under the influence of a spring, which pawl engages the minute wheel b^1 and is limited in its stroke by abuting against a bar b^5 and thus prevented from overshooting. The lever b^2 on the other side of its fulcrum is placed under the influence of a spring b^6 which brings it back to its normal position. On one of the frame studs b^7 of the secondary clock is employed loosely a pawl b^8 riding on the minute wheel b^1 and having a stud b^9 on its side upon which rests the spring end of the main lever b^2 which when upon it retains the pawl b^4 in the teeth of the wheel b^1 and thus prevents the same from unduly rotating backwards. To ensure the pawl b^8 engaging the teeth of the minute wheel b^1 when required, a pin b^{11} is fixed on the spring end of the pawl lever b^2, which at the end of the downward movement of the pawl b^4 comes into contact with an extension b^{10} on the pawl b^8 thus making its action certain. The said secondary clock comprises other wheels and pinions which convert the time from minutes to hours as in an ordinary clock.

The counter c is operated by means of a rocking lever w pivoted to the outer frame i^1 one end of which bears against the cam lever f^6 through the action of a spring in the counter and the other end being connected to the counter c by means of a rod w^1, see Figs. 1 & 12. For the purpose of indicating when the roll of paper has been nearly exhausted springs m, m^1, are so placed that on the roll being nearly exhausted an extension m^2 on the tension lever m^3 comes into contact with the spring m, and brings the same against the spring m^1 thus closing the circuit and ringing an electric bell suitably placed.

The mechanical part of the apparatus is operated as follows :—

The workman or other person using the apparatus for the purpose of recording his time of arrival or departure writes or stamps his number or name as the case may be, or when used in signal-boxes, the signal-man records the particulars of the passing trains, or when used on ship-board the man on watch records the passing of other ships or points or other matter of interest, through the recording slot a^1 onto the strip of paper g below the same and afterwards imparts one turn to the handle f^1.

The first half of the revolution of the main shaft f removes the particulars from underneath the slot a^1 to the stamp d, by means of the feeding gear previously described, in the meantime positioning for action the upper ends of the locking lever v^6, which is furnished with an anti-friction bowl, on the intermediate lever v^3 also moving the rocking lever w and registering the number on the counter c.

The second half of the revolution of the main shaft f raises the stamp d by the eccentrics f^5 actuating the levers f^6 and causes an impression, rings the signal bell c^1 and finally unlocks the intermediate lever v^3 and brings all moving parts to their normal position.

The action of the type wheels in conjunction with the secondary clock b is as follows :—

In the primary clock (not shown) is an electric circuit closer. The electric circuit

from a battery or other electric source is closed by the circuit closer of the primary clock at predetermined intervals, in the present instance every minute. The current passing round the electro-magnet t attracts the armature t^2 and the connections between the same and the four armed lever l of the minute units wheel d^3, sets the pawl l^1 back in position, as shown in Fig. 9, against the tension of spring v^5 through the intermediate lever v^3, shaft v, arm v^1, and link v^2, the backlash of the pawl l^1 being for the purpose of admitting of the unlocking of the minute units wheel locking lever s^3. This action has moved the secondary clock one minute. After the circuit has been broken by the primary clock the spring v^5 is free to act. Should however the apparatus be in use at the time of the current passing the following locking device will come into operation :—The lever v^{10} secured to the cam r^5 rotates (as indicated by dotted lines and arrow, Fig. 12,) from underneath the curved arm v^9, the free end of which is bent inwardly and which is secured upon the rocking shaft v^8 placed under the influence of a straight spring v^7. The action of the spring v^7 then causes the shaft v^8 to partially turn and place the free end of the lever v^6 in position underneath the back end of the intermediate lever v^3 to prevent it moving downward until the stamping operation is completed. After completion of the same, the lever v^6 is moved from underneath the intermediate lever v^3 and the latter set free to act, owing to the lever v^{10} coming into contact with and moving the lever v^9 outwards and the latter turning back the shaft v^8. On the minute units wheel d^3 completing one revolution the roller l^3 comes in contact with the ratchet wheel n on the governing shaft n^1 carrying it one division, and thus the minute tens wheel d^2 through the spur wheels o, o^1, one division at the same time the rocking lever roller s^2 which rides on the disc p, see Fig. 11, falls into the recess p^1 which allows the other roller s^1 at the other end of the lever s to leave the recess r^1 in the disc r.

Every sixth movement of the minute tens wheel d^2 the hour wheel d^1 is moved one division by one of the arms p^2 on the disc p coming into contact with one of the pins q on the hour wheel d^1 at the same time the roller s^6 on the lever s^7 drops into recess p^1 on the disc p and a precisely similar roller s^6 on the opposite side of the lever s^7 drops out of one of the V recesses q^2 thus allowing the hour wheel to move one division whilst otherwise the hour wheel d^1 is locked in position. The meridian wheel d^4 is moved in an exactly similar manner except that it moves only one division in two hours, its disc p having only one arm p^2 and one recess p^1.

The time stamp and and its mechanism described in connection with a clock and suitable casing can also be used for stamping the time of arrival and delivery of documents and the like onto the same.

Having now particularly described and ascertained the nature of this invention and in what manner the same is to be performed I declare that what I claim, is—

"In apparatus for checking and recording workmen's time and for other similar purposes,"

1st. The combination of the type wheels of the time stamp, consisting of a minute units wheel d^3 having numbers 0—9, a minute tens wheel d^2 having numbers 1—5 and one blank space twice, an hour wheel d^1 having numbers 1—12, the meridian wheel d^4 having six a.m.'s occupying one half and six p.m.'s the other half of the periphery, the minute units wheel d^3 being fixed on a sleeve h and the other type wheels rotating thereon loosely, substantially as set forth.

2nd. The minute units wheel d^3 having on one side a roller l^3, internal V recesses k, a ratchet wheel k^1, a lever l having reciprocal motion imparted from a magnet and furnished with a pawl l^1 and roller l^2 and on the other side a disc p having one recess p^1, in combination with a governing shaft n^1 carrying a ratchet wheel n, a spur wheel o in gear with a spur wheel o^1 on the minute tens wheel d^2, a disc p with two recesses p^1 and two arms p^2, a disc p with one recess p^1 and one arm p^2 and a locking disc r with twelve recesses r^1, the pawl l^1 being adapted to move the minute units wheel d^3 always one division, and the roller l^3 to move the ratchet

wheel n one tooth at each revolution and carry with it the discs p, p, and spur-wheel o, all substantially as set forth.

3rd. In combination with the minute units wheel d^3 and lever l the locking lever s^3 having at its free end a roller s^4 adapted to engage the internal V recesses k and the roller l^3 on the lever l to press on the lever s^3 and to lock it in position until a change in the position of the type wheels of the time stamp d is to take place, all substantially as set forth.

4th. In combination with the hour type wheel d^1, the meridian wheel d^4 and their discs p, p, respectively, the locking levers s^7, s^5, each having two rollers s^6 one being adapted to engage one of the V recesses q^2 and retain the type wheels d^1 & d^4 in position whilst riding on the periphery of the disc p and the other to engage the recess p^1 during the time the rollers p^3 of the arm p^2 comes into contact with one of the pins q on the hour type wheel d^1 and meridian wheel d^4 for the purpose of turning the same, substantially as set forth.

5th. In combination with the minute units wheel d^3 and the governing shaft locking wheel r, a double armed lever s, the roller s^2 of one arm being adapted to ride upon the periphery of the minute units wheel disc p, whilst the roller s^1 of the other arm engages one of the V recesses r^1 of the locking disc r and is allowed to leave the same when the other roller s^2 meets with and falls into the recess p^1 of the disc p for the purpose of unlocking the governing shaft n once during each revolution of the minute unit type wheel d^3, substantially as set forth.

6th. In combination with the pawl lever b^2 of the minute wheel b^1 of the secondary clock, the back pawl b^8 controlled by the pawl lever b^2, substantially as and for the purpose set forth.

Dated this 1st day of August 1894.

F. BOSSHARDT & Co.,
4, Corporation Street, Manchester, Agents to Applicant.

London: Printed for Her Majesty's Stationery Office, by Darling & Son, Ltd.—1897

A.D. 1894. April 30. N°. 8513.*
WHITEHEAD'S Amended Specification.

[2 SHEETS]
SHEET 1.

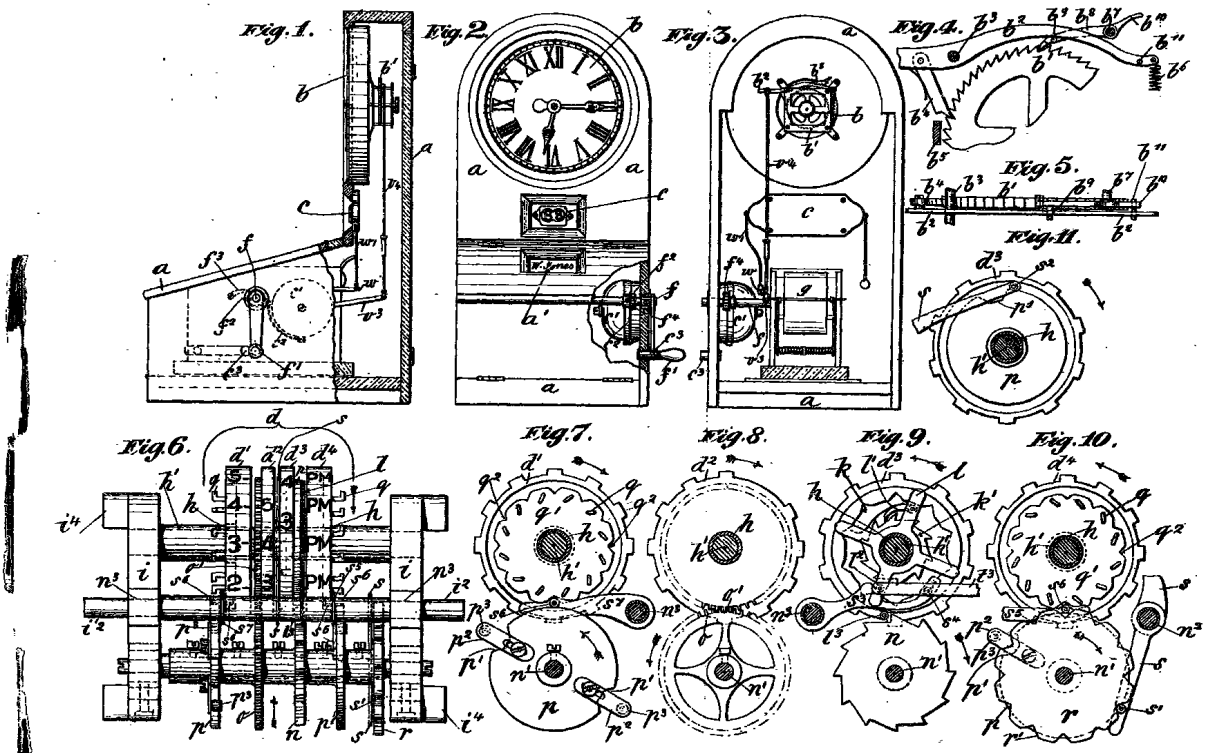

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Fig. 1.

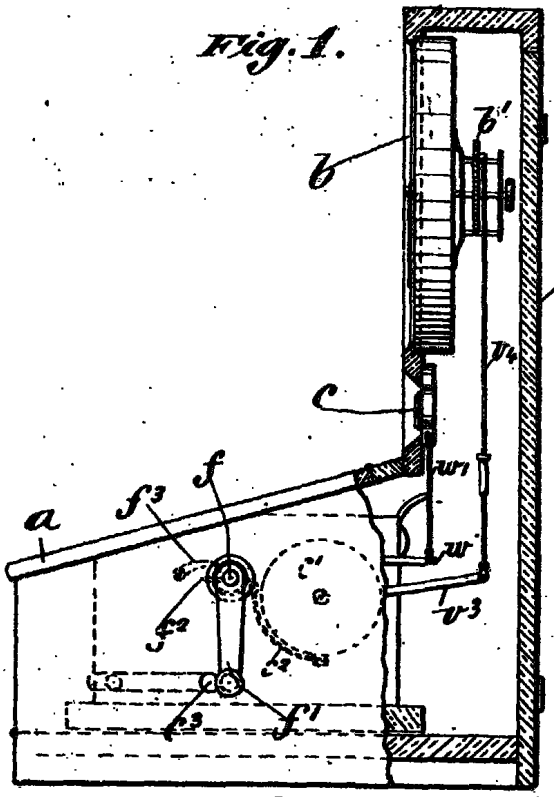
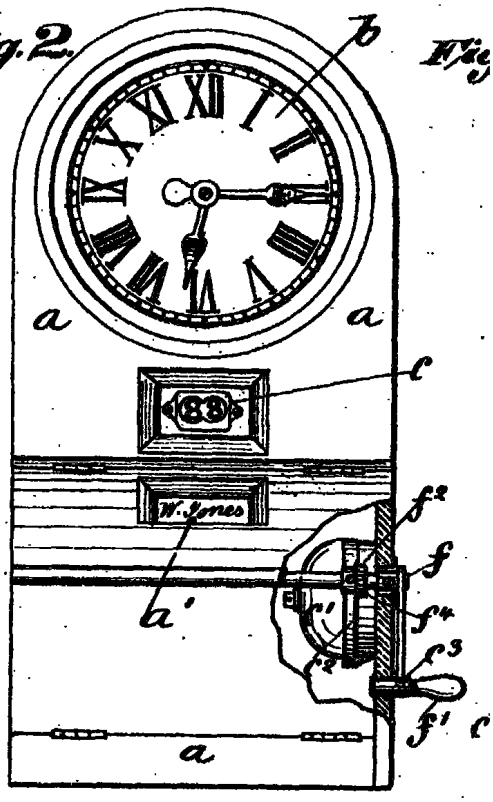


Fig. 2.



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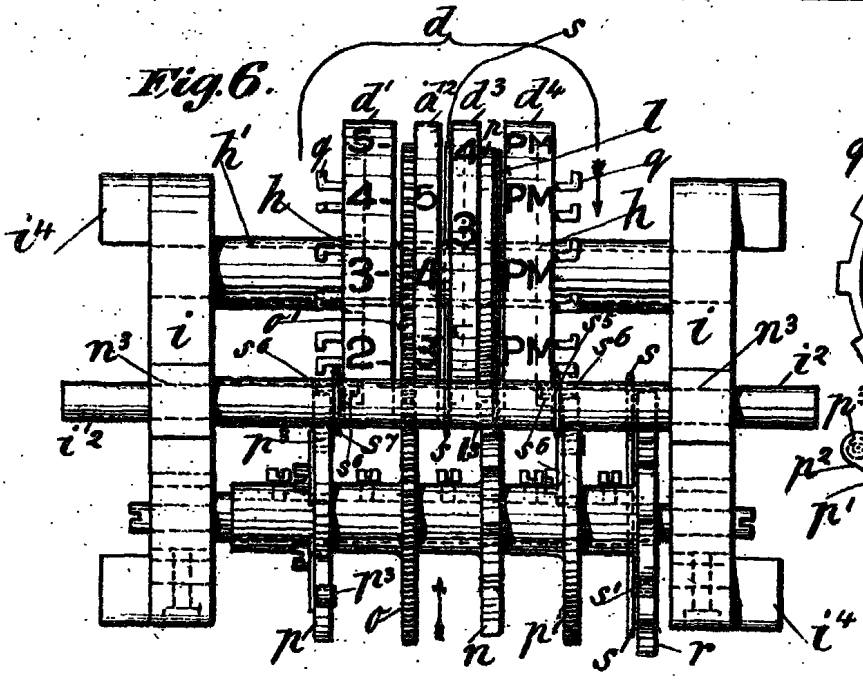

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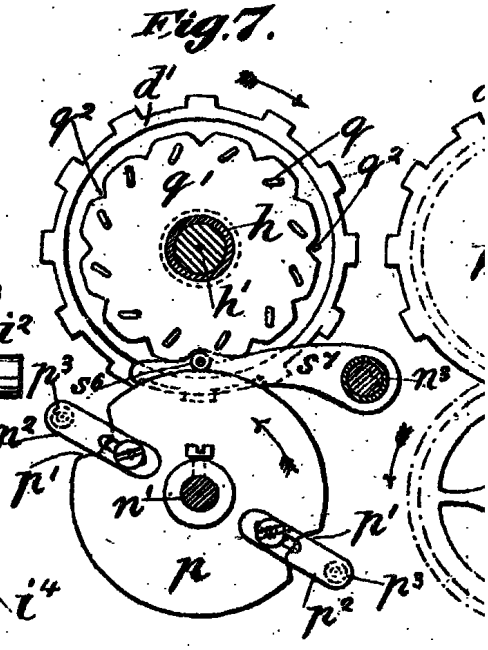

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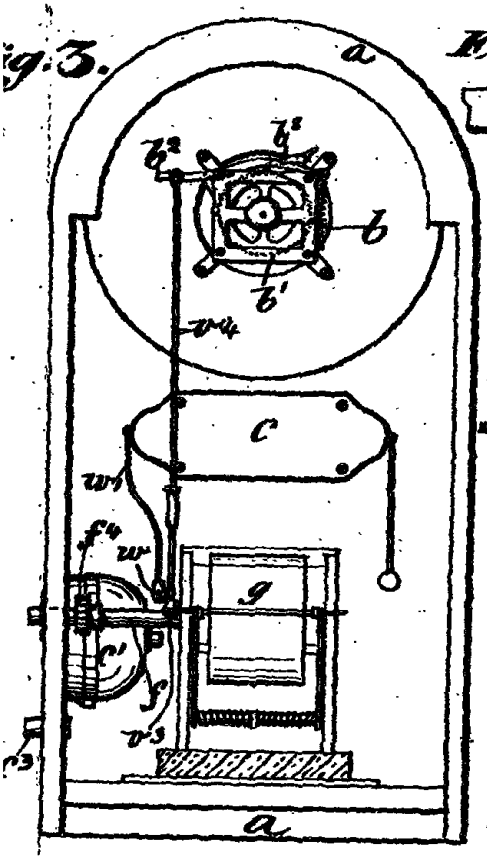

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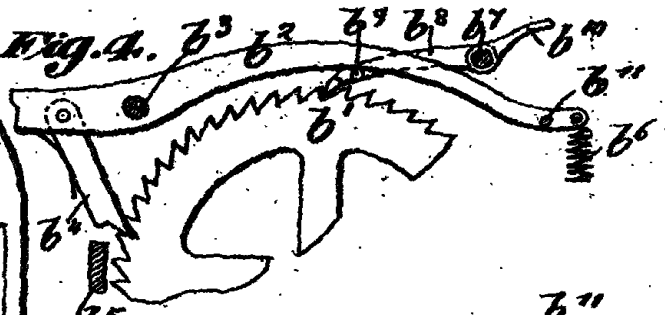

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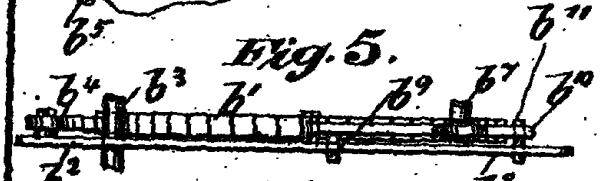

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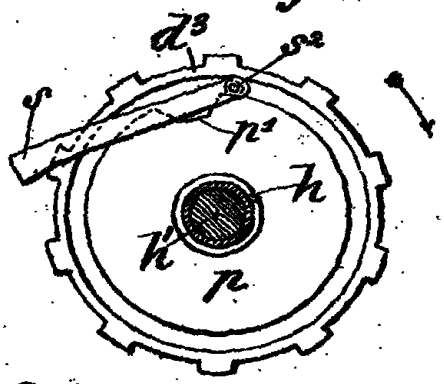
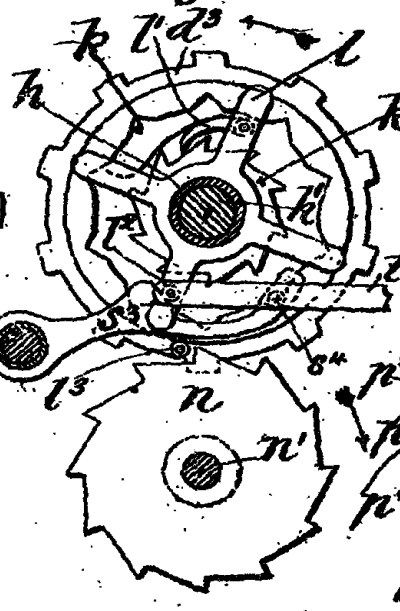


Fig. 8.

Fig. 9.



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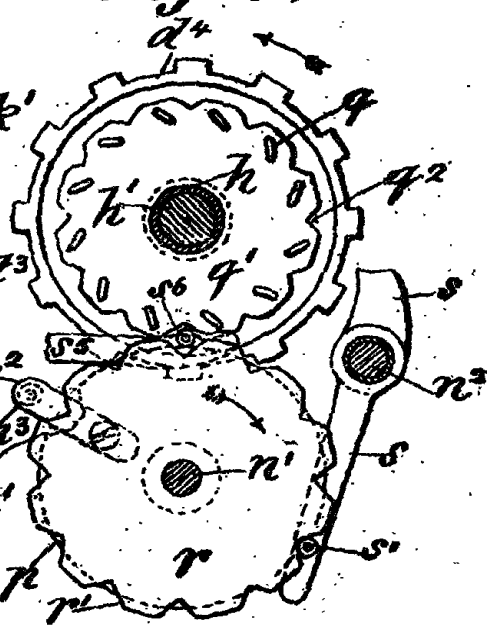

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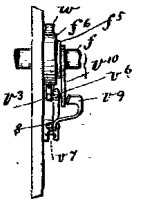
Fig. 16.



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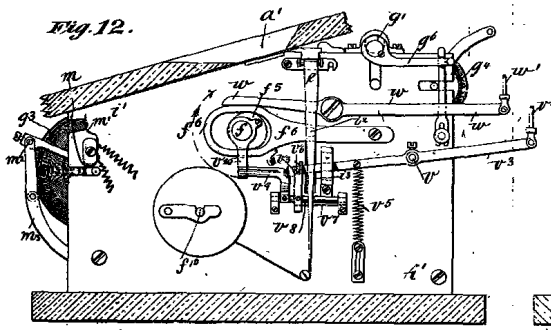

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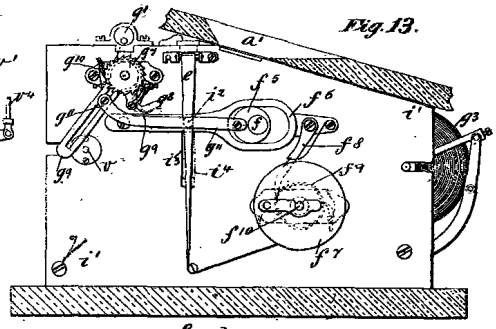

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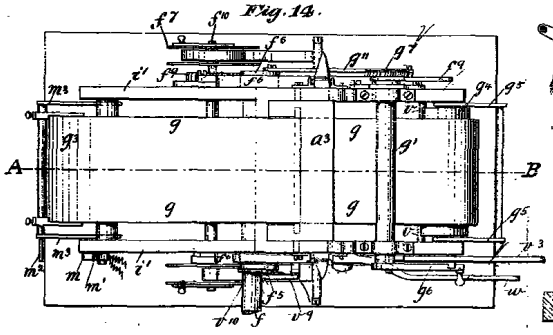

Fig. 15.

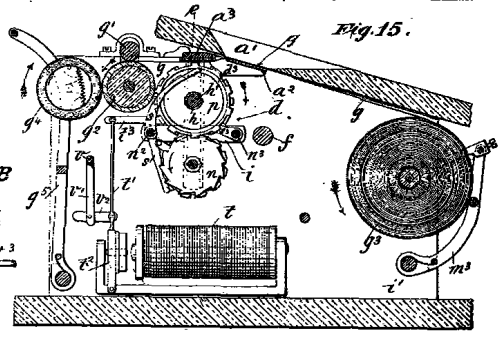

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Fig. 16.

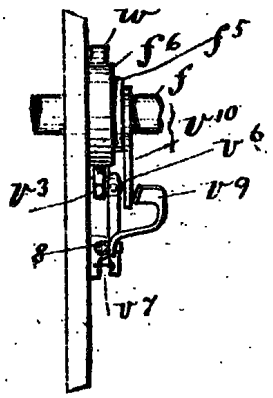

Fig. 12.

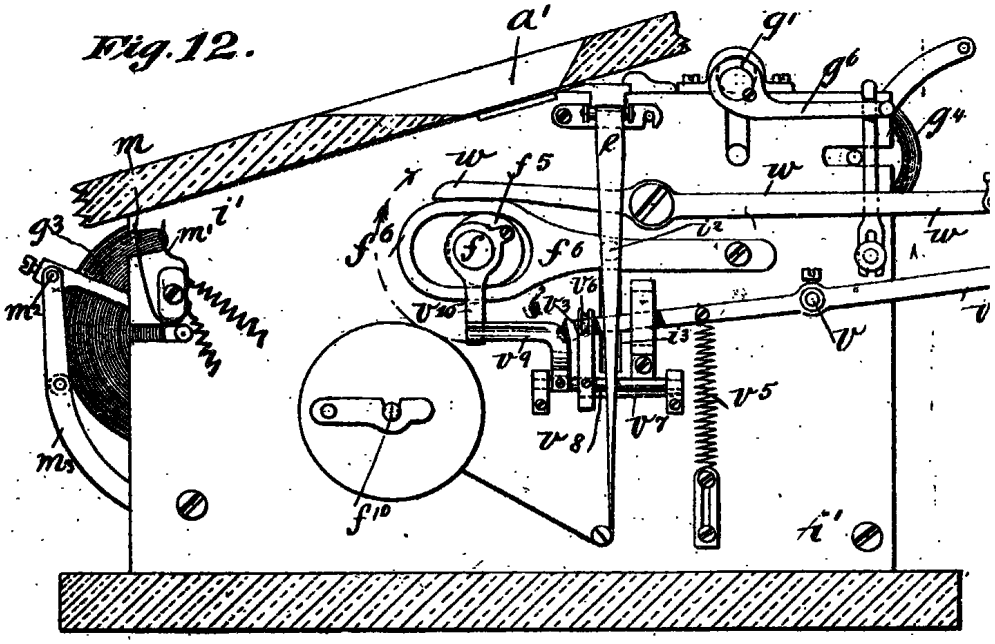

Fig. 14.

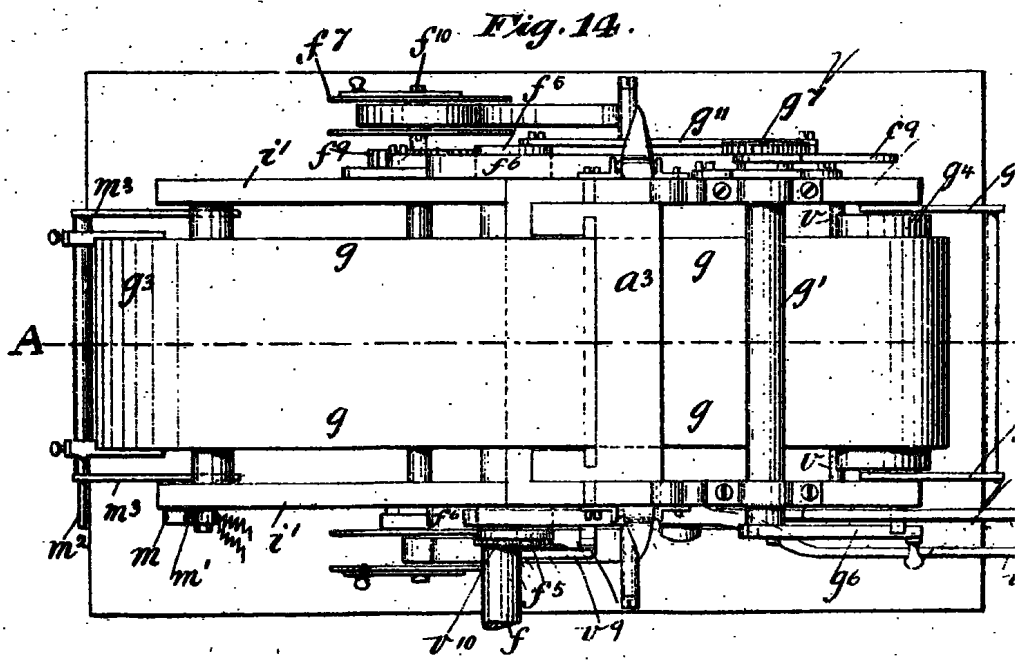

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Fig. 13.

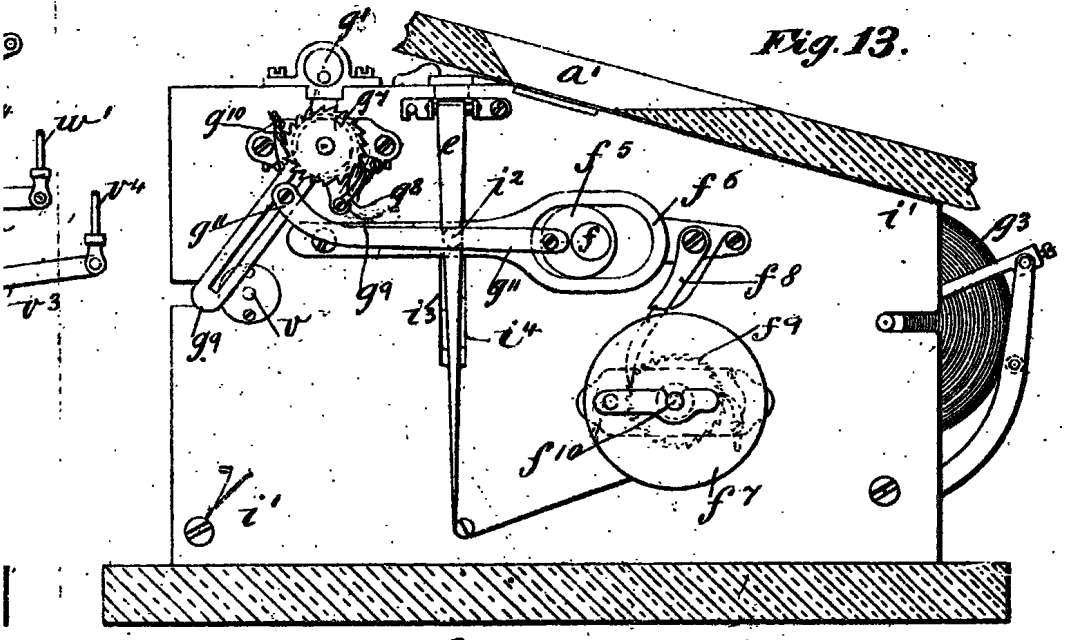
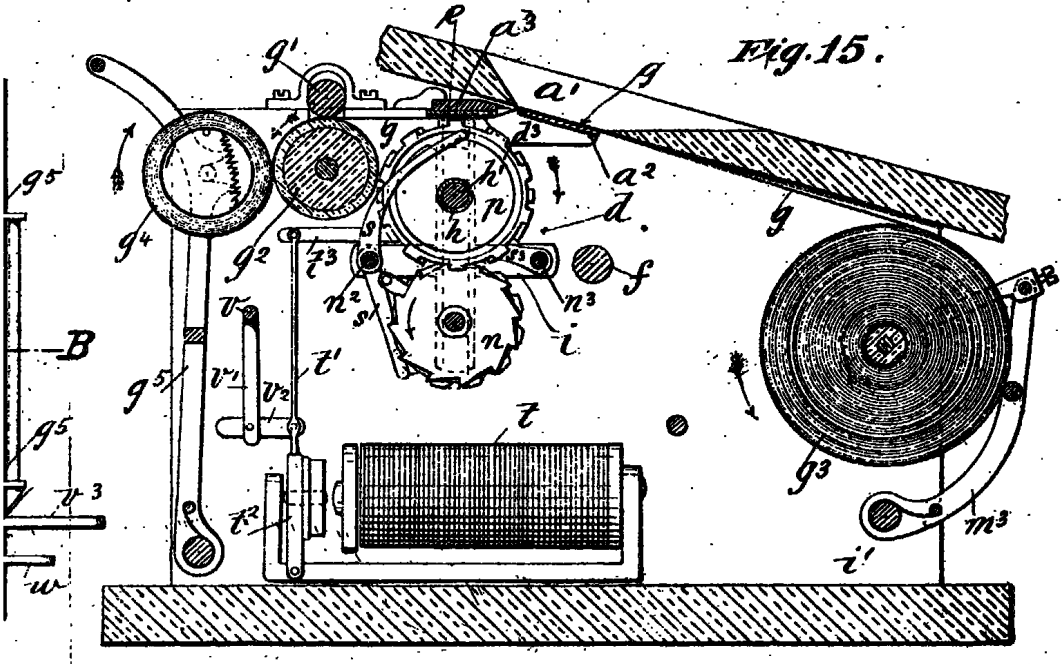


Fig. 15.



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N° 8513A A.D. 1894

Date of Application, 30th Apr., 1894

Complete Specification Left, 26th Jan., 1895—Accepted, 30th Mar., 1895

PROVISIONAL SPECIFICATION.

Improvements in and connected with Inking Devices for Time Checking and Recording Apparatus, and for Type Writing or Type Printing Instruments.

I, WILLIAM WHITEHEAD, of 160, Princess Road, Moss Side, Manchester, in the County of Lancaster, Electrical Engineer, do hereby declare the nature of this invention to be as follows :—

The object of this invention is to provide an inking device for time checking and recording apparatus and for type writing or type printing instruments which will facilitate a more reliable automatic reversing of the inking ribbon than heretofore has been the case.

To this end I employ in connection with the respective apparatus or instrument two spools, having each a pin or pins on the inner side, one of which spools is fixed upon each end of a shaft passing through a tubular spindle mounted in the frame of the apparatus or instrument. To one end of this tubular spindle is secured a ratchet wheel and to the other end a similar ratchet wheel or disc of similar diameter each having a number of holes in its side adapted to engage alternately the pin or pins of the aforesaid spools. A pawl under the influence of a spring is adapted to engage and rotate the ratchet wheel on the said spool shaft intermittently.

In connection with the said spool is employed an inking ribbon passing over a number of suitably positioned guide pulleys and adapted to be wound from one spool onto the other alternately. In connection with each spool is employed a rocking shaft having at one end a split lever through which the said inking ribbon passes and at the other end a lever connected by means of a rod to a toggle-joint, the lower end of which is jointed to a spring and the upper end being formed with a fork adapted to engage a collar capable of sliding upon the tubular spindle and connected to the spool shaft in the latter by means of a stud passing through a slot in the said tubular spindle. The said inking ribbon near each end is furnished with a projection which, when the ribbon is nearly wound off one spool, comes into contact with and raises the split lever on the respective side. This causes the position of the toggle-joint to be reversed through the medium of the respective rocking shaft lever, rod and spring and the spool shaft to be moved longitudinally in the tubular spindle so as to bring the spool unwound and out of gear, in gear with the respective disc or wheel as the case may be and thereby reverse the travel of the inking ribbon.

Dated this 2nd day of June 1894.

F. BOSSHARDT & Co.,
Agents to Applicant.

[*Price 8d.*]

COMPLETE SPECIFICATION.

Improvements in and connected with Inking Devices for Time Checking and Recording Apparatus, and for Type Writing or Type Printing Instruments.

I, WILLIAM WHITEHEAD, of 160, Princess Road, Moss Side, Manchester, in the County of Lancaster, Electrical Engineer, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement :—

The object of this invention is to provide an inking device for time checking and recording apparatus and for type writing or type printing instruments which will facilitate a more reliable automatic reversing of the inking ribbon than heretofore has been the case.

And in order that my invention may be more fully understood I have caused to be appended hereunto one sheet of drawings marked with letters of reference indicating like parts in the various figures.

Fig. 1 is a cross section and Fig. 2 a plan of my improved type inking device.

In carrying out my invention, and referring to the figures generally I employ in connection with the apparatus or instrument, the type of which requires inking, two spools a, a, mounted loosely upon the ends of a shaft b arranged inside a tubular spindle c mounted in a frame d which may be that of the respective apparatus or one specially employed for that purpose. In order to retain the spools a, a, longitudinally in position upon the ends of the shaft b the same are formed respectively with an annular groove b^1 and each spool a is furnished with a hinged catch a^1 adapted to engage in the groove b^1. The spools a, a, on their inner side are each furnished with a pin or pins a^2 and the respective ends of the tubular spindle c with a disc e having holes e^1 corresponding in position with the aforesaid pins, and adapted to engage the pin or pins of each spool alternately.

The periphery of one or both of the discs e are formed with ratchet teeth in connection with a pawl f, see Fig. 1, under the influence of a spring (not shown) and adapted to engage in the ratchet teeth and thereby rotate the hollow spindle c intermittently.

The pawl f may be actuated from any movable part of the apparatus or instrument to which the inking device is applied as may be found most convenient.

In connection with the spools a, a, is employed an inking ribbon g passing over a number of suitably positioned guide pulleys h and adapted to be wound from one of the said spools onto the other alternately. In connection with each spool a is employed a rocking shaft i, i, say mounted on the frame d having at one end a split lever i^1 through which the inking ribbon g passes and at the other end a lever i^2 connected by means of a rod k to a toggle-joint l, the lower end of which is jointed to a spring m and the upper end being formed with a fork l^1 adapted to engage a collar n capable of sliding upon the tubular spindle c and connected to the spool shaft b by means of a stud b^2 passing through a slot c^1 in the tubular spindle c. The inking ribbon g near each end is furnished with a projection e^2 which, when the ribbon g is nearly wound off one spool, comes into contact with and raises the split lever i^1 on the respective side. This causes the position of the toggle-joint l to be reversed through the medium of the respective rocking shaft lever i^2, rod k and spring m and the spool shaft b to be moved longitudinally in the tubular spindle c so as to bring the spool unwound and out of gear, in gear with the respective disc or wheel e as the case may be and thereby reverse the travel of the inking ribbon g.

The collar *n* is formed with a flange at each end which are such a distance apart from each other that the fork will not contact with the collar flange until the moment when the toggle-joint *l* snaps past its centre thus effecting the coupling and uncoupling instantaneously.

Having now particularly described and ascertained the nature of this invention and in what manner the same is to be performed I declare that what I claim, is—

An automatic ink ribbon reversing device for time checking and recording apparatus and for type writing or type printing instruments, consisting of two spools *a*, *a*, loosely mounted upon a shaft *b* mounted inside a tubular spindle *c* having at one end a ratchet wheel *e* and at the other a similar ratchet wheel or disc *e*, the said spools and discs being adapted to couple and uncouple alternately by means of a toggle-joint *l* under the influence of a spring *m* and connected by rods *k* to the rocking shaft *i*, *i*, each having a split lever i^1 through which the inking ribbon *g* passes, the latter carrying near each end a projection e^2 which comes into contact with the said split levers on the respective side when the ribbon is nearly unwound and causes, through the shaft i^2 and rods *k*, the toggle-joint *l* to change its position, uncouple the full spool from the tubular spindle *c* and couple the empty one with the same, substantially as set forth.

Dated this 25th day of January 1895.

F. BOSSHARDT & Co.,
4, Corporation Street, Manchester, Agents to Applicant.

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Fig. 1.

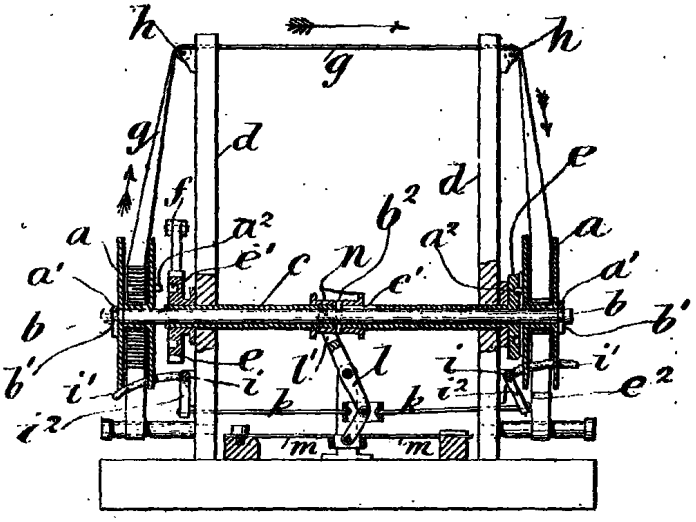
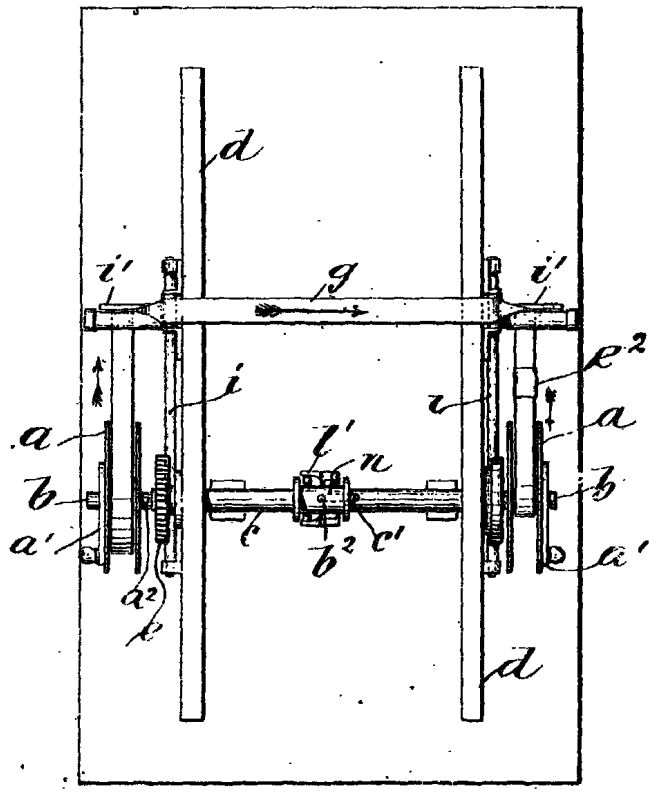


Fig. 2.



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