N° 16,662 A.D. 1893

Date of Application, 5th Sept., 1893
Complete Specification Left, 4th June, 1894—Accepted, 7th July, 1894

PROVISIONAL SPECIFICATION.

Improvements in Apparatus for Checking or Indicating the Time of Arrival and Departure of Workpeople.

I, FRANK BROOK of 9A Market Street, Huddersfield, Yorkshire Watchmaker do hereby declare the nature of this invention to be as follows:—

This invention refers to mechanism for checking or indicating the periodical arrival and departure of employées.

In carrying out my invention I employ, by preference, an ordinary eight-days clock, and from the hour or minute wheel or shaft thereof I transmit motion to a disc or discharge wheel or plate mounted on a stud secured to the frame of the clock, which is rotated to the extent of one revolution to every twenty four revolutions of the minute wheel. The said disc is marked off into divisions each representing five minutes or other fractional periods of time, and holes are punched or drilled at each division for the reception of studs or pins whose number and disposition on the said discharge wheel is determined by the times at which the checking or indicating is required to take place. I also use the ordinary striking mechanism of the clock and connected with the levers for setting said mechanism in action is a lever arm having a suitably formed end which is adapted to be engaged by the pin or pins on the discharge wheel as the latter revolves, and to release the aforesaid levers so as to give the alarm. When said levers are operated thus, the coiled spring within the barrel connected with the striking mechanism causes the parts to be rotated until the cam or snail has completed a revolution, when it is again engaged by one of the levers and further movement of the escapement prevented until a second pin on the discharge wheel again actuates the lever arm and releases the mechanism. To the spur wheel mounted on the axis of the spring barrel is geared a pinion mounted on a short shaft carrying a bevil wheel gearing with another bevil secured to one end of a vertical shaft. The partial rotation of the said spur wheel as set forth causes the pinion, and also the upright shaft through the medium of the bevil wheels, to be rotated to the extent of one revolution.

Mounted loosely on the lower end of the upright shaft is a pinion gearing into teeth formed on the outer edge of a wheel or frame made with recesses or divisions to receive twelve or other suitable number of loose boxes into which the employées checks or tallies are to be deposited.

The said pinion is provided with a stud, finger or key with which engages the end of a sleeve or hollow shaft secured to the upright shaft so as to turn therewith but which is free to be slided up or down the shaft. When the sleeve is engaged with the stud or key, the pinion revolves with the upright shaft and causes the frame or drum to be rotated to the extent of one box so as to bring a second box or division of the drum under the "shoot" into which the employées deposit their checks, and this change of boxes or divisions is effected each time a stud or pin on the discharge wheel engages the lever arm connected to the levers of the striking mechanism. The boxes or divisions of the drum or frame may be marked to accord with the time or times at which they are brought under the "shoot," and they are removeable at will. In cases where the number of checks expected to be deposited in one or other of the boxes exceeds the capacity of said box or boxes, an opening is made in the bottom of same through which the checks pass into a receptacle underneath. By sliding the sleeve out of engagement with the pinion on the upright shaft, the wheel or drum can be turned round without disturbing the clockwork, from which it is thus disconnected.

[*Price* 8*d*.]

Instead of effecting the periodical partial rotation of the drum or frame through the medium of the striking mechanism in the manner set forth, I may establish an electric connection between the lever arm or levers of the striking mechanism and an electro magnet or magnets situated under the drum or frame, which latter, each time the circuit is completed by the engagement of a pin or stud on the discharge wheel with the lever arm, release the drum and allow it to be partially rotated by a weight suspended from the end of a cord or chain wound onto the drum or its axis. The electro magnets are arranged so that when one end is withdrawn from engagement with the frame or drum, the opposite end is raised and engages with the drum when it has moved to the extent of one box; or the magnet may be withdrawn entirely to release the drum, and return to its original position before the requisite movement has been completed.

The completion of the circuit may otherwise be effected by a cam on one of the shafts of the striking mechanism acting on a lever so as to raise it to make the connection, the said lever being held in connection for a longer or shorter period by lengthening or shortening the "dwell" of the cam.

Where the drum or frame is situated at some distance from the clock, the use of an electric connection or connections for releasing the drum at stated periods is of advantage.

Dated this 4th day of September 1893.

TASKER & CROSSLEY,
Huddersfield, Agents for the Applicant.

COMPLETE SPECIFICATION.

Improvements in Apparatus for Checking or Indicating the Time of Arrival and Departure of Workpeople.

I, FRANK BROOK, of 9A Market Street, Huddersfield, Yorkshire, Watchmaker, 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 refers to mechanism for checking or indicating the periodical arrival and departure of employees.

In order that the said invention may be fully understood reference is hereinafter had to the annexed sheets of drawings and the letters of reference marked thereon.

Fig. 1 is front elevation of my improvements as applied to and operated by the mechanism of an eight day's clock. The clock face or dial is removed and the minute and hour hands and the gearing for actuating the hour hand are shewn in dotted lines for the sake of clearness.

Fig. 2 is end elevation of Fig. 1.

Fig. 3 is plan of drum or frame, and receiving boxes on a reduced scale.

Fig. 4 is a detail shewing a modification of the pivot or bearing on which the frame is supported.

Fig. 5 is transverse section shewing the clockwork and apparatus enclosed in a case or shell.

Fig. 6 is front elevation of same.

Fig. 7 is a detail of receiving box.

Figs. 8, 9, and 10 illustrate three different arrangements for releasing the drum or frame at stated intervals of time by electrical connection with the clockwork.

Referring to the drawings *a* represents the framework of the clock, *b* the arbor or shaft on which the hour wheel *c* is mounted, said hour wheel gearing with wheel *d* and receiving motion from the ordinary mechanism of an eight day's clock, which being well known, is not shewn on the drawings.

On the hour wheel arbor *b* is mounted a pinion *e* which gears into and drives a disc or discharge wheel or toothed plate *f* mounted on a stud secured to the

framework *a* said discharge plate being rotated to the extent of one revolution to every twenty four revolutions of the hour wheel.

The face of the discharge plate *f* is marked off into divisions each representing five minutes or other fractional periods of time and holes are punched or drilled at any of these divisions or intermediate thereof for the reception of studs or pins f^1 whose number and disposition around the discharge wheel are determined by the periods of time at which the checking or indicating is required to take place. In conjunction with the eight day's clockwork I employ the striking mechanism of a thirty hour's clock consisting of levers *g* and *h* for releasing said mechanism, spring barrel *i*, fusee *j*, the train of wheels *k*, k^1, k^2, k^3, "fly" k^4, and snail k^5 mounted on the shaft k^6. Connected with the lever *g* is a short lever arm g^1 which is adapted to be engaged by the pins f^1 on the discharge wheel as the latter rotates and to elevate the said lever *g* which lifts the lever *h* clear of the snail k^5 whilst the short lever arm h^1 secured on the same stud as the lever *h* is at the same time placed clear of the pin *l* on the toothed wheel k^2, whereby the mechanism is temporarily released and is put in motion by the uncoiling of the spring in the barrel *i*.

The motion of the parts, however, is only temporary so as to bring the larger diameter of the snail k^5 under the depending leg of lever *h* and is arrested by the pin *m* on wheel k^3 engaging a projection *n* on the end of lever *g*, but immediately the pin f^1 in engagement with the lever arm g^1 rides clear of said lever arm the lever *g* assumes its normal position and releases the wheel k^3 and therefore the striking mechanism whereupon the action of the coiled spring causes the parts to be rotated until the cam or snail k^5 has completed a revolution and is again locked by the depending foot of lever *h* as shewn on the drawings.

The parts remain in the positions shewn in Fig. 1 and inoperative until a second pin on the discharge wheel actuates the lever arm g^1 when they are operated as previously described and this is repeated each time a pin f^1 on the rotating discharge wheel *f* engages the lever arm g^1.

The intermittent motion obtained as above set forth is for the purpose of rotating at predetermined periods, the frame or drum *o*, in which are loosely placed the boxes *p* for receiving the workmen's tokens or checks, to the extent of one box so as to bring another box under the shoot *q* to receive the checks of workmen arriving after a given time and before the expiration of the next given period. The means I employ for transmitting such motion to the frame or drum *o* consist of a pinion *r* mounted on the snail shaft k^6 and gearing with the spur wheel *k* on the fusee *j*, or if no fusee be employed a pinion mounted on a stud and gearing with a spur wheel on the spring barrel *i* may be substituted for the arrangement shewn. On the same shaft k^6 is mounted a bevil wheel r^1 gearing into a bevil wheel *s* secured on a short shaft s^1 on which is a second bevil wheel s^2 gearing with a bevil wheel *t* supported by a bracket and having a square ended spindle which enters into the end of and is adapted to rotate a vertical shaft t^1. At the lower end of the said vertical shaft but not connected therewith is a pinion t^2 supported in a footstep t^3 and engaging with the teeth of the spur wheel o^1 cast on or attached to the drum *o*. The pinion t^2 carries a stud or pin t^4 which is adapted to enter a corresponding opening formed in the flange at the base of a hollow sleeve or tube t^5 placed on the shaft t^1. The said sleeve is secured to the shaft so as to rotate therewith by means of a set screw t^6 passing through a slot t^7 in the sleeve, but such sleeve is capable of being moved up and down the shaft to place it out of or into engagement with the pin t^4 to disconnect the drum or frame *o* from the operative mechanism or connect it therewith. When disconnected the drum or frame can be turned round to examine the contents of all the boxes or to change the order of said boxes or for other purposes without interfering with the clockwork mechanism.

It will be seen from the above that each time the escapement or striking mechanism is released by a peg or pin on the discharge wheel *f* and the snail k^3 rotated to the extent of one revolution the pinion t^2 will be likewise rotated to the extent of one revolution through the medium of bevil wheels r^1, *s*, s^2 and *t* and shaft t^1 and the number of teeth on said pinion being equal to the number of teeth

between each division of the frame or drum o the last named will be rotated to the extent of one division and bring the next box p under the shoot q into which the tokens or checks are placed by the workman who introduces them through slots q^1 in the framework or case enclosing the time checking apparatus.

The boxes or divisions of the drum or frame o are marked to accord with the time at which they are to be brought under the shoot q as indicated at Fig. 5 and said boxes are removable at will. Each workman or operative is provided with a check or token numbered or lettered to indicate to whom it belongs, and as the time at which each box is presented under the shoot is exhibited through an opening q^2, the particular boxes into which the tokens or checks are deposited establishes without question the time of arrival or departure of the workmen and there is no disputing of the record.

As an illustration of the action of the apparatus I will assume that work commences at seven o'clock A.M. and that three minutes grace is allowed. The box marked seven will remain under the shoot q until the minute hand of the clock indicates three minutes past seven whereupon a pin f^1 on the discharge wheel f will release the escapement or striking mechanism as before fully described and cause the frame or drum o to be rotated to the extent of one box, moving the box marked seven from under the shoot and presenting the next box marked at any required time—say—seven-fifteen in its place. Into this box those coming between three minutes past seven and eighteen minutes past seven will deposit their checks, and their time of arrival therefore be recorded as seven-fifteen this being repeated as many times during the day as may be required, and at any predetermined time.

The frame or drum o may be constructed to hold any number of boxes p, the number of teeth between each division, however, always being equal to those on the pinion t^2. In cases where the number of checks expected to be deposited in one or other of the boxes exceeds the capacity of said box or boxes an opening p^1 is made in the bottom thereof as shewn at Fig. 7 through which the checks pass into a receptacle underneath the frame o. The drum or frame o is supported by and rotates upon a ball bearing as shewn at Fig. 1 or on a cone bearing as illustrated at Fig. 4. Instead of effecting the periodical partial rotation of the drum or frame o through the medium of the striking mechanism in the manner set forth, I may establish an electric connection with the lever h, which is insulated from the other parts and an electro magnet u as illustrated at Fig. 8, the engagement of the lever g with the lever h completing the circuit and causing a double pallet v to be attracted by the electro magnet and tilted into the position shewn in dotted lines which moves the left hand end of said pallet clear of one of the studs v^1 secured to the underside of the drum or frame and places the opposite end in the path of the next stud. This allows the drum or frame o to be slightly moved by the weight and cord by which in this case the drum is rotated, and to place the stud v^1 beyond the reach of the left hand end of the pallet so that when the pin on the discharge wheel passes clear of the lever arm g^1 and allows the lever g to fall back to its normal position, the circuit will be broken and the pallet allowed to resume its normal position, whereby the drum will then be rotated by the unwinding of the cord off the barrel o^2 until the next stud engages with the left hand end of the pallet, the extent of motion being equal to one box p. In Fig. 9 a single pallet is shewn which is moved clear of the pegs on the underside of the drum each time an electric connection is made and returns to its normal position before the next peg arrives. Flat or spiral springs may be employed to ensure the return of the pallets to their normal position.

In Fig. 10 I use the pinion t^2 and toothed frame by which a steadier motion can be obtained. The frame or drum is rotated as in Figs. 8 and 9 by means of a cord wound upon a barrel and attached at its free end to a weight.

The pallet or lever in this case normally engages the pin t^4 and is drawn clear thereof by the electro magnet each time an electric connection is made by a pin on the discharge wheel releasing the escape mechanism. The electric connection may

be made with an ordinary turret clock and where the drum or frame is situated at some distance from the clock or where two or more time checking apparatuses are in use at different places on the premises the use of an electric connection is preferable and only one clock is required to actuate them.

Although I have shewn and described the electric connection as being established by the contact of lever *g* with lever *h* it may be made by a cam or snail on the snail or other suitable shaft of the striking mechanism acting on a separate lever, the connection being made either short or long as required by increasing or reducing the dwell on the cam.

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

Firstly. In apparatus for checking or indicating the periodical arrival or departure of employees, a discharge wheel or disc driven from the minute wheel of the clock and having provision for receiving pins or studs for determining the actuation of the checking apparatus at desired intervals of time, a lever arm adapted to be engaged by said pins and to release the parts for transmitting motion to a vertical shaft, a pinion adapted to be driven by said shaft and gearing with a toothed drum or frame which holds the check receiving boxes, all arranged and operating in the manner and for the purposes substantially as herein shewn and described.

Secondly. In apparatus for checking or indicating the periodical arrival or departure of workpeople, the combination with an eight day's clock, a discharge wheel or plate such as *f*, pins f^1, and lever arm g^1, of the parts comprising the striking mechanism, and the gearing for rotating the frame or drum *o* in the manner and to the extent substantially as herein set forth.

Thirdly. In apparatus for checking or indicating the arrival or departure of workpeople, the combination with a drum or frame constructed to hold the check receiving boxes of the toothed rim or spur wheel o^1 formed or secured thereon, and a pinion such as t^2 adapted to gear therewith and having the same number of teeth as there are teeth between each section into which the frame is divided, said parts being operated in the manner and for the purposes substantially as shewn and described.

Fourthly. In workpeople's time checking or indicating apparatuses, a sleeve or tube such as t^5 secured rotatably to the shaft t^1 but adapted to slide vertically thereon and to engage with a pin or projection on the pinion t^2 and to give motion to said pinion substantially as set forth.

Fifthly. The method and means combined with the discharge plate or disc for releasing the drum or frame *o* by electrical connection substantially as herein described and shewn in Figs. 8, 9, and 10.

Lastly. The general arrangement, combination, and operation of mechanism comprising the apparatus for checking or indicating at periodical intervals the arrival or departure of workpeople substantially as described and shewn.

Dated this 2nd day of June 1894.

TASKER & CROSSLEY,
Huddersfield, Agents.

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FIG. 1.

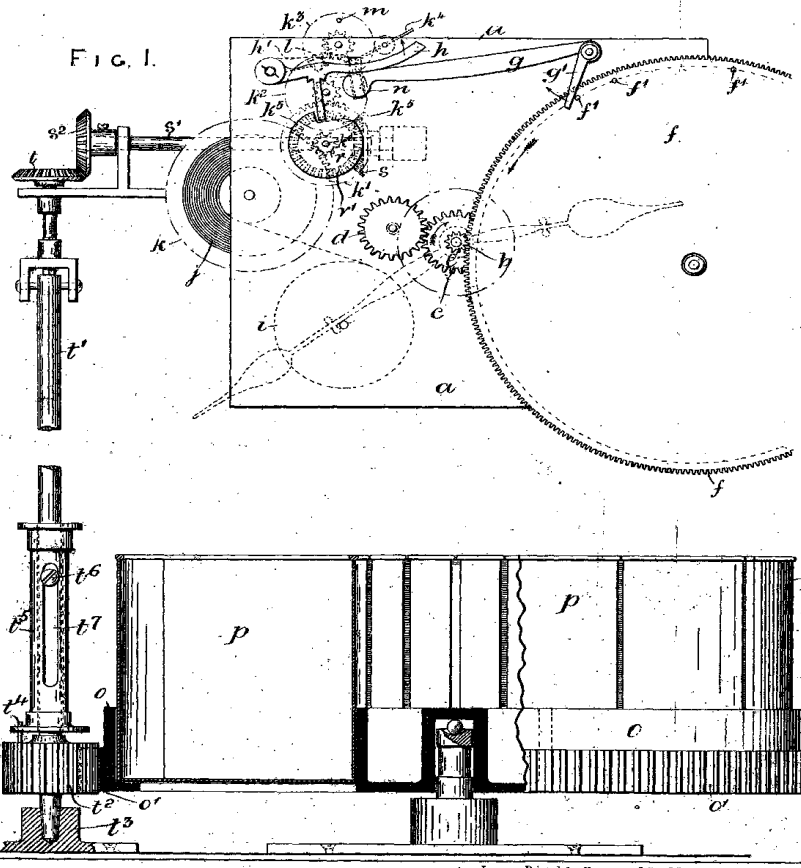

FIG. 2.

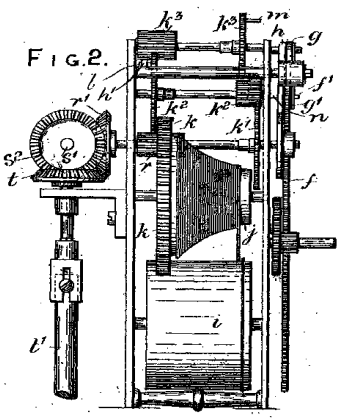

FIG. 3.

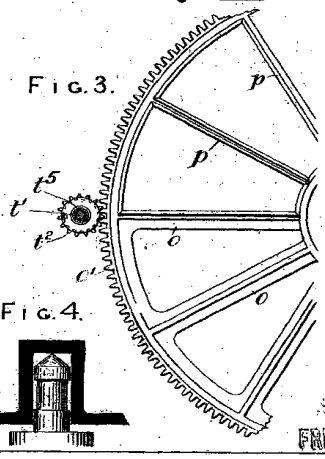

FIG. 4.

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FIG. 1.

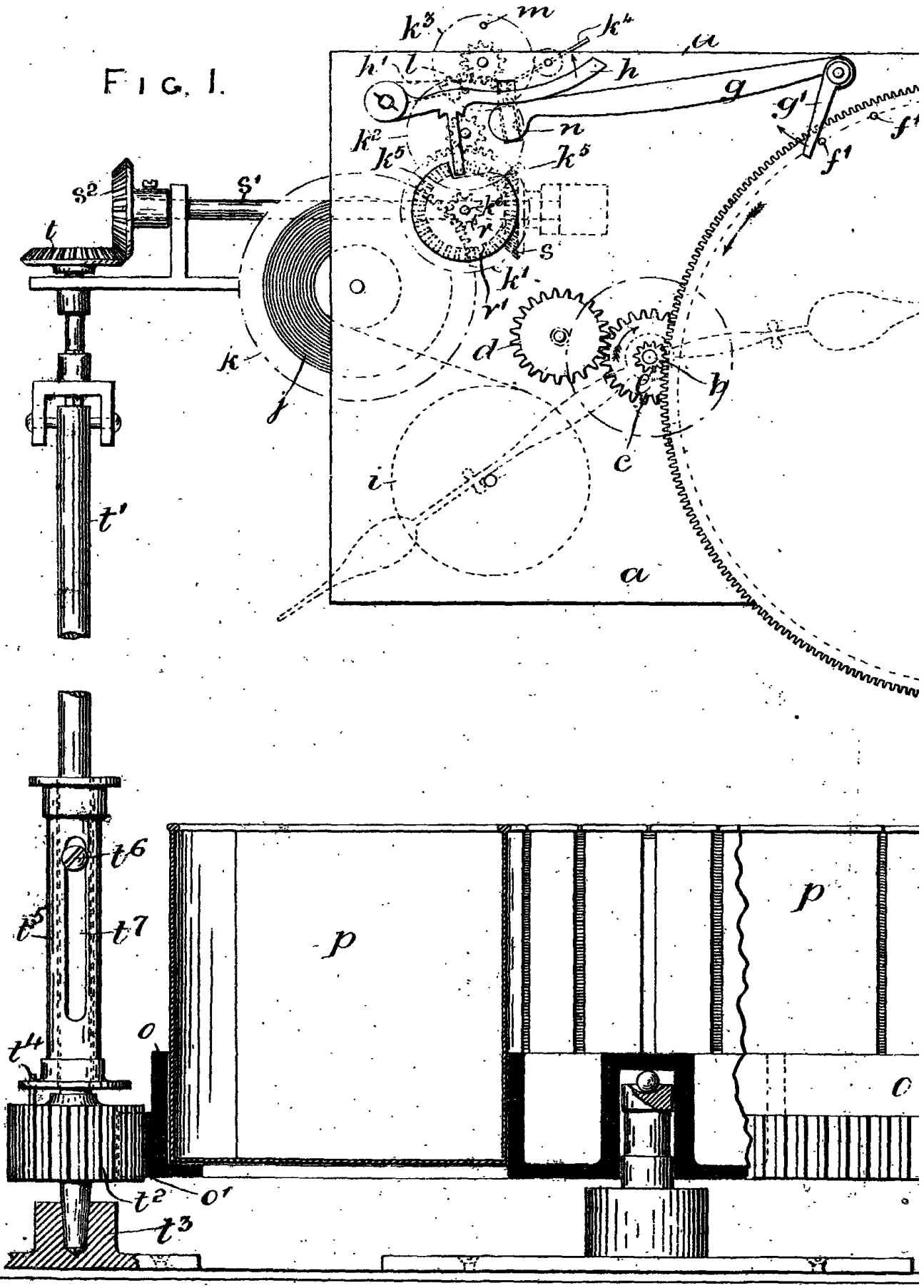

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FIG. 2.

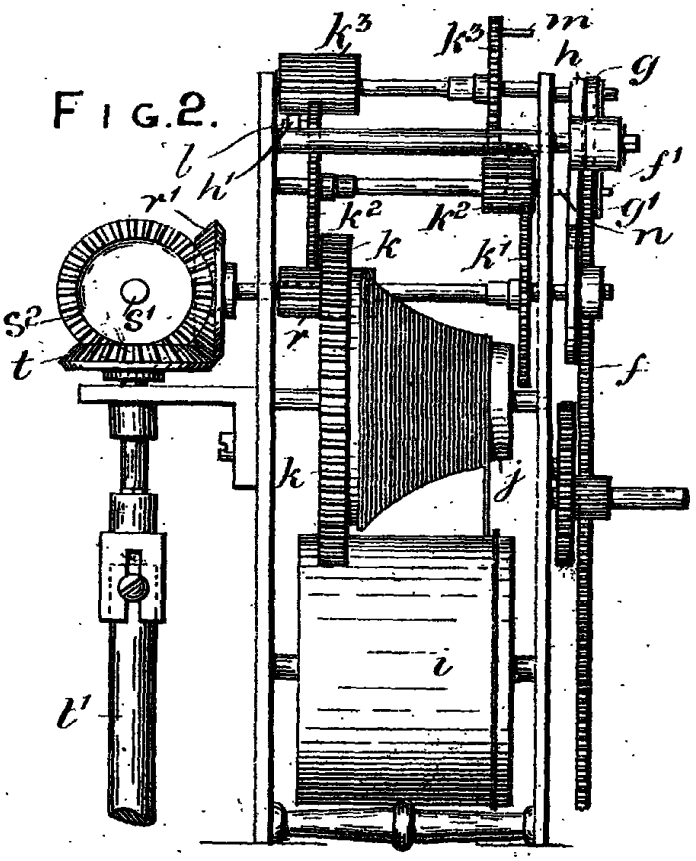


FIG. 3.

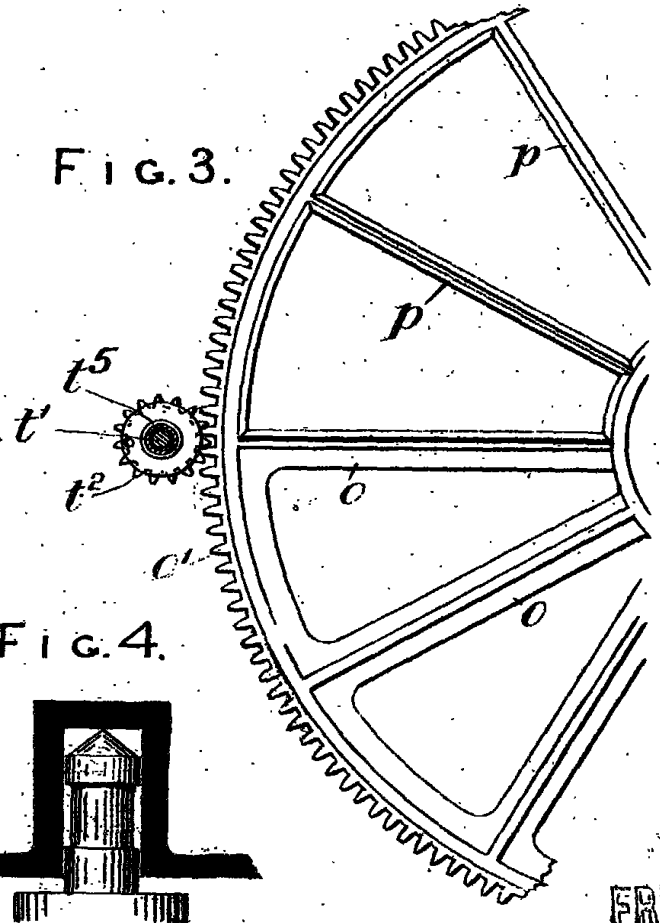
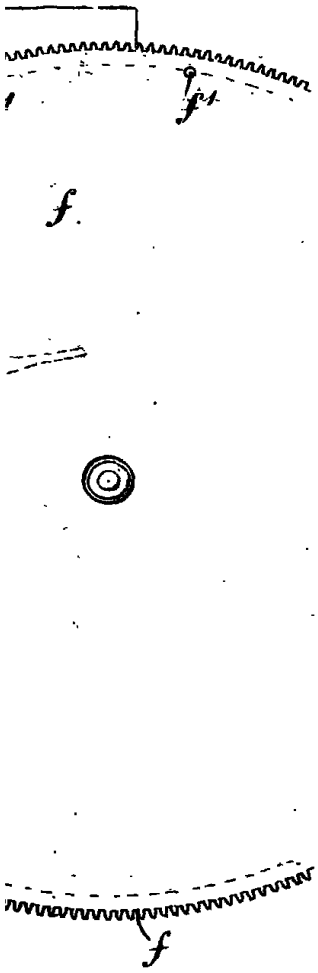
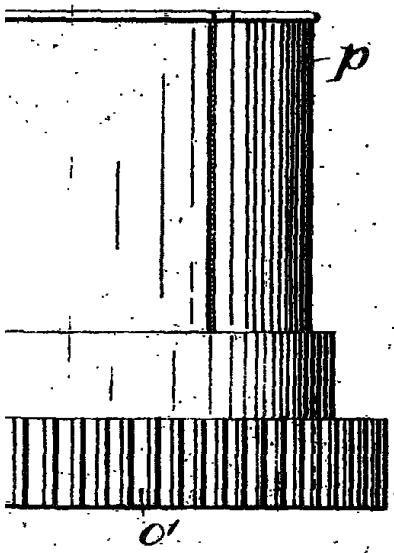


FIG. 4.





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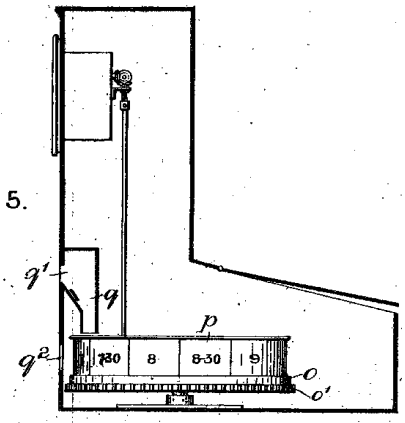
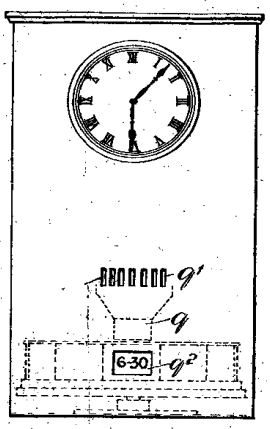
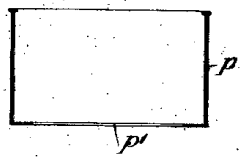
F I G. 5.



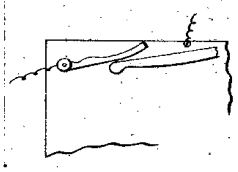
F I G. 6.



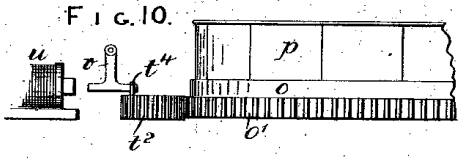
F I G. 7.



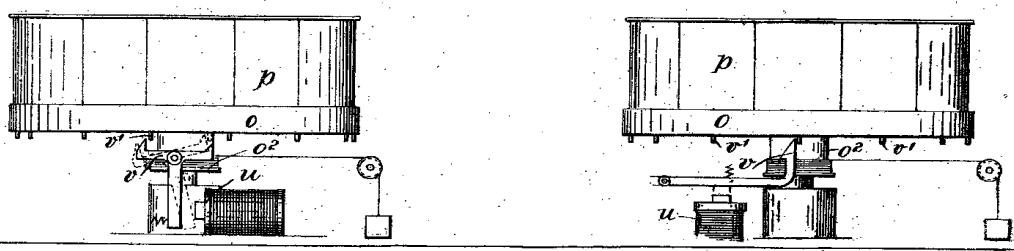
F I G. 8.



F I G. 10.



F I G. 9.



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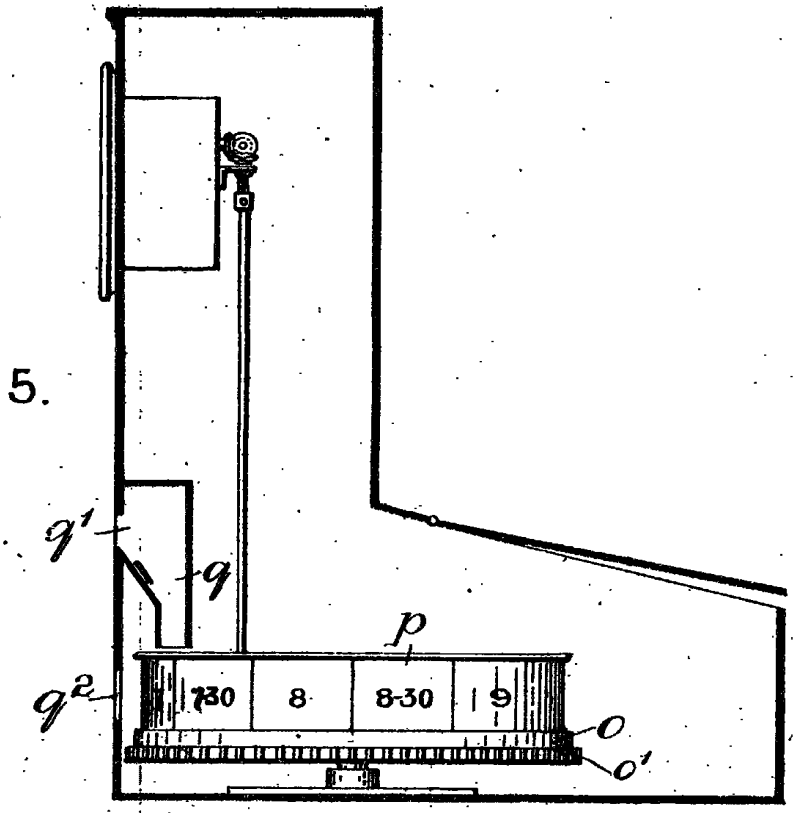
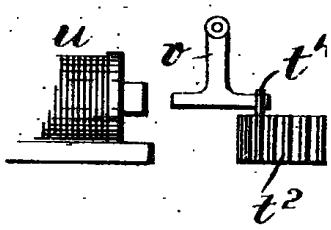
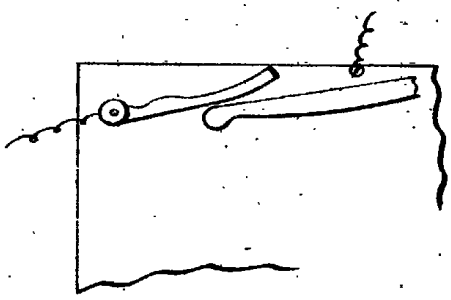
F I G. 5.



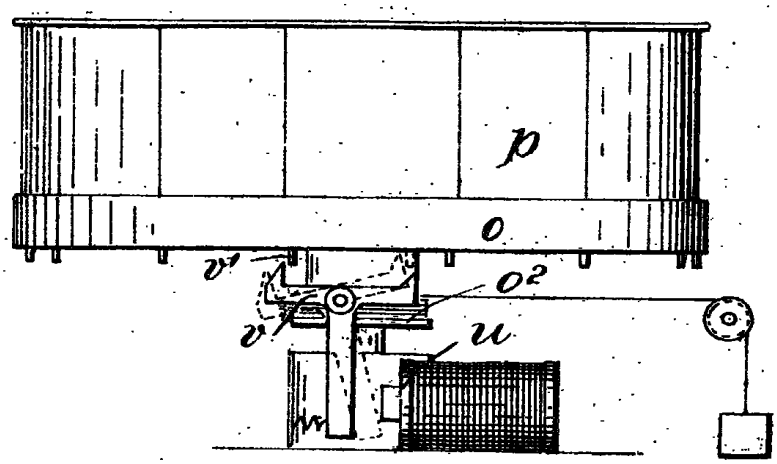
F I G. 6.

F I G. 10





F I G. 8.



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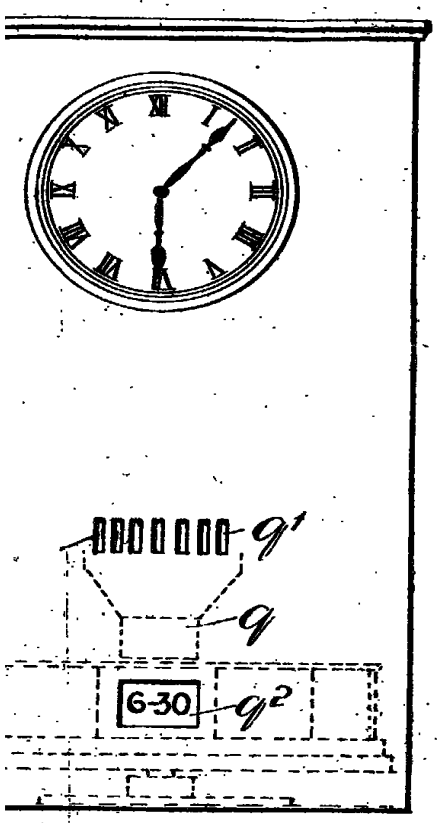
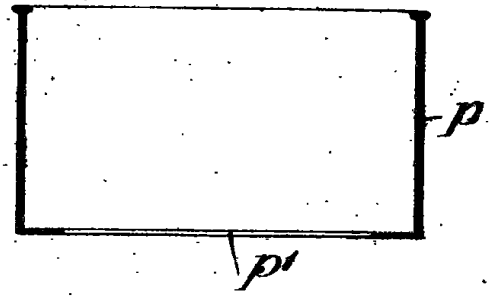


FIG. 7.



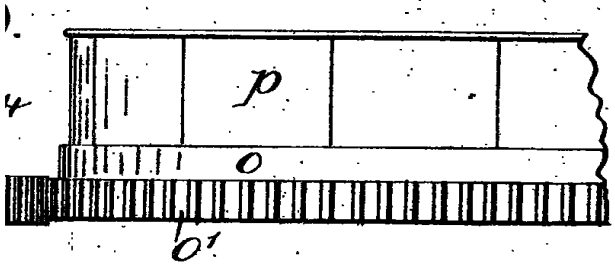
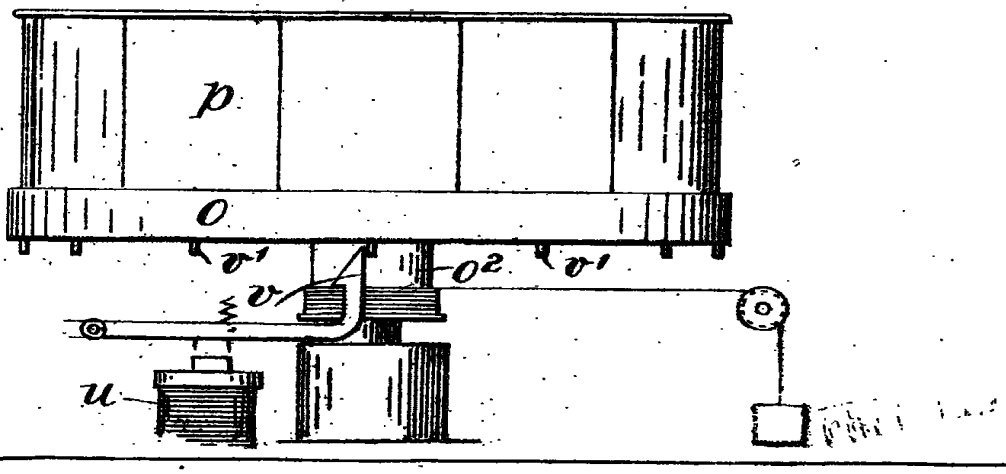


FIG. 9.



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