N° 17,795 A.D. 1898

Date of Application, 18th Aug., 1898
Complete Specification Left, 15th May, 1899—Accepted, 18th Nov., 1899

PROVISIONAL SPECIFICATION.

An Automatic Time Checking Machine.

JAMES JOHN STOCKALL, Junior, 6 and 8, Clerkenwell Road, London, Watchmaker, do hereby declare the nature of this invention to be as follows:—

An improved system of accurately checking the periodical arrival & departure of workmen or watchmen by the insertion of metal or other checks into a drawer or locker.

In carrying out my improvement, I employ by preference, an ordinary eight days' clock & from the cannon pinion direct I transmit motion to an independent train in clock.

To get direct action from the cannon pinion, on which depends the accuracy of the time for shifting arrangement, I fix on same a circular disc or snail on to which drops a lifting-piece which is in connection with the independent train of clock. The lifting-piece is so constructed that it drops into slots cut in disc or snail on cannon pinion, which, on falling, allows independent train to revolve.

The disc on cannon pinion is slotted according to times the machine is required to act. To prevent this action taking place every hour, I run into the cannon pinion, or hour-wheel, a wheel mounted on a stud which revolves once in twenty four hours and on same I attach a disc or snail on which rests the other end of my lifting-piece.

The disc or snail on twenty four hour wheel is constructed to raise or lower lifting-piece when required for use. When lifting-piece is raised it is thrown out of action of disc or snail on cannon pinion & when lowered, it is dropped on to cannon pinion disc or snail, which then has control of same.

The effect of this arrangement is that the time is checked to the utmost accuracy obtainable.

I am also able by this arrangement to control any number of boxes for receiving checks by means of an electric contact taken from "master clock."

Dated this 18th day of August 1898.

J. J. STOCKALL, JNR.

COMPLETE SPECIFICATION.

An Automatic Time Checking Machine.

I, JAMES JOHN STOCKALL, Junior, 6 and 8, Clerkenwell Road, London, 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 relates to an improved construction of that kind of apparatus for automatically checking the time at which workmen, watchmen, and the like

[*Price 8d.*]

arrive or depart, in which there is combined with an ordinary time piece an auxiliary clockwork mechanism that rotates a spout over a tray divided into compartments, the time piece being made, at definite intervals of time, to set the auxiliary clockwork in motion so as to bring the shoot over a different compartment of the tray so that on a workman dropping a check into the shoot, this will be delivered into the said compartment, which is marked with the corresponding time.

In such apparatus as heretofore constructed the setting in motion of the auxiliary clockwork has always been effected by means of a cam disc or "snail" revolved once in 12 or 24 hours by the time piece, and having a series of notches in its periphery which are successively made to act upon a detent lever so as to cause this to liberate the auxiliary clockwork at the required times for effecting the shifting of the spout.

With this arrangement inaccuracies of action are liable to occur when the times at which the workmen, or watchmen have to insert their checks are required to be exact to a minute, because the slightest looseness in the gearing which rotates the cam disc that revolves once in 24 hours may cause inaccuracies in the position of this which may amount to several minutes.

My present invention has for its object to effectually prevent such inaccuracies, and it consists in providing in combination with the cam disc that revolves once in 24 hours, or other long interval of time, a second cam disc that is made to revolve once every hour, the said detent lever that controls the auxiliary clockwork being acted upon by both the cam discs in such manner, that while the slowly revolving cam disc controls the lever so as to prevent the liberation of the auxiliary clockwork during the longer intervals of time that may elapse between the periods when the workmen are required to deposit their checks, the hour cam disc determines the fractional intervals of an hour at which the auxiliary clockwork is to be set in motion.

I will describe my said invention with reference to the accompanying drawings in which Fig. 1 shews a front view and Fig. 2 shews a back elevation of a time checking machine with my invention applied thereto, Fig. 3 shews an enlarged front elevation of the clockwork mechanism with the dial and hands removed, Fig. 4 shews part of the same view with the wheels of the minute and hour motion &c. removed so as to shew the cam discs. Fig. 5 shews a sectional side view of the mechanism and Fig. 6 shews a modified arrangement of the driving gear.

The machine is mainly of known construction; the clockwork consists namely of an ordinary clock train, preferably that of an eight day clock of which the spring barrel is shewn at X and an auxiliary clockwork mechanism of which the spring barrel is shewn at Y by means of which at determined intervals of time, a cylindrical spout *a* Fig. 2 is rotated through a certain angle into which spout the workmen or watchmen deliver their checks through a slot in the casing at *b*, and which terminates below in an angular tube *c* which by the said rotation, is brought successively over the different compartments of a fixed tray *d*, these compartments being marked with the different times at which workmen are required to deliver their checks. As before stated the motion of the spout *a*, *c*, has heretofore been controlled by a single cam disc actuated by the ordinary clock train so as to revolve once in 24 hours.

According to my invention I effect such motion by the combined action of two cam discs, arranged as shewn by way of example at Figs. 3 and 4.

Here *e* is the cannon pinion of the minute hand and *f* is the arbor of the hour hand and *g* is a wheel fixed thereto that consequently revolves once in 12 hours.

With this wheel gears a wheel *h* of double the diameter of *g*, and consequently revolving once in 24 hours. On the arbor of this wheel is fixed the cam disc *i*, Fig. 4, on the periphery of which are formed notches i^1 i^1 in positions corresponding to the different times during the 24 hours when workmen &c. are required to deposit their checks.

k is a detent lever pivotted at s which serves to control the action of the auxiliary clockwork Y that actuates the shoot a, which lever has a finger k^1 that bears upon the periphery of the cam disc i except when the notches i^1 pass under it; when the lever is held in the raised position by the full periphery as indicated in Fig. 3, it prevents the action of the auxiliary clockwork as will be presently described.

To the cannon pinion e is fixed the second cam disc j which consequently revolves once every hour, and which has notches j^1 j^2 in positions corresponding to the fractions of an hour at which it is required that the spout a c shall be shifted to another compartment of d.

By way of example the notches are shewn close together at j^1 so as to effect the shifting of the spout say, every 5 minutes while at j^2 they are shewn at longer intervals. Their spacing will of course depend upon the different intervals during an hour when the workmen &c. are required to deliver their checks. With these notches can engage a second finger k^2 on the lever k.

From the above described arrangement it will be seen that at such times during the 24 hours when no time checking is required the finger k^1 of lever k rests upon the full periphery of cam i, as indicated at Figure 3, and the detent lever k is then held in such a position that it prevents the auxiliary clockwork Y from running.

At the same time the finger k^2 is held out of the notches of the cam j.

When the time of day arrives when time-checking has to be effected, the cam i will have arrived in such a position that one of its notches i^1 faces the finger k^1, and the lever k is consequently free to drop, provided the cam j is at the same time in, such a position that one of the notches j^1 or j^2 faces the finger k^2 so that this can drop into it as shewn at Figure 4.

If on the other hand the cam j at that time presents its full periphery to the finger k^2, the lever k will still be prevented from dropping, notwithstanding that the cam i may allow it to do so, and the auxiliary clockwork will consequently still be arrested until by the farther rotation of the cannon pinion, the exact minute has arrived when the spout c requires to be shifted and a notch j^1 is presented to the finger k^2, so that lever k can drop. The auxiliary clockwork Y having been thus put in motion so as to shift the spout c one division, the cam j in continuing to revolve causes finger k^2 to rise out of the notch, and consequently the lever k in rising stops the further motion of the clockwork Y until by the rotation of j another notch j^1 has been brought opposite finger k^2. In most cases in particular where the shifts of the spout c have to be effected at short intervals, it is necessary that the duration of the motion of the clockwork Y shall be more accurately limited than can be done by the action of the notches j^1 in raising the lever k. In order to provide for such accurate action, the escapement wheel l of the auxiliary clockwork (which is controlled by the fly t) is provided with two pins m m^1, which are adapted to engage with a pallet o on the detent lever k as follows.

The pallet o is so formed, as shewn at Figs. 3, 4 and 5, that when lever k is in the raised position Fig. 3 the pin m^1 is in contact with the back surface of the pallet, and consequently the wheel l, which is urged in the direction of the arrow Fig. 3 by the spring barrel Y, is prevented from turning. The pin m is at that time slightly beyond and below the lower edge of the pallet.

When at the appointed time the lever k drops for setting the clockwork Y in motion, the upper edge of pallet o releases the pin m^1 so that wheel l can revolve. In dropping however, the lower edge of pallet o is brought into such a position that when, by the rotation of wheel l pin m arrives behind the pallet, it is stopped by the lower edge hereof, as shewn at Fig. 4, and consequently the motion of the clockwork Y and spout c is accurately limited to that corresponding to a single revolution of wheel l, although the lever k may not be raised by notch j^1 until some time after the completion of that rotation. When the lever k rises, the

pallet *o* rises in front of pin m^1 and sets pin *m* free again ready for the next rotation.

The motion of the clockwork Y is transmitted to the spout *a c* by suitable gear acting on the spindle *p* of the latter.

Instead of transmitting the motion to the 24 hour wheel *h* by means of a special wheel *g* on the hour arbor as described, this may be dispensed with and the motion of *h* be obtained directly from the pinion *q* that transmits the motion of the cannon pinion to the hour wheel *r*, as shewn at Fig. 6.

It will be evident that by arranging on the detent lever *k* an insulated contact piece for closing an electric circuit in any well known manner when it drops into the notches of the cam disc *i*, any number of electrically controlled apparatus for receiving time checks included in the said electric circuit may be made to work synchronously with the above described apparatus.

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:—

1. In an automatic time checking machine, the combination of a detent lever that controls the motion of an auxiliary clockwork, with a disc cam revolving with the cannon pinion of an ordinary timepiece and adapted to actuate the detent-lever at intervals of fractions of an hour, and a second disc-cam revolving once in 24 hours or other long period of time and adapted to prevent the detent lever from being acted upon by the first named cam except during those hours of the day when time checking is required, substantially as described.

2. In an automatic time checking machine, the combination of a disc-cam *j* with notches j^1 adapted to revolve once an hour, a second cam disc *i* with notches i^1 adapted to revolve once in 24 hours, or other long period of time a detent lever *k* controlling auxiliary clockwork Y and having a finger k^1 adapted to engage with the notches of cam *i* and a finger k^2 adapted to engage with the notches of cam *j*, substantially as described.

Dated this 11th day of May 1899.

ABEL & IMRAY,
Agents for the Applicant.

Redhill: Printed for Her Majesty's Stationery Office, by Malcomson & Co., Ltd.—1899.

A.D. 1898. Aug. 18. N° 17,795.

STOCKALL'S Complete Specification.

(1 SHEET)

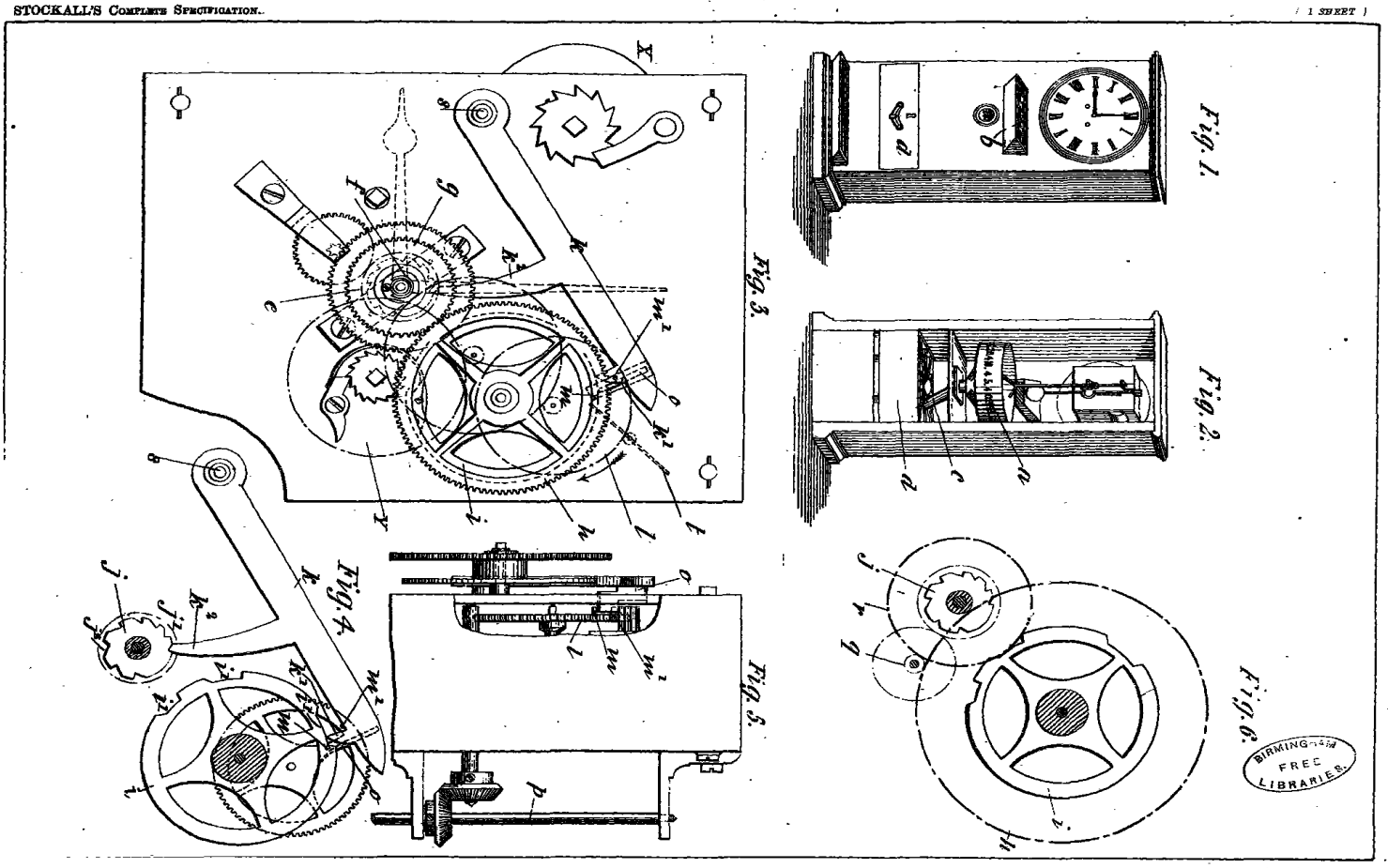

Fig. 1.

Fig. 2.

Fig. 3.

Fig. 4.

Fig. 5.

Fig. 6.

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[This Drawing is a reproduction of the Original on a reduced scale.]

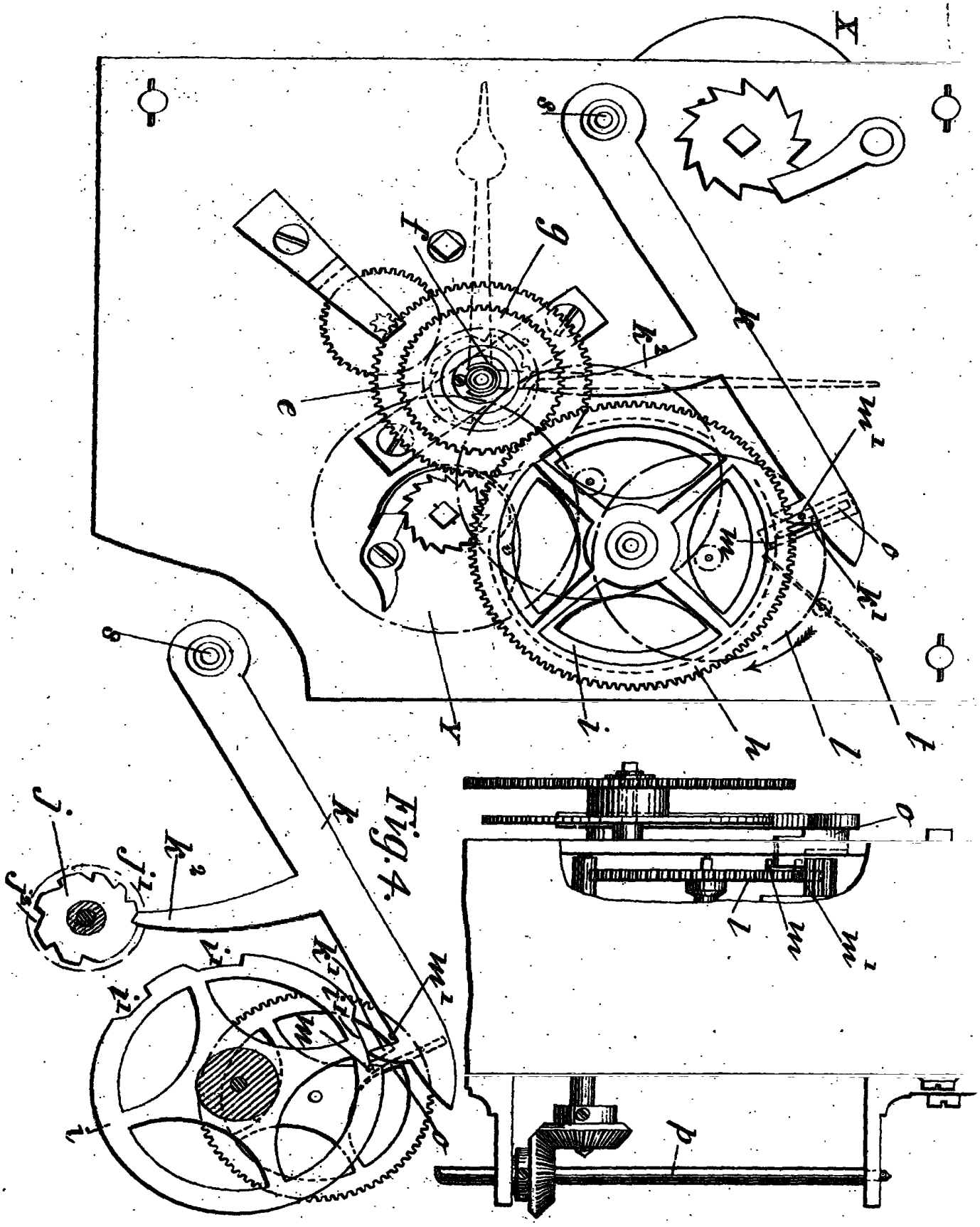

Fig. 4.

[This Drawing is a reproduction of the Original on a reduced scale.]

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Fig. 1.

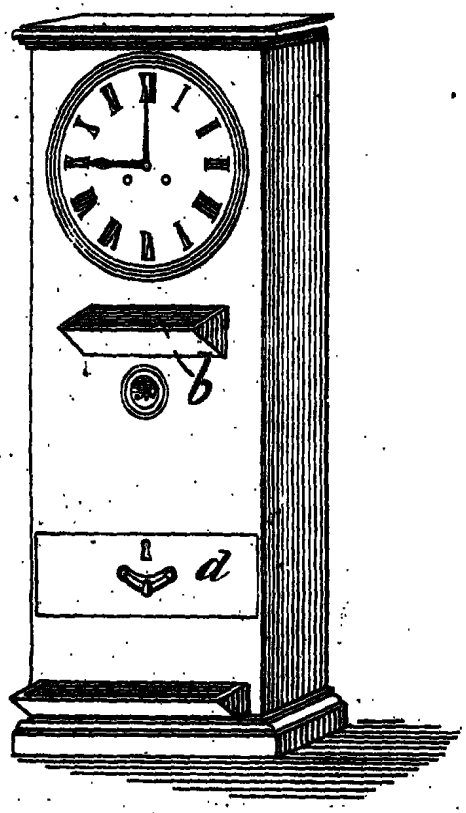

Fig. 2.

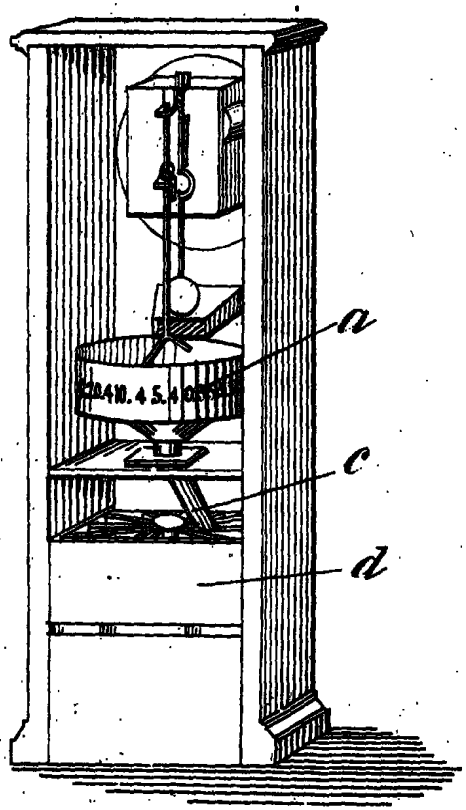

Fig. 3.

Fig. 6.

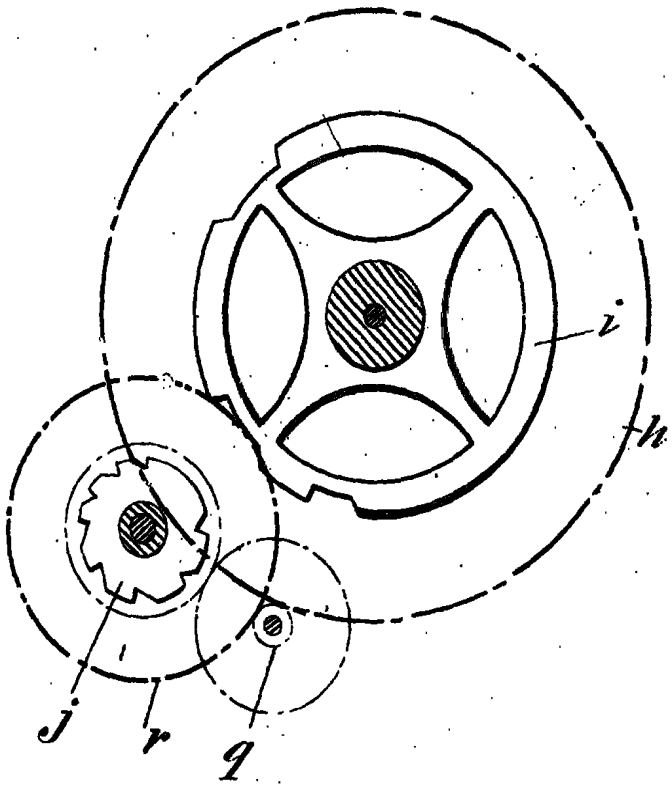

Fig. 5.

Malby & Sons, Photo-Litho.