C. E. J. NILSON.

GEARING.

APPLICATION FILED NOV. 26, 1921.

1,432,609. Patented Oct. 17, 1922.

Fig. 1.

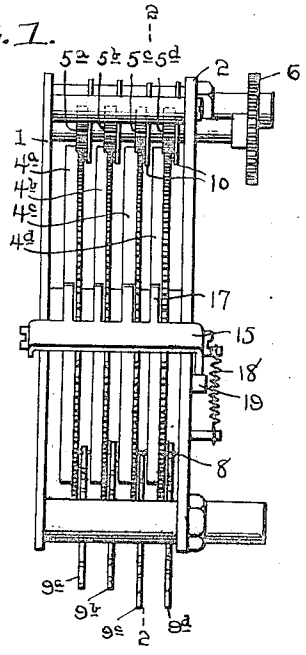


Fig. 2.

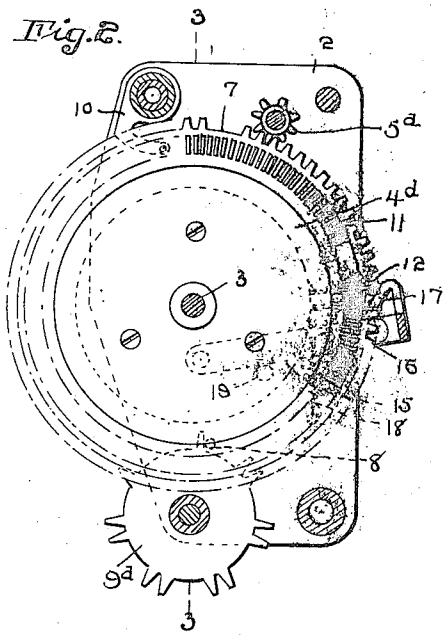


Fig. 3.

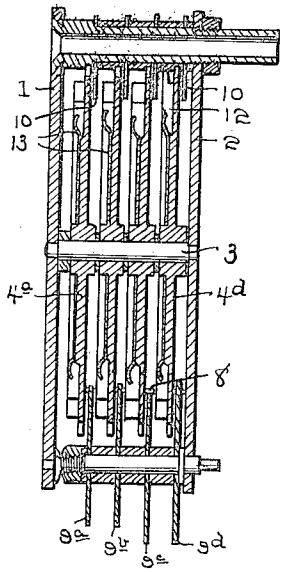


Fig. 4.

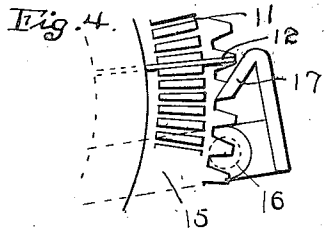
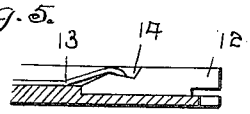


Fig. 5.



Inventor—
C. E. J. Nilson
Marks & Clerk
Attys.

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UNITED STATES PATENT OFFICE.

CARL ERIK JEAN NILSON, OF STOCKHOLM, SWEDEN.

GEARING.

Application filed November 26, 1921. Serial No. 518,058.

To all whom it may concern:

Be it known that I, CARL ERIK JEAN NILSON, engineer, a subject of the King of Sweden, and residing at Norra Smedjegatan 30–32, Stockholm, Sweden, have invented certain new and useful Gearing, of which the following is a specification, reference being made to the accompanying drawing.

The present invention relates to an apparatus having a number of members adapted to be put in motion and of which each is put in a periodically repeated motion, the member, at the time being in motion, then actuating a movable part, which is common for all the members and which is set when actuated by the member in question. The movement the said part is performing, when being set, may be utilized for, by way of example, closing an electric circuit and thereby give a signal. The part in question may also be in such a connection with another apparatus, that a member in said apparatus is set as desired. Such an apparatus may, for instance, be an apparatus recording the times of arrival and departure of workmen, the times on the record card being during certain hours of the day marked in different ways, in consequence whereof certain parts of the apparatus have to be reset.

One form of apparatus, as carried out according to this invention, is illustrated, by way of example, on the accompanying drawing in Figure 1 in front elevation. Figure 2 is a section on line 2—2 in Figure 1 and Figure 3 a section on line 3—3 in Figure 2. Figures 4 and 5 are details.

The frame of the apparatus consists of a pair of plates 1 and 2 spaced from each other and connected by means of studs in said plates being secured an axle 3 carrying a number of discs 4^a, 4^b, 4^c and 4^d that are rotatable on the axle and each provided on the circumference with teeth except on a certain part 7 on the same. For rotating the discs there is provided, for each of them, a pinion 5^a, 5^b, 5^c and 5^d, which pinions are secured on a common shaft which, for instance, is provided with a toothed wheel 6 rotated, for instance, by a clock work.

Each disc 4 is on the one side provided with a pin 8 and on the same side of the disc, where the pin is placed, is arranged a star-wheel, and all these star-wheels 9^a, 9^b, 9^c and 9^d are secured on a shaft journalled in the frame, so that, when a pin on any of the discs comes in engagement with a tooth on its star-wheel and rotates the same all the star-wheels will be rotated to a certain extent. In order that the discs 4, which for the moment are not in engagement with their pinions 5, that is when the pinion is at the part 7 of the circumference of the disc, may be retained stationary against accidental displacement, there is, adjacent to each disc, a spring 10 resting with a slight pressure on the disc. On the side opposite to that where the pin 8 is placed there is all round each disc a projection or a flange provided with grooves 11 placed close to each other, in which may be inserted, from the circumference of the disc, plates 12 which, after the insertion, project outside the flange and are locked in their places by a washer 13, secured to the side of the disc and having a yielding circumference and the outer circular portion shaped to engage with a notch 14 in the edge of the plate 12.

At one place the frame is provided with a bow-shaped member, one end of which is extended along the outside of the frame to form an arm 15 and which is pivotally mounted on pins 16, carried by the frame. The bow-shaped member is provided with a number of hooks 17 placed one opposite the flange of each disc and so directed that the same, during the rotation of the discs, will be acted upon by the plates 12 in such a way that the arm 15 will be rotated upon its pin 16. The plate 12 being again disengaged from its hook 17 the arm is returned by a spring 18 to its normal position against a stop 19.

When the pinions 5 rotate, one of the same, for instance the pinion 5^d, is in engagement with the corresponding disc 4^d which then is rotated. As the part 7 of the disk 4^d approaches the pinion 5^d, the pin 8 on the same arrives at the star-wheel 9^d and comes in engagement with a tooth on the same thus rotating the star-wheel 9^d as well as all the other star-wheels a small angle, until the part 7 on the disk 4^d reaches the pinion 5^d when the rotation of the disc ceases, with the pin 8 still in the path of the teeth of the star-wheel 9^d and the disc stops in this position until the pin 8 on the same, after a repeated rotation of the star-wheels by the pin 8 of another of the several star wheels, is acted upon by the next tooth on the star-wheel 9^d and then rotates the

disc 4^d until the pinion 5^d again comes in engagement with the teeth on the same. At the resetting of the star-wheels, that took place, when the pin 8 on the disc 4^d came in engagement with the star-wheel 9^d and the disc 4^d then was brought to stand-still, a tooth on another star-wheel, for instance the star-wheel 9^a, came in engagement with the pin 8 on the disc 4^a and rotated this one, until the pinion 5^a, which hitherto had been at the part 7 on this disc, came in engagement with the teeth on the same and put the same in rotation. The disc 4^a is then rotated one revolution, whereupon the pin 8 on the same again reaches the same tooth on the star-wheel 4^a, which it left, when the disc commenced to rotate, and turns the star-wheel until the pinion 5^a stops at 7 on the disc 4^a, when this stops and at the same time a tooth on another star-wheel comes against the pin 8 on corresponding disc and rotates this one until its pinion can rotate the same. By reason of a disc acting upon and resetting all the star-wheels at the same time as the disc stops the one disc after the other will be rotated. The sequence in which the discs are rotated is evidently determined by the number of teeth on each star-wheel as well as by the position of the teeth on the one star-wheel in relation to the position of the same on the other.

The speed with which the discs 4 are rotated may evidently be any desired one. If the apparatus is to be used for instance in a factory for giving time signals, for setting movable parts in time recording apparatus or for other purposes it may be suitable to give such a speed to the discs that the disc in motion rotates one revolution in twenty-four hours. As the times of all working days except Saturdays are alike, the star-wheels in the apparatus shown on the drawing may be so arranged, that one disc 4 is rotated each Saturday, one each Sunday and the other two operate alternately the other days. It is evident that the plates 12 may be inserted in each disc 4 in required places in order to act on the hooks 17 so as to operate the arm 15 and give signals etc., just at the desired times whichever these are.

Obviously the number of discs and thus also the pinions and star-wheels appertaining thereto may vary in the apparatus as well as more than one disc may be in motion at the time. An apparatus may evidently also be provided with more than one bow shaped member with hooks 17 and arm 15.

Having now described my invention what I claim as new and desire to secure by Letters Patent is:

1. In a device of the character described, a plurality of independently rotatable discs, projections on said discs, a plurality of members rotatable as a unit and having projections adapted to be periodically engaged by the projections of the discs, whereby rotary movement of the discs is periodically transmitted to said members, a driving member associated with each disc, and means on each disc to render it inoperative with relation to its driving member as its projection engages and actuates the rotatable member associated therewith, the intermittent movement of the rotatable members effected by the successive actuations of the discs causing the projections of said rotatable members to successively engage the projections of the discs in predetermined order thereby actuating said discs and re-establishing driving connections between the latter and the driving members associated therewith.

2. A device according to claim 1 characterized by the fact that the several driving members for the discs are mounted upon a common driven shaft.

3. A device according to claim 1 characterized by the fact that the several rotatable members are mounted upon a common shaft.

4. A device according to claim 1 characterized by the fact that the several driving members for the discs are mounted upon a common driven shaft and the several rotatable members are mounted upon a common shaft.

5. In a device of the character described, a plurality of independently rotatable discs, projections on said discs, a plurality of members rotatable as a unit and having projections periodically engageable by the projections of the discs whereby rotary movement of the discs is periodically transmitted to said members, gear teeth extending throughout the major portion of the circumference of each disc, drive pinions adapted to mesh with the gear teeth of the discs for driving the latter, said pinions being inoperative relative to the discs when disposed opposite the toothless portions of the discs, and the projections on said discs being so arranged with respect to the toothless portions thereof that as the projections of the discs and the rotatable members are brought into engagement and movement of the rotatable member is effected, the driving relation between the pinion and disc is interrupted.

6. A device as claimed in claim 1 characterized by the provision of members engageable at various points in the circumference of the discs, and means engageable and operable by said disc engaging members.

7. A device as claimed in claim 1 characterized by the provision of recesses in the discs, a member selectively engageable in any one of the recesses of each disc, and means engageable and operable by said members.

8. A device as claimed in claim 1 characterized in that each disc is provided with a plurality of recesses, a member engageable

in any one of the several recesses of each disc, means for yieldably retaining the member in position in the recess, and means engageable and operable by said member.

9. A device as claimed in claim 1, characterized by the provision of circumferentially spaced recesses in each disc, a member selectively engageable in said recesses, and a substantial bow-shaped member pivotally mounted in the path of said member to be engaged and actuated thereby.

In witness whereof I have hereunto set my hand in presence of two witnesses.

CARL ERIK JEAN NILSON.

Witnesses:
CARL TH. SUNDHOLM,
R. TOTTERMAN.