No. 887,835 PATENTED MAY 19, 1908.

A. H. NEUREUTHER.

MECHANICAL MOVEMENT.

APPLICATION FILED JULY 8, 1907.

3 SHEETS—SHEET 1.

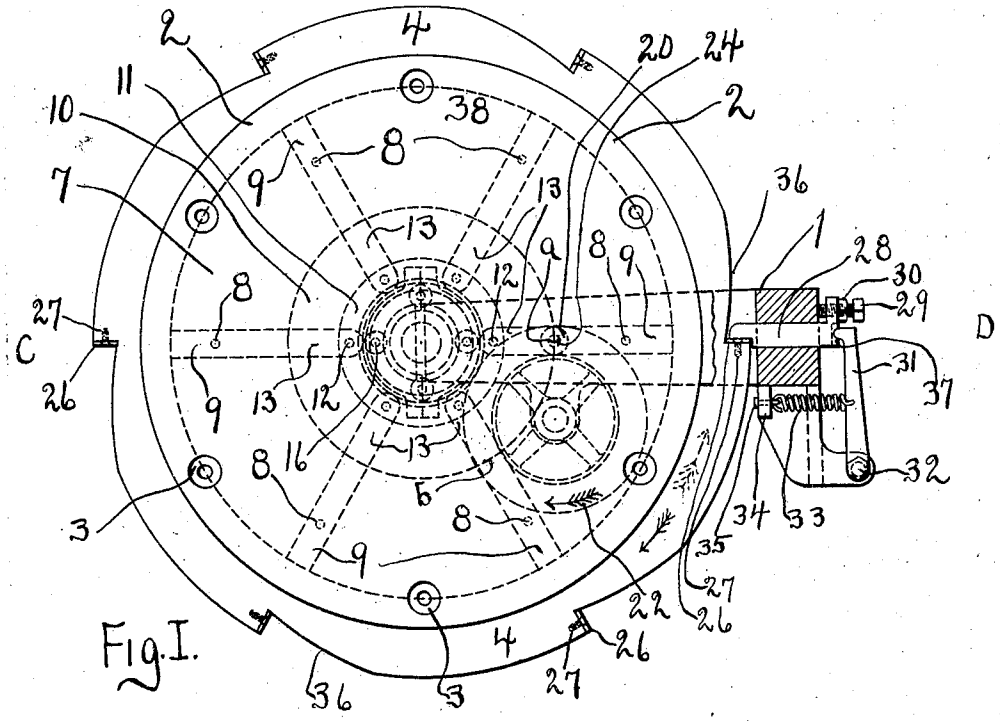


Fig. I.

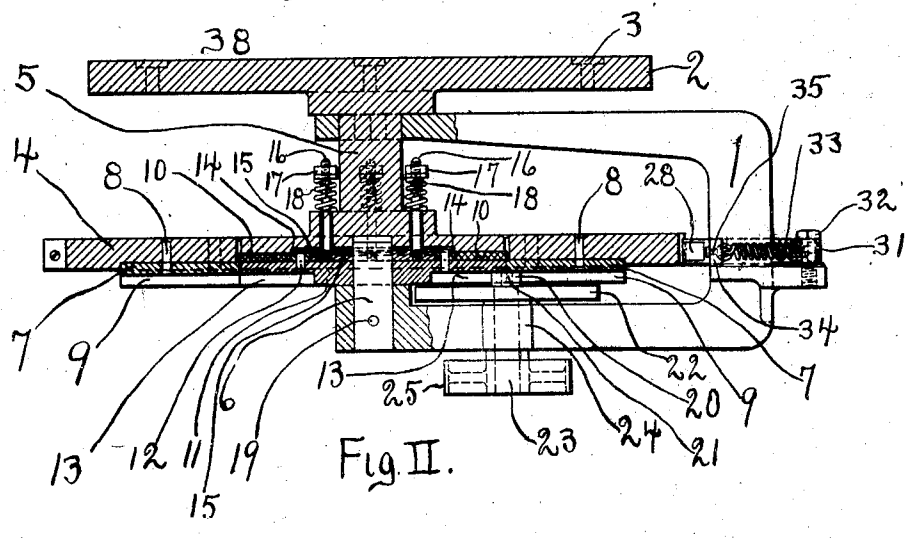


Fig. II.

WITNESSES:

H. Guy Moore.

William A. Radke.

INVENTOR

Andrew H. Neureuther

No. 887,835 PATENTED MAY 19, 1908.

A. H. NEUREUTHER.

MECHANICAL MOVEMENT.

APPLICATION FILED JULY 8, 1907.

3 SHEETS—SHEET 2.

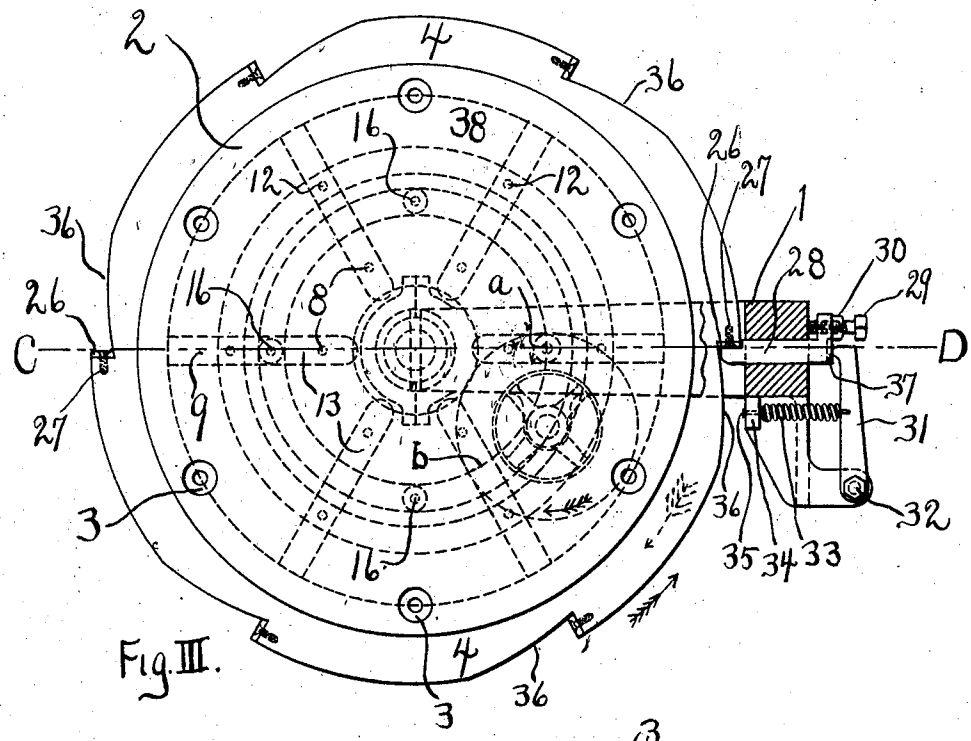


Fig. III.

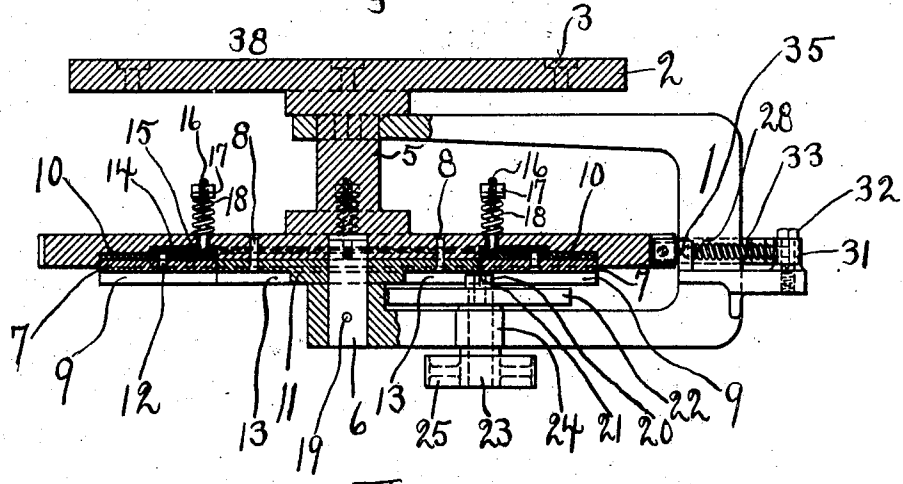


Fig. IV.

WITNESSES:

William A. Radtke.

Chas. J. Mannigan

INVENTOR

Andrew H. Neureuther

No. 887,835. PATENTED MAY 19, 1908.

A. H. NEUREUTHER.

MECHANICAL MOVEMENT.

APPLICATION FILED JULY 8, 1907.

3 SHEETS—SHEET 3.

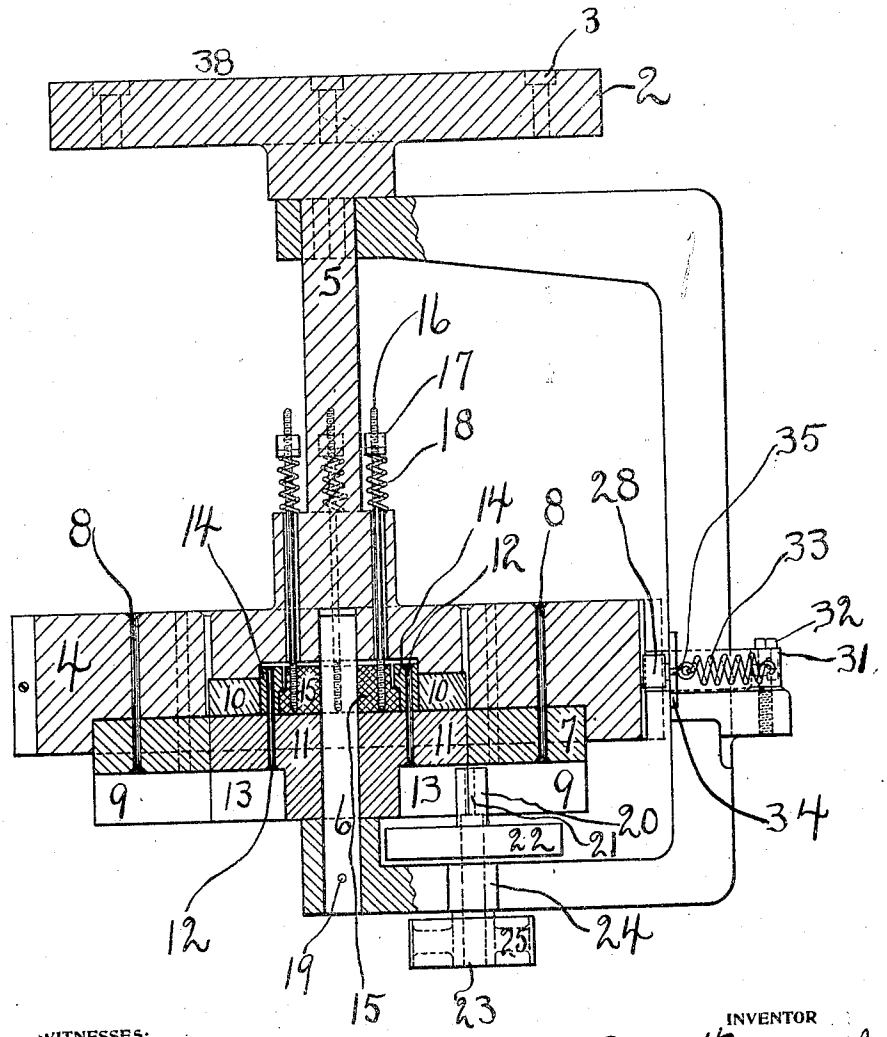


Fig. V.

WITNESSES:

William A. Radke.

Oscar W. Dauber

INVENTOR

Andrew H. Neureuther

UNITED STATES PATENT OFFICE.

ANDREW H. NEUREUTHER, OF PERU, ILLINOIS, ASSIGNOR TO THE WESTERN CLOCK MANUFACTURING COMPANY, OF LA SALLE, ILLINOIS, A CORPORATION OF ILLINOIS.

MECHANICAL MOVEMENT.

No. 887,885. Specification of Letters Patent. Patented May 19, 1908.

Application filed July 8, 1907. Serial No. 382,793.

To all whom it may concern:

Be it known that I, ANDREW H. NEUREUTHER, a citizen of the United States, residing in the city of Peru, in the county of Lasalle and State of Illinois, have invented certain new and useful Improvements in Mechanical Movements, of which the following is a specification.

My invention relates to mechanical movements, and has for its object the production of improved devices whereby a continuous rotary movement of the driving member or actuator is converted into intermittent progressive movements of the driven member, and whereby the driven member may be located in a pre-determined position with extreme accuracy and retained in said position for a given period of time.

Devices and appliances embodying my invention are susceptible of many applications and may be used in different arts. As an instance of the adaptation thereof which may be made, I mention dial feed mechanisms for power presses and automatic machines having turrets for carrying parts to be operated on, or carrying tools to operate on parts held by other means.

Figure I is a top view of my invention. Fig. II is a vertical cross-sectional view along a line C—D of Fig. I. Fig. III is a top view of another form of my invention. Fig. IV is a vertical cross-sectional view along a line C—D of Fig. III. Fig. V is a view similar to Fig. II showing the mechanism enlarged in a vertical direction.

In the drawings, (Figs. I & II) 1 represents the frame which contains the operating elements. This frame can be of any convenient shape. Mounted in frame 1 is a pin 6, which is fastened to said frame by means of a smaller pin 19 passing through it and frame 1. Journaled on this pin 6 and in the frame 1 is a member 38 having a lower flange 4, a neck 5, by means of which it is journaled in frame 1 and an upper flange 2, which, as above mentioned, may contain any suitable number of devices for holding work to be operated upon, or may carry any kind of tools for operating on work held by any of the usual methods. Rigidly fastened to member 38 and concentric with the journal 5, is a ring 7 having a plurality of slots 9, having parallelly opposed faces. Journaled on the inner circle of ring 7 and on pin 6 is a circular disk 11, which has the same number of circumferentially and radially disposed slots 13 as has ring 7 slots 9 extending towards its center. The said circular disk 11 is frictionally connected with the member 4 by means of the following device:

Circular disk 11 has a stepped ring 14 rigidly fastened to it in the position shown concentric with pin 6, by means of rivets or pins 12. Journaled within this stepped ring 14 is a shouldered member 15 whose shoulder engages the step on member 14. Fastened to this member 15 and passing through member 4, are a plurality of studs 16 having nuts 17 screwed upon their upper ends and springs 18 between said nuts 17 and member 4, thereby tending to draw members 15 and 14, and hence circular disk 11, against member 4. Placed between member 4 and circular disk 11 is ring 10 made of fiber or other durable material which has a high coefficient of friction with members 4 and 11. Member 4 is suitably shaped as shown to receive these members 15, 14, 11, 10 and 7. The frictional resistance set up in rotating member 11 while member 4 is stationary can be regulated by means of the nuts 17 and springs 18 on studs 16.

From the above description it will be seen that circular disk or member 11 is frictionally connected with member 4 and that ring or member 7 is rigidly connected with member 4. Member 4 further has a series of equidistant notches 36 cut from its circumference, each notch having a hardened plate 26 fastened to one of its sides by means of screw 27. Frame 1 carries a pin 28 whose end is resiliently held against the periphery of member 4 as shown by means of a spring 33 fastened to a lever 31 journaled on frame 1 by means of bolt 32, said lever having a projection which sets in a slot 37 on said pin 28, serving to keep the flat side of pin 28 faced toward the hardened plates 26 on member 4 with which it engages, as will be explained further along. When member 4 rotates around on pin 6 and neck 5 (by means of

which it is journaled as above mentioned) in the direction of the solid arrow (see Fig. I), pin 28 merely rides out of notch 36 and on the circumference of 4 until it comes to the next plate 26 and then drops into this notch 36, and so on. But should it be attempted to move member 4 in the opposite direction (in direction of dotted arrow) immediately after dropping pin 28 off of plate 26 when moving in direction of solid arrow, as above mentioned, it will immediately bring the hardened plate 26 against the pin 28, making it an abutment for holding the member 4 against further rotation in the direction of the dotted arrow. Bolt 29, which has a locknut 30, passes through a threaded aperture in the projection of pin 28 and serves as a means for regulating the depth of contact of said pin 28 with the plates 26 on member 4. When the depth of contact of the pin 28 is properly adjusted, bolt 29 is rigidly fastened to the projection on pin 28 by means of locknut 30, the end of the bolt 29, when thus fastened, serving as an abutment striking the member 1 before the pin 28 "bottoms" in the notch 36. Journaled in frame 1 below said members 4, 7 and 11 is a shaft 23. Fastened to the upper end of said shaft 23 is an actuator comprising a crank disk 22, which carries a pin 21 on which is journaled a roll 20 which engages in succession with slots 9 of ring 7 and 13 of member 11, said roll 20 being shown in Fig. I at *a*, on the dividing circle between members 7 and 11. The actuator is rotated by means of a pulley 23, or any other means usually used, in the direction of the arrow, and starting from *a* roll 20 enters the slot 9 of member 7, thereby rotating member 4 in the direction shown by the solid arrow, gradually starting it and gradually going faster until pin 28 is halfway between the notches, when the speed of member 4 gradually slackens until it comes at rest, when pin 28 drops over the next plate 26 on member 4 and the roll 20 has moved the slot from *a* to *b* (see Fig. I), when roll 20 is ready to enter slot 13 of frictionally mounted member 11. As roll 20 enters slot 13 of member 11, the effect of roll 20 is to cause rotation of member 11 in a direction opposite to that of member 7 and hence member 4, or to cause member 4 to move in the direction of the dotted arrow until plate 26 strikes the pin 28 which had dropped over plate 26 at the end of the previous forward motion. When plate 26 strikes pin 28, the backward movement of member 4 is thus arrested and as member 11 is rotated while the actuator rotates until the roll 20 is again at *a*, it simply holds member 4 in this position by forcing it against the pin 28. The actuator rotates continually in one direction and each time it completes one revolution by means of shaft 23, the roll 20 performs the above mentioned operation of moving the member 4 around by one notch by the pin 28 and holding said member 4 at rest against pin 28 for a given period. It will be seen that as roll 20 travels from *b* to *a* in a slot 13 of frictionally journaled disk 11, while member 4 is locked, it gradually starts from its position of rest, increasing until the center position of its travel is reached, when it gradually decreases until it reaches its position of rest relative to member 4 at the point *a* between the members 4 and 11.

From the above description it is evident that the slots 9 of member 7 and the slots 13 of member 11 must be in line when my device is assembled, and will always remain so, since the roll 20 must always pass from the position *a* to the position *b*, then again to the position *a*, the crank being so positioned that it always brings the parts to the proper registration. It is also evident that by means of blocks 26 I can secure any desirable accuracy in locating member 4 and the entire member 38, which I have here shown having a turret or table 2, having a series of pockets 3 which may carry pieces or rods to be operated on, or may carry tools for operating on pieces or rods.

In Figs. III and IV, I have shown a modification of my invention; the difference between this and the one just described is in the fastening and arrangement of circular disk 11 and ring 7. In the modification shown in Figs. III and IV, circular disk 11 is rigidly fastened to member 4 and ring 7 is frictionally mounted on said member 4, whereas in Figs. I and II as above described circular disk 11 is frictionally mounted on member 4 and ring 7 is rigidly fastened to said member 4. Whether I use one device or the other depends on the following:

If in a machine that employs my invention, it requires a short period of rest or dwell, or a low speed of rotation from notch 36 to notch 36, as is the case with large heavy turrets, I employ the form shown in Figs. I and II. If in a machine that employs my invention, it requires a longer period of rest or dwell, or a high speed of rotation from notch 36 to notch 36, as in case of lighter or smaller turrets, I employ the form shown in Figs. III and IV.

It will be noticed that for the same direction of the disk or actuator 22, the member 4 in my device shown in Figs. III and IV will be opposite to the direction of member 4 in my device shown in Figs. I and II. This will be seen at once from the solid line arrow shown in the respective drawings.

It will be understood, of course, I do not wish to limit myself to the exact arrangement and shape of parts herein shown but have here shown forms of my device which can be taken in a sense diagrammatic of

devices all of which will contain, and be within the scope of my invention.

I claim:

1. In a mechanical movement, a journaled member having a plurality of radially disposed slots, a circular member having a plurality of similarly disposed slots, journaled within said member but frictionally connected therewith, means for locking said journaled member against rotation in one direction, and means for giving said members rotary motion in opposite directions.

2. In a mechanical movement, a journaled member having a plurality of radially disposed slots, a circular member having a plurality of similarly disposed slots, journaled within said member but frictionally connected therewith, means for locking said journaled member against rotation in one direction, and means for giving said members rotary motion in opposite directions, said means comprising a roll which engages the slots of said members in succession.

3. In a mechanical movement, a journaled member having a plurality of radially disposed slots, a circular member having a plurality of similarly disposed slots, journaled within said member but frictionally connected therewith, means for locking said journaled member against rotation in one direction, and means for giving said members rotary motion in opposite directions, said means comprising a roll describing a circular path and engaging the slots of said members in succession.

4. In a mechanical movement, a journaled member having a plurality of radially disposed slots a circular member having a plurality of similarly disposed slots, journaled within said member but frictionally connected therewith, means for locking said journaled member against rotation in one direction, and means for giving said members successive rotary motion in opposite directions.

5. In a mechanical movement, a journaled member having a plurality of slots radially disposed, a ring member having a plurality of similarly disposed slots frictionally journaled on said member, with means for locking said journaled member against rotation in one direction, and means for giving said members successive movements in opposite directions.

6. In a mechanical movement, a ring having a plurality of slots, a disk having a plurality of slots journaled within said ring and frictionally connected therewith, means for locking said ring against rotation in one direction and means for giving said ring and said disk motion in opposite directions.

7. In a mechanical movement, an actuator, comprising a roll traveling in a circular path, a driven member provided with a number of slots, with which the actuator is adapted to engage in succession and thereby impart an intermittent movement to the driven member, another member having similar slots with which the actuator is adapted to engage, rotatably mounted within said driven member and frictionally connected therewith; a plurality of circumferentially disposed abutments on said driven member, and a pin for locking said driven member during its period of rest.

8. The combination with a rotatable actuator, of a driven member provided with a number of pairs of opposed faces with which the actuator is adapted to engage in succession and thereby imparting an intermittent movement to the driven member, with another member having a number of pairs of similarly opposed faces, mounted within said driven member and frictionally connected therewith, said driven member having a plurality of circumferentially disposed abutments, a member resiliently forced against said driven member and engaging with said abutments while the rotatable actuator is engaging a pair of the opposed faces of the member frictionally mounted within said driven member.

9. In a mechanical movement, a journaled member having a plurality of circumferentially disposed abutments, a stop engaging said abutments, means for giving said journaled member progressive intermittent motion and frictional means coöperating with said means for forcing the abutments on said journaled member against said stop after each period of said motion.

10. In a mechanical movement, a journaled member having a plurality of circumferentially disposed abutments, a stop with resilient means for engaging said abutments, means for giving said journaled member progressive intermittent motion and frictional means coöperating with said means for forcing the abutments on said journaled member against said stop after each period of said motion.

11. In a mechanical movement, a journaled member having a plurality of circumferentially disposed abutments, a movable abutment which engages each of said abutments in succession, means for giving said journaled member progressive intermittent motion, and frictional means coöperating with said means for forcing said journaled member against said movable abutment.

12. In a mechanical movement, a journaled member having a plurality of circumferentially disposed abutments, a movable abutment which engages each of said abutments in succession, means for giving said journaled member progressive intermittent motion, and adjustable frictional means cooperating with said means for forcing said

journaled member against said movable abutment.

13. In a mechanical movement, a journaled member having a plurality of radially disposed slots, a second member having a plurality of similarly disposed slots, rotatively mounted on, but frictionally connected with said journaled member, means for giving said members rotary motion in opposite directions, in combination with means for locking said journaled member against rotation in one direction.

ANDREW H. NEUREUTHER.

Witnesses:

WILLIAM A. RADTKE,

CHAS. G. MAURITZEN.