

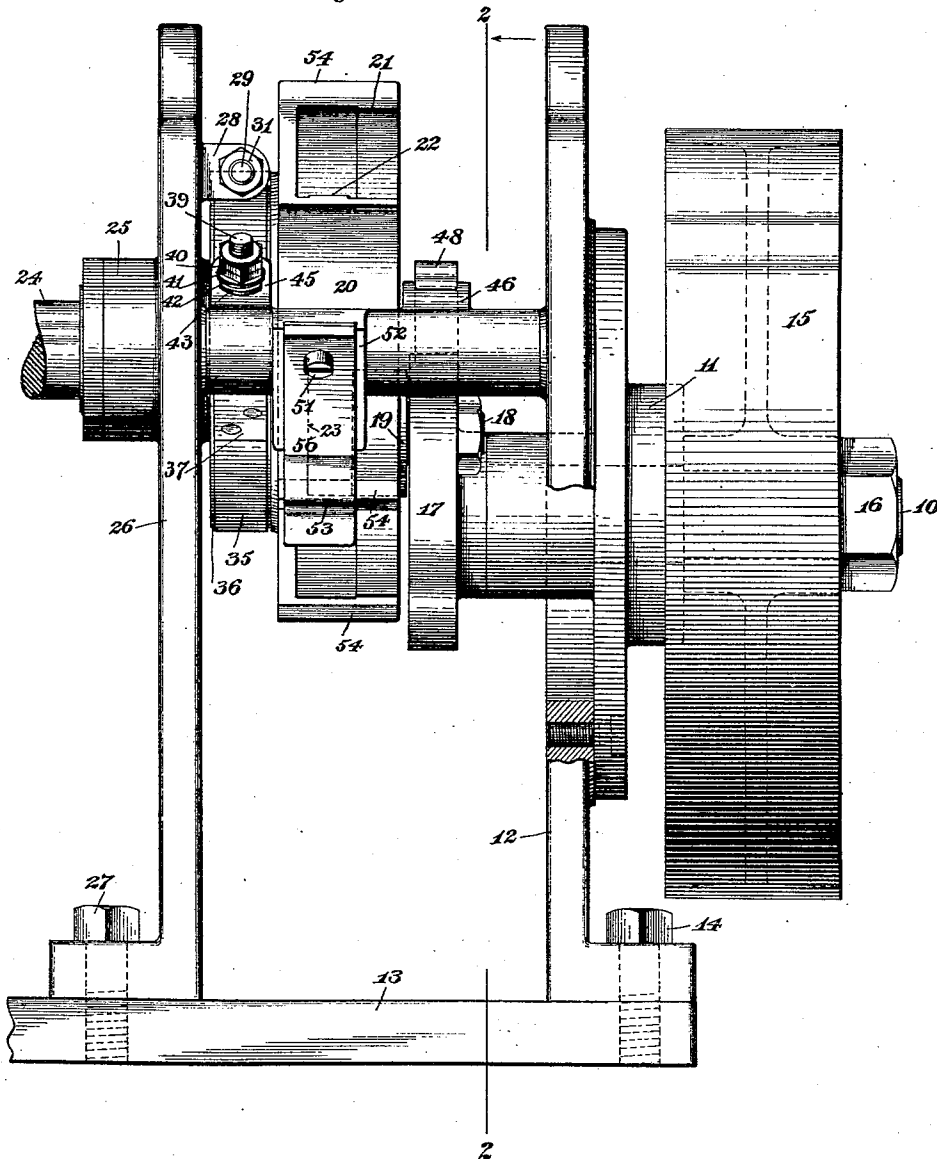
No. 841,342.

PATENTED JAN. 15, 1907.

F. H. RICHARDS.
MECHANICAL MOVEMENT.
APPLICATION FILED MAR. 23, 1900.

3 SHEETS—SHEET 1.

Fig. 1.



Witnesses:

Chas. D. Schuch

Geo. H. Hoffman.

Inventor:

F. H. Richards.

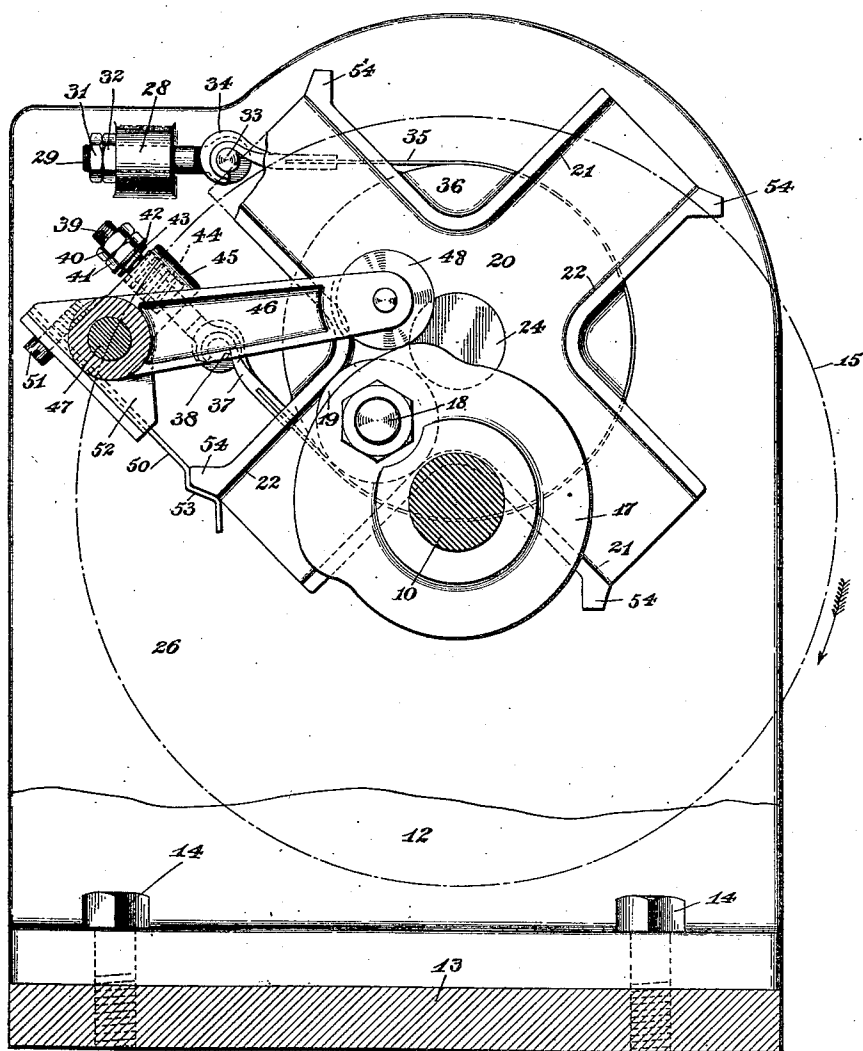
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3 SHEETS—SHEET 2.

Fig. 2.



Witnesses:

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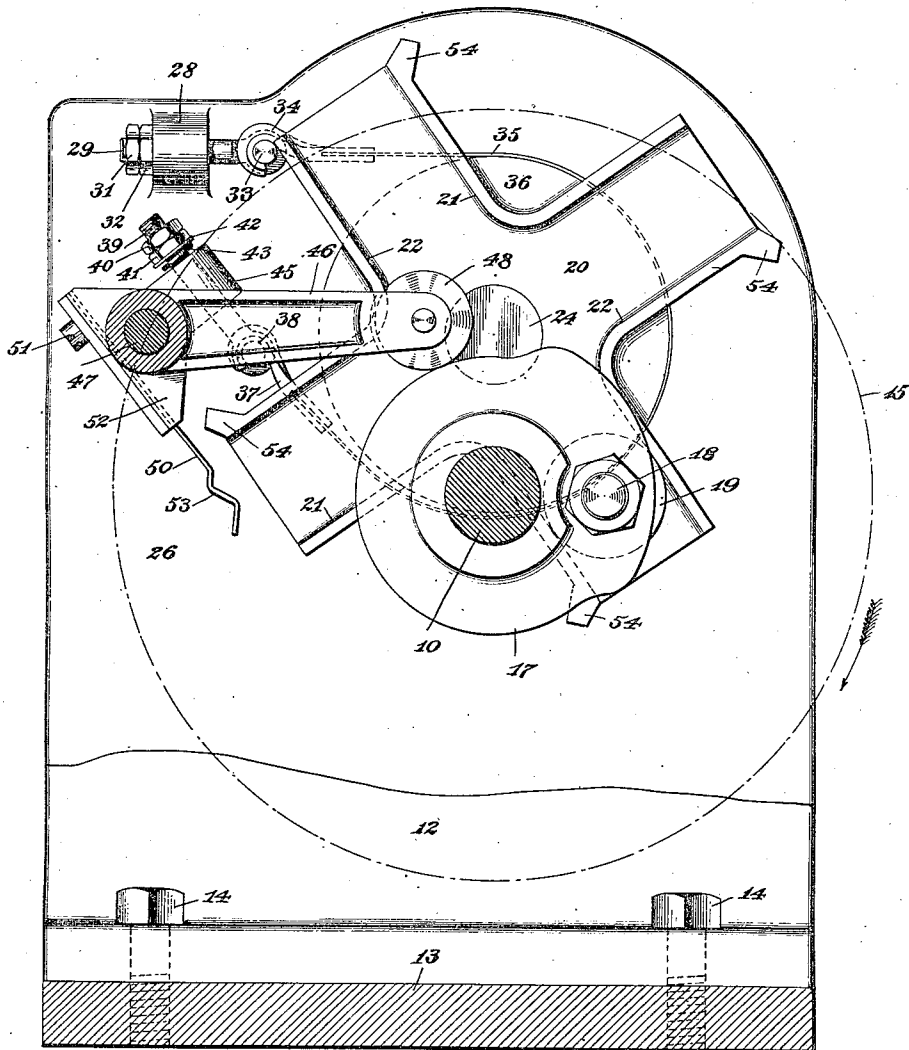
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3 SHEETS—SHEET 3.

Fig. 3.



Witnesses:

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UNITED STATES PATENT OFFICE.

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MECHANICAL MOVEMENT.

No. 841,342.

Specification of Letters Patent.

Patented Jan. 15, 1907.

Application filed March 23, 1900. Serial No. 9,855.

To all whom it may concern:

Be it known that I, FRANCIS H. RICHARDS, a citizen of the United States, residing at Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Mechanical Movements, of which the following is a specification.

This invention relates to mechanical movements; and it has for its object the provision of an improved organization of devices whereby a continuous rotary movement of the driving member or actuator is converted into intermittent progressive movements of the driven member.

Devices and appliances embodying the present mechanical movement are susceptible of various applications and may be used in different arts. As an instance of an adaptation thereof which may be made, the formation of impressions by impression devices—as, for instance, dies—through the operation of appropriate mechanism may be cited, the present movement being capable of utilization for the purpose of producing a dwell in the progressive movement of an impression device or die while in the act of making an impression.

My invention includes as one of its features an actuator constituting the driving member of the mechanism and being in the present instance substantially in the nature of a crank that is adapted for engagement with the driven member of the mechanism. The driven member is somewhat similar to what is generally known as a “star-wheel” and may be provided with a series of grooves into which the crank-pin may enter successively for imparting the proper movement to the driven member, such movement of course being dependent upon the contour of the groove-walls, which are acted upon by the actuator or crank roll.

My invention includes, furthermore, a device for retarding the movement of the driven member after it has completed the greater portion of its travel and before it has entered upon a state of rest, when the actuator has practically ceased to have the control that it exercises over said member during the moving period, the retarding action increasing progressively in efficiency until the actuator-roll has reached the ineffective period of its revolution and the driven member is locked in its proper resting position.

Another feature of my invention may be

found in a device whereby the driven member is locked against movement during the resting period. This locking device, or, as it will be hereinafter designated, the “locker,” is shown in the drawings as under the control of a properly-constructed cam-face under direct control of the actuator and preferably moving in unison therewith, and it serves not only for the purpose just specified, but as an additional means for retarding the movement of the driven member at the proper time and, subsequently, for locating the same in a predetermined position, in which position it is finally locked.

In the drawings accompanying and forming part of this specification, Figure 1 shows a side view of the mechanism embodying my invention. Fig. 2 is a vertical section on line 2 2, Fig. 1; and Fig. 3 is a similar view showing the parts in a different position.

Similar characters of reference designate like parts in all the figures of the drawings.

In the drawings, 10 designates the driving member or shaft journaled in a bearing 11, forming a part of or secured to the upright 12, which is held on a base-plate 13 by means of screws 14.

Mounted upon the shaft 10 is a pulley 15, to which rotary movement may be imparted from some suitable source of power, as by a belt, (not shown,) which may be held in place thereon by a nut 16. At the other end of said shaft is secured the actuator 17, which in the present instance is made in the form of a crank-disk having a peripheral cam-face for operating a retarding and locking device to be hereinafter described. A stud 18 is held on said disk and carries a roller 19, adapted for engagement with the driven member of the mechanism, which is herein shown as a four-armed cam (designated in a general way by 20) and the grooves of which comprise in this case two sets of cam-surfaces 21 and 22, the surfaces 21 being engaged by the above-mentioned roll 19, while the coacting surfaces 22 are engaged by a similar companion roll 23, also journaled upon the stud 18, both rollers 19 and 23 being in close engagement with their respective cam-surfaces at the same time, so that all looseness between the rolls and the driven member may be entirely obviated.

The driven member 20 may be mounted upon one end of a shaft 24, having a bearing in a journal 25, forming a part of or held on an upright 26, which may be secured to the

above-mentioned base-plate 13 by means of screws, such as 27. Said upright 26 is provided with a lug or projection 28, adapted to receive an eyebolt 29, having its ends screw-threaded, so that it may be engaged by a nut 31 and a check-nut 32, whereby sliding movement of the bolt 29 in one direction is prevented, while at the same time the position thereof in the lug 28, and consequently the tensioning of the device, may be adjusted as desired.

Secured on the eyebolt 29 is a pin 33, projecting therefrom at opposite sides and adapted to be engaged by a bifurcated hook 34, which in its turn is firmly secured to a band 35, extending around a drum 36, and which has at its other end a similarly-formed hook 37, held on a pin 38, which is secured in the eye portion of a bolt 39. The end of the bolt 39 is screw-threaded and carries a nut 40 and a check-nut 41, the latter resting against a washer 42, which forms a stop for one end of a spring 43, so that the band 35 serves practically as a brake for the drum, and consequently the driven member, whenever the bolt 39 is moved to draw said band 35 taut. The drum 36 is preferably integral with the driven member 20, and inasmuch as said member is mounted on and secured to a shaft 24 it is evident that said brake-band 35 will in the manner aforesaid retard the rotation of the shaft 24 when the rolls 19 and 23 are about to pass out of contact with their respective cam-surfaces 21 and 22.

The manner of operating the bolt 39 to apply or to release the retarding device is substantially as follows: A spring 43, surrounding the bolt 39, is seated within a recess 44, provided therefor in a lug or arm 45, forming a part of and projecting from a lever 46, which is pivoted on a stud 47, held in the uprights 26 and 12, and which carries at its inner end a cam-roll 48, adapted to ride upon a cam-face provided on the actuator 17 above mentioned, and said cam is so constructed that when the cam-rolls 19 and 23 are about to leave the surfaces 21 and 22 during their revolution around the shaft 10 said roll 48 and the lever 46 will be caused to rise, and thus oscillate the lug 45 around the axis of the pivot 47, which movement will result in drawing the band 35 taut around the periphery of the drum 36, as will be readily understood.

The cam-face actuator is so formed that the efficiency of the brake or retarding device will be progressively increasing as the actuator approaches the ineffective period of its revolution, at which point the maximum efficiency of the brake is attained.

It has been found in practice that in fast-moving machinery it is somewhat difficult to stop the rotation of a shaft or driven member exactly at the desired point, and since in

the mechanism constructed as shown in the drawings it is essential that the driven member 20 shall remain stationary when the actuating cam-rolls of the driving member pass out of engagement with their respective cam-surfaces, and in order to permit such rolls properly to engage the succeeding set of cam-surfaces, I deem it expedient to provide a precisionizer or locking means, whereby all rotation on the part of the driven member will be prevented whenever said cam-rolls 19 and 23 are out of engagement with one pair of cam-surfaces and until they are again ready to engage the succeeding set.

The precisionizer (shown most clearly in Fig. 2) consists, substantially, of a preferably resilient arm 50, which may be secured, by means of a screw 51, to a lug 52, the latter forming a part of the lever 46, above referred to, and said arm 50 may be provided at its free end with a retarding-face 53 and the co-acting faces 53' and 53'', adapted to engage successively a series of lugs 54, formed on the outer ends of the arms of the driven member 20. Simultaneously with the tightening of the band 35 the locker is carried into the path of the revolving projections 54, one of which as the driven member is about to come to a state of rest is first engaged by the retarding-face 53, when, on account of its yielding action, the locker or precisionizer will permit one of the projections 54 to pass into such a position that it may be "located" by the coacting faces 53' and 53'' by and upon the return of the locker 50 to its working position, and thus locked in place. It will be seen that when the lever 46, with its roll 48, is permitted to swing toward the axis of the actuating-shaft 10 the locker 50 will be withdrawn from the lug 54, thus removing all obstruction to the further rotation of said member 20, this condition being shown in Fig. 3 of the drawings.

The device illustrated in the drawings embodies a driven member, which may be rotated by the actuator at first with a gradually-increasing and subsequently decreasing speed. The contour of the walls of the cam-grooves may of course be modified according to different requirements suited to each individual case, so that the movement of the driven member relative to that of the actuator may be varied at will, while it is evident that each rotation on the part of the driving member will produce a certain amount of progressive rotation of the driven member.

Having described my invention, I claim—

1. 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 impart an intermittent movement to the driven member, a brake, and means operative in unison with said actuator for gradually applying and releasing

of the brake, whereby the brake is gradually applied when the actuator is inoperative to operate the driven member and released when the actuator passes into operative engagement with the driven member.

2. The combination with a rotatable actuator, of a driven member provided with a number of pairs of faces with which the actuator is adapted to engage in succession and thereby impart an intermittent movement to the driven member, and a friction-brake for first retarding and then ultimately stopping the movement of the driven member as the actuator moves out of engagement with a face.

3. The combination with a rotatable actuator, of a driven member provided with a number of pairs of faces with which the actuator is adapted to engage in succession and thereby impart an intermittent movement to the driven member, a friction-brake for first retarding and then ultimately stopping the movement of the driven member as the actuator moves out of engagement with a face, and a resilient for positioning and holding the driven member when brought to rest.

4. The combination, with an intermittently-movable driven member and a rotary actuator for engaging said member during a partial rotation of the actuator, of a device controlled by the actuator for retarding the movement of the driven member near the end of such movement, and means for varying the efficiency of said device.

5. The combination, with an intermittently-movable driven member and a rotary actuator for engaging said member during a partial rotation of the actuator, of a device controlled by the actuator for retarding the movement of the driven member near the end of such movement, and for subsequently locating said driven member relatively to the actuator.

6. The combination, with an intermittently-movable driven member and a rotary actuator for engaging said member during a partial rotation of the actuator, of a device controlled by the actuator for retarding, locating, and locking the driven member.

7. The combination, with an intermittently-movable driven member, and a rotary actuator for engaging said member during a partial rotation of the actuator, of a device for retarding, locating, and locking the driven member, and means controlled by the actuator for operating said device.

8. The combination, with an intermittently-movable driven member, and a rotary actuator for engaging said member during a partial rotation of the actuator, of a device for retarding, locating, and locking the driven member, and a cam carried by the actuator for operating said device.

9. The combination, with a driven member comprising a series of intersecting

grooves, of a rotatable actuator for engaging with the walls of the grooves and comprising a crank-roll; a brake device for retarding the movement of the driven member preparatory to the assuming by it of an ineffective position; a cam for actuating the brake; and a detent device for locating the driven member relatively to the actuator during the ineffective movement of the actuator.

10. The combination with a rotatable actuator, of a driven member provided with a number of faces with which the actuator is adapted to engage in succession and thereby impart an intermittent movement to the driven member, a brake, means operative in unison with said actuator for controlling the operation of the brake, whereby the brake is applied when the actuator is inoperative to actuate the driven member and released when the actuator passes into operative engagement with the driven member, and a precisionizer for positioning the driven member when the actuator passes out of operative relation therewith.

11. The combination with a rotatable actuator, of a driven member provided with a number of faces with which the actuator is adapted to engage in succession and thereby impart an intermittent movement to the driven member, a friction-brake controlled by the actuator for first retarding and then ultimately stopping the movement of the driven member as the actuator moves out of engagement with a face, and a detent for positioning and holding the driven member when brought to rest.

12. The combination with a rotatable actuator, of a driven member provided with a number of faces with which the actuator is adapted to engage in succession and thereby impart an intermittent movement to the driven member, a friction-brake controlled by the actuator for retarding and ultimately stopping the movement of the driven member as the actuator moves out of engagement with a face, and a detent for positioning and holding the driven member when brought to rest.

13. The combination with a rotatable actuator, of a driven member provided with a number of faces with which the actuator is adapted to engage in succession and thereby impart an intermittent movement to the driven member, a friction-brake controlled by the actuator for applying a progressively-increasing retardant force and for ultimately stopping the driven member as the actuator moves out of engagement with a face, and a detent for positioning and holding the driven member when brought to rest.

14. The combination with a rotatable actuator, of a driven member provided with a number of faces with which the actuator is adapted to engage in succession and thereby impart an intermittent movement to the

driven member, a brake for retarding and ultimately stopping the movement of the driven member as the actuator moves out of engagement with a face, and a spring-finger for positioning and holding the driven member when brought to rest.

15. The combination with a rotatable actuator, of a driven member provided with a number of faces with which the actuator is adapted to engage in succession and thereby impart an intermittent movement to the driven member, a brake for applying a progressively-increasing retardant force and for ultimately stopping the driven member as the actuator moves out of engagement with a face, and a spring-finger for positioning and holding the driven member when brought to rest.

16. The combination with a driven member comprising pairs of oppositely-disposed working faces, of a rotatable actuator for engaging with said working faces, a friction-brake controlled by the actuator for retarding the movement of the driven member preparatory to the assuming by it of an ineffective condition, a cam for actuating the brake, and a device for positioning and holding positioned the driven member when brought to rest.

17. The combination with a driven member comprising pairs of oppositely-disposed working faces, of a rotatable actuator for engaging with said working faces, a brake device for retarding the movement of the driven member preparatory to the assuming by it of an ineffective condition, a cam for actuating the brake, and a resilient detent for positioning and holding the driven member when brought to rest.

18. The combination with a driving member comprising pairs of oppositely-disposed working faces, of a rotatable actuator for engaging in succession with said pairs of working faces and comprising a pair of crank-rolls, and a device for checking the movement of the driven member as the actuator moves out of engagement with each pair of working faces.

19. The combination with a driving member comprising pairs of oppositely-disposed working faces, of a rotatable actuator for engaging in succession with said pairs of working faces and comprising a pair of crank-rolls, a device for retarding the movement of the driven member as the actuator moves out of engagement with each pair of working faces, and a device for positioning and holding the driven member when brought to rest.

20. The combination with a driven member comprising pairs of oppositely-disposed working faces, of a rotatable actuator for engaging in succession with said pairs of working faces and comprising a pair of crank-rolls, a brake device for retarding the movement of the driven member preparatory to the assum-

ing by it of an ineffective condition, means effective to actuate the brake, and a detent device for positioning and holding the driven member when brought to rest.

21. The combination with a driven member comprising pairs of oppositely-disposed working faces, of a rotatable actuator for engaging in succession with said pairs of working faces and comprising a pair of crank-rolls, a brake device for retarding the movement of the driven member preparatory to the assuming by it of an ineffective condition, a cam effective to actuate the brake, and a detent device for positioning and holding the driven member when brought to rest.

22. The combination with a rotatable actuator, of a driven member provided with a number of faces with which the actuator is adapted to engage in succession and thereby impart an intermittent movement to the driven member, a friction-brake controlled by the actuator for retarding the movement of the driven member as the actuator moves out of engagement with a face, and a separate device for positioning and holding the driven member when brought to rest.

23. The combination with a rotatable actuator, of a driven member provided with a number of faces with which the actuator is adapted to engage in succession and thereby impart an intermittent movement to the driven member, a band-brake having one end fixed, a cooperative part mounted to move with said driven member and which is encircled by said brake, an oscillatable arm to which the free end of the brake is secured, a cam moving in unison with the driving member and effective to rock said oscillatable arm and thereby apply and release said brake, and means for holding said driven member in a predetermined position when the driven member is brought to rest.

24. The combination with a rotatable actuator, of a driven member provided with a number of faces with which the actuator is adapted to engage in succession and thereby impart an intermittent movement to the driven member, a band-brake having one end fixed, a cooperative part mounted to move with said driven member and which is encircled by said band-brake, an oscillatable arm to which the free end of the brake is secured, a cam moving in unison with the driving member and effective to rock said oscillatable arm and thereby apply and release said brake, and a resilient detent moving in unison with said oscillatable arm for holding said driven member in a predetermined position when the driven member is brought to rest.

25. The combination with a rotatable actuator, of a driven member provided with a number of faces with which the actuator is adapted to engage in succession and thereby impart an intermittent movement to the driven member, and a friction-brake con-

trolled by the actuator for stopping said driven member and holding the same in a predetermined position when the driven member is brought to rest.

5 26. The combination of a shaft, a driven member attached thereto and provided with pairs of opposed faces, a crank-roll adapted to engage with such pairs of faces in succession and thereby impart an intermittent movement to the driving member and the attached shaft, a rock-lever, a brake-band one of whose ends is fixed to a stationary part and the other of whose ends is secured to said rock-lever, a cam moving in unison with said crank-roll and operative to rock the rock-lever, and a precisionizer carried by said lever for positioning said driven member when the brake-band is released.

20 27. The combination of a driven member provided with pairs of opposed drive-faces, a crank-roll adapted to engage in succession with said pairs of drive-faces and impart an intermittent movement to the driven mem-

ber, a cam operative in unison with the roll, and a resilient precisionizer controlled by said cam for positioning said driven member as the crank-roll passes out of engagement with a drive-face thereof.

28. The combination with a rotatable member, of a rotary actuator for engaging said member and intermittently rotating the same, and friction means for stopping and positioning said rotatable member at the periods of its intermission of motion.

29. The combination with a rotatable member, of a rotary actuator for engaging said member and intermittently rotating the same, and friction means controlled by the actuator for stopping and positioning said rotatable member at the periods of its intermission of motion.

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