E. P. WEBSTER.

DRIVING MECHANISM.

APPLICATION FILED NOV. 5, 1908.

928,565.

Patented July 20, 1909.

2 SHEETS—SHEET 1.

Fig. 1.

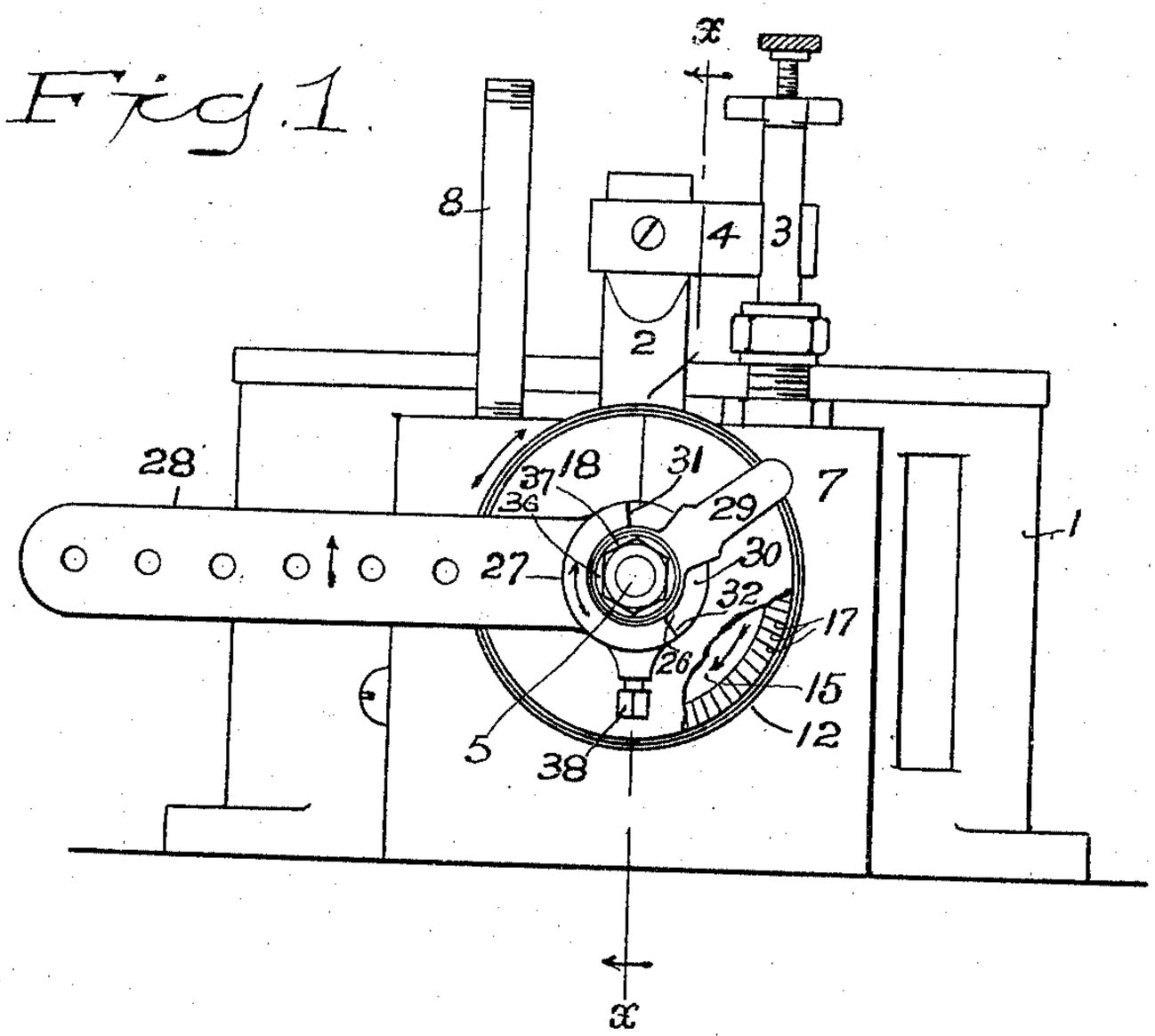

Fig. 2.

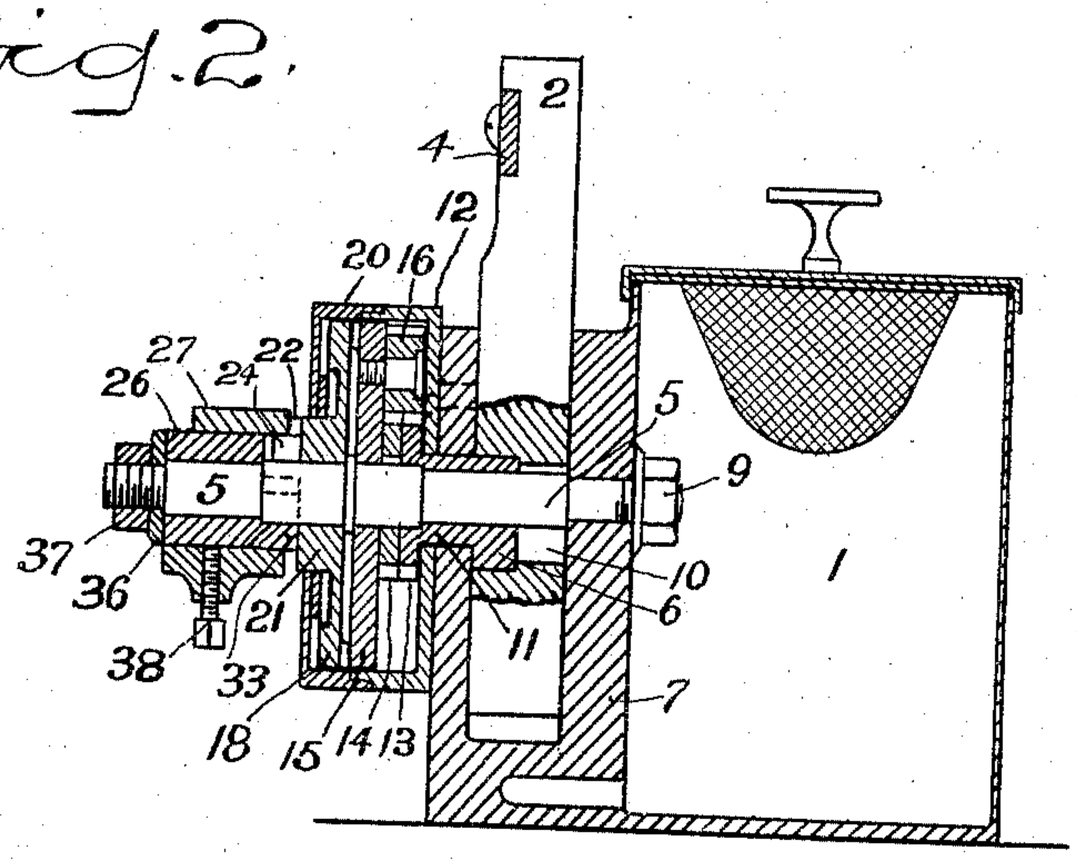

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Fig. 3.

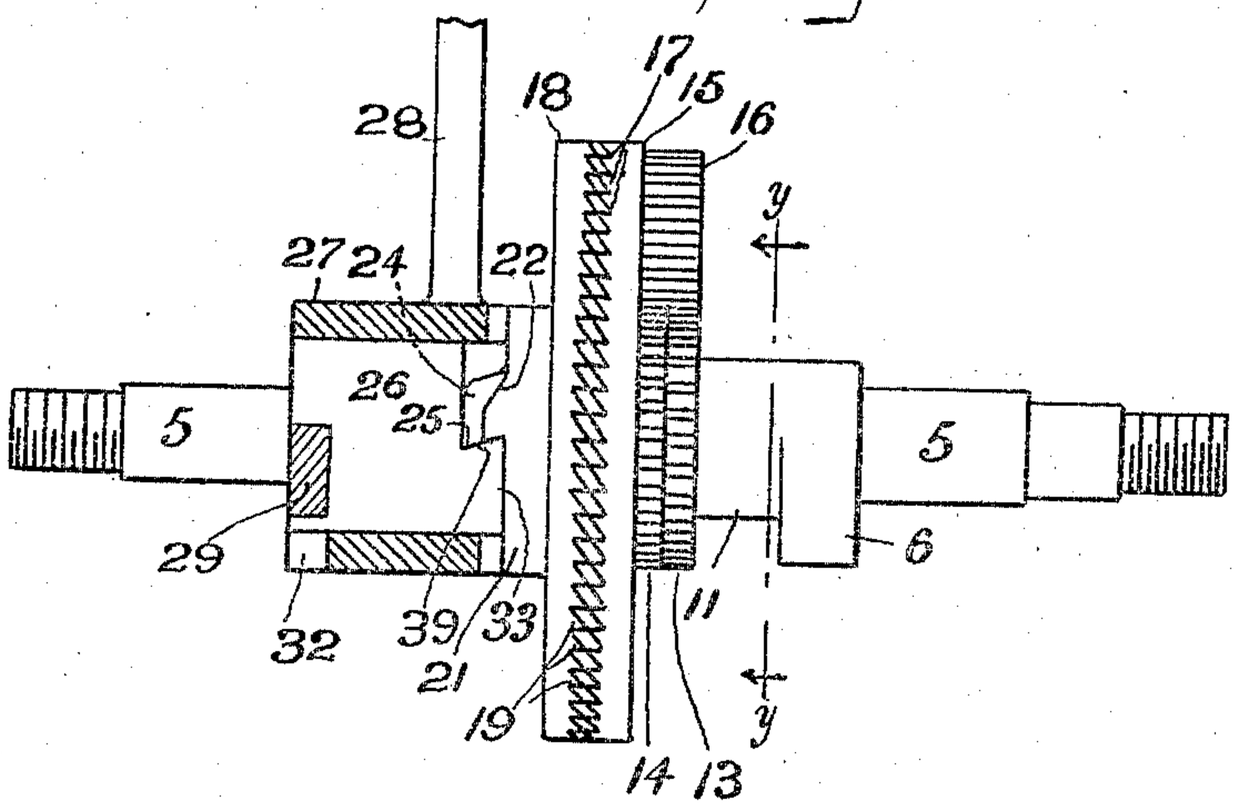


Fig. 4.

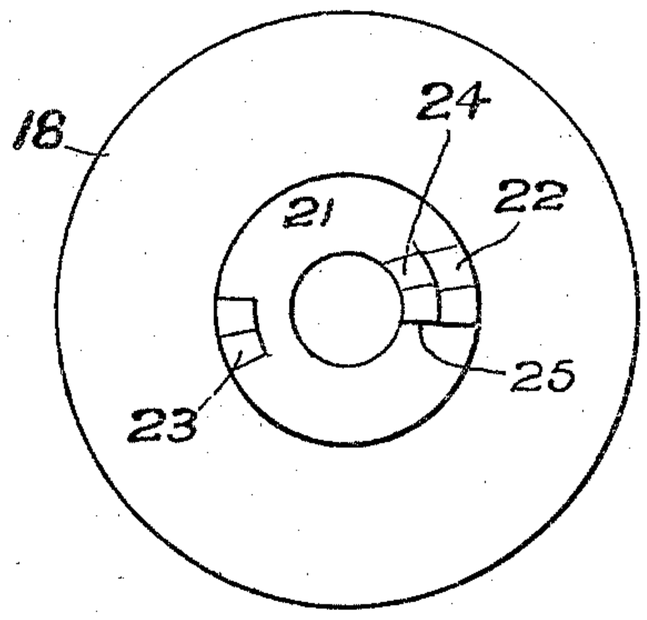


Fig. 5.

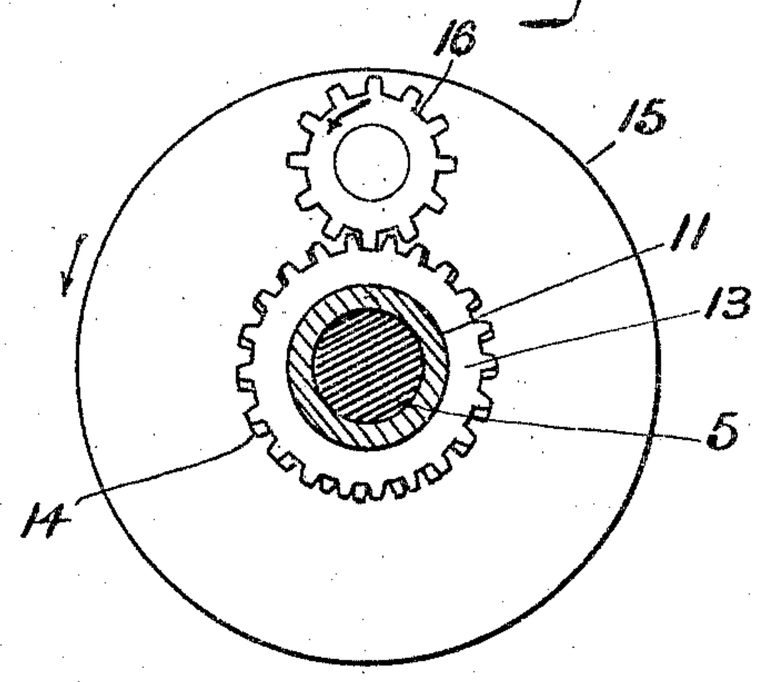
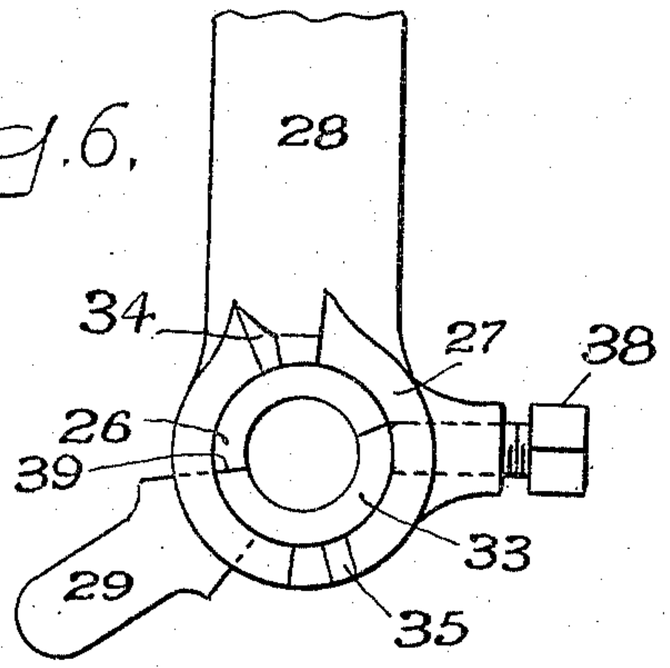


Fig. 6.



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UNITED STATES PATENT OFFICE.

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DRIVING MECHANISM.

No. 928,565. Specification of Letters Patent. Patented July 20, 1909.

Application filed November 5, 1908. Serial No. 461,156.

To all whom it may concern:

Be it known that I, EDGAR P. WEBSTER, a citizen of the United States, residing at Bridgeport, in the county of Fairfield and State of Connecticut, have invented certain new and useful Improvements in Driving Mechanism; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to driving mechanism, but more particularly has reference to certain improved means whereby the piston of a force-feed lubricator is actuated, the particular end aimed at by my invention being to operate the piston by certain means which shall be noiseless and positive, irrespective of the stroke of the engine or other prime mover in connection with which the lubricator is to be used.

With this end in view my invention consists in the details of construction and combination of parts hereinafter fully set forth and then particularly pointed out in the claims which conclude this description.

In the accompanying drawing Figure 1 is a front elevation showing a "force-feed" lubricator equipped with my improvement—Fig. 2 a section at the line x, x, of Fig. 1—Fig. 3 a detail elevation, partly in section, showing the cam shaft and the parts carried thereby—Fig. 4 a detail view of the inner face of the driving disk—Fig. 5 a section at the line y, y, of Fig. 3, and Fig. 6 a detail view of the inner face of the driving lever.

Similar numerals of reference denote like parts in the several figures of the drawing.

My invention is herein illustrated as a means for actuating the cam of a "force-feed" lubricator, and therefore I will not enter into any detail description of the lubricator itself, since the lubricator which I have illustrated in connection with my improvement is of a well known type such as shown and described in U. S. Letters Patent No. 731,731, issued June 23, 1903, to Edwin Allen and George Wallace Carver. Nevertheless, I do not wish it to be understood that my improvement cannot be applied to other forms of lubricators, since any force-feed lubricator or other machine whose parts are actuated by the intermittent or continuous rotation of a cam or other similar device can easily be equipped with my improvement.

Referring to the accompanying drawings, 1 is the oil reservoir, 2 the cam slide, 3 the piston, 4 the connecting bar between said slide and piston, 5 the cam shaft carrying the cam 6, which latter operates within a suitable opening in the cam slide, 7 the thick wall at the front of the reservoir which supports the shaft 5 and within which the slide 2 is arranged, and 8 the pipe or conduit through which the oil is led to the surfaces that are to be supplied with the lubricant.

The parts above described are all common and well known and are illustrated and set forth in the Letters Patent above referred to, and require no further description herein.

The cam shaft 5 is stationary and is secured to the thick wall preferably by means of a nut 9 driven on the end of said shaft against such wall, while the cam 6 is loose around said shaft and operates within an opening 10 in the cam slide, the hub 11 of said cam being journaled within the front portion by the wall 7, and 12 is a casing secured to the front wall in any suitable manner.

13 is a spur gear integral with the hub 11, and consequently loose around the shaft 5, and extending within the casing, and 14 is a spur gear tight on the shaft 5 and of the same size as the gear 13, said gears being side by side with their faces abutting.

15 is a disk, hereinafter referred to as the "driven disk", which is loose on the shaft 5 and carries on its rear face an idle pinion 16 whose teeth are of such width that they are in mesh with the teeth of both gears 13, 14. Concentrically cut within the outer face of said disk close to the periphery thereof are ratchet teeth 17, while a second disk 18, hereinafter termed the "driving disk", is loosely supported around the shaft 5 and is provided on its inner face near the periphery thereof with a series of concentrically disposed ratchet teeth 19 adapted, in the manner hereinafter described, to engage with the teeth 17.

20 is a cap or cover supported around the hub 21 of the disk 18 and engaging the casing 12 so as to close the same so that the parts contained therein will not be injured or clogged by dust or other foreign particles,

said casing and cover being of course a precaution rather than a necessity since they have nothing whatever to do with the operation of the parts of my improvement.

Extending from the hub 21 of the driving disk are diametrically opposite inclines 22, 23, and 24 is a lug likewise extending from said hub immediately inside the incline 22, the forward edge of said lug being undercut as seen at 25, for the purpose presently to be explained.

26 is a sleeve loose around the shaft 5 and contained within a hub 27 from which latter extends a driving lever 28. The sleeve 26 is free to turn within the hub 27 and is provided with a finger 29 which extends laterally therefrom, the outer face of the hub 27 being cut away as shown at 30, for a considerable distance in order to accommodate said finger and to provide shoulders 31, 32. Projecting concentrically from the inner edge of said sleeve is a rib 33 whose normal position is determined by turning the sleeve 26 by means of its finger 29, for the purpose presently to be explained. Extending from the inner edge of the hub 27 are diametrically opposite inclines 34, 35, which are in substantially the same vertical plane with the inclines 22, 23, on the hub 21. The hub 27 is secured in position on the shaft 5 by means of a washer 36 and nut 37.

38 is a screw driven through the hub 29 against the sleeve 26 whereby the latter is secured in any adjustment brought about by the manipulation of the finger 29.

The two disks 15, 18, are assembled with their ratchet teeth capable of being engaged so that the disk 15 may be driven by the rotation of the disk 18, while the latter is capable of a sliding movement on the shaft 5 whereby its ratchet teeth 19 may be withdrawn from engagement with the similar teeth 17 on the disk 15.

The inclines 22, 23, on the hub of the disk 18 are opposed to the inclines 34, 35, on the hub 27, so that when the latter is revolved by the manipulation of the lever 28 these inclines will wedge against each other and will thereby cause the disk 18 to be driven inwardly so that its ratchet teeth will engage with the corresponding teeth on the disk 15 and the latter will then be revolved by the movement of the lever 28, the direction in which the driving movements of these disks are effected being indicated by the arrows in Fig. 1.

The end of the rib 33 nearest to the undercut 25 of the lug 24 is likewise undercut as seen at 39, and said rib and lug are concentric and are at the same distance from a common axis of rotation, so that it will be clear that when the hub is revolved in a direction reverse to that indicated by the arrow at Fig. 1 the undercut 39 on the rib 33 will engage the undercut 25 on the lug 24 and thereby withdraw the disk 18 from the disk 15 and disengage their respective teeth, as will be more clearly understood by reference to Fig. 3 which shows the two undercuts in engagement.

If the stroke of the engine with which the driving lever 28 is connected is a long one and it is desired to effect the same feeding of oil as in the instance of an engine with a short stroke, the sleeve 26 is turned by means of its finger 29 so as to withdraw the undercut part 39 to a position normally remote from the undercut on the lug 24, so that it will be clear that the lever 28 will swing through a greater arc in its reverse movement before said undercut portions will engage to separate the disks, while at the same time said lever will likewise swing through a greater arc in its forward or driving movements before the inclines 34, 35, will engage the inclines 22, 23, for the purpose of throwing the ratchet teeth of the disks into engagement and thereafter effecting the driving movements of the disk 15. The adjustment for shorter strokes with the same feed of oil are of course effected by fixing the normal position of the undercut 39 closer to the undercut on the lug 24. For instance, referring to Fig. 1, the normal position of the finger 29 is about midway between the stop shoulders 31, 32, and therefore this is the proper adjustment for a medium stroke, and when the lever 28 is swung forward in the direction indicated by the arrow, the inclines 34, 35, on the hub 27 will engage with the inclines 22, 23, on the hub 21 after said lever is swung idly through an arc, say of 60°, and the remaining forward stroke of this lever will effect the revolution of the disk 15; as the lever is returned on the reverse stroke it will idly swing around the shaft 5, and at the end of such reverse stroke the undercuts 39, 25, will engage and separate the disks in the manner hereinafter set forth, so that when the next forward stroke of the lever 28 occurs there can be no movement of the disk 15 until the inclines on the hubs 21, 27, engage to cause the engagement of the teeth carried by said disks.

By throwing the finger 29 against the stop shoulder 32, the undercut portions 25, 39 are separated at their greatest normal distance from each other, and the parts are then in position for operation in connection with an engine having a very long stroke, and the greater portion of the forward and reverse swinging movements of the lever 28 will be merely idle, and the effective movement of said lever to revolve the disk 15 will be just equal to the corresponding movement of said lever in the instance of a shorter stroke.

The rotation of the disk 15 effects the rotation of the cam 6 in the following manner:— Referring particularly to Figs. 3 and 5, I would call attention to the fact that the cam

gear 13 has one more tooth than the tight gear 14, and therefore when the disk 15 has completed one revolution, the idle pinion 16 will have caused the revolution of the cam gear throughout the extent of a single tooth. For instance, the cam gear 13, shown in the drawing, has twenty-one (21) teeth, while the tight gear 14 has twenty (20) teeth, and therefore it will require twenty-one complete revolutions of this disk 15 to effect a complete revolution of the cam 6. Of course, if the cam gear had two more teeth than the tight gear, then the cam would be revolved twice as fast by the turning of the disk 15.

I have shown and described two diametrically opposite inclines on the hubs 21 and 27, but one of these inclines on each of the hubs will answer the purposes of my invention, although I prefer to have the two diametrically opposite inclines for the reason that the disk 18 is thereby drawn more evenly and squarely toward the disk 15. Of course it will be readily understood that instead of moving the lever 28 back and forth in order to rotate the cam intermittently, said lever may be continuously revolved at the proper speed so as to effect the desired revolution of said cam.

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

1. The combination of the stationary shaft, the cam loosely mounted on said shaft, the spur gear carried by said cam, the spur gear tight on said shaft and abutting against the first named gear said gears having an unequal number of teeth, the rotary driven disk having on its front face ratchet teeth, an idle pinion carried on the rear face of said disk and meshing with said gears, the slidable rotary driving disk having teeth on its inner face adapted to engage with the first named teeth and provided with an outwardly extending hub having inclines and an undercut lug, and a rotary element mounted on said shaft and having oppositely disposed inclines adapted to engage the first named inclines and carrying an adjustable undercut rib adapted to engage said undercut lug.

2. The combination of the stationary shaft, a spur gear rigid therewith, the cam loose on said shaft, a spur gear carried by said cam and of the same size as the first named gear but having a different number of teeth, the driven disk loosely supported around said shaft, an idle pinion carried by said disk and meshing with said gears, and means for driving said disk whereby said cam is actuated.

3. The combination of the stationary shaft suitably supported, the cam supported by said shaft and capable of a free rotation, the spur gears of the same size and having an unequal number of teeth and assembled side by side, one of said gears being rigid with said cam while the other is rigid on the shaft, the rotary driven disk supported on said shaft and having ratchet teeth on one face, an idle pinion in mesh with said gears and carried on the other face of said disk, the slidable rotary driving disk supported on said shaft and having on one face teeth adapted to engage with the first named teeth and having projecting from its other face a hub provided with diametrically opposite inclines and an undercut lug, an adjustable sleeve loosely supported around said shaft and capable of rotation and having projecting from the rear face thereof an undercut rib capable of engaging with said lug, and a rotary hub within which said sleeve is contained and which has diametrically opposite inclines in the same vertical plane with the first named inclines each pair of said inclines having opposed inclined surfaces.

In testimony whereof I affix my signature in presence of two witnesses.

EDGAR P. WEBSTER.

Witnesses:

F. W. Smith, Jr.,

M. T. Longden.