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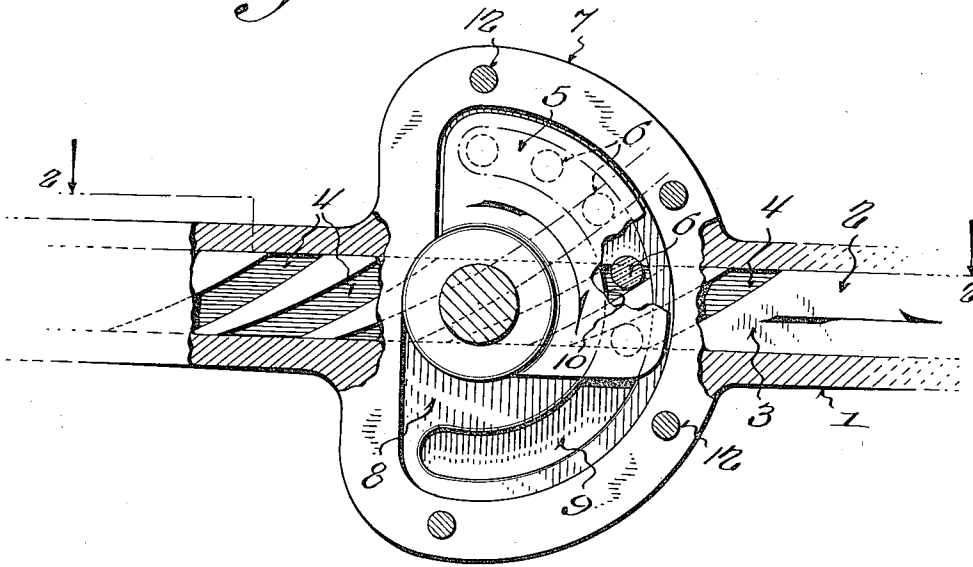
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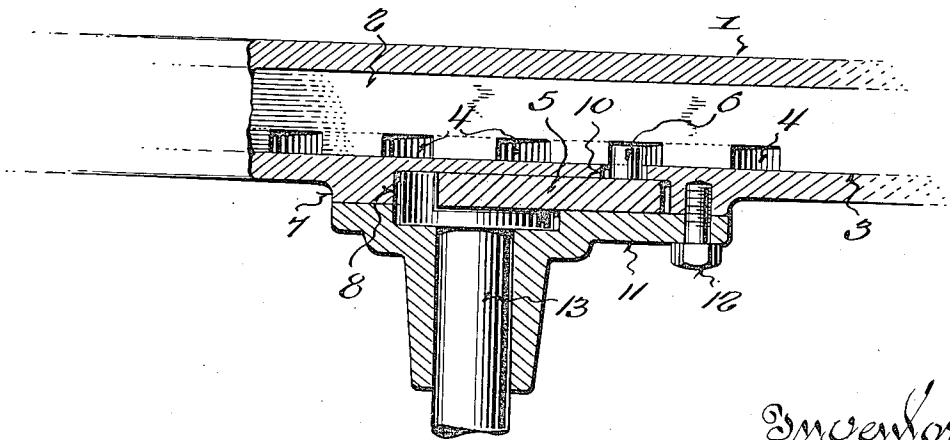
MECHANICAL MOVEMENT

Original Filed June 26, 1933

*Fig. 1.*



*Fig. 2.*



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## MECHANICAL MOVEMENT

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Original application June 26, 1933, Serial No.  
677,539. Divided and this application June 22,  
1934, Serial No. 731,801

7 Claims. (Cl. 74—55)

This invention, which constitutes a division of  
co-pending application for spot light, filed June  
26, 1933, Serial No. 677,539, pertains to improve-  
ments in mechanical movements, and more par-  
ticularly to a mechanism for converting recipro-  
cative movement into rotary movement, or vice  
versa.

Various mechanisms for accomplishing the  
foregoing results, such as reciprocative cams for  
actuating rotary members, are well known in the  
art, and, therefore, the present invention does  
not contemplate broadly the inclusion of such  
devices, but rather has primarily for its object  
the provision of an exceedingly simple, compact,  
and efficient mechanism, in which the reciproca-  
tive member is provided with a plurality of cams  
for progressive engagement with aligning projec-  
tions carried by the rotary member, whereby the  
arc of movement of the rotary member is mat-  
terially increased beyond the movement imparted  
by a single cam, thus permitting the use of ex-  
ceedingly short cams, and at the same time dis-  
tributing wear between a plurality of engaging  
surfaces to greatly prolong the life of the mech-  
anism.

Incidental to the foregoing, a more specific  
object of the present invention resides in the  
provision of a reciprocative bar having a flat  
face provided with a plurality of spaced trans-  
verse cam grooves open at their ends for progres-  
sive engagement with respective spaced projec-  
tions carried by a rotary member journaled ad-  
jacent said bar for rotary movement in a plane  
parallel to said flat face.

A still further object is to form the foregoing  
cam grooves in such manner as to provide con-  
stant leverage and relative movement between  
the reciprocative and rotary members.

With the above and other objects in view,  
which will appear as the description proceeds,  
the invention resides in the novel construction,  
combination and arrangement of parts, sub-  
stantially as hereinafter described and more par-  
ticularly defined by the appended claims, it be-  
ing understood that such changes in the precise  
embodiment of the herein disclosed invention  
may be made as come within the scope of the  
claims.

In the accompanying drawing is illustrated one  
complete example of the physical embodiment of  
the present invention constructed according to  
the best mode so far devised for the practical  
application of the principles thereof.

In the drawing:—

Figure 1 is a fragmentary elevation, illustrat-

ing one form in which the principles of the  
present invention may be applied, parts being  
broken away and in section, and

Figure 2 is a fragmentary section taken on the  
line 2—2 of Figure 1.

Referring now more particularly to the specific  
structure illustrated in the accompanying draw-  
ing, the numeral 1 designates a guide, in which  
a reciprocative bar 2 is slidably journaled, and  
held against rotation by means of its flattened  
sides, the bar being rectangular in cross section.  
However, it is to be understood that the fore-  
going may be accomplished in various conven-  
tional ways, such as by keys, splines, and the like,  
without departing from the invention.

One of the flat faces 3 of the bar 2 has formed  
therein a plurality of spaced, transverse cam  
grooves 4 extending across the entire width of the  
face to present open ends at the upper or lower  
edges of the bar, which is highly essential to the  
invention, as will be hereinafter pointed out.

Pivotaly mounted at one side of the bar 2,  
for relative movement in a plane parallel to the face  
3, is a rotary member 5, shown as a sector, and  
provided with a plurality of spaced, laterally  
extending projections 6 for engagement in the  
cam grooves 4.

Merely for illustrative purposes, the guide 1 is  
shown as having an enlarged boss 7, formed at  
one side and provided with a recess 8 for re-  
ception of the sector 5, the inner wall of the  
recess being provided with an arcuate groove 9  
to permit rotary movement of the projections 6.  
That portion of the groove intersecting the cam  
rod 2 is interrupted to form an opening  
through the wall of the guide 1 to permit engage-  
ment of the projection 6 in the cam grooves 4.  
A plate 11, secured to the face of the boss 7 by  
screws 12, or any other suitable fastening means,  
forms a closure for the recess 8, and a bearing for  
the shaft 13 secured to the sector 5.

Obviously, in the position of the parts illus-  
trated in Figure 1, movement of the bar in the  
direction indicated by the arrow, either manu-  
ally or otherwise, will impart rotary movement  
to the sector 5 through engagement of the pro-  
jection 6 in the cam grooves 4, and naturally  
reverse movement will oscillate the sector.

While in the present showing the cam grooves  
4 are illustrated as being identical, and of such  
arcuate formation as to provide constant leverage  
and relative movement between the cam bar 2  
and rotary member 5, if desired the intermediate  
portions of one or more of the grooves may be  
generated to vary the leverage and relative move-

ment, it being merely necessary to form the ends of the grooves correspondingly in fixed relation to the projections carried by the rotary member 5. Further, while the grooves 3 are shown as spaced equidistantly, the spacing may be varied in relation to such variation as may be made in the projection 6 of the rotary member 5, it being unnecessary, although more desirable, to space the projections equidistantly from each other. Nor is it essential that the projections be spaced equidistantly radially from the axis of the sector.

Also, it is important to note that the cam grooves are so spaced with relation to the projections 6 that as one projection is leaving its groove, another enters the adjacent groove, and, obviously, if desired, a plurality of projections may be engaged by the cams at all times by either spacing the projections closer together, or increasing the width of the cam bar to extend the length of the cam grooves, as indicated in the dot and dash lines on Figure 1.

Furthermore, it will be readily understood that the leverage between the movable members may be varied by changing the angle of the cord of the cam groove arcs with relation to their end edges. In this manner it is also possible to reverse the operation and reciprocate the cam bar through actuation of the rotary member, which cannot be accomplished when the angle of the cam grooves is acute with relation to the upper edge of the cam bar.

From the foregoing explanation, considered in connection with the accompanying drawing, it will be readily apparent that an exceedingly simple, compact, and efficient mechanism has been provided for converting reciprocative movement into rotary or oscillatory movement, or vice versa, the novel and highly advantageous feature of the invention residing in the provision of a reciprocative member having a plurality of cams progressively engaging successive projections carried by the rotary member, whereby maximum arcuate movement is imparted to the rotary member by a reciprocative member of minimum width, and consequently cams of minimum length. At the same time, wear is distributed to a plurality of intermittently engaging surfaces, thus materially prolonging the life of the mechanism.

I claim:—

1. A mechanical movement comprising a reciprocative member provided with a plurality of cams, and an oscillatory member provided with a plurality of projections aligned concentrically with the axis of the oscillatory member for progressive engagement with said cams to effect relative movement of the members upon actuation of one of said members.

2. A mechanical movement comprising a reciprocative member provided with a plurality of angularly disposed parallel cams, and an oscilla-

tory member provided with a plurality of projections aligned concentrically with the axis of the oscillatory member for progressive engagement with said cams to effect constant relative movement of the members upon actuation of one of the members.

3. A mechanical movement comprising a reciprocating member provided with a plurality of cams, and a rotary member provided with a plurality of projections for progressive engagement with said cams to effect relative movement of the members upon actuation of one of said members, said rotary member having oscillatory movement in a plane parallel to the path of movement of said reciprocative member.

4. A mechanical movement comprising a reciprocative member provided on one of its faces with a plurality of transverse, angularly disposed cams, an oscillatory member journaled adjacent said reciprocative member for rotary movement in a plane parallel to said cam face, and projections carried by said rotary member for progressive engagement with said cams to effect relative movement between the members upon actuation of one of said members.

5. A mechanical movement comprising a reciprocative bar having a flat face and provided with a plurality of cam grooves in said face, the grooves being open at their ends, and a rotary member provided with a plurality of projections for progressive engagement in said cam grooves to effect relative movement of the members upon actuation of one of said members, said projections being so spaced that one or more projections are engaged in their respective cam grooves at all times.

6. A mechanical movement comprising a reciprocative bar having a flat face and provided with a plurality of cam grooves in said face, the grooves being open at their ends, and a rotary member provided with a plurality of projections for progressive engagement in said cam grooves to effect relative movement of the members upon actuation of one of said members, said projections being so spaced with relation to said cam grooves with at least two adjacent projections engaged in their respective cam grooves during the exit and entrance of said projections in said cam grooves.

7. A mechanical movement comprising a reciprocative member provided with a plurality of parallel, uniformly spaced, arcuate cams, and an oscillatory member provided with a plurality of uniformly spaced projections aligned concentrically with the axis of the oscillatory member for engagement with said cams to effect relative movement of the members upon actuation of one of said members.

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