Oct. 22, 1929. A. NOVICK 1,732,945

MECHANICAL MOVEMENT

Filed April 12, 1923

Fig. 1.

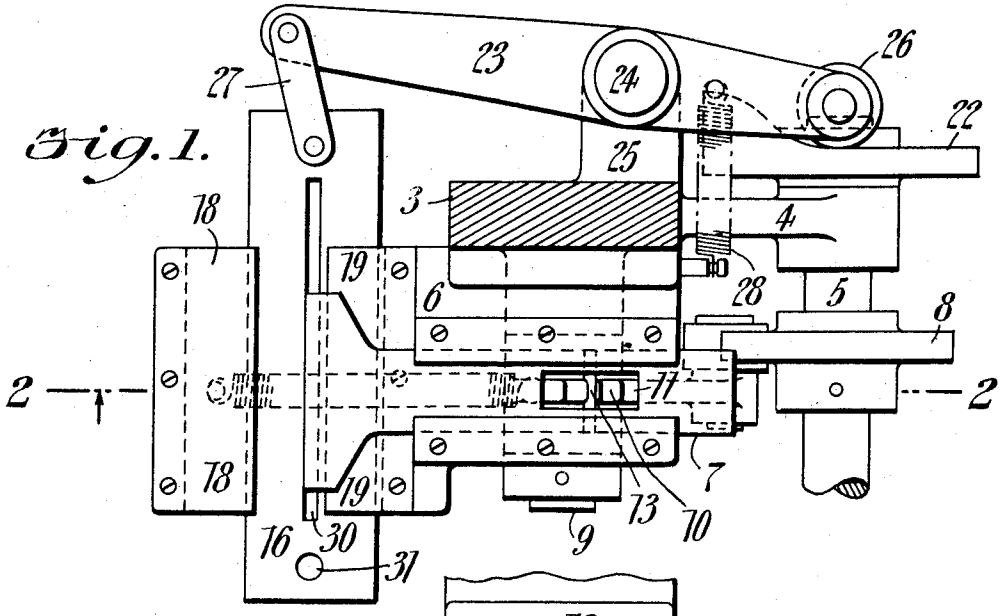


Fig. 2.

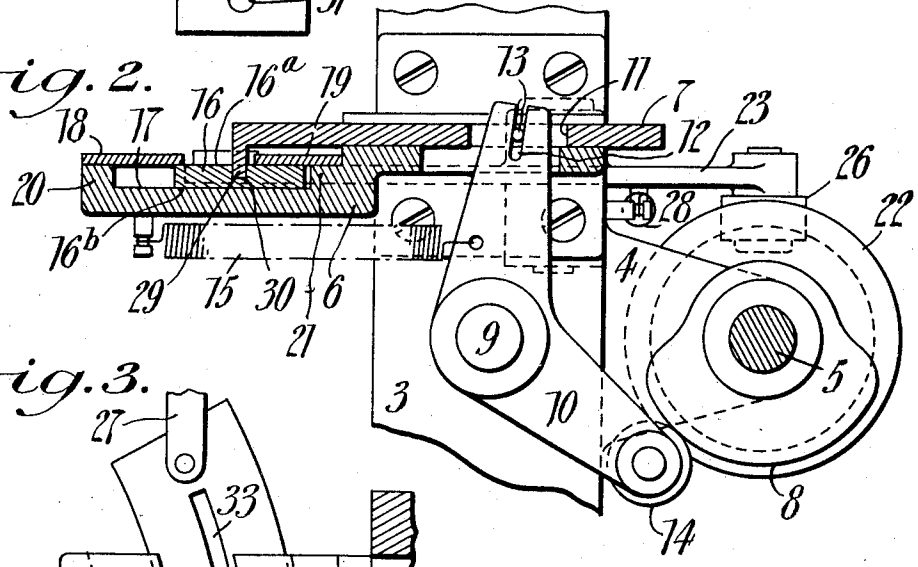
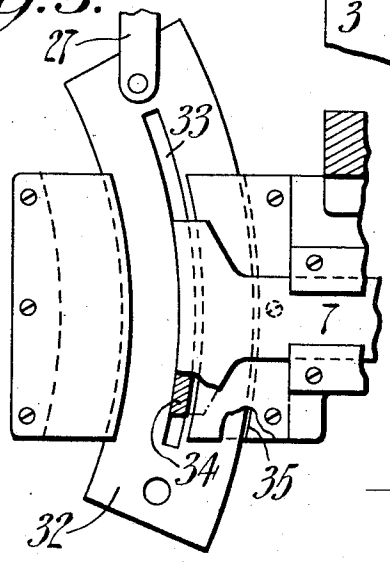


Fig. 3.



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UNITED STATES PATENT OFFICE

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MECHANICAL MOVEMENT

Application filed April 12, 1923. Serial No. 631,576.

This invention relates to mechanical movements, and has for its object to provide a device of the class specified for converting the movements of two independent moving members to movements in two directions of a driven member. A further object is to accomplish this result with a minimum of mechanism.

To these ends my improvements comprise features illustrated in their preferred embodiment in the drawing accompanying this specification, wherein:

Figure 1 is a plan view of a mechanism embodying my improvements. Fig. 2 is a sectional elevation on line 2, 2 of Fig. 1. Fig. 3 is a fragmentary plan view showing a modification of my improvements. The three views are to one scale.

Referring first to Figs. 1 and 2, upright frame 3 has ear 4 terminating in a bearing for shaft 5. Projecting in parallelism with said shaft, from frame 3, is bracket 6, having mounted therein slide 7 for reciprocation in a direction transverse to the direction of shaft 5. Said slide may be reciprocated from edge cam 8, fixed to shaft 5, by the following means: Pivoted on stud 9 projecting from frame 3 parallel with shaft 5 is arm 10, the upper end of which is operatively connected with slide 7. As a suitable form of connection, said slide is provided with an opening 11 therethrough, into which projects the upper end of said arm 10. Said arm is slotted in its upper end at 12 for engagement with pin 13 carried by said slide and extending across said opening 11. The lower end of arm 10 carries roll 14 for engagement with cam 8. Pull spring 15 is efficient for urging said roll to engagement with said cam.

Arranged and constrained for universal movement in one plane is slide 16. Said slide is provided with opposite parallel faces, 16^a, 16^b, and face 16^b engages guide way face 17 formed in a portion of bracket 6, and face 16^a is engaged by overhanging gibs 18, 19 fixed to opposite upstanding portions 20, 21, respectively, of bracket 6. The distance between said upstanding portions 20, 21 is greater than the width of slide 16, whereby said slide is permitted movement in a direction transverse its length as well as in the direction of its length.

Said slide 16 may be moved in the direction of its length from face cam 22 fixed to shaft 5 by the following means: Lever 23 is pivoted on stud 24 in ear 25 projecting rearwardly from frame 3, Fig. 1. One end of said lever 23 carries roll 26 for engagement with said cam 22 and the other end of said lever is operatively connected with slide 16 by link 27. Pull spring 28 is efficient for urging roll 26 to engagement with cam 22. Slide 16 and its gibs 18, 19 lie below the plane of the lower face of slide 7, and said slide 7 extends to the left over gib 19 and over the space between that gib and gib 18. Said slide is preferably of greater width where it overhangs slide 16 than where it is engaged by the guideway of bracket 6, and said overhanging portion terminates in downwardly reaching transverse tongue 29 in engagement with the side walls of groove 30 lengthwise in slide 16. Said groove is preferably parallel with the edges of said slide and is longer than the engaging portion of tongue 29 of slide 7.

The operation of my improved mechanical motion is as follows: Shaft 5 being rotated in clockwise direction, the high part of cam 22 will oscillate lever 23, whereby slide 16 will be moved downwardly Fig. 1, in the direction of its length in parallelism with a given line, such as the axis of shaft 5, and said slide will be maintained in parallelism with said line by the engagement of its groove 30 with tongue 29 of slide 7. Then, as roll 14 rides down from the high part of cam 8, arm 10 will be oscillated by its spring 15 and slide 7 will be moved to the left, Figs. 1 and 2, and will in turn move slide 16 to the left an equal amount, without disturbing the parallelism of that slide with the axis of shaft 5. It is obvious that cams 8 and 22 may be timed so as to produce said movements of slide 16 sequentially or in overlapping relation as described, whereby any given portion of said slide, as pin 31, may be made to travel any desired path within the restrictions of the plane movement of said slide 16. Also it is obvious that the contours of the operative faces of said cams may be modified as desired.

In the modification of Fig. 3, slide 32, corresponding with slide 16 of the earlier figures of the drawing, is a portion of an annular ring and curved groove 33 thereof is parallel with the edges of said slide, and tongue 34 of slide 7 is curved to correspond with and fit groove 33. In this modification, slide 32 will be maintained in parallelism with a given curved line, such as 35, representing one wall of the guideway for slide 32, and will be moved in parallelism with that line by the movement of lever 23 through link 27.

I claim:

1. The combination of a slide, a support on which the slide rests and with reference to which the slide is constrained to move in a single plane, means for moving the slide in one direction in such plane relatively to its support, said means also serving as a guide to direct the movement of the slide in another direction in said plane, and means for moving the slide in such other direction relatively to its support.

2. The combination of a slide, means for confining the slide to movement in one plane comprising a slide support on which the slide rests, reciprocatory means for reciprocating the slide in one direction relatively to its support and independent reciprocatory means for reciprocating the slide in a direction transverse to the direction of said movement.

3. The combination of a slide having two parallel faces, guideways engaging said parallel faces for restraining said slide to universal movement in one plane, a second slide mounted for movement in the direction of its length, means on said second slide for engaging and moving said first slide and for maintaining said first slide in parallelism with a line transverse to the direction of said movement, means carried by said first slide for engagement by the engaging and moving means of said second slide, means for moving said second slide, and means for moving said first slide in parallelism with said transverse line.

4. The combination of a slide having two parallel faces, guideways engaging said parallel faces for restraining said slide to universal movement in one plane, a second slide mounted for movement in the direction of its length, a tongue on said second slide extending in a direction transverse to the direction of movement of said slide, a groove in said first slide adapted for sliding engagement with said tongue, means for moving said second slide, and means for moving said first slide in a direction transverse to the direction of movement of said second slide.

5. The combination of a slide, means on which the slide rests, supporting said slide and permitting it to have universal movement in one plane relative to the supporting means, means for moving said slide in one direction and for maintaining said slide in parallelism with a line transverse to the direction of said movement, said means comprising a second slide, a bell crank operatively associated with said slide, and a cam for actuating said crank, and means for moving said slide in parallelism with the said transverse line, said means comprising a link, a lever, and a cam operatively connected to said slide.

6. The combination of a slide, a support on which the slide rests at all times, means for moving said slide in one direction and for maintaining said slide in parallelism with a line transverse to the direction of said movement, a cam for actuating said means, a second means for moving said slide in parallelism with said transverse line, and a second cam operatively associated with said second means, said second cam being carried on a shaft common to aforesaid cam, but the adjustment of said second cam being independent of the aforesaid cam.

In witness whereof, I hereby affix my signature this 10th day of April, 1923.

ABRAHAM NOVICK.