J. PROKSA.

MECHANISM FOR CONVERTING MOTION.

APPLICATION FILED MAY 27, 1914.

1,167,017. Patented Jan. 4, 1916.

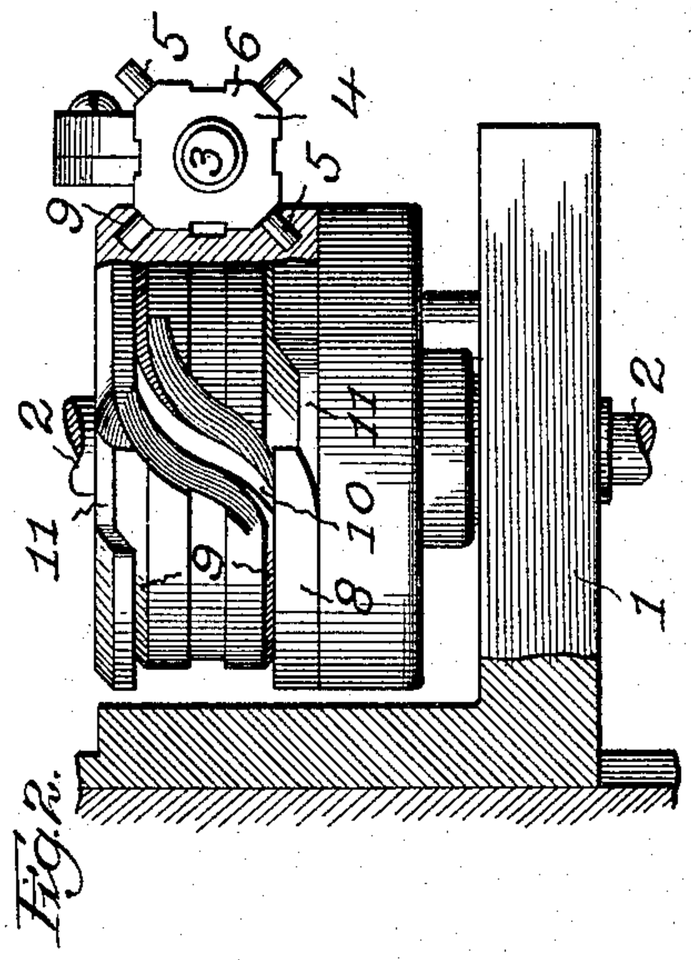

Fig. 2.

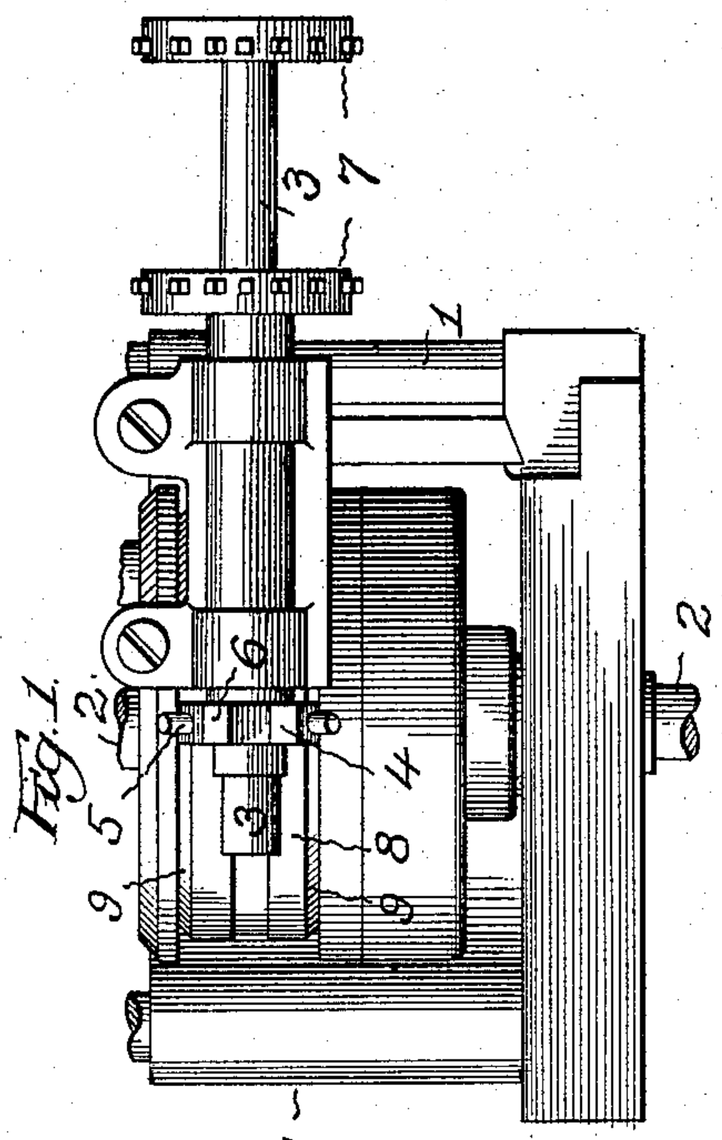

Fig. 1.

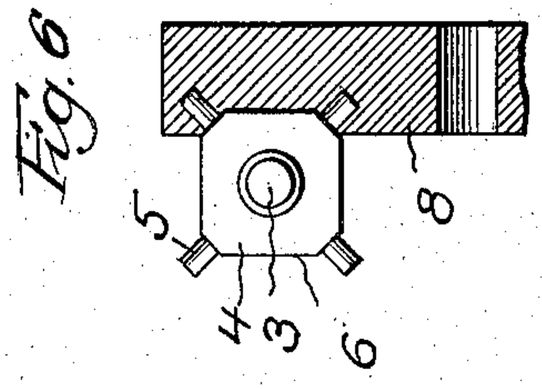

Fig. 6

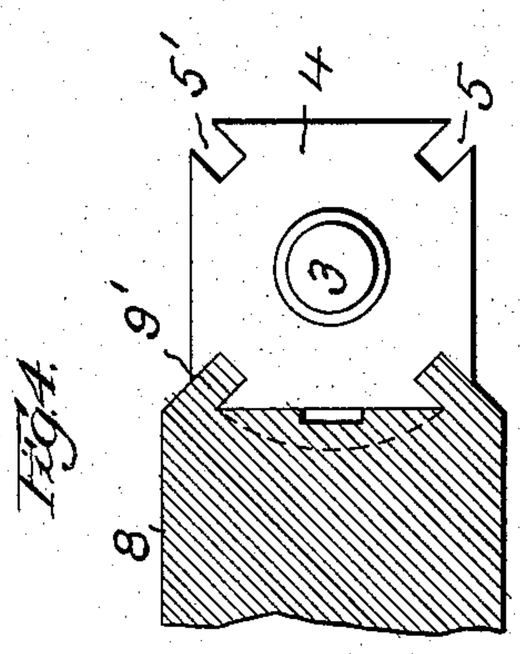

Fig. 4.

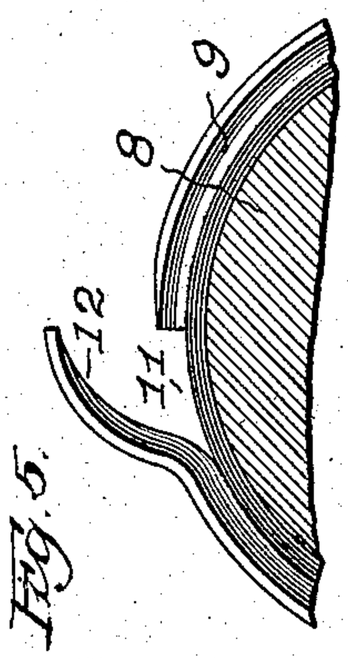

Fig. 5.

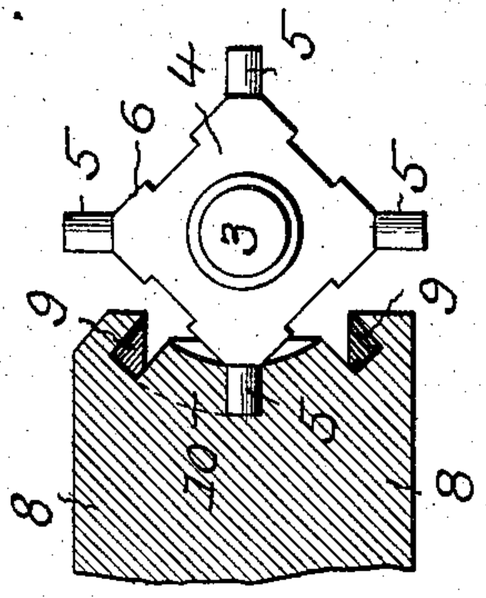

Fig. 3.

Witnesses:
Leo J. DuMais.
Arthur B. Franke.

Inventor:
John Proksa,
by, Robert Burns, Atty.

COLUMBIA PLANOGRAPH CO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

JOHN PROKSA, OF CHICAGO, ILLINOIS.

MECHANISM FOR CONVERTING MOTION.

1,167,017. Specification of Letters Patent. Patented Jan. 4, 1916.

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To all whom it may concern:

Be it known that I, JOHN PROKSA, a citizen of the United States of America, and a resident of Chicago, in the county of Cook, State of Illinois, have invented certain new and useful Improvements in Mechanism for Converting Motion, of which the following is a specification.

This invention relates to means for converting continuous rotary into intermittent rotary motion, and has for its object to provide a simple and efficient formation and arrangment of parts in a mechanism for producing intermittent rotary motion, such as in the step-by-step film feeding mechanism of a moving picture apparatus, and with which a rapid active movement or feed of the film is attained in an even manner and with the avoidance of jerking, and in which the film and its feeding accessories are effectively held in their position of rest and lost motion between the parts prevented, all as will hereinafter more fully appear.

In the accompanying drawings:—Figure 1, is a front elevation of a mechanism embodying the present invention, and illustrating the same in connection with the film feeding sprocket drum of a moving picture apparatus. Fig. 2, is an end elevation of the same, with parts in section. Fig. 3, is a detail sectional elevation of the cam drum and its star wheel, with the parts in a different position from that shown in Fig. 2. Figs. 4, 5 and 6, are detail views illustrating modified forms of the present invention.

Similar reference numerals indicate like parts in the several views.

Referring to the drawings, 1 represents a supporting frame or housing of any usual and suitable construction, and in which are journaled the driving shaft 2, and the driven shaft 3 of the mechanism. In the construction shown in Fig. 1, the driven shaft 3, carries at one end a pinion 4, preferably of the star-wheel type shown, and at the other end the film feeding sprocket drum 7 of a moving picture apparatus.

8 is a cam disk or drum secured to and rotating with the driving shaft 2, and formed with cam grooves and other star wheel engaging means, now to be described.

9 are a pair of oppositely inclined counterpart grooves formed in parallel relation in the periphery of the cam disk 8, and disposed in separated relation so that they will receive two radially adjacent and cylindrically formed prongs 5 of the star wheel 4, above referred to. As shown in the drawing, the inclination of the grooves 9 will correspond with the radial disposition of the aforesaid prongs 5, so that the same will snugly fit the grooves and prevent any independent movement of the star wheel 4, while such engagement prevails.

In the preferred form of the present mechanism, the star-wheel 4 is formed with flat portions 6 in its perimeter, intermediate of the radial prongs 5, and said flat portions 6 are adapted to successively bear upon the central cylindrical portion of the cam disk 8, that is intermediate of the cam grooves 9, and thus materially aid in preventing any quiver or lost motion of the star wheel during its periods of rest.

10 is a spiral groove or passage formed in the periphery of the cam disk 8 and forming a transverse communication between the aforesaid pair of cam grooves 9 of the cam disk, and providing the means for imparting the required partial rotation to the star wheel 4 on each revolution of the cam disk.

11 are lateral throats or passages connecting with, and individual to, the pair of cam grooves 9, aforesaid, and adapted in the one case, to permit the star-wheel prongs 5 to successively, pass into one of the grooves 9, and in the other case, to permit said star wheel prongs to successively pass out of the other of said grooves 9 in the continued operation of the mechanism.

With the described construction the star-wheel 4 is positively and effectively held from independent movement of rotation during its normal period of rest by the described close and extended engagement of its prongs 5 with the pair of grooves 9, and in consequence, in the case of a moving picture apparatus, the portion of the picture film undergoing exposure, is very effectively held from any movement during the described period of rest of the star-wheel.

In the present construction as the spiral groove 10 begins operative engagement with one of the star-wheel prongs 5, the next star-wheel prong in advance, begins to leave its engagement with the groove 9, in which it had engagement, through the lateral throat or passage 11 of said groove. And as said spiral groove 10 nears the end of its operative engagement with the first men-

tioned star-wheel prong 5, the next star-wheel prong to the rear, comes into engagement with the other groove 9, through its lateral throat or passage 11. Said engagement between the last mentioned prong and groove prevails until the cam disk 8, in its circular movement brings said prong into operative engagement with the spiral groove or passage 10, for a succeeding intermittent operation of the star-wheel. In that the first described prong, as it moves out the spiral groove 10, passes into the groove 9 which communicates with the tail end of said spiral groove, it follows that two of the star-wheel prongs will be in holding engagement with the pair of cam disk grooves 9, to effectively hold the star wheel against any independent rotation. Ordinarily, the lateral throats 11 before described, will open laterally through the outer walls of the respective grooves 9, as illustrated in Fig. 2. When however, it is desired to insure greater certainty in the entrance of the star wheel prongs 5 into the initial one of said grooves 9, the outer wall of said groove will be provided with a curved deflector wing 12, as illustrated in Fig. 5, which wing is adapted to pass over an adjacent star-wheel prong to direct and move said prong into said groove 9.

The scope of the present invention embraces a reverse formation of the cam grooves 9 and 10 of the cam disk, and the radial prongs 5 of the star-wheel, and so that a peripheral rib 9′ will replace the grooves 9, 10; and a radial recess 5′ replace each individual star wheel prong 5, as illustrated in Fig. 4. The scope of the invention also embraces the disposal or formation of the cam grooves 9, 10, or cam ribs 9′ in the side face of a cam disk, in manner indicated in Fig. 6.

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

1. In a mechanism for converting motion, the combination of a driven shaft, a pinion carried by said shaft and formed with flat portions on its perimeter, a cam disk formed with a pair of oppositely inclined holding faces disposed in separated relation and with a spiral operating face intermediate of and connecting said holding faces and adapted for operative engagement with the aforesaid pinion, and a driving shaft carrying said cam disk, the said cam disk having flat circular faces adjacent to its inclined holding faces for bearing engagement with the flat portions of the pinion aforesaid, substantiallv as set forth.

2. In a mechanism for converting motion, the combination of a driven shaft, a star-wheel carried by said shaft, a cam disk formed with a pair of holding grooves disposed in separated relation and with a spiral operating groove intermediate of and connecting said holding grooves and adapted for operative engagement with the prongs of the star-wheel aforesaid, the holding grooves having lateral passages, and a driving shaft carrying said cam disk, substantially as set forth.

3. In a mechanism for converting motion, the combination of a driven shaft, a star wheel carried by said shaft, a cam disk formed with a pair of peripheral holding grooves disposed in separated relation and with a peripheral spiral operating groove intermediate of and connecting said holding grooves and adapted for operative engagement with the prongs of the star-wheel aforesaid, and a driving shaft carrying said cam disk, substantially as set forth.

4. In a mechanism for converting motion, the combination of a driven shaft, a star-wheel carried by said shaft, a cam disk formed with a pair of oppositely inclined holding grooves disposed in separated relation and with a spiral operating groove intermediate of and connecting said holding grooves and adapted for operative engagement with the prongs of the star-wheel aforesaid, and a driving shaft carrying said cam disk, substantially as set forth.

5. In a mechanism for converting motion, the combination of a driven shaft, a star wheel carried by said shaft a cam disk formed with a pair of oppositely inclined peripheral holding grooves disposed in separated relation and with a peripheral spiral operating groove intermediate of and connecting said holding grooves and adapted for operative engagement with the prongs of the star-wheel aforesaid, and a driving shaft carrying said cam disk, substantially as set forth.

6. In a mechanism for converting motion, the combination of a driven shaft, a star-wheel carried by said shaft and having flat portions in its perimeter intermediate of its prongs, a cam disk formed with a pair of oppositely inclined holding means separated by a cylindrical portion of the disk and with a spiral operating means intermediate of and connecting said holding means and adapted for operative engagement with the aforesaid star wheel, and a driving shaft carrying said cam disk, substantially as set forth.

7. In a mechanism for converting motion, the combination of a driven shaft, a star wheel carried by said shaft and having flat portions in its perimeter intermediate of its prongs, a cam disk formed with a pair of holding grooves separated by a cylindrical portion of the disk and with a spiral operating groove intermediate of and connecting said holding grooves and adapted for operative engagement with the prongs of the star wheel aforesaid, the holding grooves

having lateral passages, and a driving shaft carrying said cam disk, substantially as set forth.

8. In a mechanism for converting motion, the combination of a driven shaft, a star wheel carried by said shaft and having flat portions in its perimeter intermediate of its prongs, a cam disk formed with a pair of peripheral holding grooves separated by a cylindrical portion of the disk and with a peripheral spiral operating groove intermediate of and connecting said holding grooves and adapted for operative engagement with the prongs of the star-wheel aforesaid, and a driving shaft carrying said cam disk, substantially as set forth.

9. In a mechanism for converting motion, the combination of a driven shaft, a star wheel carried by said shaft and having flat portions in its perimeter intermediate of its prongs, a cam disk formed with a pair of oppositely inclined holding grooves separated by a cylindrical portion of the disk and with a spiral operating groove intermediate of and connecting said holding grooves and adapted for operative engagement with the prongs of the star wheel aforesaid, and a driving shaft carrying said cam disk, substantially as set forth.

10. In a mechanism for converting motion, the combination of a driven shaft, a star wheel carried by said shaft and having flat portions in its perimeter intermediate of its prongs, a cam disk formed with a pair of oppoistely inclined peripheral holding grooves separated by a cylindrical portion of the disk and with a peripheral spiral operating groove intermediate of and connecting said holding grooves and adapted for operative engagement with the prongs of the star-wheel aforesaid, and a driving shaft carrying said cam disk, substantially as set forth.

Signed at Chicago, Illinois, this 23rd day of May, 1914.

JOHN PROKSA.

Witnesses:
ROBERT BURNS,
IVA L. CRANE.