May 5, 1942. B. STECHBART 2,281,726

INTERMITTENT FEED DEVICE

Filed Sept. 18, 1939 2 Sheets-Sheet 1

Fig. 1.

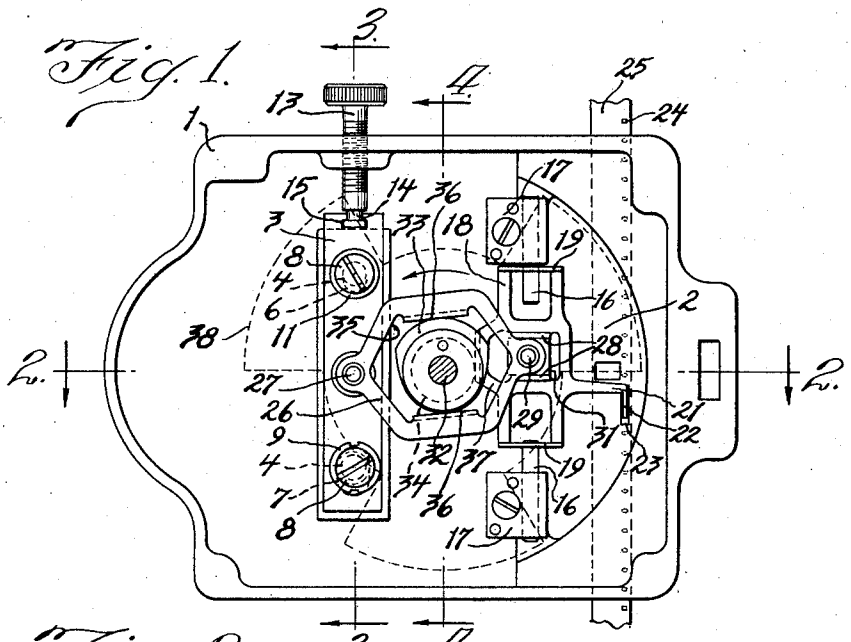


Fig. 2.

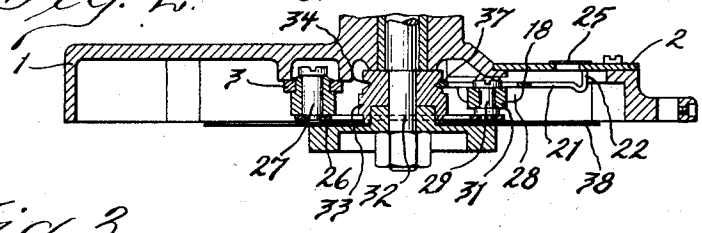


Fig. 3.

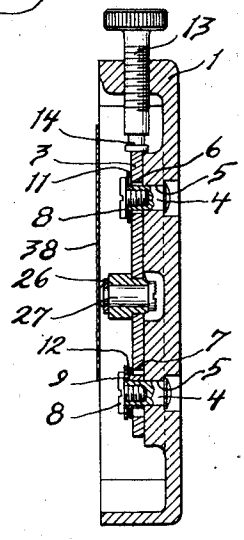
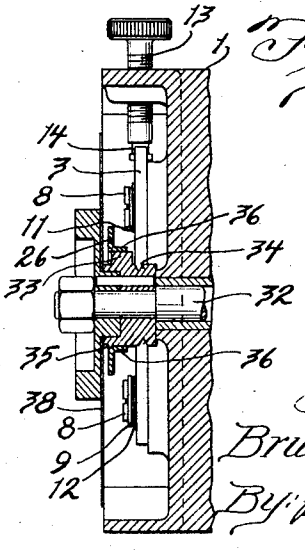


Fig. 4.



Inventor:
Bruno Stechbart
By: Robert F. Mickley Jr.
Atty.

May 5, 1942. B. STECHBART 2,281,726

INTERMITTENT FEED DEVICE

Filed Sept. 18, 1939 2 Sheets-Sheet 2

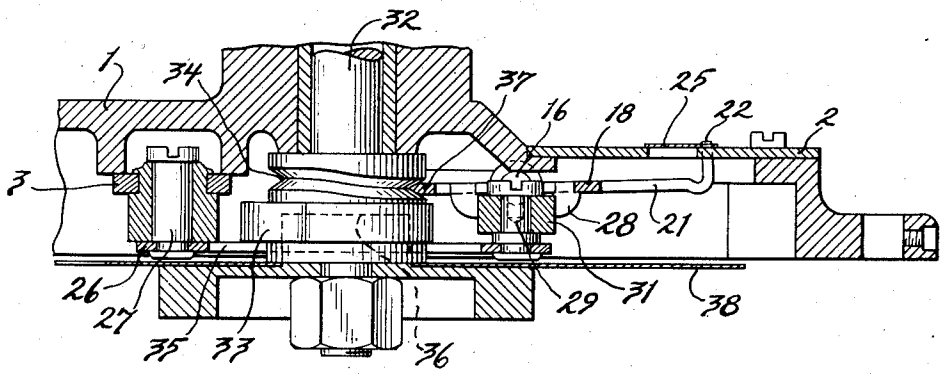


Fig. 5.

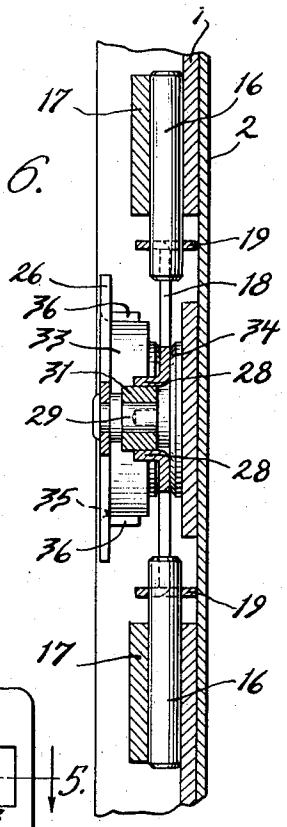


Fig. 6.

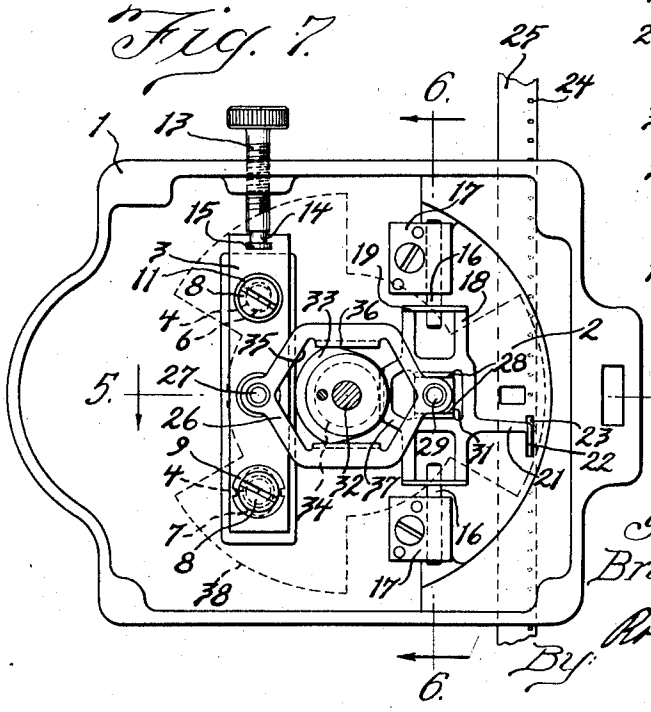


Fig. 7.

Inventor:
Bruno Stechbart
By Robert F. Mehl Jr.
Atty.

Patented May 5, 1942

2,281,726

UNITED STATES PATENT OFFICE

2,281,726

INTERMITTENT FEED DEVICE

Bruno Stechbart, Chicago, Ill., assignor to The Bell & Howell Company, Chicago, Ill., a corporation of Illinois

Application September 18, 1939, Serial No. 295,479

6 Claims. (Cl. 88—18.4)

My invention relates particularly to intermittent feed devices such as are used on motion picture machines although not limited to this use alone.

The general object of the invention resides in the provision of a simple, effective and accurate intermittent feed device which is particularly adapted for use in motion picture machines, the invention contemplating economy in manufacture and provision for assembly and service adjustment of the mechanism.

With this object in view my invention consists in certain features of novelty in the construction, combination and arrangement of parts by which the said objects and certain other objects, hereinafter appearing, are effected, all as fully described with reference to the accompanying drawing and more particularly pointed out in the appended claims.

In the said drawings—

Figure 1 is a partial view in front elevation of motion picture projecting machine with parts removed and embodying my invention;

Figure 2 is a partial sectional view substantially on the line 2—2 of Figure 1;

Figure 3 is a partial sectional view substantially on the line 3—3 of Figure 1;

Figure 4 is a partial sectional view substantially on the line 4—4 of Figure 1;

Figure 5 is an enlarged partial sectional view substantially on the line 5—5 of Figure 7;

Figure 6 is an enlarged partial sectional view substantially on the line 6—6 of Figure 7; and

Figure 7 is a view similar to Figure 1 showing parts in different positions from those in which they are shown in Figure 1.

Referring to the drawings, 1 designates a vertically disposed frame part, and a vertically extending apertured front face guide member 2 of a film feed guide is secured against a rear face of the frame part 1. See Figures 1, 2 and 5.

A vertically disposed carrier 3, laterally spaced from the guide member 2, is mounted on the frame 1 in the following manner: Headed thimbles 4 pass through vertically spaced bores 5 in the frame part and through vertically spaced and extending slots 6 and 7 through the carrier member, and headed screws 8 are screwthreaded into the thimbles. The upper thimble slidably engages the upper slot 6 and a flanged eccentric bushing 9 is rotatably engaged on the lower thimble and slidably engages the lower slot 7, this bushing being clamped in angularly adjusted position against the frame part by the lower screw 8. A spring washer 11 is engaged between the head of the upper screw 8 and the carrier 3 and another spring washer 12 is engaged between the flange of the bushing 9 and the carrier 3 to frictionally position the carrier.

The carrier 3 is thus vertically adjustable and is also adjustable laterally by angular adjustment of the eccentric bushing 9.

A vertically disposed headed screw 13 is screwthreaded downwardly through the upper wall of the frame part 1, and the lower end of this screw is provided with a circumferential groove 14 which is engaged in an undercut slot 15 at the upper end of the carrier 3. Accordingly, manual rotation of the screw 13 by means of the head thereof, which is disposed exterior of the frame part 1, effects vertical adjustment of the carrier.

A pair of vertically alined and spaced bearing studs 16 are secured, as designated at 17, on the frame part 1 adjacent the face guide 2, and a vertically disposed toothed feed shuttle 18 is provided with horizontally disposed and apertured upper and lower ends 19 which are slidably and pivotally engaged on the bearing studs 16, so that the shuttle is mounted for horizontal pivotal movement and for vertical reciprocating movement along its pivotal axis. See Figures 1, 6 and 7.

The shuttle 18 is provided with a laterally extending arm 21 having a rearwardly projecting toothed end 22 which projects through a vertical slot 23 through the guide member 2 for engagement with perforations 24 in a film 25 at the rear surface of the guide member 2 for the feeding of the film, oscillation of the shuttle on its pivotal axis effecting toothed engagement and disengagement of the shuttle with the film and reciprocation of the shuttle along its pivotal axis effecting film feed and return movement of the shuttle.

An actuating member or plate 26 is pivotally mounted at one end, as designated at 27, on the intermediate portion of the carrier 3 on a horizontal rearwardly and forwardly extending axis, whereby this actuating member is mounted for oscillation vertically corresponding with vertical reciprocating movement of the shuttle 18. See Figures 1, 3, 5 and 7. The actuating member 26 extends laterally toward the shuttle 18, and the other end of the actuating member is operatively connected with the shuttle 18 to vertically reciprocate the same in the following manner:

The shuttle 18 is provided with vertically spaced parallel flanges 28 forming a bearing slot

extending transversely of the pivotal axis of the shuttle. See Figures 1, 5, 6 and 7. The said other end of the actuating member is provided with a rearwardly extending pivot stud 29 on which a slide bearing block 31 is pivotally mounted. This bearing block is slidably engaged between the flanges 28 to form a slot or slide bearing engagement between the portion of the shuttle 18, intermediate the bearings thereof, and said other end of the actuating member 26 and extending transversely of the pivotal axis of the shuttle, whereby the shuttle is reciprocated vertically by oscillation of the actuating member, the slot bearing accommodating differences of movement between the actuating member and shuttle transversely of the pivotal axis of the shuttle.

A forwardly and rearwardly extending drive shaft 32 is rotatably mounted on the frame part 1 between the ends of the actuating member 26 and is disposed in a horizontal plane intermediate the ends of the carrier 3 and the shuttle 18. Cams 33 and 34 are secured on the shaft 32, the cam 33 being a radial cam and the cam 34 being a grooved axial cam disposed immediately to the rear of the cam 33.

The intermediate portion of the actuating member 26 is apertured, as designated at 35, and the shaft 32 extends therethrough. The actuating member 26 is provided with vertically spaced parallel laterally extending bearing flanges 36 at the aperture 35, and the cam 33 engages between these flanges to oscillate the actuating member with rotation of the shaft 32 to effect vertical reciprocation of the shuttle 18 by means of the aforesaid slot bearing.

The portion of the shuttle 18 intermediate the bearings thereof is provided with a vertically extending cam follower portion 37 which is engaged in the groove of the cam 34 to oscillate the shuttle on its pivotal axis with rotation of the shaft 32. The cams 33 and 34 are so timed that the shuttle 18 is vertically reciprocated and oscillated on its pivotal axis to effect intermittent feed of the film 25. A usual rotary light shutter 38 is secured on the shaft 32 to operate in timed relation with the intermittent feed of the film.

Vertical adjustment of the carrier 3 by means of the screw 13 effects vertical adjustment of the pivotal axis of the actuating member 26 for the purpose of "framing," and adjustment of the eccentric bushing 9 effects lateral adjustment of the carrier 3 and with it the pivotal axis of the actuating member to vary the extent of the throw of the actuating member and the extent of the reciprocating movement of the shuttle. This latter adjustment is for the purpose of adjusting the feed and return movement of the shuttle to conform with the spacing of the feed perforations of the film.

While I have thus described my invention, I do not wish to be limited to the precise details described as changes may be readily made without departing from the spirit of my invention, but having thus described my invention I claim as new and desire to secure by Letters Patent the following:

1. In an intermittent feed device the combination with a feed shuttle mounted for reciprocating movement, of an actuating member mounted for pivotal movement corresponding with reciprocating movement of said shuttle, rotatory means for oscillating said actuating member, an operative connection between said shuttle and actuating member adapted to accommodate differences of movement therebetween transversely of reciprocating movement of said shuttle, and means for adjusting the pivotal axis of said actuating member in the plane of movement thereof and transversely of reciprocating movement of said shuttle.

2. In an intermittent feed device the combination with a feed shuttle mounted for reciprocating movement, of an actuating member mounted at one end for pivotal movement corresponding with reciprocating movement of said shuttle, rotatory means operative on said actuating member intermediate the ends thereof for oscillating the same, a slot bearing connection between said shuttle and the other end of said actuating member and extending transversely of reciprocating movement of said shuttle, and means for adjusting the pivotal axis of said actuating member in the plane of movement thereof and transversely of reciprocating movement of said shuttle.

3. In an intermittent feed device the combination with a feed shuttle mounted for reciprocating movement, of an actuating member mounted at one end for pivotal movement corresponding with reciprocating movement of said shuttle, rotatory means operative on said actuating member intermediate the ends thereof for oscillating the same, a slot bearing connection between said shuttle and the other end of said actuating member and extending transversely of reciprocating movement of said shuttle, means for adjusting the pivotal axis of said actuating member longitudinally of reciprocating movement of said shuttle, and a second means for adjusting the pivotal axis of said actuating member in the plane of movement thereof and transversely of the reciprocating movement of said shuttle.

4. In an intermittent feed device the combination with a toothed feed shuttle mounted for pivotal movement and for reciprocating movement along its pivotal axis, of an actuating member mounted for pivotal movement corresponding with reciprocating movement of said shuttle, an operative connection between said shuttle and actuating member adapted to accommodate differences of movement therebetween transversely of the pivotal axis of said shuttle, rotatory means for effecting oscillation of said shuttle and actuating member in timed relation to effect intermittent feeding movement of said shuttle, and means for adjusting the pivotal axis of said actuating member in the plane of movement thereof and transversely of reciprocating movement of said shuttle.

5. In an intermittent feed device the combination with a toothed feed shuttle mounted for pivotal movement and for reciprocating movement along its pivotal axis, of an actuating member mounted at one end for pivotal movement corresponding with reciprocating movement of said shuttle, an operative connection between said shuttle and the other end of said actuating member adapted to accommodate differences of movement therebetween transversely of the pivotal axis of the shuttle, rotatory means for effecting oscillation of said shuttle and actuating member in timed relation to effect intermittent feeding movement of said shuttle, said rotatory means being operative on said actuating member intermediate the ends thereof, means for adjusting the pivotal axis of said actuating member longitudinally of the reciprocating movement of said shuttle, and a second means for adjust-

ing the pivotal axis of said actuating member in the plane of movement thereof and transversely of the reciprocating movement of said shuttle.

6. In an intermittent feed device, the combination with a toothed feed shuttle, of spaced and alined bearings carrying said shuttle at opposite ends thereof for pivotal movement and for reciprocating movement along its pivotal axis including spaced and alined stationary bearing studs, an actuating member mounted at one end for pivotal movement corresponding with reciprocating movement of said shuttle, a slot bearing engagement between the other end of said actuating member and the portion of said shuttle intermediate said ends thereof and operative between said bearing studs and extending transversely of the pivotal axis of the shuttle, a pair of timed coaxial rotating cams for effecting oscillation of said shuttle and actuating member in timed relation and disposed axially in a plane normal to the axis of and intermediate said studs, one of said cams being a radial cam operative on said actuating member intermediate the ends thereof and the other cam being an axial cam, and a cam follower on said intermediate portion of said shuttle and extending longitudinally of the pivotal axis thereof and engaged with said axial cam.

BRUNO STECHBART.