C. C. SPINKS.

FILM FEED DEVICE.

APPLICATION FILED JULY 1, 1910.

1,007,012.

Patented Oct. 24, 1911.

2 SHEETS—SHEET 1.

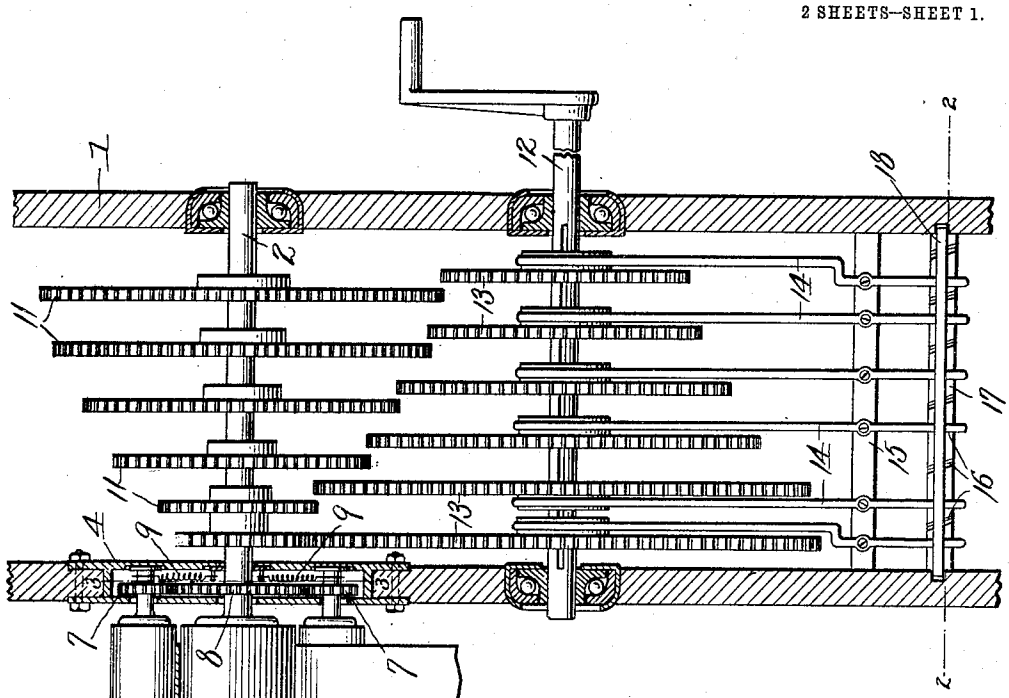

Fig. 1.

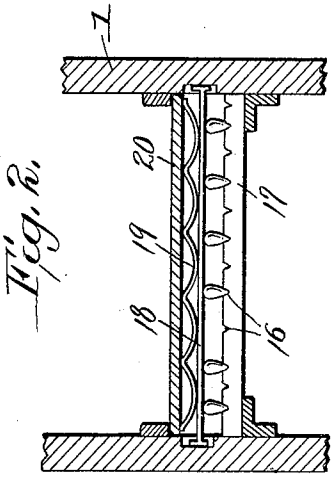

Fig. 2.

Witnesses

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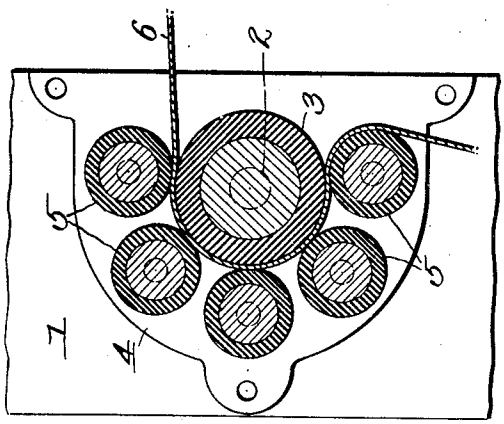

Fig. 4.

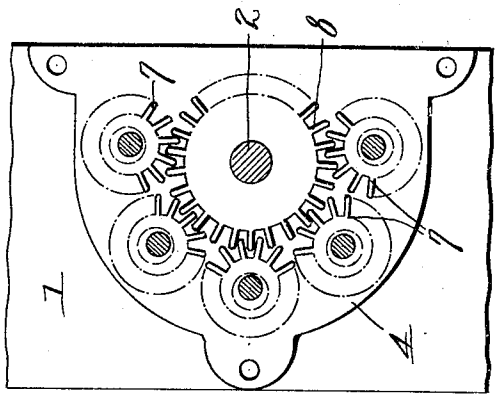

Fig. 5.

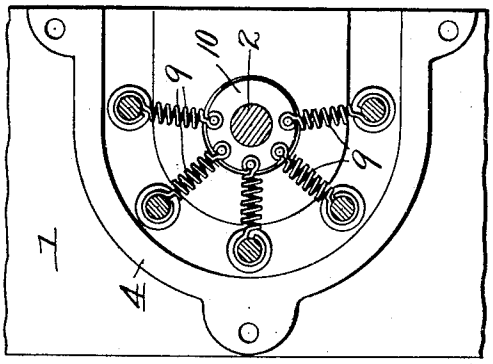

Fig. 3.

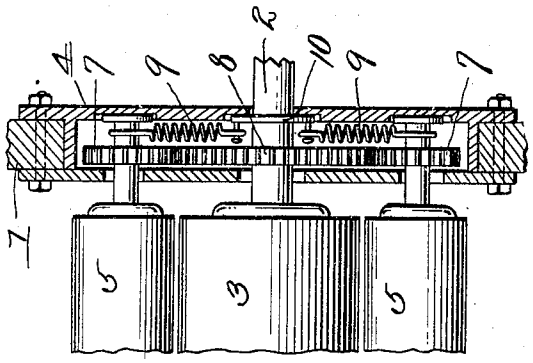

Fig. 6.

Witnesses

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UNITED STATES PATENT OFFICE.

CHARLES C. SPINKS, OF MEMPHIS, MISSOURI, ASSIGNOR TO M. C. SPINKS AND M. A. POOR, OF MEMPHIS, MISSOURI.

FILM-FEED DEVICE.

1,007,012. Specification of Letters Patent. **Patented Oct. 24, 1911.**

Application filed July 1, 1910. Serial No. 569,981.

To all whom it may concern:

Be it known that I, CHARLES C. SPINKS, a citizen of the United States, residing at Memphis, in the county of Scotland and the State of Missouri, have invented a new and useful Improvement in a Film-Feed Device, of which the following is a specification.

This invention relates to a device for feeding photographic films, either in the form of a sensitized negative in a camera, or in the form of a positive in a projecting device. This feed may be used in connection with any of the various machines now on the market, and for the purpose of feeding any of the standard sizes of films up to seven inches or more in width. The invention is however, especially adapted to be used in connection with the shutter described in my application executed and filed June 30, 1910, Serial Number 569,824 and also in combination with a differential feed, which is the subject of a separate application filed July 2, 1910, Serial Number 570,100.

The object of the invention is to feed films of different sizes, thus making it possible to run any of the standard films now on the market with the one device, and without using sprocket teeth for the purpose of engaging perforations cut in the margins of the film. As most of the machines of this type are run at a high rate of speed it is either necessary in them to employ the sprockets, which tear the edges of the film and cause vibrations, or if a friction feed is employed a strong grip is necessary, which is injurious to the delicate film surface.

My invention consists of the novel features of construction, hereinafter described, set forth in the claims and shown in the accompanying drawings, in which,

Figure 1 is a side elevation, of the feed roller, a film and portions of a frame work, and certain bearings, being in section. Fig. 2 is a section on the line 2—2 of Fig. 1. Fig. 3 is a section on the line 3—3 of Fig. 1. Fig. 4 is a section on the line 4—4 of Fig. 1. Fig. 5 is a section on the line 5—5 of Fig. 1. Fig. 6 is a detail sectional view illustrating the manner of journaling certain friction rollers.

In these drawings, 1 represents the frame work and a shaft 2 is journaled in roller bearings in said frame. Fixed upon the shaft 2 is a main feed roller 3, which roller has a soft, pliable surface. Adjacent each end of this feed roller is a gear casing 4, and the shaft 2 passes loosely through said casings. Grouped about the roller 3 are a plurality of smaller friction rollers 5, having also surfaces of the same soft, pliable material. The rollers 5 are in frictional contact with the roller 3, or with the film when the same is in place.

As shown in the drawings, a film 6 runs half way or more around the feed roller and between the same and the friction rollers, which are preferably five in number. If frictional contact between the larger roller 3 and the smaller rollers was depended upon for the purpose of driving them it would be necessary for them to grip more tightly than is desirable, and I avoid this injurious gripping and at the same time obtain a perfectly uniform rate of feed by providing the reduced end portion of the rollers 5 with gears 7 which mesh with gears 8 fixed upon the shaft 2, the teeth of both the gears 7 and 8 being cut very deep in order to allow for a yielding movement of the rollers 5. To permit this yielding movement the rollers 5 are not mounted in fixed or tight bearings but are connected by means of coil springs 9 to suitable plates 10, which plates are placed within the casings 4 and are concentric with the shaft 2. These springs hold each roller 5 in yielding engagement with the film, and also hold the gears 7 in mesh with the gears 8. This construction also mounts each roller 5 independent of any of the other rollers, and therefore permits independent yielding movement upon the part of each of these rollers.

It will be obvious that films of different sizes with different sized pictures thereon will require different feeds, in order to compensate for the variations in the sizes of the pictures. This is provided for by placing upon the shaft 2 a series of gear wheels 11, increasing in size, and mounting parallel to the shaft 2 a second drive shaft 12, upon which are slidably keyed gear wheels 13 which also increase in size from one end of the shaft 12 to the other, but which are arranged reversely with respect to the gear wheels 11. Thus it will be noted that the largest gear wheel 13 meshes with the

smallest gear wheel 11, and these two gear wheels will produce the most rapid rotation of the shaft 2 and the feed rollers.

In order to shift the gears 13 to obtain the proper speed necessary with the size of the film used, I employ shifting levers 14 which are suitably pivoted upon a bar 15, and are locked in suitable notches 16 formed in a cross bar 17. To prevent accidental movement of these levers, I employ a bar 18 which is movable toward and away from the levers, and is held in transverse engagement with them by means of a spring 19, which spring I prefer to bend in a series of curves and amount between the bar 17 and a plate 20.

The shaft 12 may be driven by hand, or may be operated in conection with the feed device shown in my other application, Serial Number 570,100.

If the film is thick on one edge and thin on the other the friction rollers 5 can successively adjust themselves thereto, having spring support at each end, and the soft pliable surface also springs or yields with the tension as the case may require. It will also be noted that in this feed device, either a perforated or non-perforated film can be used.

I prefer to use a non-perforated film, and one of the special objects of this invention is to be able to use a film without the marginal perforations, as in addition to other advantages this allows the making of a larger picture without increasing the size of the film.

What I claim is:—

1. A device of the kind described comprising a shaft, plates through which said shaft passes, a feed roller fixed upon the shaft, gears fixed on the shaft and adjacent opposite ends of the feed roller, friction rollers grouped about the first mentioned roller, gears carried by opposite end portions of the friction rollers and meshing with the first mentioned gears, and springs secured to said plates, and also secured to said friction rollers, as and for the purpose set forth.

2. A shaft, gear wheels fixed thereon, a feed roller fixed upon the shaft between said gear wheels, coöperating friction rollers, gears carried by opposite ends of the friction rollers, plates loosely carried by the shaft, and coil springs having their inner ends secured to said plates, and having their outer ends loosely engaging said friction rollers, as and for the purpose set forth.

3. The combination with a shaft, having a feed roller thereon adapted to receive varying widths of film, coöperating friction rollers grouped thereabout and adapted to bear on said film, means for driving each of the friction rollers from the said shaft, of a series of gears fixed upon said shaft and graduated in size, a second shaft, a series of graduated gears slidably keyed on the second shaft, the second series being arranged in reverse order to the first, and means for sliding gears of the second series into and out of engagement with the gears of the first series, thereby regulating the rate of rotation of the said feed and friction rollers.

4. In a film feeding device, a drive shaft, a feed roller thereon of a length adapted to take films of various widths, a plurality of additional rollers grouped in an arc about said feed roller, independent springs having their inner ends fixed in said arc and pulling said second mentioned rollers toward the feed rollers, means for positively driving all of said rollers, and means for varying the rate of speed of all of said rollers.

CHAS. C. SPINKS.

Witnesses:
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E. B. MCBATH.