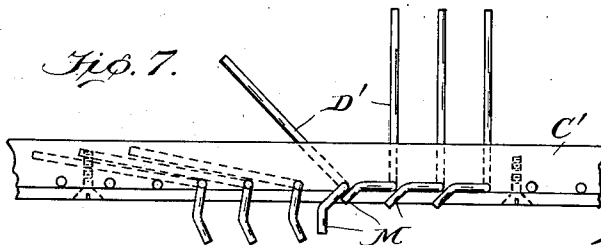
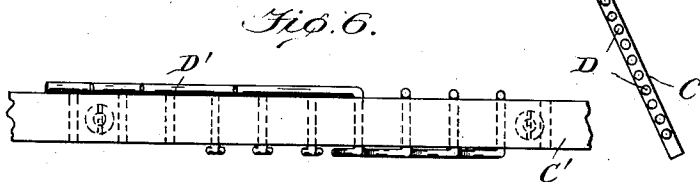
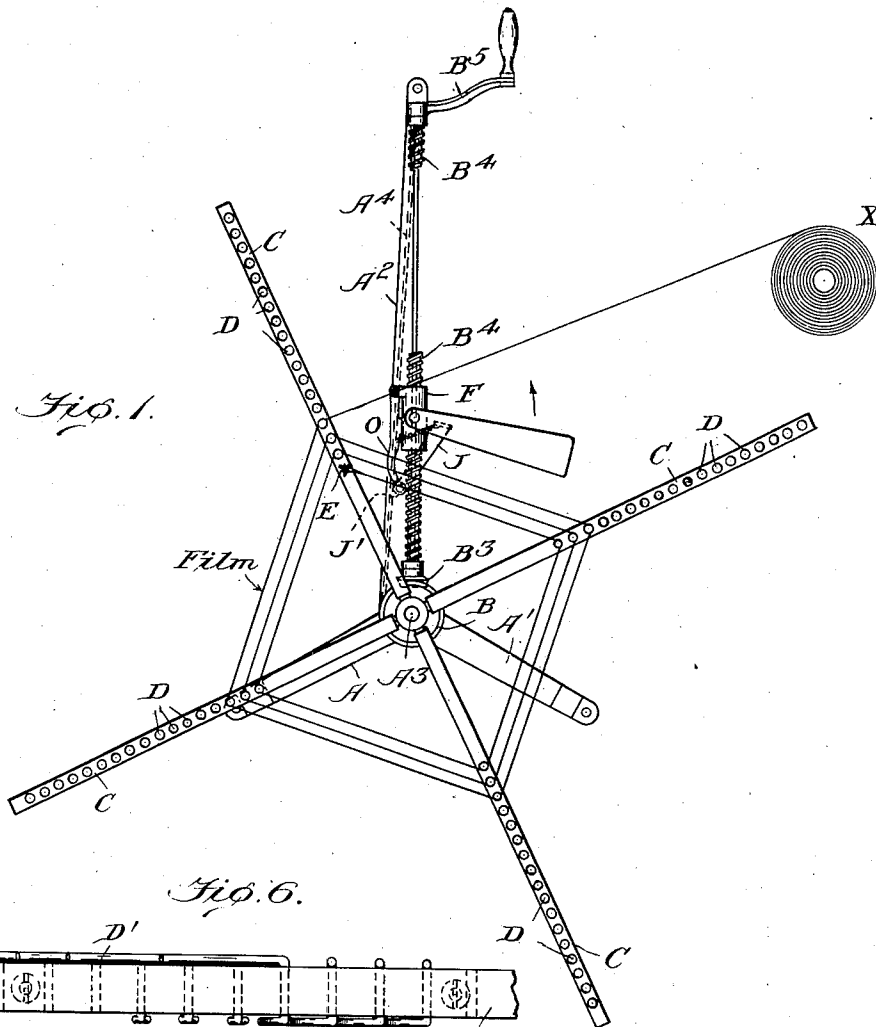


C. F. JENKINS.
 PICTURE FILM RACK.
 APPLICATION FILED JUNE 27, 1912.

1,045,410.

Patented Nov. 26, 1912.

2 SHEETS—SHEET 1.



Witnesses

Edwin L. Bradford
 Robert Craig Greene.

Inventor

C. F. Jenkins

By

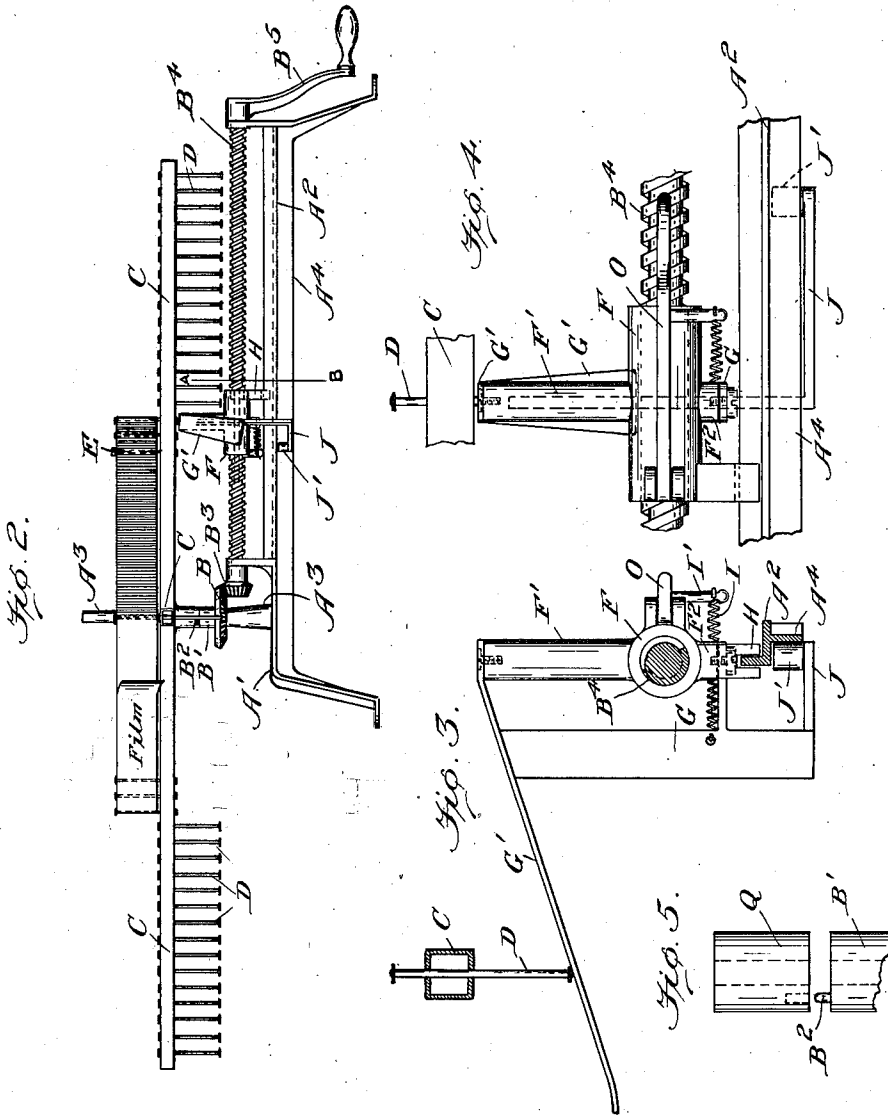
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UNITED STATES PATENT OFFICE.

CHARLES FRANCIS JENKINS, OF WASHINGTON, DISTRICT OF COLUMBIA.

PICTURE-FILM RACK.

1,045,410.

Specification of Letters Patent.

Patented Nov. 26, 1912.

Application filed June 27, 1912. Serial No. 708,186.

To all whom it may concern:

Be it known that I, CHARLES FRANCIS JENKINS, a citizen of the United States, residing at Washington, in the District of Columbia, have invented certain new and useful Improvements in Picture-Film Racks, of which the following is a specification, reference being had therein to the accompanying drawing.

This invention relates to racks for holding long picture films during the operations to which they are subjected between the time of exposure and the time when they are ready for practical use. During such operations, it is desirable to have the film in as compact and convenient form as possible without incurring danger of contact of its different parts with each other, and also important that manipulation of the apparatus with little or no light may be safe and certain.

With these conditions in view, I provide a rotary film rack which may be virtually increased in size while the film is being wound thereon and similarly decreased when the film is unwound, the film in winding forming a plane spiral the successive turns of which are at suitable distances apart. The rack involves a plane rotary member having radial sets of spaced fingers arranged to move successively into or out of position for holding separated the successive turns of a film wound upon the fingers and forming a plane spiral approximately parallel to the said member. For illustration said member is shown as a plane spider or star wheel, in the arms of which are headed fingers each sliding freely in its own vertical way in its arm, so that if the spider be rotated and the fingers, beginning with the innermost, be raised at the proper instant, film winding on them passes below the head of each and prevents it from descending when the finger-raising force ceases to act. In unwinding the film from the reel, the fingers fall in succession as the film passes from beneath the head of each. In this way, the effective diameter of the rack progressively varies during winding and unwinding. This construction forms one of many embodiments of the broader ideas involved in the invention.

In the accompanying drawings, Figure 1 is a plan view of the apparatus. Fig. 2 is a

side elevation of the same devices. Fig. 3 is a section on the line A-A, Fig. 2. Fig. 4 shows the devices of Fig. 3, looking from the right. Fig. 5 is a detail view of spider-supporting devices. Figs. 6 and 7 show in plan and elevation part of a modified arm and fingers.

In these figures, A, A', A² represents a supporting frame shown as having three arms radiating from a common point at which rises a post A³, upon which is revolvably mounted a spider which has in this instance four hollow, angularly equidistant arms C, of rectangular cross section, although such arms may vary in number and form. Each arm is provided with a series of vertical perforations in which slide loosely fingers D, each having at its upper end a head which normally rests upon the arm, and also, preferably, a head at its lower end so that it cannot be separated from the arm.

On one arm the finger which is nearer the axis of the spider than any other has a head E readily distinguishable by the sense of touch from any other of the fingers, and to this finger, when raised, the end of the film is secured below the head E and above the arm. If the film, which is usually in a roll X, have its end thus secured and be held in the proper plane a little above the plane of the spider arms, the rotation of the spider will bring a second or next succeeding arm into such position that if its innermost finger be raised, by hand or otherwise, the film will wind against its side just below its head and prevent the finger from again falling when the outside force ceases to act as a support. If the rotation be continued and the innermost finger of each arm be thus raised at the proper time, the film will be wound in a gradually increasing spiral until all the fingers are raised or until the end of the film is reached. The separation of successive turns of the spiral will of course depend upon the arrangement of the fingers along the several arms; and preferably the spacing of the fingers is gradually increased as the distance from the center increases so that the longer reaches of the film may be farther apart than the shorter segments nearer the center. The film being thus wound, the rack may be lifted from its supporting post and subjected to the usual op-

erations. When it is to be re-wound into a roll, the spider is again placed upon the post and as the film leaves the rack it moves out from beneath the heads of the fingers in succession, the fingers falling quickly, one after the other, until the innermost one is reached.

Instead of the fingers already described, I have sometimes used the forms shown in Figs. 6 and 7. Here the spider arms C' are provided with rocking fingers D' lying loosely in horizontal bearings or holes in the arms and bent at right angles at the arm's lateral faces, a straight end portion on one face forming a film engaging finger proper, while the end portion projecting on the opposite face is shorter and has its end M bent in its own vertical plane, as shown, the arrangement being such that when any finger, proper, is swung from normal position alongside its spider arm to erect position, where it is perpendicular to the plane of the spider, the end M rocks the next finger, counting from the spider's axis, to inclined position and is then stopped thereby. When the fingers are not held after raising, gravity, acting first on the bent end portions and then on both end portions, quickly restores all to normal position.

In use, the innermost finger of the spider is rocked to vertical position and the end of the film is attached thereto. The spider is then rotated and the innermost fingers of the other arms are raised in succession and are held erect by the film which winds upon them. After an inner finger on each arm is thus raised, it is only necessary to rotate the spider, the film itself engaging the inclined fingers in succession and rocking them to erect position and thereby inclining the succeeding finger. Thus by continued rotation of the spider all the fingers are raised, if the film be long enough, and the film is at the same time wound upon them in a sort of spiral. When the film is unwound, the spider is allowed to rotate in a contrary direction and as fast as it releases the fingers they fall automatically to normal position.

When either of the described forms is used, nothing but the spider and its pivotal support is required, but that the first form may be used with added advantages, I provide other devices, the use of which is optional. In adding these other devices, I place upon the post A³, which is provided with a suitable shoulder to support it, a bevel gear B, the hub, B', of which is provided with a vertical pin B². This gear is rotated by a pinion B³ carried by a threaded shaft B⁴ mounted in bearings on the arm A² and rotated without longitudinal movement by means of a hand crank B⁵. The hub of the spider is bored to receive the pin B² so that when in position it must rotate with the gear. With this addition, the spider may be

conveniently rotated by the crank, the fingers being raised as before, but I have further provided for raising them automatically when desired. For this purpose, a traveling nut F is mounted upon the threaded shaft and provided with rigid vertical arms or projections F', F², upon which is pivoted to swing about a vertical axis a frame G having an inclined upper member G' initially lying in the path of the innermost fingers of the rack and in position to raise it as the rack rotates in the proper direction. The nut F is also provided with a forked projection H which loosely engages the upper side of a flange extending along the spider arm and prevents the nut from rotating with the shaft.

The swinging frame G is provided with a rigid arm J bearing at its free end a roller J' which bears against the side of a rib or flange A⁴ on the lower side of the spider arm A² at a point nearer the axis of the spider than the axis of the frame G and is held in contact therewith by a spring I connecting the swinging frame with a stud I' on the nut. The rib A⁴ is not parallel to the shaft but gradually approaches it as the distance from the spider's axis increases, and hence the roller is gradually forced toward the vertical plane of the shaft as the nut moves outward along the latter, so that the frame and its inclined upper member G' are progressively swung in the direction of the arrow (Fig. 1) and the member is thus always in the path of the lower end of the next finger to be raised, whatever the distance of that finger from the axis of the spider. Thus when all the parts thus far described are used, it is only necessary to raise the pin E, attach the end of the film thereto and rotate the crank,—all being readily done without aid from the eye.

When the film is to be wound from the reel or rack, or when it is not desired to use the shaft and its immediate connections, a block Q, Fig. 5, is placed upon the central post so that it rests upon the hub of the bevel gear to support the rack in raised position where it may rotate freely upon the post as an axis. The outer end of the film being now drawn outward in a plane parallel to that of the rack the latter rotates and the film passes from beneath the head of the fingers in succession and each finger as it is thus released instantly drops until its head rests upon its arm, below the plane of the film.

Preferably the nut F is provided with a device O by which it may be instantly disengaged from the threads of the shaft or engaged therewith; but this device is without novelty herein claimed.

This particular embodiment of the invention requires the rotary finger-carrying member to be approximately horizontal

since the fingers are moved downward wholly by gravity; but in its broader aspects the invention is not thus limited.

What I claim is:

5 1. In a rack for the purpose set forth, the combination of a rack member mounted to rotate in its own plane about a central axis and carrying radiating sets of spaced fingers of means for moving the fingers outward
10 from the plane of said member, in succession, into position for supporting a film strip as it winds upon them when said member rotates.

2. In apparatus of the class described, the
15 combination with a rack member mounted to rotate in its own plane upon a central axis, of radiating sets of spaced fingers carried by said member, and automatic means for moving the fingers outwardly from said
20 axis into position for supporting a film strip winding upon them as said member rotates.

3. In apparatus of the class described, the combination with a suitable support, of a
25 spider revolubly mounted upon said support, sets of spaced fingers carried by the spider arms, respectively, and automatic means for moving all the fingers outwardly from the spider's plane, in succession, beginning with
30 the inner fingers of the sets, while the spider is rotating.

4. In a rack of the class described, the combination with a suitable support, of a
35 plane spider revolubly mounted in horizontal position on said support and provided with a series of headed fingers sliding freely in vertical ways in its arms and means for sliding the fingers, successively, in their ways as the spider rotates.

40 5. The combination with a suitable sup-

port, of a plane spider revolubly mounted on said support and having in each arm a set of spaced, vertically sliding headed fingers, means for rotating the spider, an inclined arm adapted to raise a finger passing over it, 45 and automatic means for moving the arm progressively outward to raise all the fingers in succession.

6. The combination with a suitable support, of a plane spider revolubly mounted 50 on said support and having in each arm a set of spaced, vertically sliding headed fingers, means for rotating the spider, an inclined arm adapted to raise a finger passing over it, automatic means for moving the arm 55 progressively outward to raise all the fingers in succession, and automatic means for swinging the arm about a vertical axis to positions approximately in planes tangent to the paths of the fingers which it is to raise. 60

7. In apparatus of the class described, the combination with an approximately plane rack member, of a series of fingers independently mounted in said member, at progressively increasing distances from a central 65 point, and arranged to be moved separately into positions where each projects perpendicularly to the plane of said member into the plane in which the film is to be wound, and means whereby a film strip may be pro- 70 gressively wound upon the projecting fingers as they are moved successively into such position.

In testimony whereof I affix my signature in presence of two witnesses.

CHARLES FRANCIS JENKINS.

Witnesses:

JAMES L. CRAWFORD,
ROBERT CRAIG GREENE.