

**No. 649,730.**

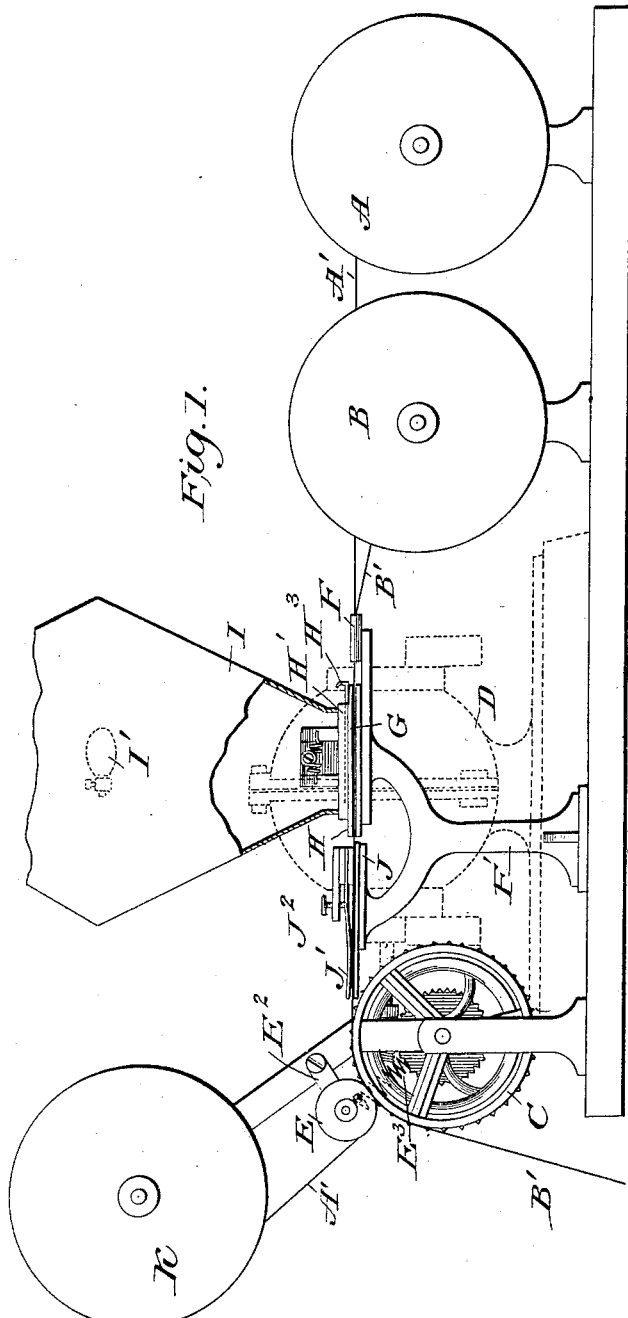
**Patented May 15, 1900.**

**C. F. JENKINS.**

## PHOTOGRAPHIC PRINTING APPARATUS.

(Application filed Dec. 19, 1896.)

(No Model.)



*Fig. 1.*

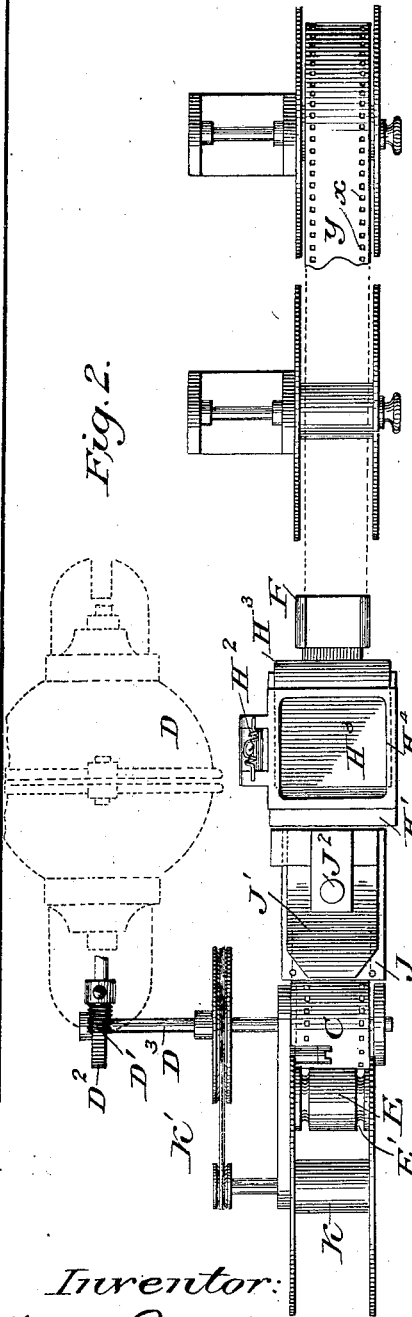


Fig. 2.

Witnesses:

Alex. Scott.

Jas. W. Graham

*Inventor:*

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# UNITED STATES PATENT OFFICE.

CHARLES FRANCIS JENKINS, OF RICHMOND, INDIANA.

## PHOTOGRAPHIC-PRINTING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 649,730, dated May 15, 1900.

Application filed December 19, 1896. Serial No. 616,290. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES FRANCIS JENKINS, a citizen of the United States, residing at Richmond, in the county of Wayne and State of Indiana, have invented certain new and useful Improvements in Photographic-Printing Apparatus; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to apparatus for forming a succession of prints upon a constantly-advancing sensitized strip. To this end a corresponding negative strip is synchronously advanced alongside the sensitized strip as the latter passes along that portion of its path in which the printing is to be done by a transverse beam of light.

The apparatus chosen for illustrating the invention is such as has been for many months in practical use for producing the long ribbon-like picture-bearing strips employed in phantascope, kinetoscope, and like devices; but it is evident that the invention is not limited to producing prints of any particular size and that when formed the prints may be used separately for any desired purpose.

It is to be noted that the word "negative" is used in this specification to signify that which may be used in the production of a positive print, as the technical negatives of the photographic art are used, and that it includes photographs, cyclostyle letters, &c. So, too, the word "strip" herein employed includes a succession of negatives not integrally connected and a succession of sensitized surfaces or plates whether or not they be integrally continuous, it being, for example, a question of expediency whether to sensitize a continuous strip or to connect independent pieces of sensitized material.

In the accompanying drawings, Figure 1 is a partial side elevation of the apparatus, certain portions being broken away and a certain motor being indicated in dotted lines. Fig. 2 shows in plan most of the devices of Fig. 1.

In the drawings, A and B are spools mounted in the same plane and carrying, respectively, a negative strip A' and a sensitized

strip B', the two being so wound that as they are unwound and superposed the negative bearing-face of the one naturally meets the sensitized face of the other. The two strips are provided throughout with identically-similar and similarly-placed rectangular perforations  $xy$  near their margins. The ends of the two strips are drawn out together and by means of their perforations engaged with accurately cut and spaced pyramidal teeth upon the periphery of a feeding-drum C, which may be rotated by any suitable means and is shown as operated by a motor D, having on its shaft a worm D', which engages a worm-wheel D<sup>2</sup> upon the shaft D<sup>3</sup> of the drum. As the spacing of the teeth corresponds precisely with the spacing of the perforations in the strips, the rotation of the drum draws the strips forward together without the possibility of the slipping of the one upon the other to an appreciable extent. Were there inappreciable slipping at any tooth, the next tooth would tend to correct the error. The two superposed strips are held at the base of the teeth in contact with the drum by means of a roller E, provided with annular grooves E', registering with the teeth and mounted upon a swinging arm E<sup>2</sup>, held down by a spring E<sup>3</sup>. As the strips leave the spools A and B they pass through a guide F, carried by a suitable standard F', and thence between an opaque plate G and a transparent plate H, the latter secured in a metallic frame H', which is hinged to the plate G and pressed downward gently by a spring H<sup>2</sup>. Between the frame and the plate H slides an opaque shutter H<sup>3</sup> for regulating the width of the exposed portion H<sup>4</sup> of the plate. Upon the frame is removably mounted a chamber I, closed except at the bottom and containing a light I' of variable intensity. Between the plates just described and the drum C the strips pass over a plate J in the plane of the plate G and beneath a broad flat presser-plate J', which holds the strips flat and in perfect contact at the instant before they are engaged by the teeth of the drum. The pressure needed is very slight, and it may be regulated by a thumb-screw J<sup>2</sup>. As the strips pass from the drum they separate, the negative strip being wound upon a drum or spool

K, driven from the drum-shaft by an elastic belt K', incapable of exerting any undesirable tension upon the strip.

If the rate of rotation of the feeding-drum C be uniform, it is plain that each negative of the negative strip will be exposed in passing the opening regulated by the sliding shutter for precisely the same time as every other negative, so long as the shutter is undisturbed, and that this interval of exposure is readily changed by adjusting the shutter. The requisite change in a sensitized surface may be produced either by a certain interval of exposure in a given light or by a shorter exposure in a more intense light. The results in the two cases are not in all respects identical, and practically it is desirable to vary the relations of these two elements, and the light is therefore varied, as may be desired, by varying the resistance in the circuit when an electric light is used or by such other well-known means as may be found convenient.

It is to be noted that the sensitized and negative surfaces are pressed into close contact during exposure and hence that small variations in the direction of the beam of light are not material.

In the machine of the illustration the negative strip is wound upon a spool as fast as it leaves the film or positive strip, that being desirable in the work which the practical machine is now doing; but when a short strip is used, or when for other reasons it is desirable to use the negative strip repeatedly without interruption, it is obvious that the ends of the strip may be joined to form an endless band, this being an expedient adopted for such reasons in the phantoscope of my Patent No. 536,569 and in devices shown in the patents of Edison and others, and for a long time in very successful daily use, it being a very simple matter to join the ends of the bands ordinarily used.

What I claim is—

1. The combination with means for syn-

chronously and continuously advancing a sensitized strip and a superposed negative strip, of a source of light, devices arranged to admit light to a transverse band only of the moving strip, means for varying at will the width of said band, and means for causing the strips to follow divergent paths after passing said devices.

2. The combination with means for synchronously and continuously advancing a sensitized strip and a superposed negative strip, of a support for the advancing strips, a transparent plate arranged to press the moving strips upon said support, and means for projecting a beam of light through said plate upon the moving strips.

3. The combination with means for continuously and synchronously advancing a sensitized strip and a superposed negative strip, of a support for the advancing strips, a hinged transparent plate swinging toward said support to press the strips between the two, a spring arranged to urge such swinging, means for directing a beam of light upon said plate, and means for at will varying the amount of light thrown upon the plate.

4. The combination with the two spools and the constantly-driven toothed drum for drawing film-strips from said spools of the supports arranged below the path of the films passing from the spools to the drum, the hinged transparent plate pressing toward the first support, the downwardly-open chamber above said plate, a source of light within the chamber, a shutter for varying the amount of light passing from the chamber, a tension-plate exerting a variable pressure toward the second support, and means for carrying the two films in different directions after they leave the drum.

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

C. FRANCIS JENKINS.

Witnesses:

WALLACE GREENE,  
HARRY BARTON.