

No. 688,115.

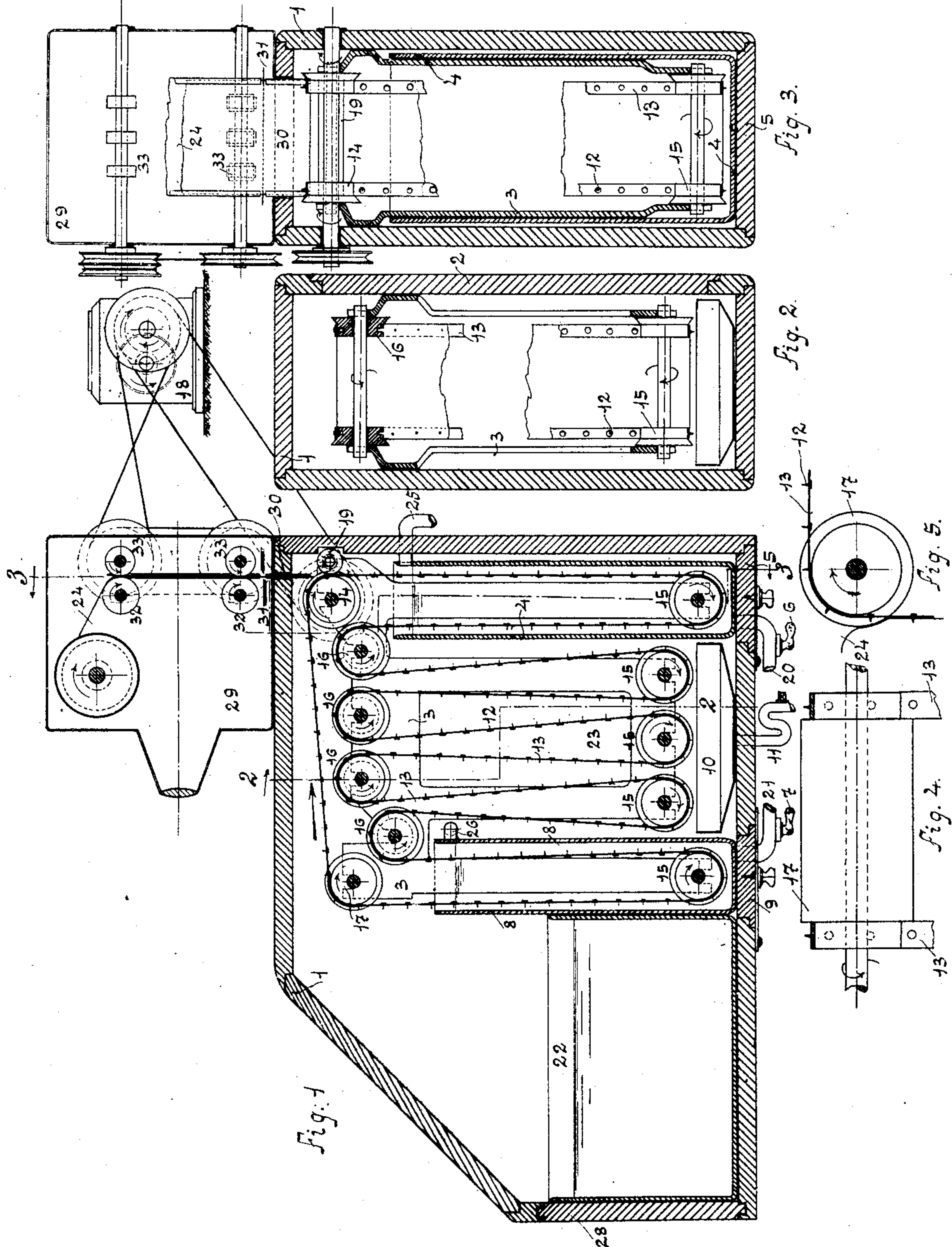
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A. POLLAK & J. VIRAG.

AUTOMATIC DEVELOPING APPARATUS FOR PHOTOGRAPHIC RECORDS.

(No Model.)

(Application filed Dec. 14, 1899.)



WITNESSES:

Frederick White
René Prouine

INVENTORS:

Anton Pollak and Josef Virag,

By Attorneys,

Arthur C. Brisson & Co.

UNITED STATES PATENT OFFICE.

ANTON POLLAK AND JOSEF VIRAG, OF BUDAPEST, AUSTRIA-HUNGARY.

AUTOMATIC DEVELOPING APPARATUS FOR PHOTOGRAPHIC RECORDS.

SPECIFICATION forming part of Letters Patent No. 688,115, dated December 3, 1901.

Application filed December 14, 1899. Serial No. 740,235. (No model.)

To all whom it may concern:

Be it known that we, ANTON POLLAK and JOSEF VIRAG, subjects of the Emperor of Austria-Hungary, residing at Budapest, in the
5 Empire of Austria-Hungary, have invented certain new and useful Improvements in Automatic Developing Apparatus for Photographic Records, of which the following is a specification.

10 This invention relates to the automatic developing of photographic records or images upon a moving strip or sheet of sensitized paper or other flexible material, (hereinafter called the "film;") and its object is to make
15 such automatic development practicable independent of the length of the film carrying the photographic records. Hitherto it has not been possible to carry such automatic developing into effect, owing, on the one hand,
20 to the difficulty of feeding the exposed film into the developer, and, on the other, said film could only be fed through the apparatus if its length was at least equal to the length of its travel through the developer. Even if it
25 was only necessary to develop a photographic record of partly that length it was necessary to supply a film of the length of the entire travel through the apparatus, so that the record had to be lengthened by a strip of paper or similar material to the full length of
30 the travel. The present invention is devised to remove this drawback by fastening the film to endless guiding-bands, made of metal, leather, or other suitable material, provided
35 with pins and passing over guiding cylinders or rollers of the apparatus. By these means even the smallest piece of exposed film can be readily fed through the entire apparatus. According to circumstances, one or more guid-
40 ing-bands may be provided. At the end of the travel is provided a suitably-formed roller devised to release the photographic film from the endless bands whereupon the film is conveyed into the fixing-bath.

45 The entire apparatus is of course arranged within a light-proof box.

A form of construction of the apparatus is hereinafter described, reference being had to the annexed drawings, making a part of this
50 specification.

In the drawings, Figure 1 shows a vertical

longitudinal section of the apparatus; Fig. 2, a section on the line 2 2 of Fig. 1; Fig. 3, a section on the line 3 3 of Fig. 1; Fig. 4, a side view of the releasing-roller, and Fig. 5 shows
55 a front view of the same.

1 is a light-proof box with door 2. Within this box is provided the frame 3, supporting the rollers or cylinders. The developing liquid is placed in the vat 4, supported upon
60 the sliding bottom-piece 5, through which is passed the feeding-pipe, provided with a cock outside of the box. The vat 4 can be removed with the bottom-piece 5. A second vat 8 filled with water is similarly supported
65 upon a bottom-piece 9, and a pan 10, supported upon the bottom of the box and provided with a siphon-like discharge-pipe 11, is adapted to collect and discharge the developing liquid dripping from the photographic
70 film.

One or more endless bands or tapes 13, made of metal or other suitable material, provided with metal pins 12, are provided for the fastening thereto of the photographic
75 films 24, that are to be passed through the developer. Two bands are shown in the drawings, which pass over the feeding-roller 14, the guiding-rollers 15 and 16, and the releasing-roller 17. The surfaces of the feeding-
80 rollers 14, of the guiding-rollers 15, and the releasing-roller 17 are smooth, while the surfaces of the rollers 16 are grooved for the reception of the pins 12. The feeding-rollers 14 are rotated by any suitable motor—for in-
85 stance, a clockwork 18—in the direction of the arrow and impart this motion to the impaling-roller 19, with which they are in frictional contact and which impaling-roller is also grooved for the reception of the pins.
90 The releasing-roller 17 has a smaller diameter at the place of contact with the ribbon 13 than in the center, over which passes the photographic film, and this difference in diameter is slightly more than the thickness of
95 the endless ribbon and the height of the pins.

Pipes 20 and 21, provided with cocks 6 and 7, respectively, are provided for feeding the developing liquid into vat 4 and water into
100 vat 8, and the drain-pipes 25 and 26, respectively, serve to discharge the exhausted developing liquid or the dirty water. This

construction allows of a continuous supply of both liquids. The vat 22, also provided in the same light-proof box, contains the fixing liquid. Doors 2 and 28 give the necessary admission to the apparatus.

The operation of the apparatus is as follows: The film emanating from the photographic camera 29 passes under the exclusion of light through slit 30 into the box 1, between the rollers 14 and 19, where it is impaled upon the pins 12. The rollers 14 and 19 continue to feed the film into the apparatus until the further feed is interrupted or cut off by scissors 31. The feeding of the film from the camera is effected by the cylinder 32 and the roller 33, arranged in said camera, and which are rotated for this purpose by hand by means of a crank, or which may be intermittently driven by the clock-work 18 by means of gearing thrown into or out of action, as required. The part of film fastened to the bands can now be readily passed through the developer until it reaches the releasing-roller 17. Now as the photographic film passes over the higher part of said roller and the bands pass over the lower part, Figs. 4 and 5, the film is released from the pins and drops into the fixing-bath 22, provided adjacent to the washing-bath, from where it can be removed from time to time.

As shown, the film is developed in vat 4, the excess of developing liquid drips down while it passes through chamber 23, and it is washed in vat 8.

It will be understood that the number and size of the various vats or chambers may be increased or diminished, those shown being convenient for use where separate developing, fixing, and washing operations are to be carried on.

While our invention mainly involves the use of an endless carrier for the film, yet it is in part applicable in case where so long a strip of film is used as to render such carrier unnecessary.

What we claim is—

1. In developing apparatus, a receptacle for the developer, and a traveling carrier moving into the receptacle, having along its surfaces a plurality of successive means for engaging a film.

2. In developing apparatus, the combination with a receptacle of an endless carrier moving into said receptacle and having projections for engaging a film.

3. In a developing apparatus, the combination with a receptacle, of an endless carrier moving into said receptacle and having projections for engaging a film, and means for disengaging it therefrom.

4. In developing apparatus, the combination with a receptacle and an endless carrier moving into said receptacle, and having projections for engaging a film, of means for engaging the film with the projections.

5. In developing apparatus, the combination with a receptacle and an endless carrier

moving into said receptacle, and having projections for engaging a film, of means for engaging the film with the projections, and means for disengaging it therefrom.

6. In developing apparatus, a receptacle for a developer, a receptacle for a washing-bath, and a receptacle for a fixing-bath, in combination with a traveling band having means for seizing a film, moving into said two first-mentioned receptacles, and means for disengaging a film from the band, and moving said disengaged film into the third receptacle, whereby the film is first developed, then washed, and finally fixed.

7. In developing apparatus, a receptacle for the developer, a receptacle for a bath, a roller in the developer-receptacle, intermediate rollers between the two receptacles, a traveling band guided by said rollers, having means for engaging a film, and means for releasing the film when at a point above said bath.

8. In developing apparatus, a receptacle for the developer, a receptacle for a bath, a traveling carrier moving into the developer-receptacle and having means for engaging a film, and means for releasing the film when at a point above said bath, comprising a roller adapted to force the film away from the carrier.

9. In developing apparatus, a case, and a receptacle for the developer comprising a drawer movable into and out of said case.

10. In developing apparatus, a case, a traveling carrier in said case having a depending portion, and a receptacle comprising an upright drawer moving through the bottom of said case and in its closed position surrounding said depending portion of the carrier.

11. In developing apparatus, a case, depending arms supported by the case, and carrying guiding provisions for a band, and a receptacle comprising a drawer moving upwardly through the bottom of the case, and in its closed position surrounding said guiding provisions.

12. In developing apparatus, the combination of a traveling band, receptacles for developing and washing liquids, rollers in said receptacles, and a plurality of intermediate rollers guiding said band, whereby the band descends into the receptacles, and between the two forms a series of convolutions, out of contact with the developing and washing liquids, permitting the film to drain during its passage from one receptacle to the other.

13. The combination with an exposing apparatus containing means for feeding a strip of sensitive film, of a developing apparatus connected to said exposing apparatus, and comprising a receptacle for a developer, and an endless carrier passing into said receptacle, and having means for engaging a film, said endless carrier having a rate of travel equal to the rate of travel of the film.

14. The combination with an exposing apparatus containing means for feeding a strip

of sensitive film, of a developing apparatus
connected to said exposing apparatus, and
comprising a receptacle for a developer, and
an endless carrier passing into said receptacle,
5 and having means for engaging a film, said
endless carrier having a rate of travel equal
to the rate of travel of the film, and a cutting
mechanism located between the exposing ap-
paratus and the developing apparatus.

10 In witness whereof we have hereunto signed

our names in the presence of subscribing wit-
nesses.

ANTON POLLAK.
JOSEF VIRAG.

Witnesses as to Anton Pollak:

ADOLPH D. WEINES,
F. A. HUBBARD,

Witnesses as to Josef Virag:

EUGENE E. MYERS,
AGNES I. DUNN.