(No Model.)

U. S. RUSH.

PHOTOGRAPHIC PRINTING APPARATUS AND PROCESS.

No. 487,937. Patented Dec. 13, 1892.

Fig. 1.

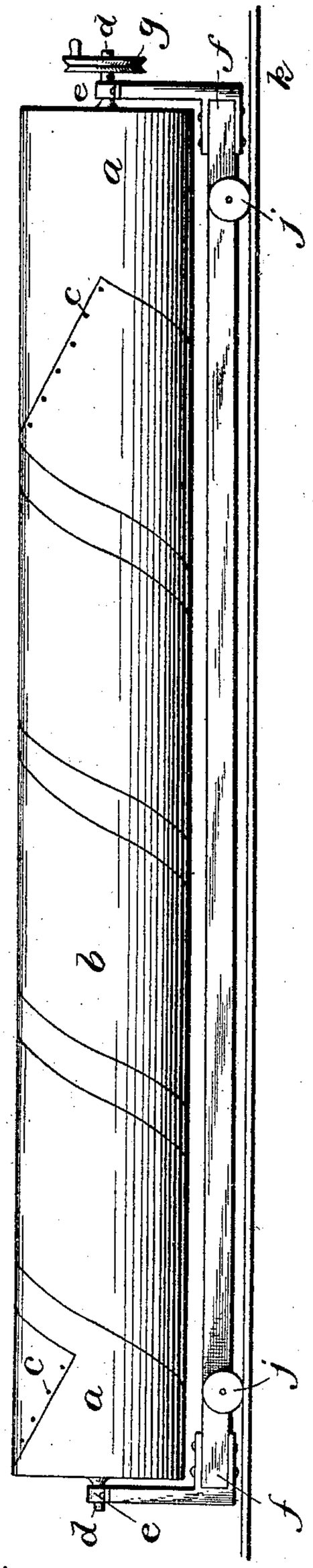
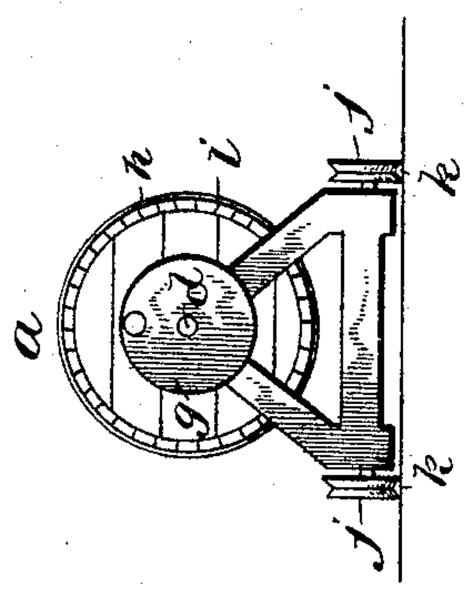


Fig. 2.



Witnesses:
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UNITED STATES PATENT OFFICE.

ULYSSES S. RUSH, OF TACOMA, WASHINGTON, ASSIGNOR OF TWO-THIRDS TO HERBERT L. JENKINS AND WILLIAM G. GOSSLIN, OF SAME PLACE.

PHOTOGRAPHIC-PRINTING APPARATUS AND PROCESS.

SPECIFICATION forming part of Letters Patent No. 487,937, dated December 13, 1892.

Application filed December 26, 1891. Serial No. 416,277. (No model.)

To all whom it may concern:

Be it known that I, ULYSSES S. RUSH, a citizen of the United States, residing at Tacoma, Pierce county, State of Washington, have invented a new and useful Improvement in Photographic-Printing Machines, of which the following is a specification.

My invention relates to an improvement in the method of printing or photographically reproducing drawings, plans, or pictures by means of a long-exposure cylinder or other similar form in lieu or place of the spring-board printing-frame or other apparatus now in use.

The objects of my invention are, first, to hold the drawing, plan, or picture firmly and closely in contact with the sensitized paper or other substance upon which the photographic reproduction is desired to be made; second, to distribute the pressure required and necessary for such firm and close contact evenly and equally upon all parts of the drawing, plan, or picture without straining or drawing the same more than merely sufficient to make it smooth; third, to enable a drawing, plan, or picture of great length to be photographically reproduced at one time by one exposure or impression, which cannot be accomplished by the use of the spring-board, printing-frame, or other apparatus now in use.

Prior to my invention drawings, plans, or pictures of great length have been printed or photographically reproduced, whether in blue print or otherwise, in sections, with the unavoidable result of differing colors or shades, due to the greater or lesser exposure of the sections being printed at different times and by different impressions, and often with poor and imperfect contact, all of which objections are avoided by means of my invention and improvement, which consists of a long-exposure cylinder or other similar form, around which is spirally wrapped, first, the sensitized paper or other substance upon which the photographic reproduction is desired to be made; second, over the sensitized paper or other substance is spirally wrapped the plan, drawing, or picture which is to be copied, so as to cover evenly and smoothly the paper or substance upon which the copy is to be made and fastened by thumb-tacks or other means at each end, by means of which spiral wrapping and fastening the drawing, plan, or picture and the sensitized paper or other substance beneath it are held firmly and closely in contact at all points. This is accomplished by means of the effect of the spiral wrapping around the long cylinder, by which two concave surfaces beneath the said spiral wrapping are produced, one being a concave surface longitudinally and the other transversely of the drawing, plan, or picture, thus securing perfect contact between the two spiral wrappings at all points without straining or drawing them beyond a tension merely sufficient to keep them smooth. In wrapping the sensitized paper and the flexible negative upon its curved exposure-support, as above described, care should be taken that the convolutions do not lap upon each other. These objects I attain by means of the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a side view or elevation of the cylinder, mechanism, and carriage, showing the position on the cylinder of the spiral wrappings and the manner of adjusting the drawing, plan, or picture for the purpose of making a photographic reproduction upon the sensitized paper or other substance beneath. Fig. 2 is an end view or elevation of the same.

Similar letters refer to similar parts throughout both views.

a designates the rotary receiver or exposure-support for the tracing or other flexible negative and the sensitized paper or other fabric to be acted upon by the light. It has a curved exterior surface, being preferably in the form of a long cylinder—that is, a cylinder having a length greater than its diameter—the particular shape in cross-section of the support *a* being, however, immaterial, so long as it is curved exteriorly. It is mounted or swung in a frame or carriage *e f* by means of a shaft, which forms its axis, or by journals or gudgeons *d*, and is provided with a crank or wheel *g* or other means by which it may be rotated. This carriage is preferably mounted upon trucks *j*, which travel upon tracks *k*, or other suitable means may be adapted for easily moving the cylinder or support *a* from and into the dark-room.

In Fig. 1 is shown the method of placing the sensitized paper and the drawing, plan, tracing, or other flexible negative *b* upon the support. As shown, they are placed around the curved support *a* upon a line or lines inclined to its axis, the ends being secured by tacks *c*. Two important results arise from this way of securing the negative and the sensitized paper, to wit: A uniform and gentle stretching action is exerted upon all parts of the negative and the sensitized paper, as has been explained, and prints of great length can be produced and perfect uniformity of exposure can be given to all parts thereof. These results are not attainable where the negative and sensitized paper are wrapped upon a curved surface on lines at right anles to the axis of such surface, as in such cases the limit as to the length of the print taken is soon reached, as a cylinder of great enough size in diameter to accommodate a very long print when placed as supposed would be entirely impracticable.

I do not claim the invention of any new chemical process or method of photographic printing, nor do I claim any new principle or invention in the mechanism of the carriage, wheels, track, or cylinder; but

What I do claim as my invention, and desire to secure by Letters Patent, is—

1. A photographic-printing machine consisting of a rotatable curved support for supporting a flexible negative and the sensitized fabric while they are being exposed to the light, having a length greater than its diameter, whereby it is adapted to have wound thereon in a direction inclined to its axis a long print, and means for revolving the said support, substantially as set forth.

2. In an exposure photographic-printing machine, the combination of a cylinder *a*, a movable carriage in which it is supported, and means for revolving the said cylinder, substantially as set forth.

3. The improvement in the art of obtaining prints from photographic negatives, which consists in supporting the sensitized fabric and the overlying flexible negative in spiral form, so that the convolutions lie smoothly and nowhere overlap each other, and then rotating the same while exposed to the light, so as to bring all the exposed portions thereof uniformly under the same actinic influences, whereby relatively-long prints may be made all at once of substantially-uniform tint and shade, substantially as specified.

ULYSSES S. RUSH.

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