(No Model.)

E. COPE.

SOLAR PRINTING APPARATUS.

No. 306,721. Patented Oct. 21, 1884.

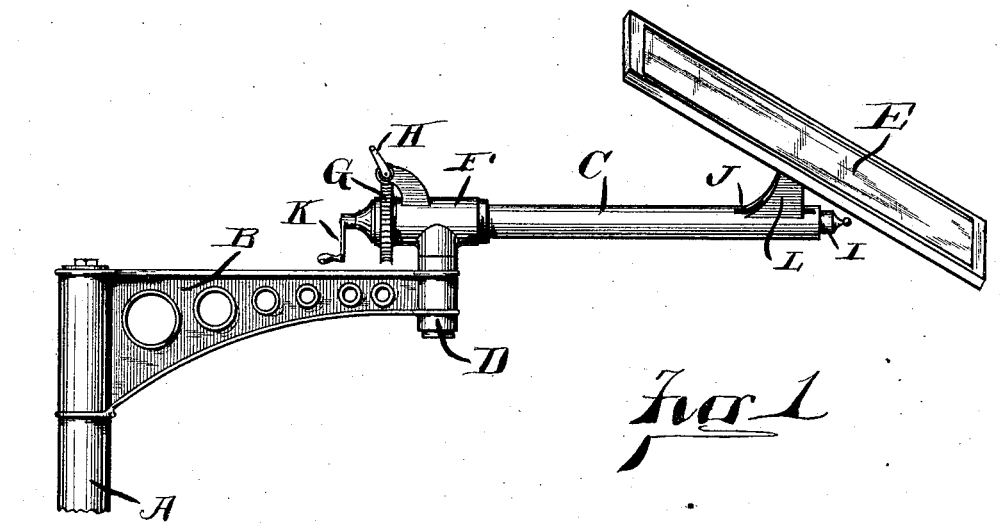

Fig 1

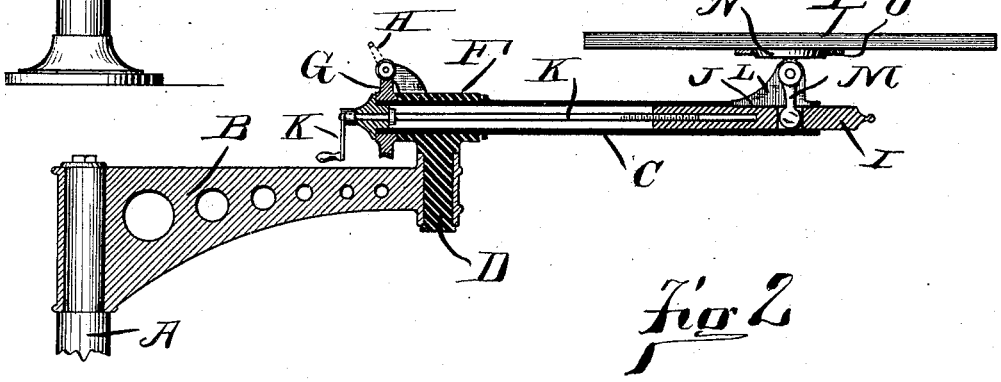

Fig 2

Witnesses:
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UNITED STATES PATENT OFFICE.

EZRA COPE, OF HAMILTON, OHIO.

SOLAR-PRINTING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 306,721, dated October 21, 1884.

Application filed May 22, 1884. (No model.)

To all whom it may concern:

Be it known that I, EZRA COPE, of Hamilton, Butler county, Ohio, have invented certain new and useful Improvements in Solar-Printing Apparatus, of which the following is a specification.

This invention pertains to solar-printing apparatus, and it relates to the arrangement of parts for permitting a ready adjustment of the exposure-piece—such as a printing-frame—into a proper correspondence with the direction of the sun's rays.

The invention will be readily understood from the following description, taken in connection with the accompanying drawings, in which—

Figure 1 is a side elevation of a printing apparatus illustrating my invention, and Fig. 2 a vertical section of the same.

I illustrate my invention as embodied in an apparatus mounted upon a crane, so as to be readily projected outward from a window, as is common in large printing-frames.

In the drawings, A represents a crane-post, such as is usually secured to the floor or wall just within the window at which the apparatus is used; B, a jib swiveling upon the crane-post; C, an arm, forming an extension of the jib; D, a pivot-joint, with a vertical axis, uniting the arm C to the jib, whereby an articulated system is produced, as usual; E, a printing-frame of ordinary construction, adapted to receive sensitive paper, a negative, &c.; F, a pivot-bearing with a horizontal axis at the joint D, in which is journaled the inner end of the arm C; G, a worm-gear fast upon the extreme inner end of the arm C; H, a worm and hand-crank by which the worm-gear and the arm C are revolved upon their axis; I, a slide fitted to reciprocate within the arm C, which is hollow; J, a mortise through the side of the arm C under the printing-frame; K, a cranked screw journaled in the arm and engaging the slide I in such manner that by turning the screw the position of the slide in the arm may be longitudinally adjusted, as will be obvious from Fig. 2 of the drawings; L, supporting-lugs projecting from the side of the arm at its end where the mortise J is located and in position to receive the connections of the printing-frame; M, a lever attached to the printing-frame, fulcrumed upon an axis at right angles to the axis of rotation of the arm supported by the lugs L, and engaging with its lower end the mortise in the slide I; N, a turn-table plate formed upon the upper end of the lever M; and O, a bearing-clamp, by which the printing-frame is attached to the turn-table, so as to secure the printing-frame to the lever, and at the same time permit the printing-frame to be revolved upon an axis at right angles to its own plane.

The printing-frame is supported horizontally within the room for preliminary manipulations, and is projected out of the window for exposure, in a manner common to printing-frames mounted upon cranes. After the frame has been projected out of the window, the angle of exposure must be adjusted to suit the inclination of the solar rays.

My invention has to do exclusively with these movements of adjustment for exposure-angle. By means of the worm and worm-gear the arm may be revolved and the printing-frame thereby adjusted in a circle whose axis coincides with the axis of the arm-bearing. By adjusting the slide I inward or outward the lever M is oscillated, and the printing-frame may thereby be adjusted in an arc whose axis is the fulcrum-pivot of the lever and which is at right angles to the axis of rotation of the arm-bearing. By means of these two motions any desired angle of exposure in any direction may be obtained. The turn-table motion is as usual, and is for convenience in the preliminary manipulations of the printing-frame. It should be understood that either one of the two motions provided may be used in the adjustment of the printing-frame through the diurnal arc. Thus the arm may be rotated into an adjustment suited to the latitude, and then the slide and lever may be used for the diurnal adjustment; or the lever and slide may be used in the preliminary adjusting of the printing-frame into correspondence with the latitude, and then the arm may be rotated for the diurnal adjustment. The appropriation of these movements relatively will of course depend largely upon the direction of the approach of the solar rays with reference

to the general position of the apparatus. Clock-work may of course be applied to whichever of the two movements is chosen for securing diurnal conformity, and for extremely perfect operations clock-work may be applied to both of the motions.

As my invention relates entirely to the movements of adjustment, I do not feel limited to the application of my invention exclusively to solar-printing apparatus. I contemplate the embodiment of the principle of my invention in apparatus other than solar-printing apparatus—such, for instance, as solar cameras, telescopes, &c. I therefore herein define, as an equivalent to the printing-frame E, any apparatus or device which has a capacity for utilizing the compound motions of exposure herein set forth, and it is obvious that the invention is as applicable to any rigid form of main support of an exposure apparatus as it is of the crane arrangement, which latter becomes of utility only in cases where exposure apparatus is to be moved in and out through a window or the like.

I claim as my invention—

The combination, substantially as set forth, of a main support for an exposure apparatus, a hollow arm attached at one end to said support by a journal of rotation with its axis horizontal, a lever fulcrumed at the free end of said arm upon a pivot-axis arranged at right angles to the axis of said journal of rotation, an exposure apparatus, as a printing-frame attached to one end of said lever, and an adjusting-screw housed within said arm and engaging said lever.

EZRA COPE.

Witnesses:
W. A. SEWARD,
J. W. SEE.