No. 666,087. Patented Jan. 15, 1901.

B. DAY.

SAFETY ADJUSTER FOR PRINTING FILMS.

(Application filed Oct. 31, 1900.)

(No Model.) 2 Sheets—Sheet 1.

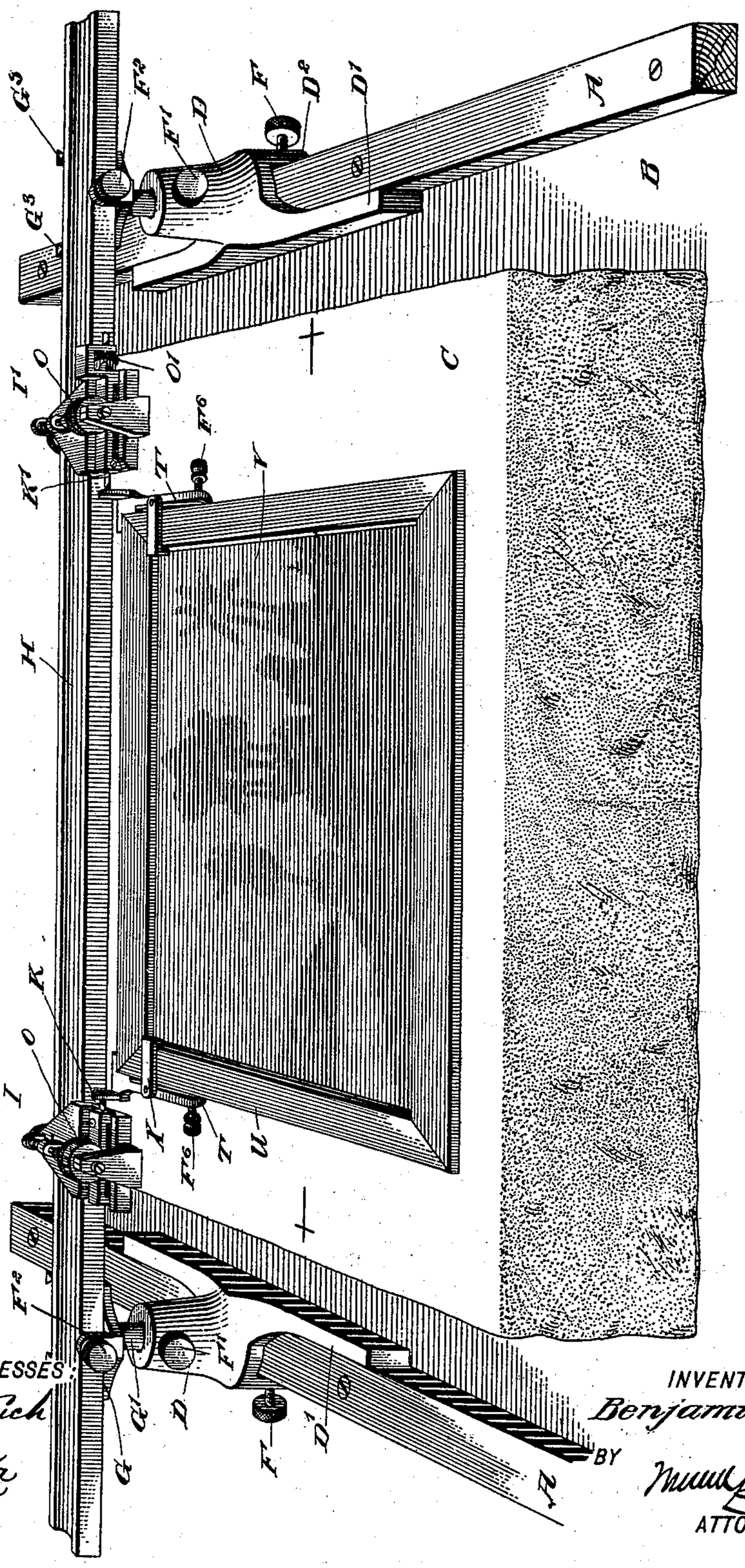

Fig. 1.

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Fig. 2.

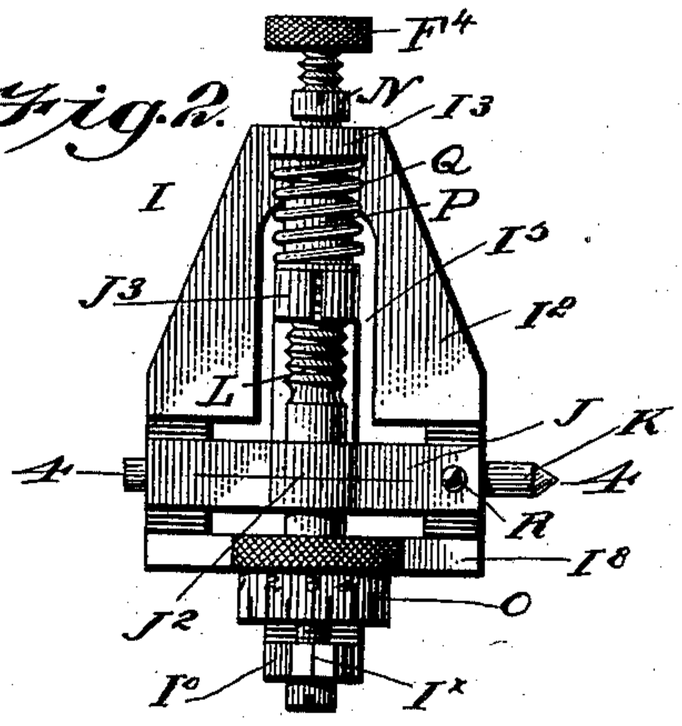


Fig. 3.

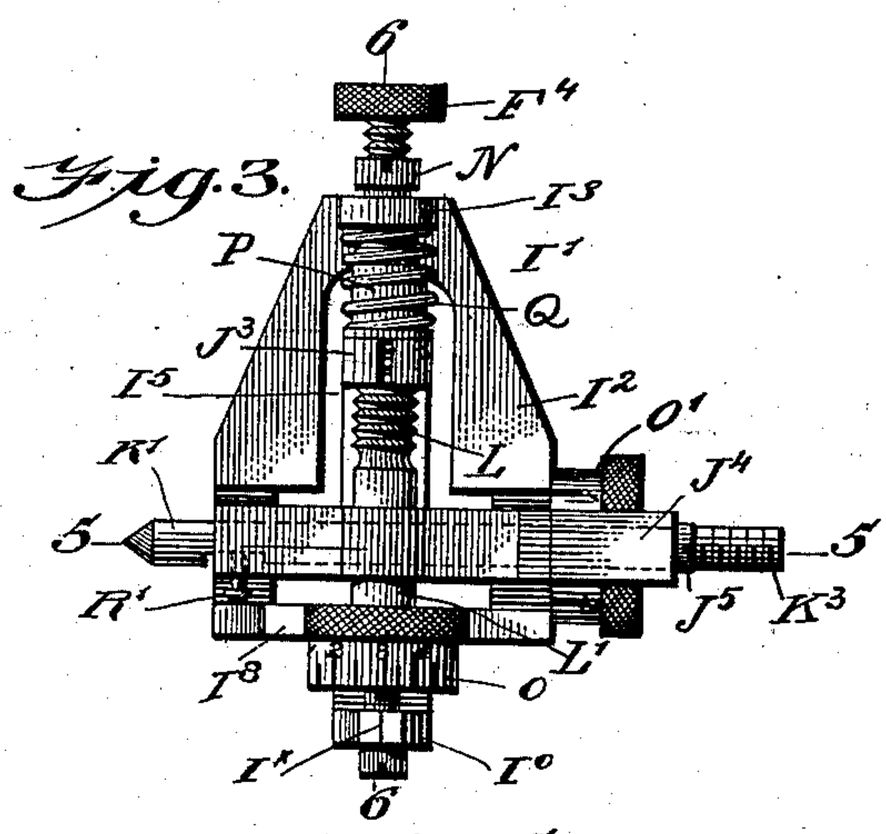


Fig. 4.

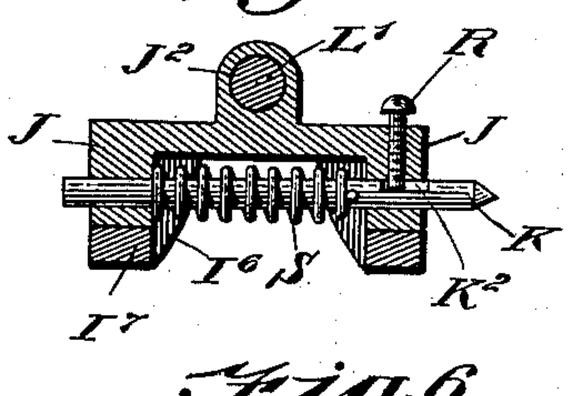


Fig. 5.

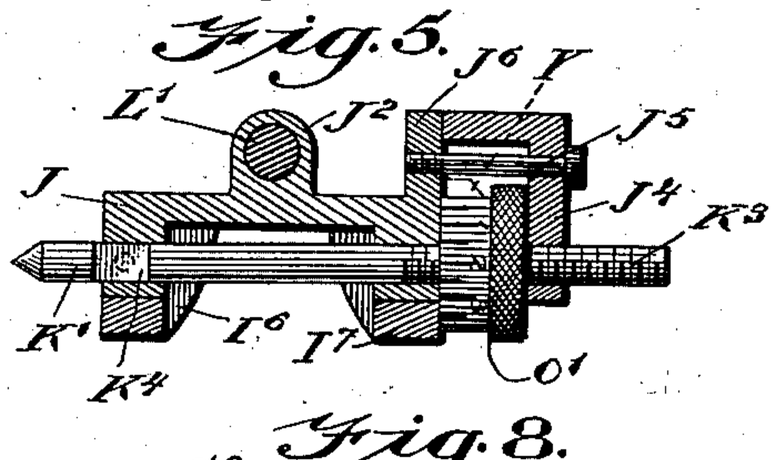


Fig. 6.

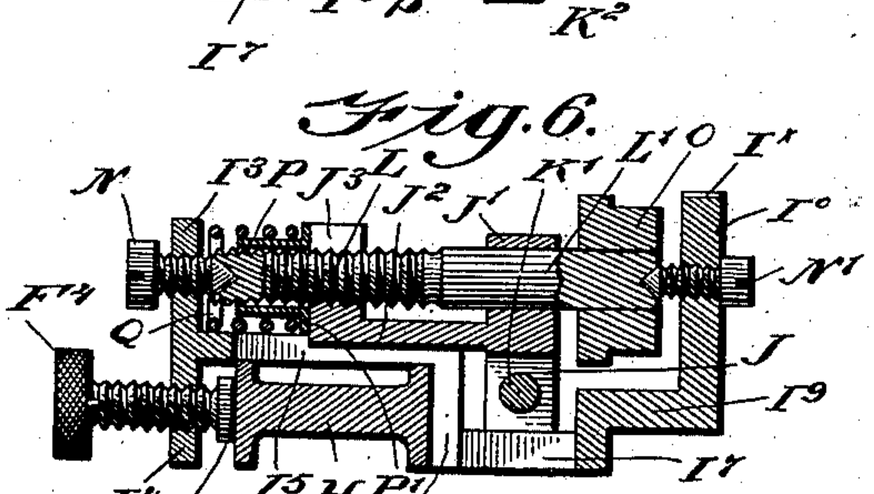


Fig. 7.

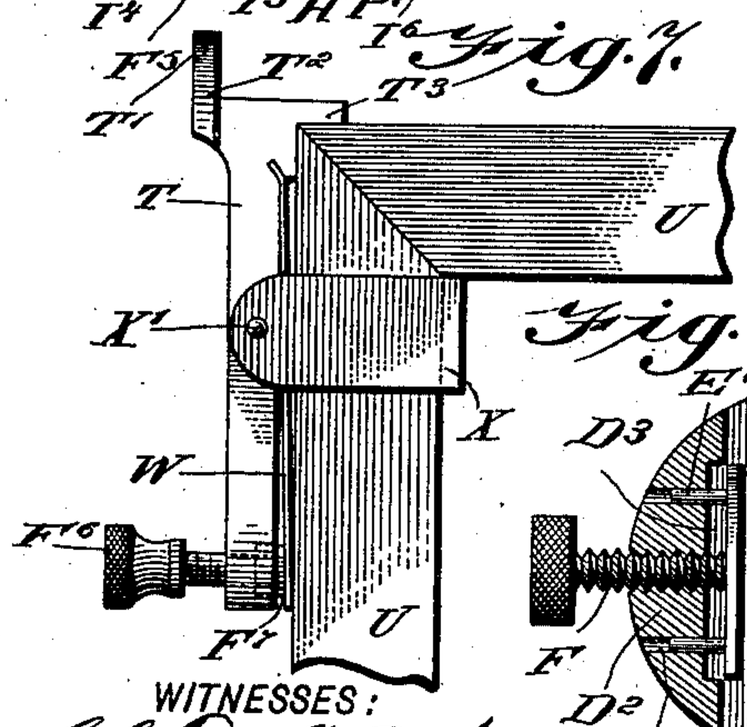


Fig. 8.

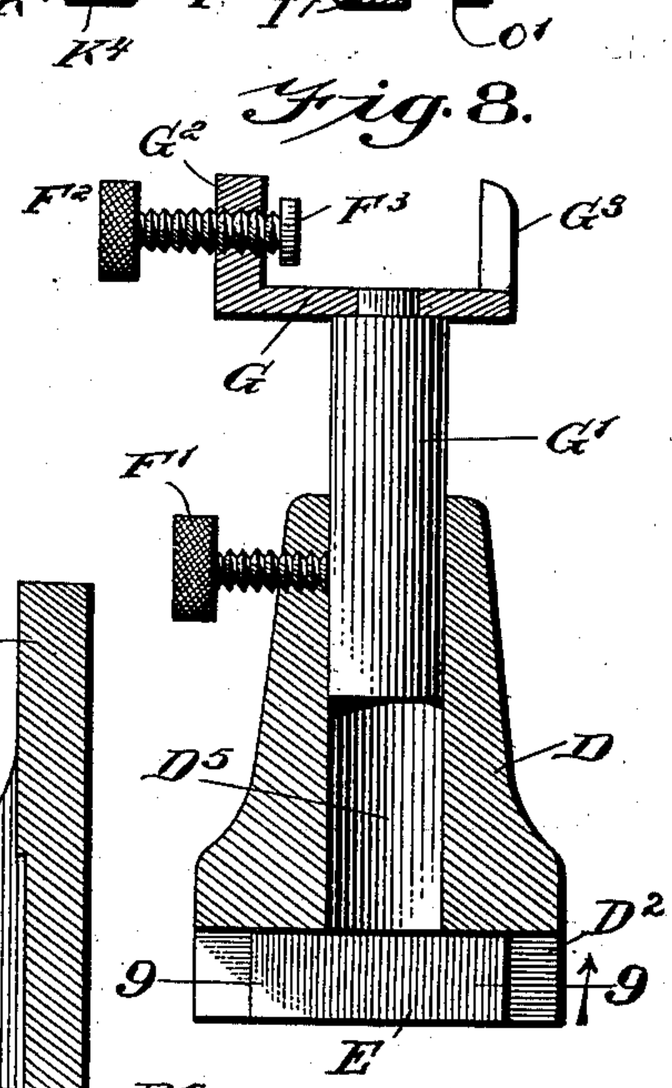
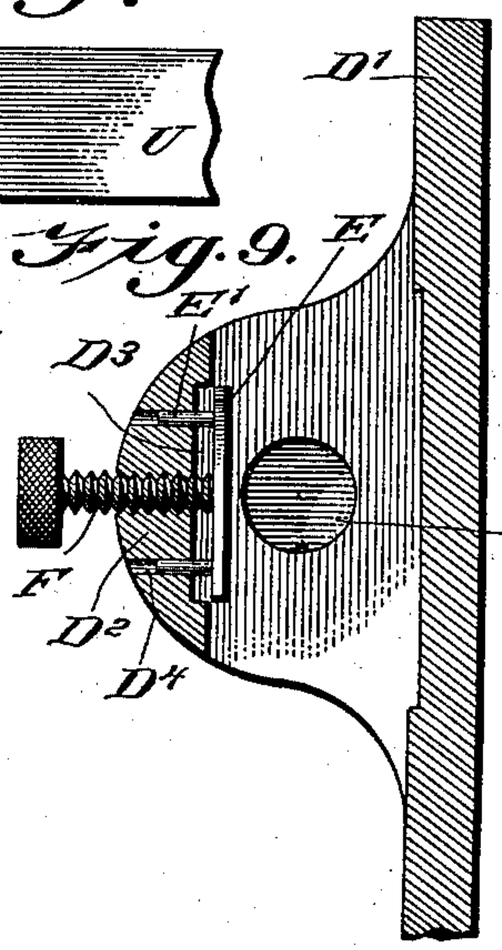


Fig. 9.



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UNITED STATES PATENT OFFICE.

BENJAMIN DAY, OF WEST HOBOKEN, NEW JERSEY.

SAFETY-ADJUSTER FOR PRINTING-FILMS.

SPECIFICATION forming part of Letters Patent No. 666,087, dated January 15, 1901.

Application filed October 31, 1900. Serial No. 35,030. (No model.)

To all whom it may concern:

Be it known that I, BENJAMIN DAY, a citizen of the United States, and a resident of West Hoboken, in the county of Hudson and State of New Jersey, have invented new and useful Improvements in Safety-Adjusters for Printing-Films, of which the following is a full, clear, and exact description.

My invention relates to adjustable holders or frames for printing-films or the like used in lithography and for similar purposes, and has for its object to provide a construction by which the operator is enabled to accurately adjust and hold the framed film, to adjust, remove, and readjust the film after inking or reinking with a certainty of obtaining accurate shading, and to shift the frame minutely and accurately in two directions, thereby throwing subsequent prints slightly out of register with the first print in such a way as to positively cause the subsequent prints to overlap, continue, or thicken the original print in such parts thereof as may be desired to produce darker tones of the original tint, thus varying the shading with a certainty of the results to be obtained.

The invention consists in certain features of construction and arrangement of parts, as will be described hereinafter and specifically pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a perspective view of the entire apparatus in position for use. Fig. 2 is a detail plan of one of the supports for the printing-film frame. Fig. 3 is a similar view of the other support. Fig. 4 is a sectional elevation on line 4 4 of Fig. 2. Figs. 5 and 6 are sectional elevations on lines 5 5 and 6 6, respectively, of Fig. 3. Fig. 7 is a detail plan, on an enlarged scale, of a corner of the film-holding frame and the attachment for pivotally connecting said frame with its support. Fig. 8 is an elevation, with parts in section, of a standard or clamp for connecting the apparatus with a table or other support; and Fig. 9 is an inverted sectional plan on line 9 9 of Fig. 8.

The apparatus comprises two parallel guide-bars A, secured by screws or otherwise to a support B, which may be a table or a drawing-board and which is adapted to receive between the guide-bars A a lithographic stone C or a support for paper, cardboard, zinc, copper, or other metal, or, generically speaking, the surface or material on which the printing is to be done. The stone C or its equivalent will generally be of a sufficient weight to render its accidental movement on the table B unlikely and special fastening devices dispensable.

On each side of the guide-bars A is mounted to slide a standard D, (preferably made of aluminium,) having an inner member D′ of considerable length arranged to engage the guide-bar A, and a centrally-disposed short outer member D^2, provided with a recess D^3 for the flush reception of a clamping-plate E, and with perforations D^4, into which fit pins E′, projecting from said clamping-plate. A screw F, extending through the member D^2, serves to move the clamping-plate E toward the inner member D′. The standard is tubular, having a vertical bore D^5, in which is vertically adjustable and also mounted to turn a shank G′, projecting downwardly from a plate G, said shank being normally locked by a set-screw F′. The plate G has on one side a centrally-disposed upward projection G^2, and on the other side at about equal distances from the center upwardly-projecting lugs G^3, preferably tapered to an edge on their inner sides, as shown in Fig. 8. Through the projection G^2 passes a screw F^2, having a clamping ring or disk F^3, which moves with the screw lengthwise, but may refrain from turning when brought against a resistance.

Between the lugs G^3 and the clamping-plate F^3 is adapted to be held a cross-bar H, preferably I-shaped in cross-section and made of aluminium, said bar serving for the attachment of the film-frame supports, as will be described.

The film-frame supports or registering-plates I I′ are alike in many respects, but differ in the construction of the pivots and the parts directly connected therewith. Each support has at its rear end a rearwardly-tapering top plate I^2, with an upward lug I^3 and a downward projection I^4, through which passes a screw F^4, having a clamping-plate F^5 of the same construction as the plate F^3.

This plate F^5 is adapted to engage the rear surface of the cross-bar H. At the front end of the top plate I^2, which has a central slot I^5, arms I^6, having curved inner edges, are projected downward at each side, these arms being adapted to bear against the forward face of the cross-bar H. From the arms I^6 arms I^7 extend forwardly to connect with a cross member I^8, having at its center a forward extension I^9, from which rises a lug I^0. Upon the arms I^7 are adapted to slide the feet of an inverted-U-shaped frame J, in which is supported the transverse pivot K or K'. The frame J has at its center a bearing J' and an arm J^2, extending in the slot I^5 of the plate I^2, and at the end of said arm is provided another bearing J^3, preferably split, so as to have a resilient action. The bearing J' is smooth and the bearing J^3 screw-threaded. (See Fig. 6.) They receive the adjusting-screw L, having a smooth portion L' in the bearing J' and provided at its ends with conical recesses to receive the trunnion-points of screws N N', secured to the lugs I^3 and I^0, respectively. Between the bearing J' and the lug I^0 a graduated milled wheel O is secured on the screw L, and the indications on said wheel are adapted to register with a line or notch $I^\times$ on top of the lug I^0. Between the bearing J^3 and the lug I^3 is located a sleeve P, shorter than the distance between said lug and bearing and surrounding a portion of the screw L. Said sleeve has an annular flange P', engaged by one end of a spring Q, the other end of which is in contact with the inner face of the lug I^3. The spring always presses the slide or frame J forward, so as to prevent any lost motion of the bearing or nut J^3.

The pivot-pin K of the support I is mounted to slide in the frame J, a screw R projecting into a recess K^2 in the pin K both to limit the longitudinal movement of the pin and to prevent it from turning. A spring S is coiled around the pin K and bears with one end against the frame J, while its other end is fast to the pin. It will be understood that owing to this construction the pin K is capable of a yielding inward movement. The pivot-pin K' of the other support I' is likewise mounted to slide in the frame J, but instead of being yieldingly mounted, as the pin K, is screw-threaded at one end K^3 preferably with the same thread as the screw L, said end passing loosely through smooth-bore openings in the frame J and in an arm J^4, secured by a screw J^5 to an extension J^6 of said frame. Adjacent to the other end the pin K' has a recess K^4, engaged by a screw R', secured to the frame J, to keep the pin from turning and to limit its sliding movement. Between the frame J and the arm J^4 a graduated milled wheel O' is arranged with sufficient looseness to be capable of rotation, yet without any appreciable play lengthwise of the pin K'. The said wheel has an interior screw-thread engaging that of the pin. A pointer Y, secured to the front face of the extension J^6 and indicated by dotted lines in Fig. 5, serves to indicate on the wheel O'.

The pin K' is preferably of larger diameter than the pin K, and the conically-pointed inner ends of the pins are adapted to enter sockets T' at the ends of arms T^2, projected from attachment-plates T, having corner-pieces T^3 to engage the adjacent corners at the top of the frame U, which holds the printing-film V. A flat spring W is secured to the attachment-plate T upon the inside to engage the side of the frame U, and an L-shaped holding member X is pivoted to the plate T at X' in proper position to engage the inner surface of the side member of the frame U. A screw F^6 extends through the lower portion of the plate T and is provided with a head or plate F^7, (similar to the heads F^3 F^5,) adapted to engage the spring W at its free end to clamp the plate T in position upon the frame U.

The operation and capabilities of the apparatus will be obvious from the preceding description. The attachment-plates T are first secured to the corners of the frame or holder U, and the construction of these plates allows of a slight vertical adjustment of the frame U at either side, as it is not absolutely necessary that the lower face of the member X should engage the side bar of the frame. The use of springs W prevents looseness and a marring of the frame U by the screw F^6. The supports I I' being clamped in proper position on the cross-bar H, the socket T' at the left-hand side of the frame is engaged with the pin K and the frame is pushed toward the left (the spring S allowing the pin K to yield) until the right-hand socket T' can be engaged with the end of the pin K'. The frame U is now capable of a pivotal movement on the axis of the pins K K'. To adjust the frame laterally—that is, lengthwise of the cross-bar H—the wheel O' is turned, thus shifting the pin K', and with it the frame U, the pin K following such movement, since the spring S keeps it in contact with the arm T^2 of the plate T. To adjust the frame forward or rearward—that is, toward or from the cross-bar H—the wheels O are manipulated, (of course both wheels should be turned to the same division,) which causes the frame J to slide forward or rearward, changing the position of the pins K K' correspondingly. The screw adjustment allows the frame to be shifted very accurately and minutely. The adjustability of the supports I I' on the cross-bar H makes the apparatus suitable for use with film-frames of different widths. The length of the bar H is sufficient to enable it to be used in connection with tables B of different widths. The pivotal connection of the plates G with the standards D allows the bar H to be placed obliquely instead of straight across, if desired, while the vertical adjustability of the plate G allows the film-frame U to be brought to the proper level relatively to the impression-surface C. The construc-

tion of the standards D as slides adjustable forward and rearward on the guide-bars A also enables the bar H to be placed at various angles to the table B and to be shifted forward or backward, as may be desirable.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. An apparatus of the class described, comprising a support or table provided with guides extending from front to rear, sliding standards movable along said guides, means for clamping the standards in position, holding-plates pivotally connected with the standards at the top, a cross-bar carried by said holding-plates, and supports carried by the cross-bar and constructed to hold a printing-frame.

2. An apparatus of the class described, comprising a support or table provided with guides extending from front to rear, sliding standards movable along said guides, each standard having at one side an elongated bearing member, and at the other side a centrally-located clamping member, a cross-bar connecting the upper portions of said standards, and supports carried by the cross-bar and constructed to hold a printing-frame.

3. An apparatus of the class described, provided with standards attachable to a table or equivalent support, a cross-bar connecting said standards, supports carried by said cross-bar, a slide-frame movable on each support transversely of the cross-bar and provided with an arm extending transversely of the cross-bar, the slide-frame and its arm each having a bearing, an adjusting-shaft journaled in the support and passing through the bearings of the slide-frame, having an adjusting engagement therewith, and pivot-pins extending lengthwise of the cross-bar and carried by the said slide-frames to hold a printing-frame.

4. An apparatus of the class described, provided with standards attachable to a table or equivalent support, a cross-bar connecting said standards, supports carried by said cross-bar, a slide-frame movable on each support transversely of the cross-bar and provided at its center with an arm extending transversely of the cross-bar, the slide-frame and its arm each having bearings one of which is smooth and the other screw-threaded, a rotary adjusting-screw journaled in the support and passing through the bearings of the slide-frame, a spring interposed between the slide-frame and the support to keep the threaded bearing in engagement with the screw, and pivot-pins extending lengthwise of the cross-bar and adapted to hold a printing-frame, said pivot-pins being carried by the said slide-frames, one of them yieldingly, and the other adjustably for movement toward or from its mate.

5. An apparatus of the class described, provided with standards attachable to a table or equivalent support, a cross-bar connecting said standards, supports carried by said cross-bar and provided with alining pivot-pins, attachment-plates having sockets for the reception of said pivot-pins, an arm pivotally connected with each attachment-plate and adapted to engage the inside of a printing-frame member, and a clamping device carried by said attachment-plate.

6. An apparatus of the class described, provided with standards attachable to a table or equivalent support, a cross-bar connecting said standards, supports carried by said cross-bar and provided with alining pivot-pins, attachment-plates having sockets for the reception of said pivot-pins, an arm pivotally connected with each attachment-plate and adapted to engage the inside of a printing-frame member, a spring extending lengthwise of the attachment-plate and adapted to engage the outside of said printing-frame member, and a clamping device carried by said attachment-plate and arranged to engage said spring.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

BENJAMIN DAY.

Witnesses:
JOHN LOTKA,
EVERARD BOLTON MARSHALL.