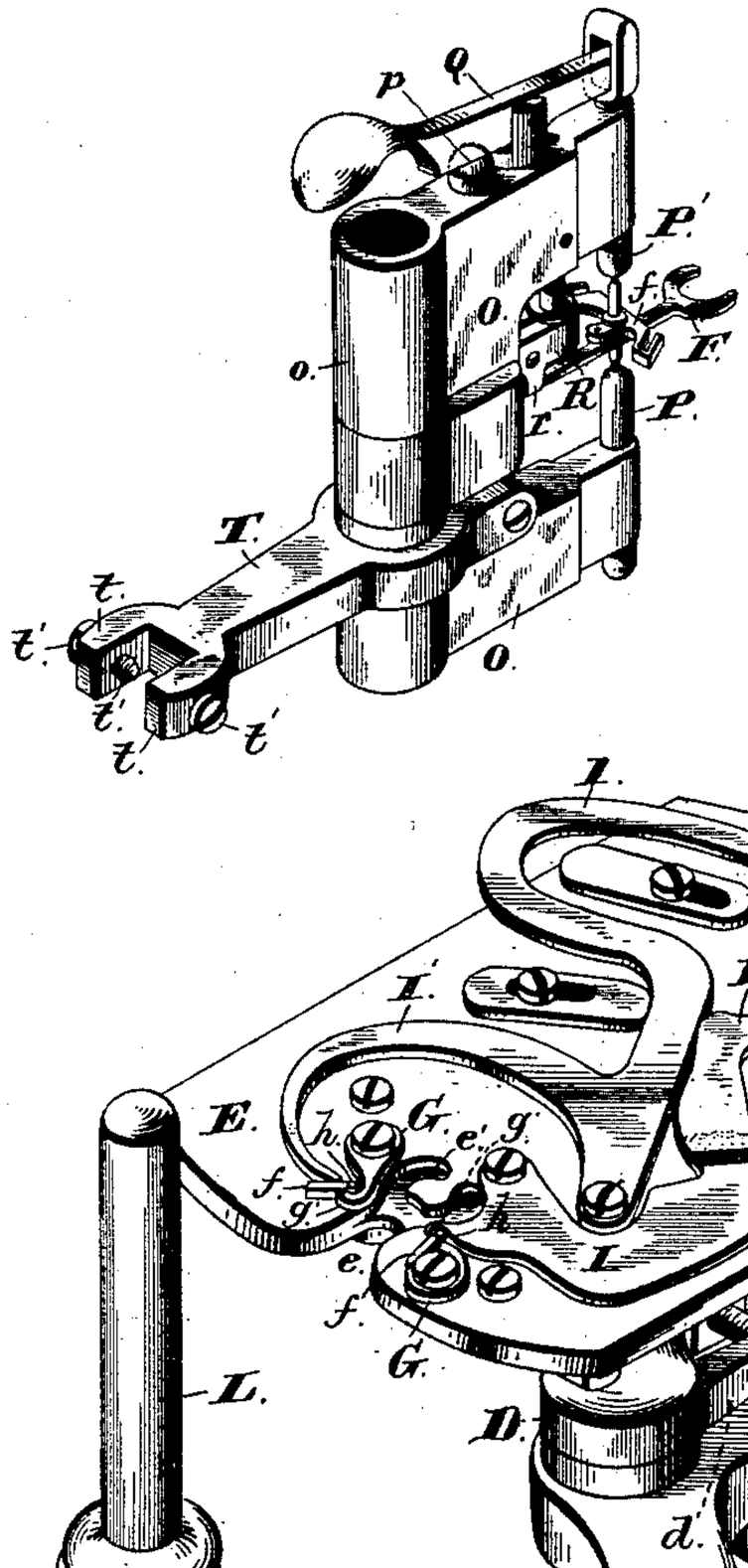
(No Model.) 5 Sheets—Sheet 1.

S. T. J. BYAM

TOOL FOR SETTING PALLET JEWELS.

No. 360,416. Patented Apr. 5, 1887.

Fig. 1.



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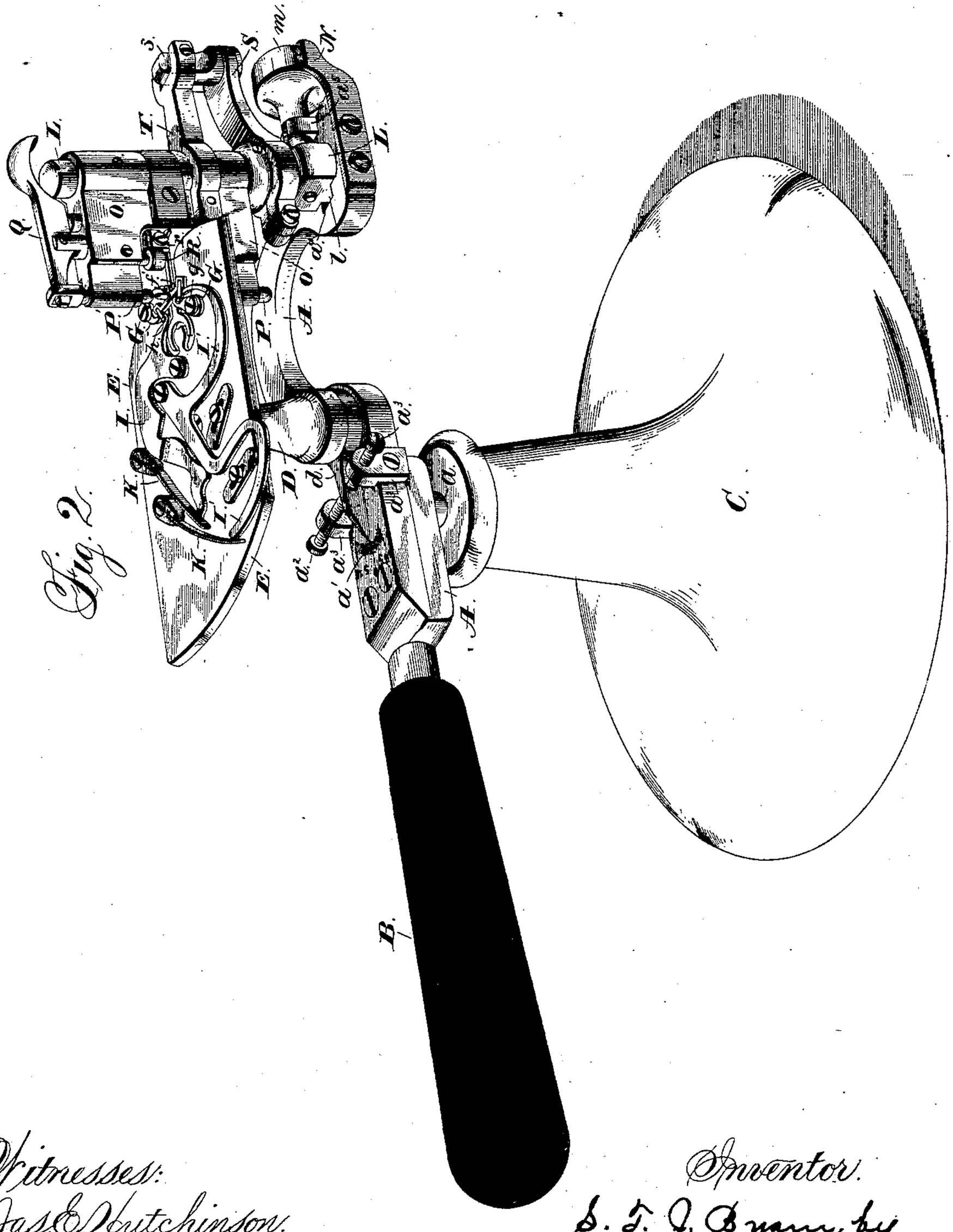

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Fig. 3.

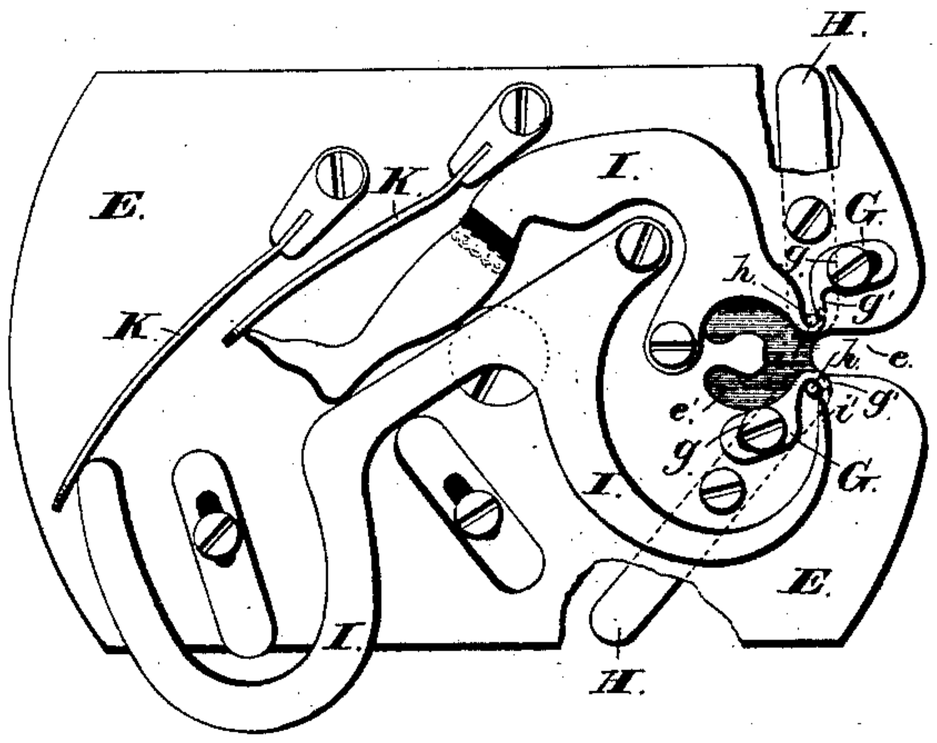
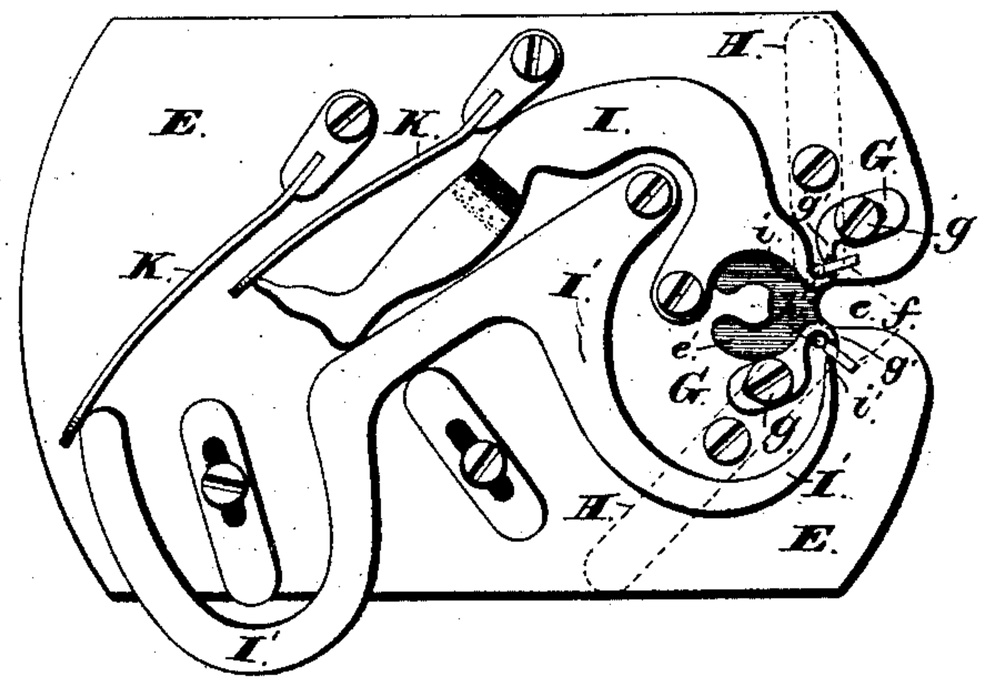


Fig. 4.



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S. T. J. BYAM.

TOOL FOR SETTING PALLET JEWELS.

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Fig. 5.

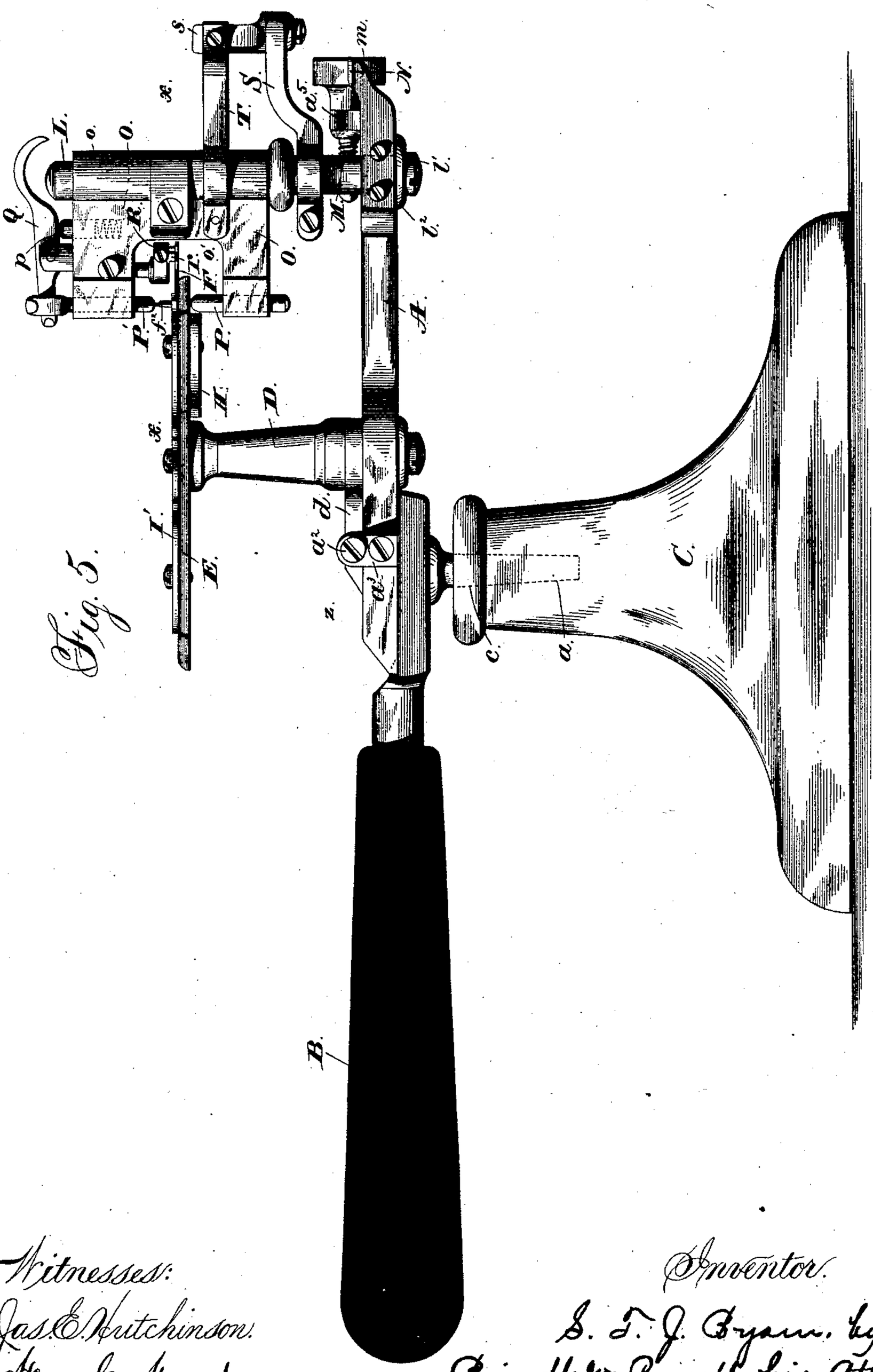

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Fig. 6.

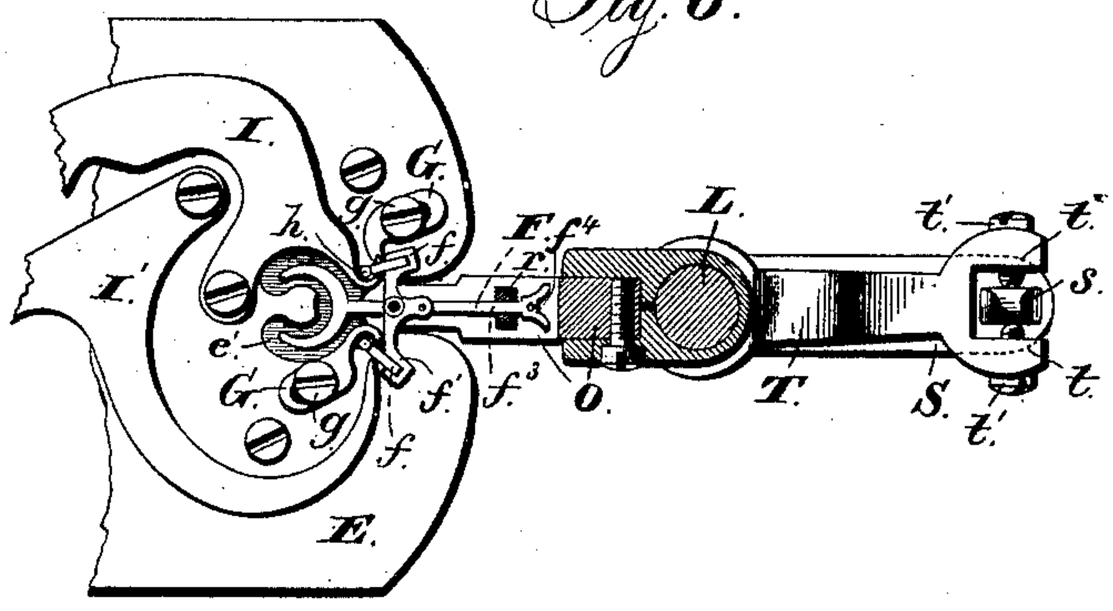


Fig. 7.

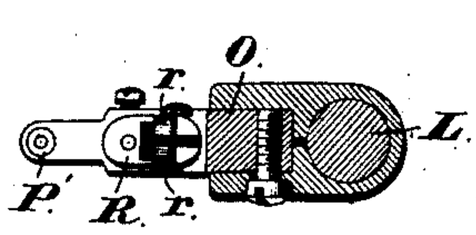
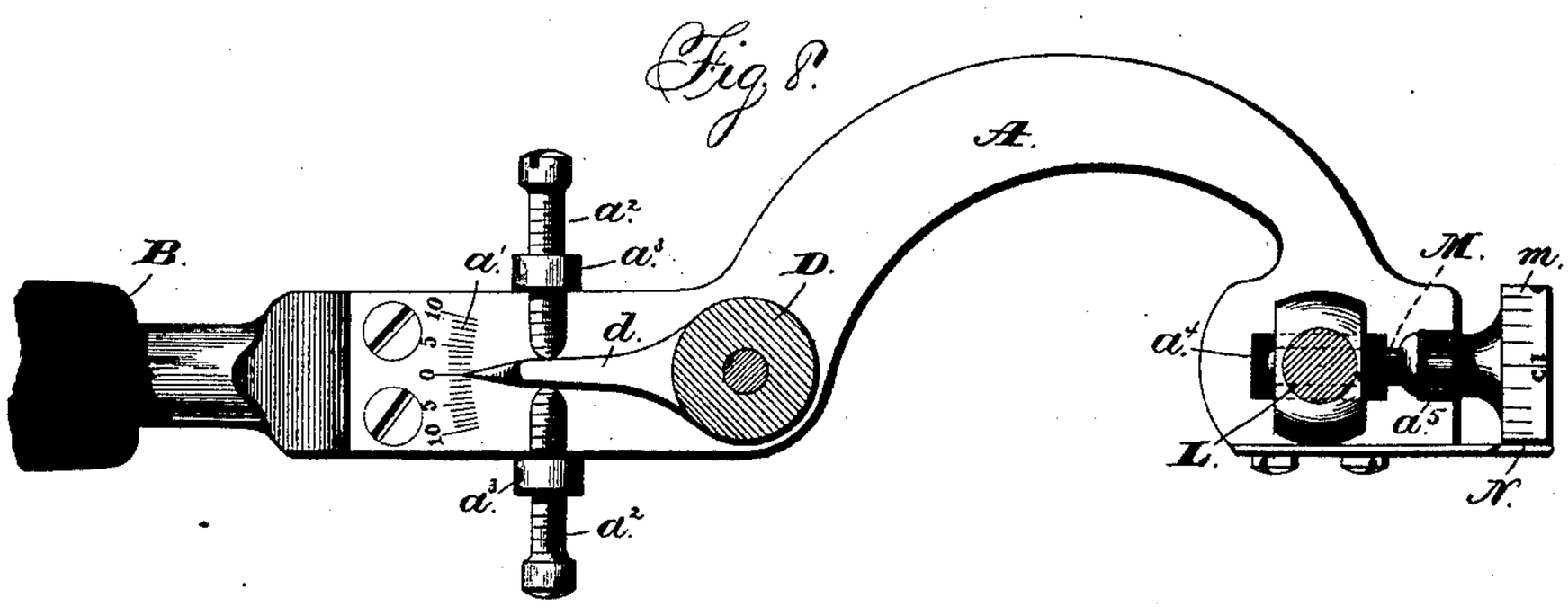


Fig. 8.



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UNITED STATES PATENT OFFICE.

SEWALL T. J. BYAM, OF NEW HAVEN, CONNECTICUT, ASSIGNOR TO THE NEW HAVEN WATCH COMPANY, OF SAME PLACE.

TOOL FOR SETTING PALLET-JEWELS.

SPECIFICATION forming part of Letters Patent No. 360,416, dated April 5, 1887.

Application filed October 28, 1886. Serial No. 217,491. (No model.)

To all whom it may concern:

Be it known that I, SEWALL THOMAS JEFFERSON BYAM, of New Haven, in the county of New Haven, and in the State of Connecticut, have invented certain new and useful Improvements in Tools for Setting Pallet-Jewels; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, in which—

Figure 1 is a perspective view of the parts of my tool separated from each other. Fig. 2 is a like view of the same combined for use. Figs. 3 and 4 are plan views of the jewel-holder, and show, respectively, the arrangement of parts before and after the jewels are clamped in position therein. Fig. 5 is a side elevation of the tool when containing pallet lever and jewels. Fig. 6 is a section of the pallet-holder upon line *x x* of Fig. 5, and a plan view of the jewel-holder, looking downward. Fig. 7 is a like view of said pallet-holder, looking upward; and Fig. 8 is a section upon line *z z* of Fig. 5, looking downward.

Letters of like name and kind refer to like parts in each of the figures.

In the manufacture of watches it has heretofore been and is now customary to cement each jewel within its pallet in a position approximately correct, and then, by one or more changes of position, to secure such accuracy as is obtainable; but as the cement employed for fastening the jewel (shellac) can only be softened by heat, the operation described is very difficult and the perfect adjustment of a jewel usually requires a considerable amount of time and work.

To obviate such difficulty and to enable pallet-jewels to be easily, perfectly, and cheaply secured in position is the design of my invention, which invention consists, principally, in a mechanism in which are combined clamping devices that are adapted to engage with and independently lock each of two pallet-jewels in certain predetermined relative positions, substantially as and for the purpose hereinafter specified.

It consists, further, in a mechanism in which are combined spring-actuated automatic clamping devices that are adapted to engage with the arbor-pivots of an escape-lever, and an adjustable centering device which is adapted to engage with the tail of the lever when its arbor-pivots are thus engaged, and thereby hold said lever in a predetermined position with relation to the frame of the mechanism, substantially as and for the purpose hereinafter shown.

It consists, further, in a mechanism in which are combined clamping devices for securing two pallet-jewels in relative position upon a supporting plate or table, a holder that is adapted to engage with the arbor-pivots and tail of an escape-lever, and means whereby said lever-holder may be moved downward with reference to said jewel-supporting plate and its pallets caused to pass over and automatically assume correct positions with relation to said jewels, substantially as and for the purpose hereinafter set forth.

It consists, further, in the means employed for varying the relative positions of the jewel-holding clamps, substantially as and for the purpose hereinafter shown and described.

It consists, further, in the means employed for varying laterally the position of the jewel-clamping devices with reference to the lever-holding device, substantially as and for the purpose hereinafter specified.

It consists, further, in the means employed for varying laterally the position of the lever-holding device with relation to the jewel-clamping devices, substantially as and for the purpose hereinafter shown.

In the carrying of my invention into practice I employ a bar, A, which, preferably, has the general form shown in Fig. 8, and at one end is provided with a handle, B. Said bar is intended for use as the supporting-frame of my mechanism, and at a point near its said handle is provided with a tapering pin, *a*, that projects from its lower side downward, as seen by the full and dotted lines of Fig. 5. Said pin corresponds to and is adapted to be placed within a vertical opening, *c*, which is provided in the upper end of a base, C, in which event it operates to hold said bar in a horizontal position.

Pivoted within the upper side of the bar A, a short distance in front of the pin *a*, is the

lower end of a post, D, that from thence extends upward about one inch, and upon its upper end has secured a plate, E, which plate has, preferably, in plan view a general rectangular form with curved ends and is arranged with its upper face at a right angle to the axis of said post.

The plate E is intended to occupy a position with its longitudinal axis in a line substantially with the straight portion of the frame-bar A, and in order that such position may be varied, for reasons hereinafter given, the post D is provided with an arm, *d*, that extends from its lower portion rearward over the upper side of said frame-bar, and has its rear end pointed. Beneath the pointed end of said arm a scale, *a'*, is formed upon said bar A, and upon each side of said arm, near its said end, is a screw, a^2, which passes inward through a lug, a^3, that projects upward from the side of said frame-bar. As thus arranged, by moving one of said screws outward and the other inward the rear end of said arm *d* will be correspondingly moved, and the post D and said plate E turned in the same direction.

Within the front end of the plate E is formed a V-shaped notch, *e*, with a rounded inner end, and immediately in front of the same, within the face of said plate, is cut an annular recess, *e'*, which has a length of about three-fourths of a circle, and is adapted to receive and contain the pallet end of an escape-lever, F. Upon each side of the notch *e'* there is secured upon the face of the plate E a gage, G, which has, preferably, the shape shown in Figs. 3 and 4 and is adapted to be swung upon its pivotal binding-screw *g*, so as to vary the position of its inner engaging end, *g'*. Immediately adjacent to the engaging end *g'* of each of said gages is an opening in said table which contains a pin, *h*, that projects upward through the same from one end of a bar, H, which bar is pivoted upon the lower face of said table. The size of the openings is such as to enable said pins, which also act as gages, to be moved within the necessary limits by the swinging of their said bars upon their pivot binding-screws.

Each pair of gages is intended for use with one of the jewels of an escape lever, the gage *g'* being adapted to engage with the locking-face of its jewel *f*, while the gage *h* engages with the end or impulse face of the same, and said pairs of gages have such relative positions as to cause the jewels when thus engaged to have the precise relative positions which they would occupy when secured in a lever.

The jewels *f* and *f* are locked in position against their gages by means of two levers, I and I', which, preferably, have the forms shown in Figs. 3 and 4, and, by means of springs K and K, have their ends *i* and *i'* held with a yielding pressure in engagement with said jewels, as seen in Fig. 4. When thus held between said gages and levers, the portion of each of said jewels which is to be contained within the pallet *f'* of the escapement is unobstructed, so that said pallets may be readily placed in position over said jewels, as hereinafter shown.

The front end of the frame-bar A is provided with a vertical slot, a^4, which is elongated in a line with the longitudinal axis of said bar and contains the tenoned end *l* of a post, L, that is correspondingly shaped, so as to enable said post to be moved lengthwise of said slot, but not to rotate within the same. The shoulder which constitutes the upper end of said tenon rests upon the upper side of said bar A, while a screw, *l'*, and washer l^2 upon its lower end operate to confine said post in place without interference with its freedom of movement lengthwise of said slot.

The adjustment of the post L lengthwise of the frame-bar A is effected by means of a screw, M, which has its threaded body contained within a correspondingly-threaded opening in said post, and near its head *m* is journaled horizontally within a lug, a^5, that is provided upon the upper side at the front end of said bar, the arrangement being such that by the rotation of said screw said post may be moved in either direction, as desired. In order that the amount of such motion may be accurately determined, the periphery of said screw-head *m* is graduated, and a pointer, N, is arranged in close proximity to the same.

Fitted upon the post L is a sleeve or barrel, *o*, which is formed at one end of a block, O, that has, preferably, the form in side elevation shown in Figs. 1 and 5, and within its opposite end is provided with a recess, *o'*, which vertically has about one-half the height of said block, and horizontally extends from said end about one-half way to its opposite end.

Within the rear end of the block O are two centers, P and P', which are arranged vertically in the same axial line. The lower center, P, is stationary, while the upper center, P', is adapted to be moved longitudinally, and may be so moved by means of a lever, Q, that is pivoted centrally upon the upper edge of said block and has one of its ends in engagement with the upper end of said center. By depressing the free end of said lever, said center P' will be raised, while upon releasing said lever a spring-actuated stud, *p*, beneath its said free end will move the latter upward and cause its opposite end to be depressed, so as to move said center to the lower limit of its motion.

The inner contiguous ends of the centers P and P' are adapted to receive and engage with the pivots of the arbor f^2 of the escape-lever F, so as to hold the latter in a horizontal position, as shown in Fig. 5, and in order that said lever when thus held may be centered or caused to occupy a position in a line with the longitudinal axis of the straight portion of the frame-bar A, its forked end or tail is engaged by two jaws, *r* and *r*, that project downward from a gage, R. Said gage is made vertically adjustable upon or within the frame-block O, while its said jaws are relatively adjustable and are adapted to grasp the neck f^3 of said

lever-tail. If desired, said gage may be adapted for engagement with the roller-jewel slot f^4, instead of said neck, for the purpose of centering said lever.

The lever-holding frame O is centered, when placed upon and moved downward over the post L, by an arm, S, which is secured upon and projects forward from near the lower end of said post, and at its outer end is provided with a flat stud, *s*, that projects vertically upward, with its flat parallel faces in a line with the longitudinal axis of the straight portion of the frame-bar A and its upper end rounded or made wedge-shaped.

From the front end of the frame-block an arm, T, projects forward, as shown, and at its outer end is bifurcated, so as to adapt its jaws *t* and *t* to pass upon opposite sides of the stud *s* as the frame-block O is moved downward over the post L. A set-screw, *t'*, passing horizontally inward through each of said jaws, has its inner end in engagement with the contiguous side of said stud, and, in connection with the opposite screw, *t'*, furnishes means whereby said frame-block may be adjusted circumferentially upon said post.

In the use of my apparatus the escape-lever-holding portion is removed and a lever placed in position within the same, after which two pallet-jewels are placed within the clamping devices and said lever-holder then placed upon and moved downward over its post, when, as it reaches the lower limit of its motion, the slotted pallets *f'* will pass over said jewels and rest upon the supporting-plate. A pellet of shellac is now placed upon each pallet and melted, and then permitted to harden by cooling, when it will be found that each of said jewels occupies the precise predetermined position with relation to the other jewel and to the parts of said escape-lever, and that no further adjustment is required.

As the parts of my mechanism when once adjusted will perform their offices in precisely the same way upon any desired number of escape-levers and jewels, no special skill is required for such work, and the same may be done by the most ordinary class of operatives, while for the setting of pallet-jewels by means or methods heretofore in use only the most skillful and high-priced labor is available.

Having thus described my invention, what I claim is—

1. A mechanism in which are combined clamping devices that are adapted to engage with and independently lock each of two pallet-jewels in certain predetermined relative positions, substantially as and for the purpose specified.

2. A mechanism in which are combined spring-actuated automatic clamping devices that are adapted to engage with the arbor-pivots of an escape-lever and an adjustable centering device which is adapted to engage with the tail of the lever when its arbor-pivots are thus engaged, and thereby hold said lever in a predetermined position with relation to the frame of the mechanism, substantially as and for the purpose shown.

3. A mechanism in which are combined clamping devices for securing two pallet-jewels in relative position upon a supporting plate or table, a holder that is adapted to engage with the arbor-pivots and tail of an escape-lever, and means whereby said lever-holder may be moved downward with reference to said jewel-supporting plate and its pallets caused to pass over and automatically assume correct positions with relation to said jewels, substantially as and for the purpose set forth.

4. In combination with clamping devices for holding the pallet-jewels, the means for supporting and varying the position of the pin used for gaging the end of each pallet-jewel, consisting of a bar which has said pin secured within one of its ends and is pivoted centrally upon the lower face of the clamp-supporting bed, substantially as and for the purpose shown and described.

5. As a means for varying the relative positions of the escape-lever and jewel-holding mechanisms, and in combination therewith, a supporting-post which at its upper end is secured to the bed of the jewel-clamping devices and at its lower end is pivoted within the main frame, an arm that is attached to and extends radially from said post, and two set-screws which are adapted to engage with opposite sides at the outer end of said arm, substantially as and for the purpose specified.

6. In combination with the frame of the escape-lever-holding device, which is adapted to fit over and upon a round supporting-post, an arm that is secured to and projects radially from said frame and at its outer end is bifurcated and provided within its forks with two oppositely-arranged set-screws, and a relatively-fixed stud which projects upward from the main frame and is adapted to be engaged by the inner ends of said set-screws, substantially as and for the purpose shown.

In testimony that I claim the foregoing I have hereunto set my hand this 27th day of September, A. D. 1886.

SEWALL T. J. BYAM.

Witnesses:
JOHN T. SLOAN,
LEWIS J. MULFORD.