Aug. 13, 1940. C. L. HENDERSON 2,211,566

WORK SQUARING TABLE

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Fig. 1

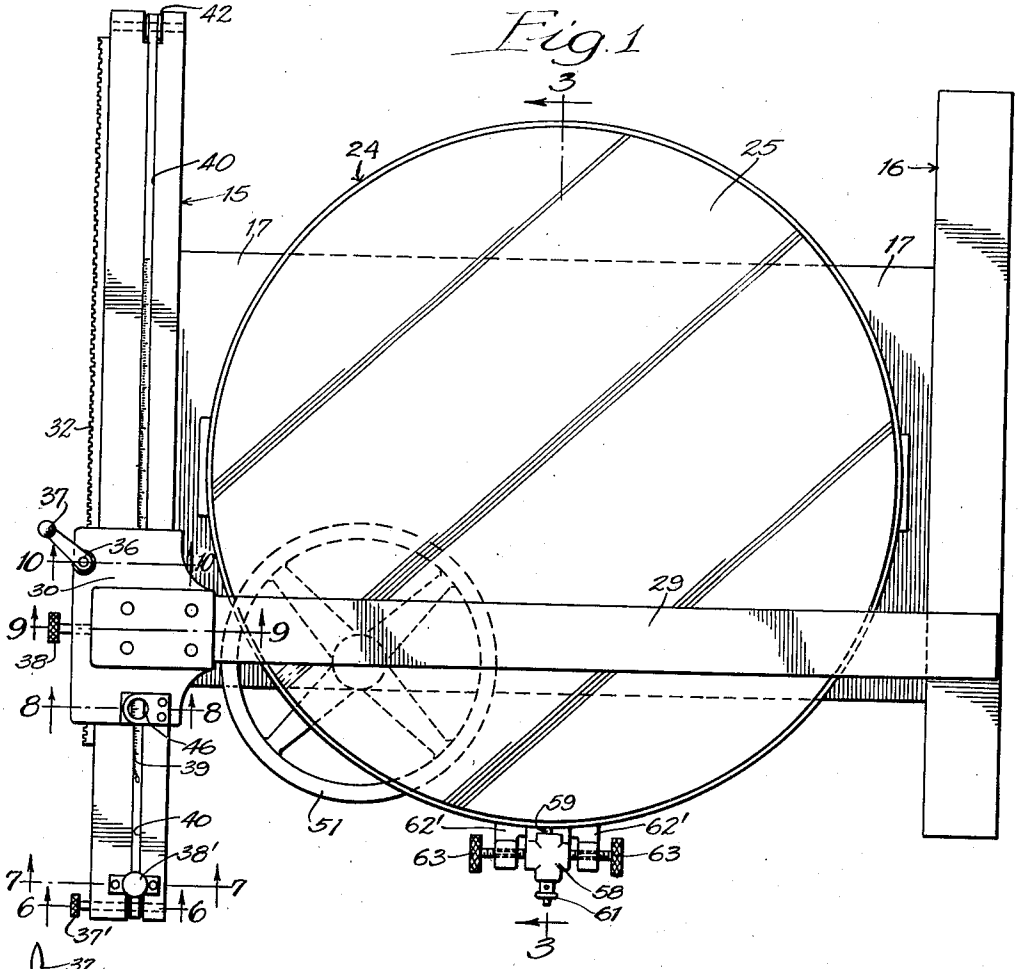
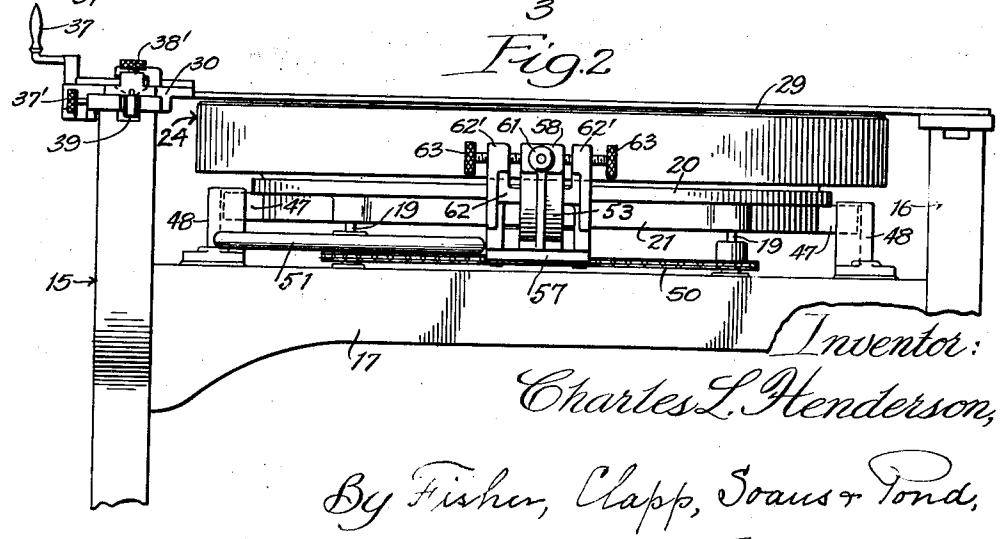


Fig. 2



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WORK SQUARING TABLE

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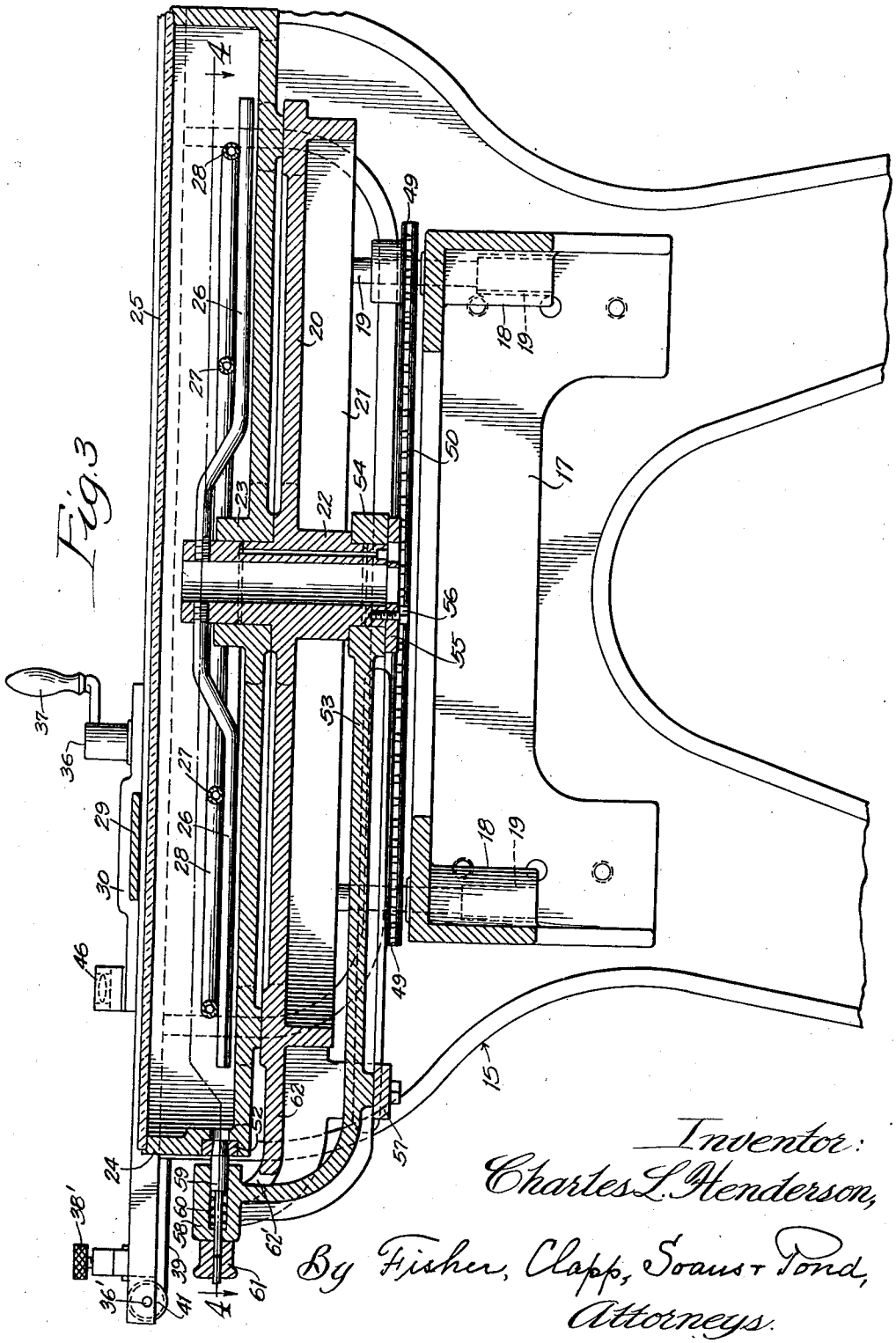


Fig. 3

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WORK SQUARING TABLE

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Fig. 4

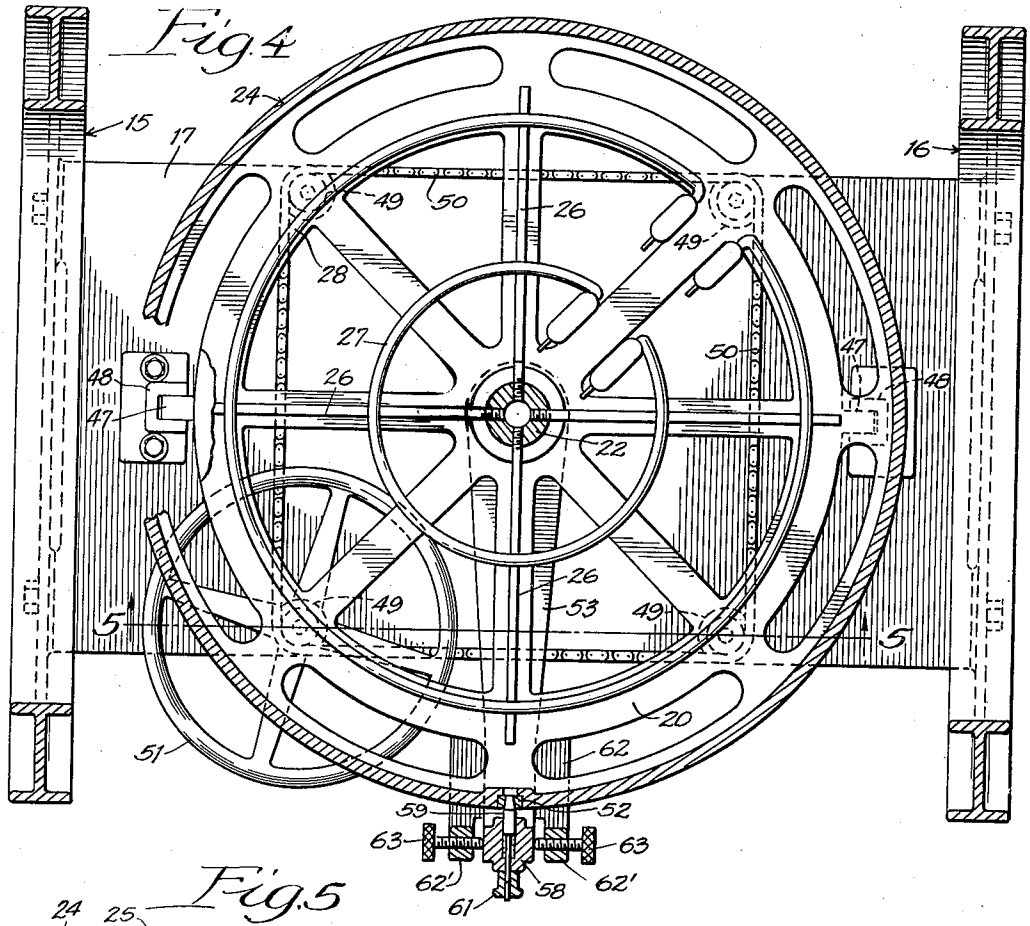
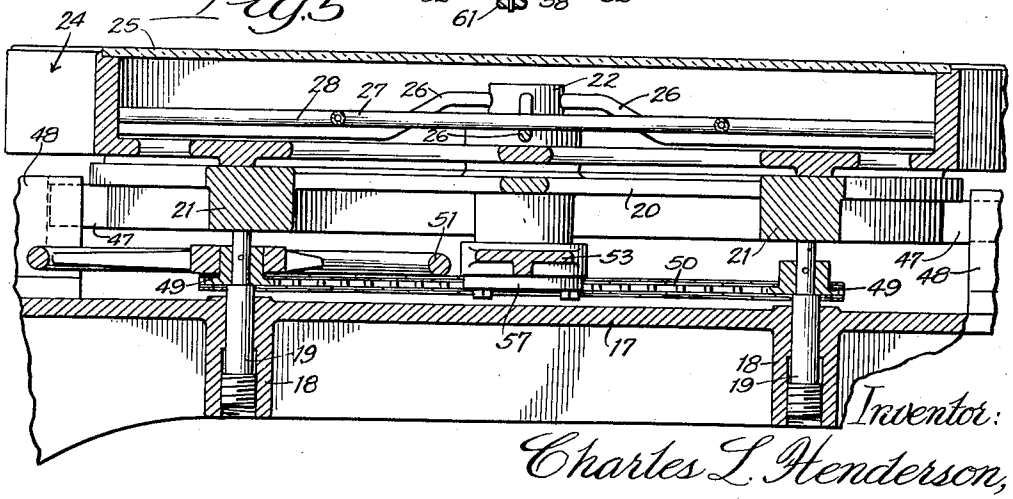


Fig. 5



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WORK SQUARING TABLE

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Fig. 6

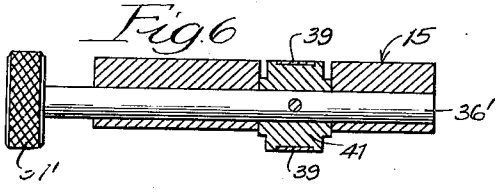


Fig. 7

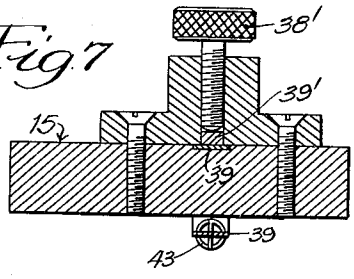


Fig. 10

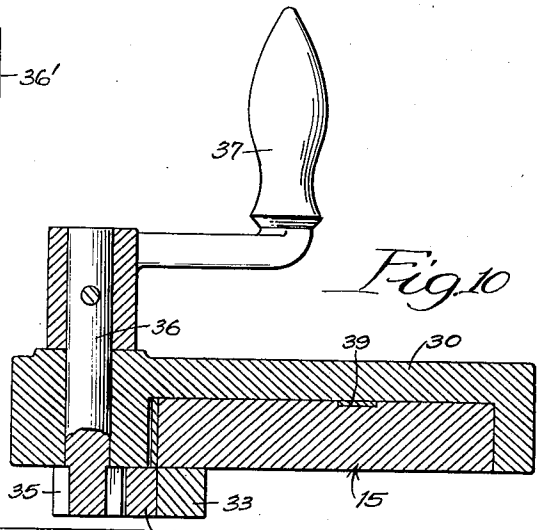


Fig. 8

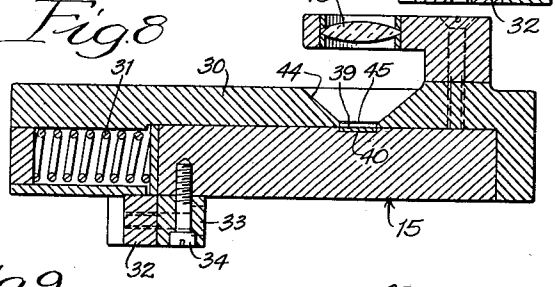


Fig. 9

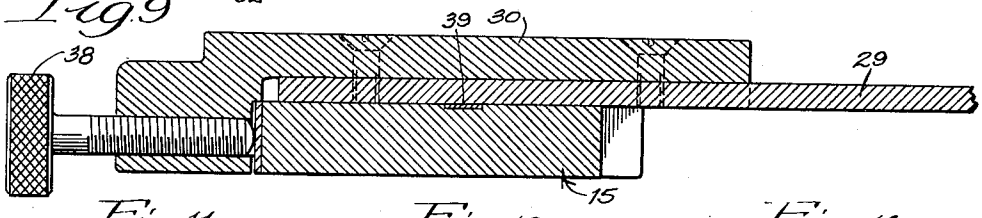


Fig. 11

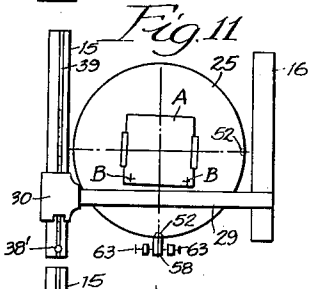


Fig. 13

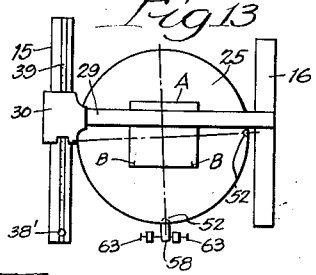


Fig. 14

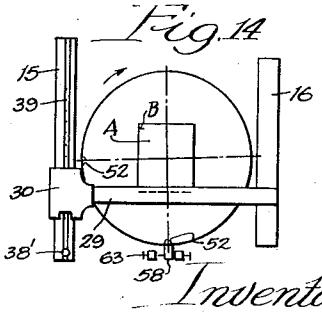
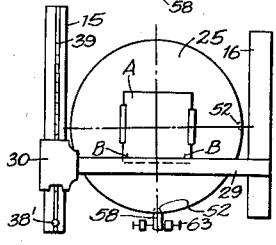


Fig. 12



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Patented Aug. 13, 1940 2,211,566

UNITED STATES PATENT OFFICE

2,211,566

WORK SQUARING TABLE

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Application December 15, 1938, Serial No. 245,849

6 Claims. (Cl. 33—78)

This invention relates to tables used for squaring work of various sorts, and has been designed by me more particularly for use in trimming and squaring photographic films prior to mounting them on a glass plate for subsequent photographing onto the sensitized surface of a printing roll.

The general object of the invention has been to facilitate and expedite the work of transferring photographic positives onto a glass plate through the provision of improved means for trimming and squaring the films to the desired size and rectangular form. More specific objects have been to provide an apparatus for this purpose characterized by a high degree of accuracy, freedom from danger of damage to the film during manipulation, relative immobility of the film support and the straight edge during the cutting operation, capability of cutting the four edges with a measured shift of the straight edge in a rectilinear direction only, and a high degree of visibility. Other objects and attendant advantages will be apparent to those skilled in the art from the following detailed description of one practical and approved embodiment of the invention shown in the accompanying drawings, in which—

Fig. 1 is a top plan view.

Fig. 2 is a front elevation, with a portion of the frame broken off.

Fig. 3 is an enlarged diametric section on the line 3—3 of Fig. 1.

Fig. 4 is a plan section on the line 4—4 of Fig. 3.

Fig. 5 is an enlarged vertical section on the line 5—5 of Fig. 4.

Figs. 6, 7, 8, 9 and 10 are enlarged vertical sections on the lines 6—6, 7—7, 8—8, 9—9 and 10—10 respectively of Fig. 1.

Figs. 11, 12, 13 and 14 are diagrams illustrating the method of squaring and cutting a film on four sides thereof.

Referring to the drawings, the frame of the apparatus comprises parallel upright side frames 15 and 16 and a bed plate 17 rigidly connecting and spacing the side frames. In the four rectangularly spaced internally threaded sockets 18 (Figs. 3 and 5) of the bed plate 17 are mounted vertical screws 19, on the upper ends of which rests a circular table supporting member 20, this latter being formed with a depending annular flange 21 that rests on the top of the screws 19. This table supporting member 20 is formed with a central hollow hub 22, on the upper portion of which is rotatably mounted the hub 23 of a hollow work supporting table designated as an entirety by 24. The top wall 25 of the table is of glass or other rigid translucent material. Mounted in the hub 22 is a spider comprising four radial arms 26 that support inner and outer circular helium lights 27 and 28 (Fig. 4).

Overlying the table top 25 is a straight edge 29, preferably taking the form of a T-square, the head 30 of which is slidably engaged with and guided by the top horizontal limb of the side frame 15, in the manner clearly shown in Figs. 8, 9 and 10. The other end of the straight edge 29 rests upon and slides over the top horizontal limb of the other side frame 16, as clearly shown in Fig. 1. As shown in Fig. 8, a thrust spring 31 housed in the outer depending flange of the head 30 maintains the latter in snug sliding engagement with the frame top 15, thereby maintaining the straight edge 29 always at exactly right angles to the side frames 15 and 16.

The straight edge 29 is bodily shiftable in a rectilinear path and in the direction of its width over the table top 25, a simple means for effecting such movement of the straight edge comprising a rack bar 32 attached to a strip 33 that is secured to the underside of the top member of frame 15 as by screws 34, (Figs 8 and 10) and a pinion 35 (Fig. 10) engaged with said rack bar and itself mounted on the lower end of a shaft 36 journaled in the head 30, and a crank 37 fast on the upper end of shaft 36. The head 30 is locked rigid with its support in any adjusted position by a clamp screw 38 (Fig. 9).

To measure the distance between different positions of the straight edge 29 on the work, such as a photographic positive to be trimmed, a scale, herein shown as taking the form of a tape 39 is slidably mounted in a shallow channel 40 in the top horizontal limb of the side frame 15, said tape being guided over pulleys 41 and 42 at the ends of the support 15 and its ends being connected by a coil spring 43 to maintain the tape under tension. To shift the tape one of the pulleys, as 41, is keyed to a shaft 36′ (Fig. 6) equipped with a knob 37′ for turning the same. A clamp screw 38′ (Fig. 7) acting through a block 39′ locks the scale tape in any set position. As shown in Fig. 8, a conical sight hole 44 is formed through the head 30 directly over the tape 39 and is equipped with a cross hair 45 that can be brought into vertical register with any mark on the scale. To improve the visibility, magnifying lens 46 is mounted on the head 30 directly over the sight hole 44.

Referring once more to the table supporting member 20, this member is non-rotatable but ca-

pable of vertical adjustment by the screws 19. It is locked non-rotatable and guided in its vertical movements by means of diametrically opposed radial lugs 47 on its periphery (Fig. 2) slidably engaged with grooved lugs 48 mounted on the bed plate 17. The purpose of making the table support 20 vertically movable is to prevent any rubbing and possible scratching of the film or other work on the table top 25 through contact with the straight edge 29 when either shifting the latter over the negative or rotating the table beneath the straight edge; this being accomplished by lowering the table to carry the work out of contact with the straight edge. The means for raising and lowering the table herein shown consists of sprocket wheels 49 keyed on screws 19, a sprocket chain 50 encircling the group of sprocket wheels (see Fig. 4), and a hand wheel 51 keyed to the hub of one of the sprockets 49. By this means all four of the screws are simultaneously and equally raised or lowered.

The apparatus also includes a means for locking the work supporting table against rotation, and associated therewith is a device by which certain marks on the film designating a cutting edge (usually the base edge) may be brought into exact parallelism with the straight edge 29 when the latter is moved to the cutting position. Describing these features, the periphery of the table is formed with two locking holes or notches 52 disposed exactly ninety degrees apart and preferably of conical shape as shown in Fig. 3. 53 designates a radius arm formed with a hub 54 having a bearing on the lower end of the hub 22, the hub 54 being supported by an underlying plate 55 (Fig. 3) attached to the end of the hub 22 as by screws 56. The outer portion of the radius arm 53 extends through and is supported by a hanger 57 depending from the annular flange 21 of the table supporting member 20. Beyond the hanger 57 the radius arm curves upwardly and terminates at its free end in a chambered block 58 in which is slidably mounted a locking pin 59 that is urged by a spring 60 into one of the locking holes 52. By means of a knob 61 on the projecting stem of the pin 59, the latter may be retracted, to permit the table to be given a quarter revolution by hand.

On the periphery of the work supporting table 20 is a radially extending forked arm 62, the two limbs of the fork designated by 62' (see Figs. 2 and 4) straddling with clearance the chambered block 58 of the radius arm 53. In the limbs 62' are mounted opposed adjusting screws 63 the inner ends of which bear on opposite sides of the chambered block 58. By turning up one of the screws 63 and simultaneously backing off the other to an equal extent, the radius arm 53 is shifted angularly to a slight extent, and when the work table is locked thereto by the pin 52, the table, of course, partakes of this slight angular shifting movement.

The manner of manipulating the apparatus for trimming a positive photographic film to an exact rectangular form will be best understood by reference to Figs. 11 to 14 inclusive which diagrammatically illustrate steps in the trimming operation. The photographic positive, indicated by A is laid on the glass top 25 and secured to the latter by gummed tape (not shown). The straight edge 29 is brought up to the cross marks B which indicate the cutting edge. If, as is usually the case and as indicated in Fig. 11, they are not perfectly parallel with the straight edge, they are brought into perfect parallelism by the adjusting screws 63. This is illustrated in Fig. 12. The straight edge is locked immovable by its clamp screw 38 and the tape is moved by turning knob 37' to bring the zero on the tape directly beneath the cross hair 45 under the lens 46, and it is locked in this position by its clamp screw 38'. The edge of the film is then cut. The table top is then lowered by a slight turn of the hand wheel 51 so that the film will not rub on the bottom of the straight edge while the latter is moving, and the straight edge is then moved upwardly to the desired reading on the tape for the next cut parallel with the cut previously made, as shown in Fig. 13, and the hand wheel 51 is again operated in the reverse direction to bring the film up to the straight edge. This second edge is now cut, and the table top lowered. The locking pin is pulled out and the table revolved ninety degrees by hand and the locking pin engaged in the other locking hole or notch. The same operations are then repeated for the other two edges, except that, the film having been preliminarily squared with the straight edge for the cutting of the first or base edge and the top edge, no manipulation of the adjusting screws 63 is necessary before cutting the other two edges.

The hollow hub 22 can be further utilized for the passage of the necessary leads (not shown) to the lights 27 and 28.

By means of the apparatus herein shown and described I have found that it is possible to square film positives very quickly and with an accuracy of less than .003'' tolerance.

Variations and modifications in the structural details may be resorted to without departing from the invention or sacrificing any of the advantages thereof within the scope and purview of the claims.

I claim:

1. In a work squaring table, the combination of a frame, a non-rotatable table-supporting member supported on said frame, a work-supporting table revolubly supported on said table-supporting member, said table having peripheral holes, a straight edge mounted on said frame above said table and bodily shiftable over the latter in a rectilinear path in the direction of its width, an angularly shiftable radius arm carrying a locking pin engageable with said holes, and means mounted on said table-supporting member for effecting angular shift of said radius arm and acting through said locking pin to correspondingly shift said table to bring cutting edge indicating marks on the work into exact register with said straight edge.

2. In a work squaring table, the combination of a frame, a non-rotatable vertically adjustable table-supporting member supported on said frame, a work-supporting table revolubly supported on said table-supporting member, said table having peripheral holes, a straight edge mounted on said frame above said table and bodily shiftable over the latter in a rectilinear path in the direction of its width, an angularly shiftable radius arm mounted on said table supporting member and carrying on its free end a locking pin engageable with said holes, and means mounted on said table-supporting member for effecting an angular shift of said radius arm.

3. In a work squaring table, the combination of a frame, a non-rotatable vertically adjustable table-supporting member supported on said frame, a work-supporting table revolubly sup-

ported on said table-supporting member, said table having peripheral holes, a straight edge mounted on said frame above said table and bodily shiftable over the latter in a rectilinear path in the direction of its width, an angularly shiftable radius arm mounted on said table supporting member and carrying on its free end a locking pin engageable with said holes, a forked arm rigid with said table-supporting member straddling the free end of said radius arm, and opposed adjusting screws mounted in said forked arm and bearing on opposite sides of the free end of said radius arm.

4. In a work squaring table, the combination of a frame, a work-supporting table revolubly mounted on said frame, a straight edge slidably mounted on said frame above said table and bodily shiftable over the latter, means for locking said table in set position against turning, means for locking said straight edge rigid with said frame, and means for raising and lowering said table toward and from said straight edge comprising a group of vertical screws mounted in the frame, a non-rotatable vertically movable member supported on said screws and itself supporting the table, and means for effecting simultaneous and equal turning movements of said screws.

5. In a work squaring table, the combination of a frame, a work-supporting table revolubly mounted on said frame, a straight edge slidably mounted on said frame above said table and bodily shiftable over the latter, means for locking said table in set position against turning, means for locking said straight edge rigid with said frame, and means for raising and lowering said table toward and from said straight edge comprising a group of vertical screws mounted in the frame, a non-rotatable vertically movable member supported on said screws and itself supporting the table, sprocket wheels keyed on said screws, a chain encircling the group of sprocket wheels, and a handle member for turning one of said sprocket wheels.

6. In a work squaring table, the combination of a frame including a top horizontal rectilinear limb formed with a shallow longitudinal channel, a work-supporting table revolubly mounted on said frame, means for locking said table to said frame in positions ninety degrees apart, a T-square overlying said table with its head slidably mounted and guided on said top limb of the frame and formed with a sight hole, an endless measuring tape mounted on said top limb beneath said head with its upper lap in said channel and visible through said sight hole, means for shifting said tape lengthwise and for locking it in shifted position, means for shifting said head lengthwise of said top limb comprising a rack bar secured to and lengthwise of said top limb, a vertical shaft journaled in said head, a pinion on said shaft engaged with said rack bar, and an operating handle on said shaft; and means for locking said head to said frame in shifted position.

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