April 30, 1946. J. WEST ET AL 2,399,610

PRINTER'S LINEUP TABLE

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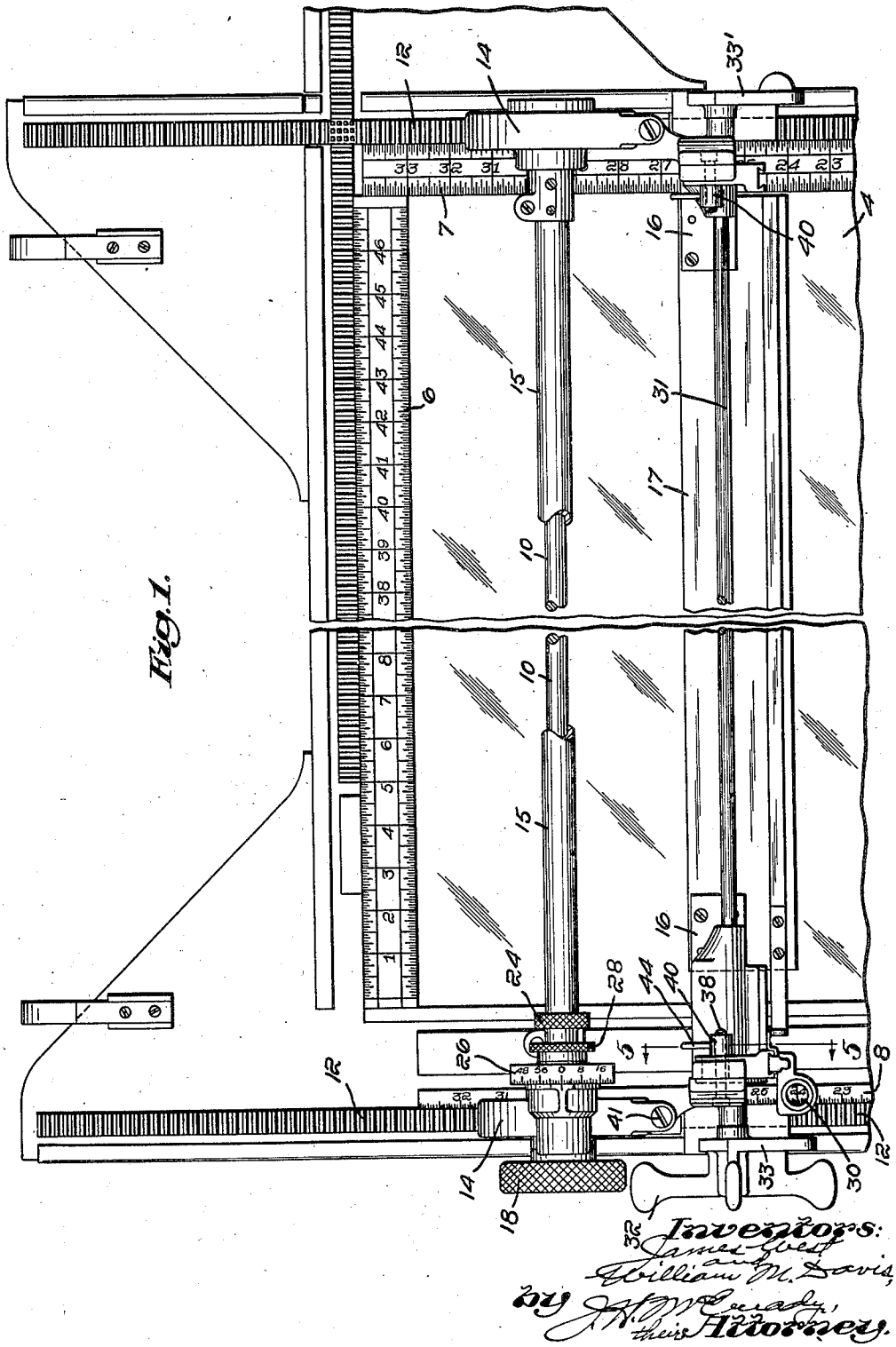


Fig. 1.

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Fig. 2.

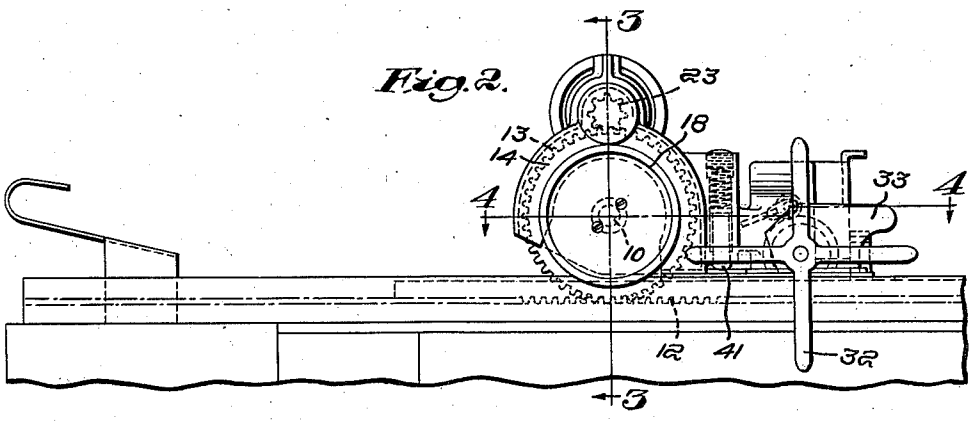
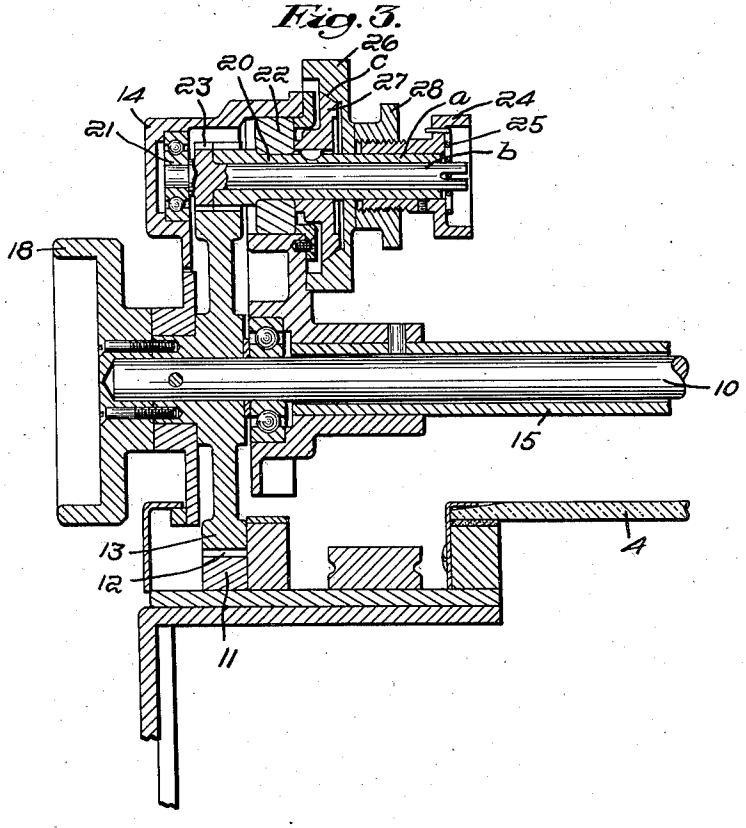


Fig. 3.



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Fig. 4.

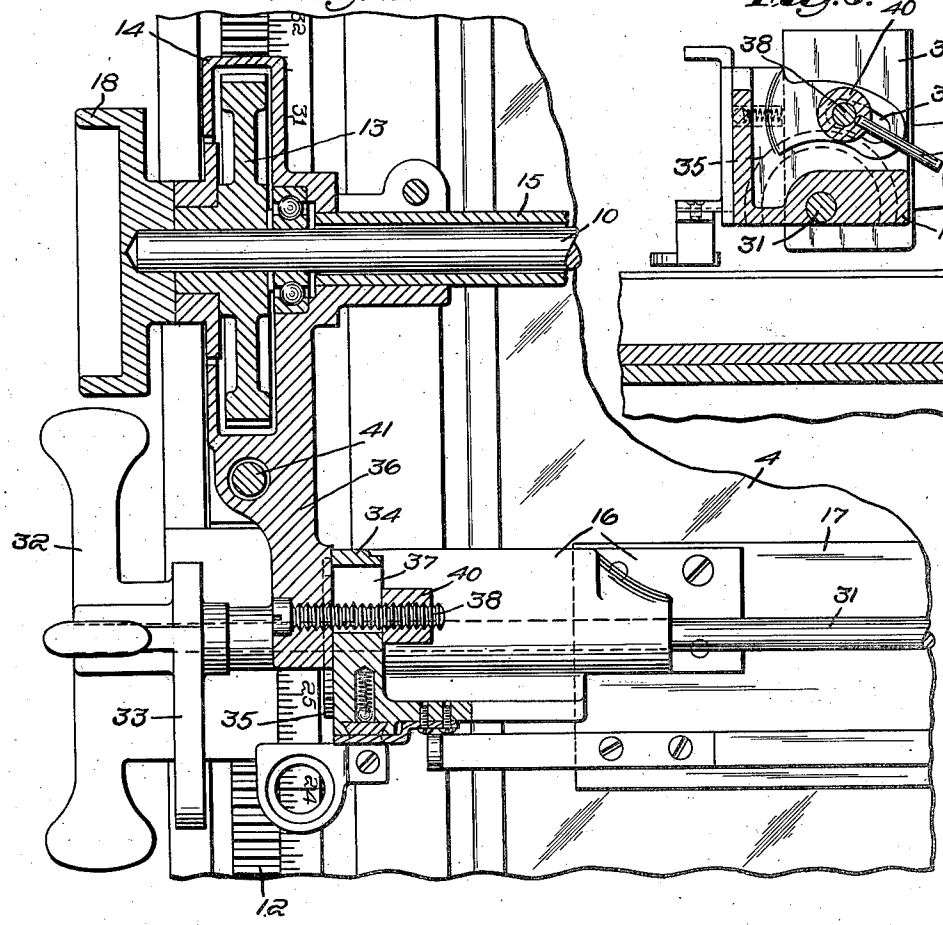


Fig. 5.

Fig. 6.

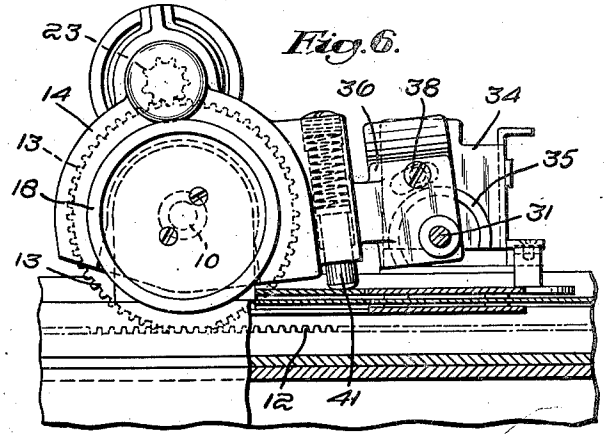
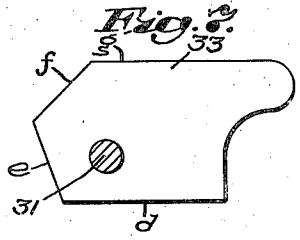


Fig. 7.



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UNITED STATES PATENT OFFICE

2,399,610

PRINTER'S LINE-UP TABLE

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Application May 22, 1942, Serial No. 444,008

5 Claims. (Cl. 33—80)

This invention relates to that class of apparatus used chiefly in the printing trade and commonly known as "lineup tables." They are designed primarily for the purpose of facilitating accuracy in the line-up of the work and precicion register of the copy, although they also find additional uses, particularly in marking or lining the work, scoring negatives, and the like.

The present invention aims to improve tables of this character with a view to facilitating the matter of adjusting the straight edge with extreme accuracy, positioning it for operation on work of different thicknesses, and making these adjustments rapidly but still with precision.

The nature of the invention will be readily understood from the following description when read in connection with the accompanying drawings, and the novel features will be particularly pointed out in the appended claims.

In the drawings:

Figure 1 is a plan view of a portion of a lineup table including features embodying the present invention;

Fig. 2 is an end view of the carriage and adjacent parts;

Figs. 3 and 4 are vertical and horizontal sectional views taken, respectively, on the lines 3—3 and 4—4 of Fig. 2;

Fig. 5 is a vertical, sectional view on the line 5—5, Fig. 1;

Fig. 6 is a side view similar to Fig. 2 but on a larger scale and with some parts eliminated or broken away in order better to illustrate details of construction; and

Fig. 7 is a sectional view through the shaft for lifting the straight edge and illustrating the cam provided for this purpose.

Referring first to Figs. 1 and 2, the table there shown is similar in construction to that illustrated in our earlier Patent No. 2,252,535, except that the tracks on which the two carriages are mounted are arranged in the manner used in the well known Craftsman line-up table. Only one carriage is here shown comprising a shaft 10 having gears secured to its opposite ends to run on the racks 12—12. One of these gears is shown in Fig. 2 at 13. They are enclosed in housings 14—14 and the housings are connected by a sleeve 15 which encircles the shaft 10. Also, the housings are provided with integral extensions on which brackets 16—16 are supported, the straight edge 17 being secured rigidly to the lower sides of these brackets. This straight edge, as usual, is substantially flat, or at least has a flat lower face which engages the work. Because the work is always flat and rests on the flat table top, the plane of the straight edge, when in its working position, is always parallel with said table top. At its left-hand end, Figs. 1 and 3, the shaft 10 has a knob or hand wheel 18 secured thereto so that by turning this knob the carriage can be moved backward and forward on the tracks or racks 12—12. Both the carriage and the straight edge span a table top 4 which customarily is made of transparent material and is supported firmly on the frame of the machine. Scales 6 and 7, Fig. 1, are associated with the table top and another scale 8 lies beside the left-hand rack 12.

So far as the features above described are concerned, the construction is not essentially different from that in the commercial Craftsman table above referred to.

One of the objects of this invention is to provide means for facilitating the quick adjustment of the straight edge 17 while still making such adjustment with an exceptionally high degree of accuracy. For this purpose a counter-shaft 20 is mounted above the carriage shaft 10 in bearings 21 and 22 and it carries a pinion 23 meshing with the gear 13. A knob 24 secured to the end of the shaft provides a convenient means for turning it, thus rotating the gear 13 at a very slow rate and so producing a correspondingly gradual adjustment of the carriage along the racks 12.

In order to eliminate any back lash in the connections between the knob 24 and the gear 13, the pinion 23 is split or divided on a radial plane into two sections and the shaft 20 is made in corresponding sections indicated at *a* and *b*, respectively, Fig. 3. Each of the shaft sections is integral with one of the pinion sections and one shaft section telescopes within the other, as clearly shown in the drawings. At the right-hand end of the shaft of the section *b* it is slotted to receive one end of a torsion spring 25, the other end of which is anchored in the knob 24. This spring is inserted under tension so that it tends constantly to rotate one of the pinion sections relatively to the other and the force so exerted is sufficiently great to prevent any back lash in the engagement of the pinion 23 with the gear 13.

It is desirable to be able to set the adjusting mechanism at a zero position for a major graduation on the scale 8 and to provide means for measuring or indicating the degree of adjustment of the straight edge from such major graduation on a considerably larger scale than is af-

forded by the scale 8 itself. For this purpose a graduated vernier disk 26 is mounted on the shaft 20 for rotation therearound and it is provided with a tapered face *c*, Fig. 3, to engage the correspondingly tapered surface of a disk 27 keyed to the outer member *a* of the shaft 20. These two disks 26 and 27 thus constitute a friction clutch and a knob 28 is threaded on to the shank of the knob 24 where it will back up the disk 26 and will serve to clamp it to its cooperating clutch disk 27 or to release it for adjustment relatively thereto, as desired.

Assuming that it is desirable to make adjustments of the straight edge toward or from a major graduation, or any other selected point on the scale, as for example the graduation "24" on the scale 8, as shown in Fig. 1, the straight edge is first adjusted to that point, the adjustment being read through the magnifying lens 30, Fig. 1, which is secured to the carriage and overlies the scale 8. Then the graduated vernier disk 26 can be released from the shaft 20 by backing up the knob 28, after which the vernier may be set to zero, as indicated in Fig. 1. The knob next is tightened up and thereafter adjustments of the straight edge can be made from this major graduation and can be read on the disk 26 in thousandths of an inch, or in whatever units of measurement the vernier disk is graduated.

This is an important advantage in connection with certain kinds of printing and it is of advantage also in enabling a workman to re-set the straight edge to a given position after the adjustment has been lost for any reason.

In line-up tables designed for some purposes, it is customary to mount the table top so that it can be vertically adjusted toward or from the path of travel of the straight edges. While such adjustment is extremely important for some classes of work, the range of adjustment so provided is not required for others. At the same time there usually must be some provision for accommodating variations in the thickness of the paper, negatives, or other article of work. It is one of the objects of this invention to provide for such adjustment of the straight edge toward and from the table top and thus to avoid the much larger expense of making the table top adjustable.

To this end a shaft or rod 31 extends across the machine through the brackets 16—16 to which the straight edge 17 is secured, and it is equipped with a handle or knob 32 by means of which it may be rotated. A cam 33 used as a carriage supporting member, best shown in Figs. 4 and 7, is formed integral with the knob 32 and is secured fast on the shaft 31, this cam resting on a flat surface at the edge of the table so that by rotating the knob any one of its four faces *d*, *e*, *f* or *g* may be brought into position to support the shaft at a spaced distance above said surfaces. A cam of the same construction is secured on the opposite end of the shaft 31, as shown in Fig. 1 at 33' so that both are operated in unison. Since the cam faces are spaced at different radial distances from the shaft, this arrangement provides for the adjustment of the straight edge about the axis of the shaft 10 into four different angular relations to the table top.

In addition to this provision for making an angular adjustment, means also is provided for adjusting the straight edge relatively to the carriage into different planes parallel to the table top. Referring to Figs. 4, 5 and 6, it will be seen that the left-hand bracket 16, Fig. 1, is provided with an upright plate-like member 34 having a laterally extending arcuate rib 35 curved about the axis of the shaft 31 and fitting slidably in a correspondingly shaped groove formed in an upright abutting face of a portion 36 of the carriage. Also formed in the part 34 is an arcuate slot 37 curved about the axis of the shaft 31 and a threaded stud 38, anchored in the part 36, projects through this slot. A nut 40 threaded on it and provided with a handle 44 serves to clamp the part 34, and consequently the bracket 16, to the adjacent portion 36 of the carriage. The same construction is provided at the opposite end of the carriage, as shown in Fig. 1.

A typical use of this adjustment occurs in setting the straight edge initially to a new piece of work, say a negative. The operator loosens the nuts 40—40 at opposite ends of the straight edge and turns the knob or handle 32 to lower said straight edge into direct contact with the work piece. It automatically adjusts itself to a flat position on the work moving around the axis of the shaft 31 for this purpose. The operator then locks the straight edge in this position by tightening the nuts 40—40. Thereafter when he wishes to move the straight edge over the surface of the work he lifts it by means of the handle or knob 32, and lowers it again when it is in the proper position. A spring pressed plunger 41, Fig. 6, is mounted in the carriage member 36 where it will bear on a part of the frame when the straight edge is lowered and act as a shock absorber. Another plunger is similarly located at the opposite end of the straight edge. By this means the straight edge may be adjusted quickly and with little effort into different planes above the table top and all parallel to it. Thus much of the necessity for vertically adjusting the table top itself is eliminated, while many of the advantages of that adjustment are obtained more simply and much less expensively.

While we have herein shown and described a preferred embodiment of our invention, it will be evident that the invention is susceptible of embodiment in other forms without departing from the spirit or scope thereof.

The claims in this application are confined to the mechanism for producing angular or vertical adjustments of the straight edge into different positions above the table top, no claim here being made to the mechanism for adjusting the straight edge in a generally parallel direction to the table top, since that mechanism is claimed in our divisional application Serial No. 498,966, filed August 17, 1943.

Having thus described our invention, what we desire to claim as new is:

1. A line-up table structure comprising the combination of a table top, a carriage mounted for movement across said top, a straight edge mounted on said carriage, said straight edge having a plane work engaging face and means operable to adjust said straight edge relatively to said carriage to position said face in any one of a series of planes above the table top and all parallel with it, said means including a carriage supporting member mounted on said carriage for adjustment around said axis and having a plurality of faces located at different radial distances from said axis to engage a cooperating part of said structure.

2. A line-up table structure comprising the combination of a table top, a carriage mounted for movement across said top, a straight edge

mounted on said carriage, said straight edge having a plane work engaging face, means operable to adjust said straight edge about an axis into any one of a plurality of angular relations to the table top, and additional means operable to adjust said straight edge relatively to said first mentioned adjusting means to position the plane of said face in any one of a series of different planes all substantially parallel with but located above the table top.

3. A line-up table structure comprising the combination of a table top, a carriage mounted for rolling movement across said top, a straight edge mounted on said carriage, said straight edge having a plane work engaging face, means operable to adjust said straight edge about an axis into any one of a plurality of angular relations to the table top, additional means operable to adjust said straight edge about another axis through the carriage and parallel to the first mentioned axis, whereby the straight edge can be positioned in various elevations above said table top, with the plane of its face parallel to said table top, and means for locking said straight edge in any of said positions.

4. A line-up table structure comprising the combination of a table top, a carriage mounted for rolling movement across said top, a straight edge mounted on said carriage for movement therewith across the table top, said straight edge having a plane work engaging face, a shaft mounted in said carriage parallel to the axis on which said carriage rolls, a carriage supporting member mounted on said shaft and shaped to engage a stationary part of said structure to hold said shaft spaced at different distances from said table top, whereby rotation of said carriage supporting member will tip said carriage and said straight edge about the axis on which the carriage rolls, additional means supporting said straight edge on said shaft for adjustment about the shaft itself into different angular relationships to the table top, whereby said straight edge may adjust itself to the work by its contact therewith, and means for locking said straight edge in any of its various adjusted positions.

5. A line-up table structure according to preceding claim 4, in which said means supporting said straight edge on said shaft for adjustment about the shaft itself includes brackets supporting said straight edge and mounted for pivotal movement on said shaft relatively to said carriage, and screw-threaded means cooperating with said brackets and parts of said carriage to lock the straight edge in any one of its various adjusted positions.

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