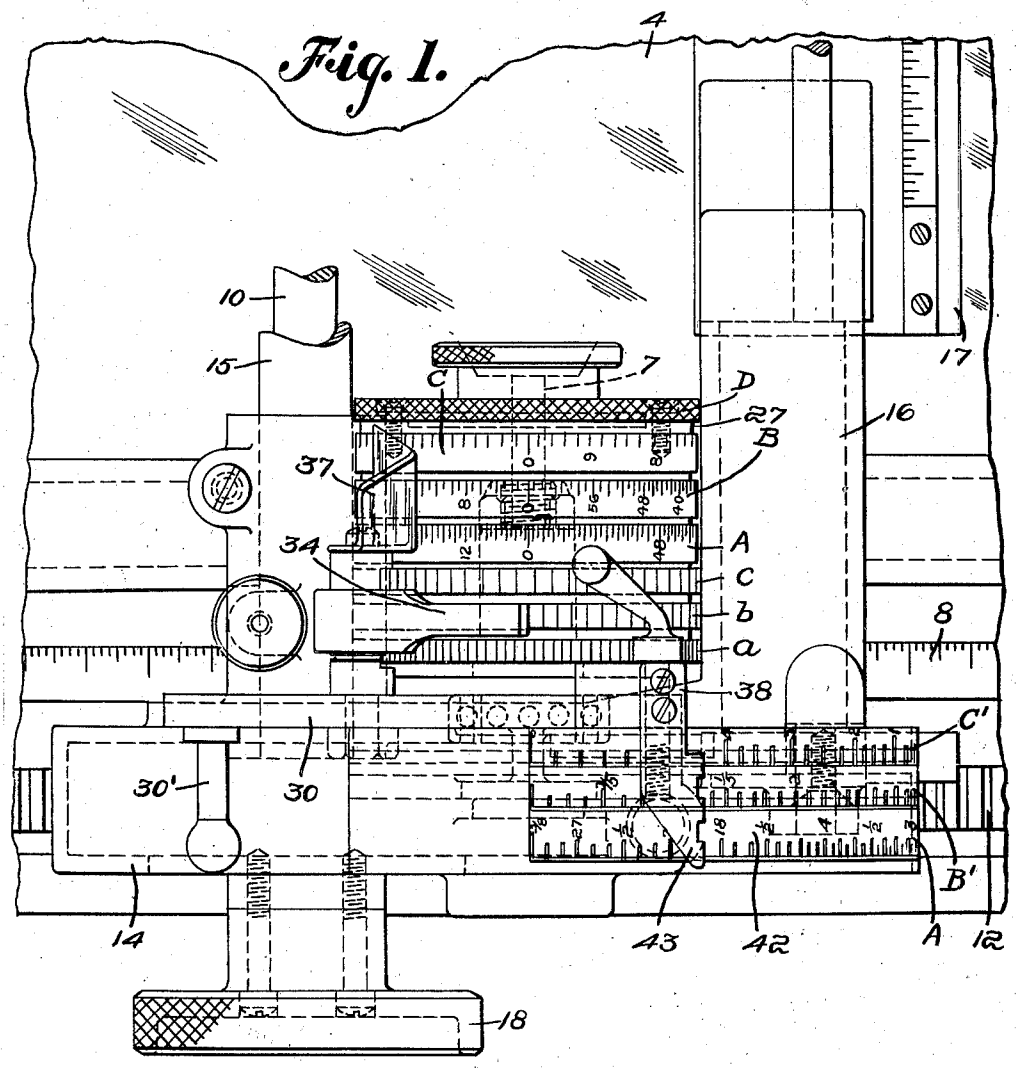
June 3, 1947. F. L. DODGE 2,421,686

SPACING MECHANISM FOR LINE-UP AND REGISTER TABLES

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Fig. 1.



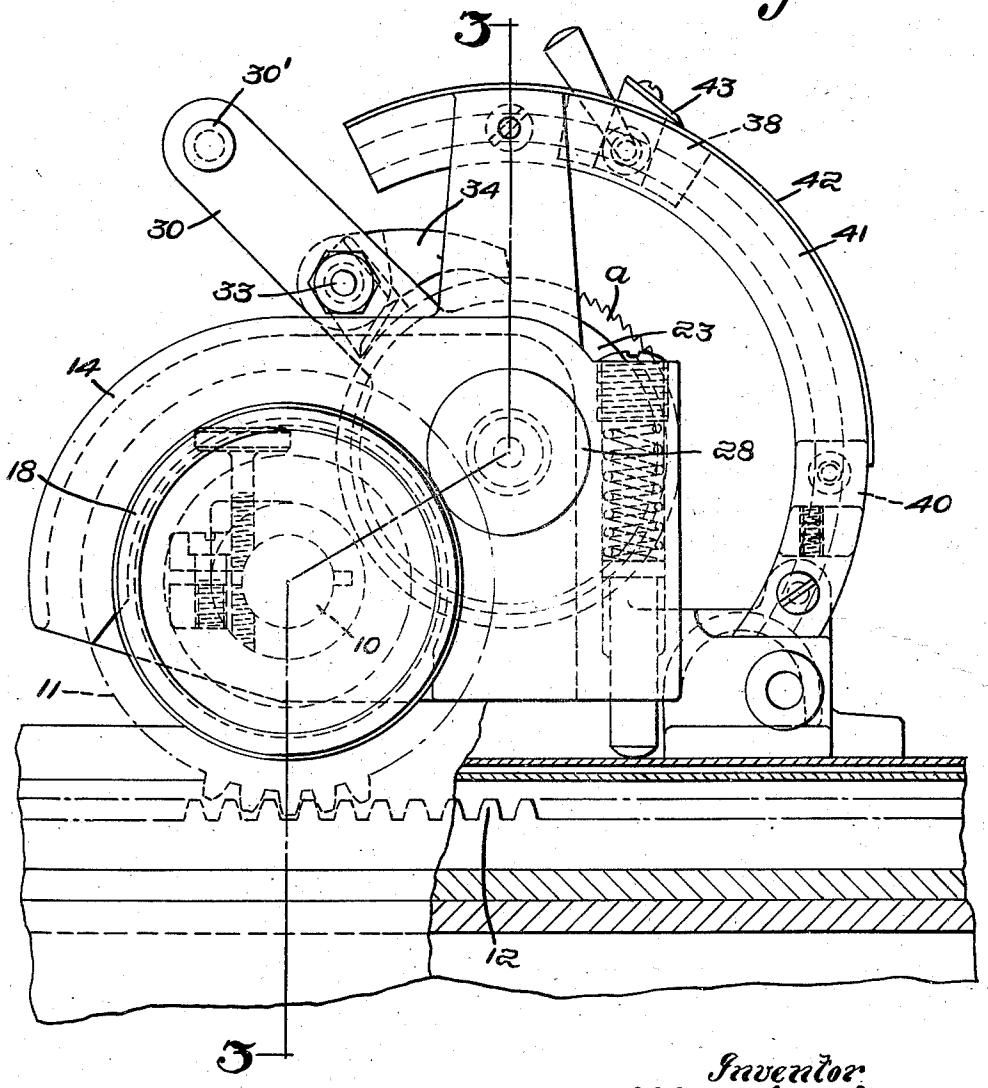
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SPACING MECHANISM FOR LINE-UP AND REGISTER TABLES

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Fig. 2.



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SPACING MECHANISM FOR LINE-UP AND REGISTER TABLES

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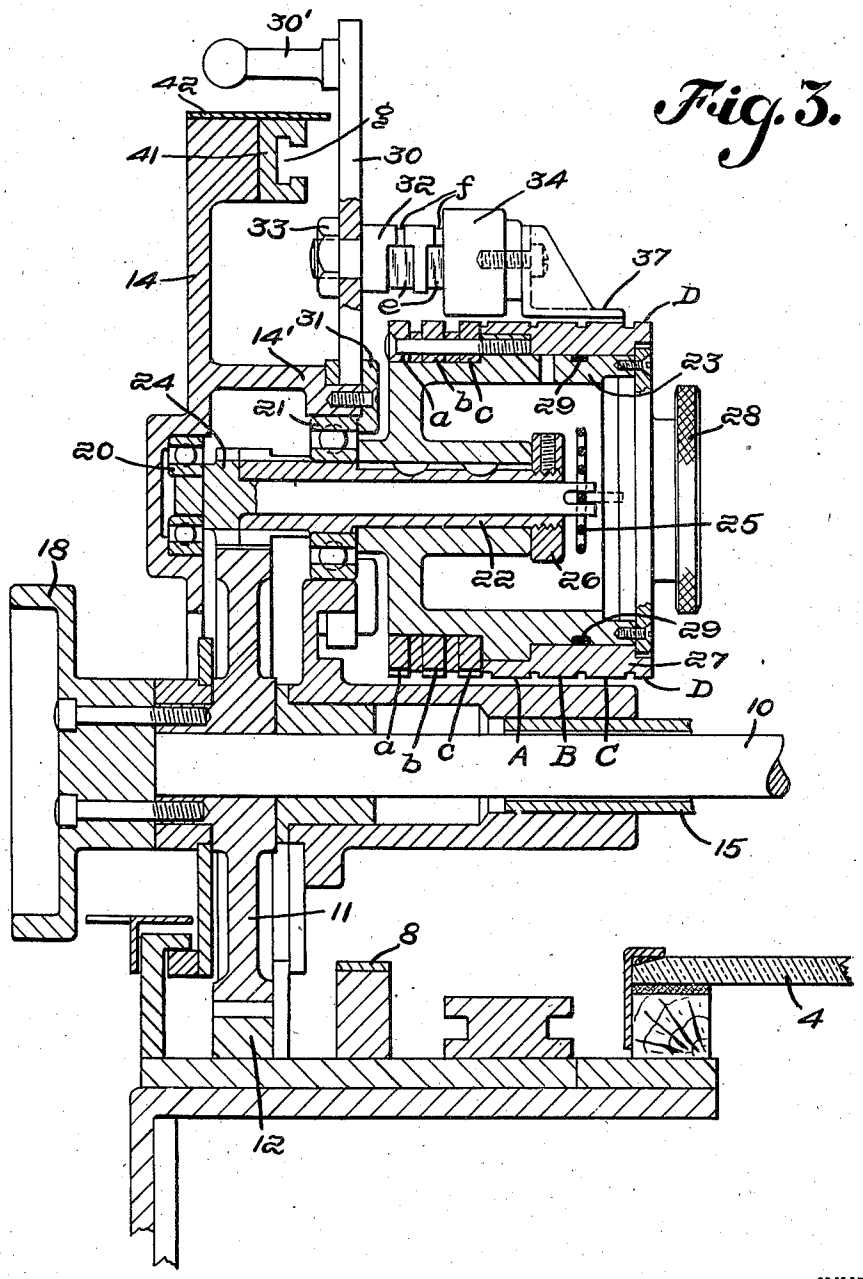


Fig. 3.

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SPACING MECHANISM FOR LINE-UP AND REGISTER TABLES

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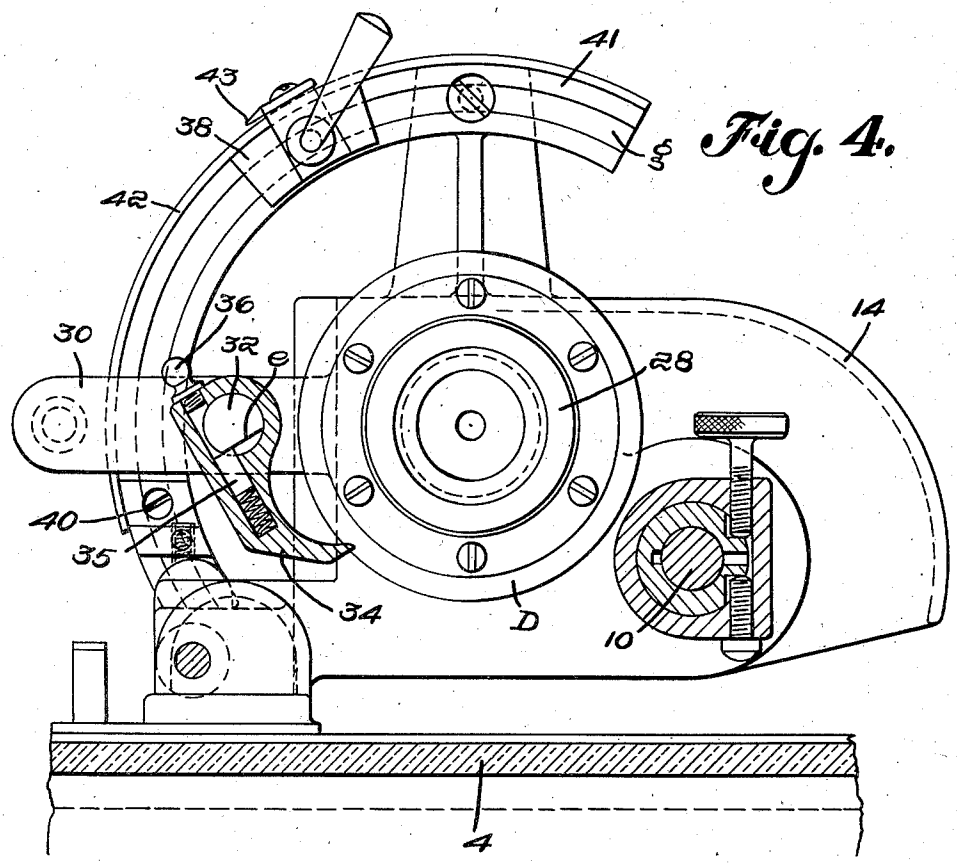


Fig. 4.

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2,421,686

UNITED STATES PATENT OFFICE

2,421,686

SPACING MECHANISM FOR LINE-UP AND REGISTER TABLES

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Application April 17, 1945, Serial No. 588,802

9 Claims. (Cl. 33—184.5)

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This invention relates to the so-called "line-up" or "register" tables used mainly in the printing trade. They are intended primarily for use in securing the accurate register of the work and in performing certain of the make-up operations, such as lining, ruling, scoring negatives, and the like. In fact, in recent years the use of the apparatus for these purposes has become increasingly important. It is largely for the latter reason that the table shown in Patent No. 2,252,535, assigned to the assignee of the present invention, has met with an exceptionally favorable reception. The fact that this machine is equipped with a spacing mechanism, easily operated and adjustable to suit the requirements of a considerable variety of work, has particularly appealed to the printing trade.

The present invention aims further to improve the table construction shown in said patent with a view to increasing its range of utility. More especially the invention aims to improve the spacing mechanism and its association with the table structure, to the end of simplifying both the construction and operation of this mechanism, while at the same time increasing its adaptability to a wider range of work which the various branches of the printing industry are required to perform.

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,

Fig. 1 is a plan view of a portion of a line-up table illustrating more particularly a spacing mechanism embodying features of this invention and the means for supporting said mechanism;

Fig. 2 is a front elevation of the mechanism shown in Fig. 1;

Fig. 3 is a central, vertical section taken approximately on the line 3—3, Fig. 2; and

Fig. 4 is a rear view of a portion of the spacing mechanism.

Referring first to Figs. 1 and 3, the table construction there shown is very similar to that illustrated in the patent above referred to, except that the tracks on which the two carriages are mounted are arranged in the manner used in the well known Craftsman lineup table. Only one carriage is here shown. It is mounted on the shaft 10 which normally connects both carriages and is provided with gears, one of which is shown at 11, secured to its opposite ends to run on the tracks at opposite edges of the table top. In this construction the gear just referred to is mounted in a

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casing 14 forming part of the carriage, and the sleeve which customarily connects the two casings is shown at 15. This casing also includes the usual bracket 16, rigid with it and forming the support for one end of the straight edge 17. A hand wheel or knob 18 is mounted on the end of the shaft 10 by means of which the latter can be turned to revolve the gears 11 to move the carriage backward and forward on the tracks or racks 12. Also, the usual scales, one of which is shown at 8 in Figs. 1 and 3, are associated with the table top to indicate the position of the carriage relatively to it.

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.

In the present construction a drum or barrel 23, Fig. 3, is keyed to a shaft 22 which is supported in ball bearings 20 and 21 mounted in the casing 14, and the shaft carries a pinion 24 meshing with the gear 11. Preferably the pinion is made in two sections integral with the respective sections of the shaft. They are telescoped, one within another, and are connected by a torsion spring 25 which tends to rotate one pinion section relatively to the other and thus to prevent any back lash in the drive between the gear 11 and the barrel 23. A nut 26, Fig. 3, threaded on the end of the outermost section of the pinion shaft holds the barrel in place.

Mounted on this barrel to rotate therearound is a dial sleeve 27 having three dial rings indicated, respectively, at A, B and C, Figs. 1 and 3, the three being graduated to designate different units of length. Also encircling the barrel 23, but secured rigidly to it, are three ratchet rings indicated, respectively, at *a*, *b* and *c*. The teeth in these rings are made to conform to the graduations on the respective dials A, B and C. Screwed to the outer end of the barrel 23 is a knurled knob 28 by means of which the barrel and the shaft 22 may be revolved, if desired, to adjust the straight edge across the table, although it is more common to use the knob 18 for this purpose. The larger disk-like end of the knob 28 overlies the end of the dial sleeve 27 and prevents the latter from being displaced axially with reference to the barrel. Also, a wavy spring 29 positioned in a circumferental groove in the barrel frictionally connects the dial sleeve with the barrel and makes them revolve in unison but permits rotation of the sleeve on the barrel, when desired.

The operating element of the spacer consists of a lever 30 having a large annular end portion ma-

chined to fulcrum on the cylindrical bearing section of an extension 14', Fig. 3, of the casing 14. It is held in place by a retaining ring 31, Fig. 3, which is screwed to the end of said extension. Secured to this lever and projecting at the inner side thereof, is a stub shaft 32 rigidly held in place by a nut 33 and provided with three flattened faces, each interrupting a groove extending circumferentially around the part 32. One of these faces is shown in Fig. 4 at *e* and two are illustrated in Fig. 3. Mounted to rock on this shaft 32 is a pawl 34 provided with a spring-pressed plunger 35, Fig. 4, which is slidable in one end portion of a bore extending lengthwise of the pawl itself, the other end being closed by a plug 36.

When the pawl is swung backwardly around its shaft 32, the plunger yields to permit this motion and its inner end rides off the flat face *e* and into the groove *f*, Fig. 3, in line with that face. The pawl, however, is fitted to be moved slidably lengthwise of the stub shaft 32 into position to operate any one of the ratchet rings *a*, *b* or *c*, as may be desired. The plunger associated with the pawl serves to apply sufficient drag to its movements around the shaft 32 to hold it in any inoperative position to which it may be moved. Also, as the pawl is brought down into its operative position, the plunger snaps over the edge of the flat surface *e* and the spring thereafter acts to hold the tip or edge of the pawl firmly but yieldingly in contact with the teeth of the particular ratchet ring on which it may be adjusted to operate. The outer end of the shaft 32 has an indicating element 37 secured to it, the rearward edge of which forms a match line with which the zero lines of the dials A, B and C can be registered in starting any spacing operation.

Associated with the operating lever 32 are stops 38 and 40, respectively, Fig. 4, both adjustable in a guide 41 which is curved around the axis of the barrel 23 and is screwed to the carriage 14. This element 41 has a guiding groove *g*, Figs. 3 and 4, formed in it which is undercut at both edges, as shown in Fig. 3, to receive a gib or slide into which the clamping screw with which each stop is equipped, is threaded, so that by loosening this screw the stop can be freely adjusted lengthwise of the groove *g* and then locked by tightening the screw.

Supported on the guide 41 is a narrow, curved sector 42, best shown in Fig. 1, which is graduated to designate units of measurement corresponding to those on the three dials A, B and C. The lower stop 40 is adjusted to arrest the lever 30 in its zero position, as indicated on the sector, and the upper stop 38 carries an indicator arm 43 having an edge which is used as a match line to cooperate with the three lines of graduations on the sector 42. This stop 38 is set to agree with the distance which it is desired to move the straight edge at each forward stroke of the lever 30.

In this connection it may be pointed out that the graduations on the dials A, B and C and those on the sector 42, while indicating different fractions of an inch, such as fiftieths, sixty-fourths, and seventy-seconds, nevertheless do not have their spacing marks separated by these distances. These graduations and the figures associated with them indicate the distances that the lever or the dial, as the case may be, must be moved in order to move the straight edge a fiftieth, a sixty-fourth, or a seventy-second of an inch. Successive graduations on the dials and on the sector 42 will be spaced apart by considerably larger distances than those which they indicate because of the reduction gearing through which motion of the lever 30 is transmitted to the carriage 14 and, consequently, to the straight edge 17.

In using this apparatus, and assuming that it is desired to rule a negative with lines spaced apart by seventeen seventy-seconds of an inch, the stop 38 will be set with the match line of the indicator 43 at the mark 17 on the lowermost scale shown in Fig. 1 on the plate 42. The lever at this time is between the two stops 38 and 40, as shown for example in Fig. 4, and the operator simply moves the lever backwardly against the stop 38 and then forwardly against the stop 40, draws his line, or makes his line of scoring, as the case may be, swings the lever back again against the stop 38, and repeats these operations until the desired area has been lined or scored.

The extreme range of adjustment of the lever provided for in this particular design is that necessary to move the straight edge a half inch at one swing of the lever, although this distance, as measured along the sector plate 42, actually is nearly five inches.

To re-set the dial to zero, the operator grasps the end of the barrel 23 by the knurled edge surface D, Figs. 1, 3 and 4, and turns the dial sleeve relatively to the ratchet rings back to its zero position.

From the foregoing it will be seen that the invention provides a line-up table which will accommodate, without change, except in adjustment of some of the parts, an exceptionally wide range of work. Also, that the construction is very simple, eliminates the use of clutches in the spacing mechanism, and is not likely to get out of order. In some cases it will be preferable to substitute a dial graduated in thousandths of an inch, instead of one of those shown in this application. But such a substitution can readily be made. Also, if it is desirable to add one or more additional dials, the changes necessary for that purpose can be made easily and without great expense. Manipulation of the apparatus also is made easier by the elimination of the clutches.

While a preferred form of the invention has been herein shown and described, it will be evident that it may be embodied in other forms without departing from the spirit or scope thereof.

Having thus described my invention, what I desire to claim as new is:

1. A spacing mechanism for a line-up table having a top, a carriage mounted for movement across said top, a straight edge mounted on said carriage, and racks supporting said carriage for said movement, said carriage having gears meshing with said racks, said spacing mechanism comprising a pinion positively geared to one of said racks, bearings in said carriage supporting said pinion for rotation around its own axis, a plurality of dials graduated in different units of length mounted for rotation in unison around said axis, a corresponding number of ratchet rings also mounted for rotation around said axis, means connecting said disks with said rings to revolve in unison with them but also permitting independent rotation of said rings, a lever mounted adjacent to said ratchet rings to rock about said axis, and means carried by said lever for operating said ratchet rings selectively.

2. A spacing mechanism for a line-up table having a top, a carriage mounted for movement across said top, a straight edge mounted on said carriage, and racks supporting said carriage for

said movement, said carriage having gears meshing with said racks, said spacing mechanism comprising a pinion positively geared to one of said racks, bearings in said carriage supporting said pinion for rotation around its own axis, a barrel mounted for rotation around said axis, a plurality of dials encircling said barrel and graduated in different units of length, a plurality of ratchet rings also encircling said barrel, said rings being rigid with the barrel and said dials being mounted to revolve normally in unison with said rings but free to be rotated independently of them, a lever mounted at one end of said barrel to rock about said axis, and pawl means carried by said lever and adjustable into position to operate said ratchet rings selectively, the ratchet rings being toothed to agree with the graduations on the respective dials.

3. In a line-up table according to preceding claim 2, a construction including means for integrally connecting together said dials for rotation in unison.

4. In a line-up table according to preceding claim 2, a construction including means for integrally connecting together said dials for rotation in unison and means for frictionally connecting said dials with said barrel so that they normally revolve with it.

5. In a line-up table according to preceding claim 2, a construction in which said pawl means comprises a single pawl, and means for adjusting said pawl to a position to operate said ratchet rings selectively.

6. In a line-up table according to preceding claim 2, a construction in which said pawl means comprises a single pawl and said lever carries a

stub shaft on which said pawl is mounted for adjustment lengthwise of said shaft into cooperative relationship to said respective ratchet rings.

7. In a line-up table according to preceding claim 2, a construction in which said pawl means comprising a single pawl and means on said lever for carrying a stub shaft on which said pawl is mounted, means on said stub shaft for adjusting said pawl lengthwise of said shaft into cooperative relationship to said respective ratchet rings, a spring-pressed plunger carried by said pawl, said stub shaft having a plurality of surfaces, and said plunger cooperating with said surfaces on said stub shaft to hold the tip of the pawl normally pressed yieldingly against the teeth of the particular ratchet ring on which it is operating.

8. In a line-up table according to preceding claim 2, a construction including means on said lever for carrying a match line cooperating with all of said dials.

9. In a line-up table according to preceding claim 2, a construction including stops, which stops cooperate with said lever to limit its range of oscillating movement, and a sector is mounted beside said lever said sector being graduated in units like those of the respective dials.

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