Aug. 25, 1942. C. L. GILBERT 2,294,335

SCORING DEVICE FOR SAMPLE PAPER BOXES

Filed Sept. 23, 1940 3 Sheets-Sheet 1

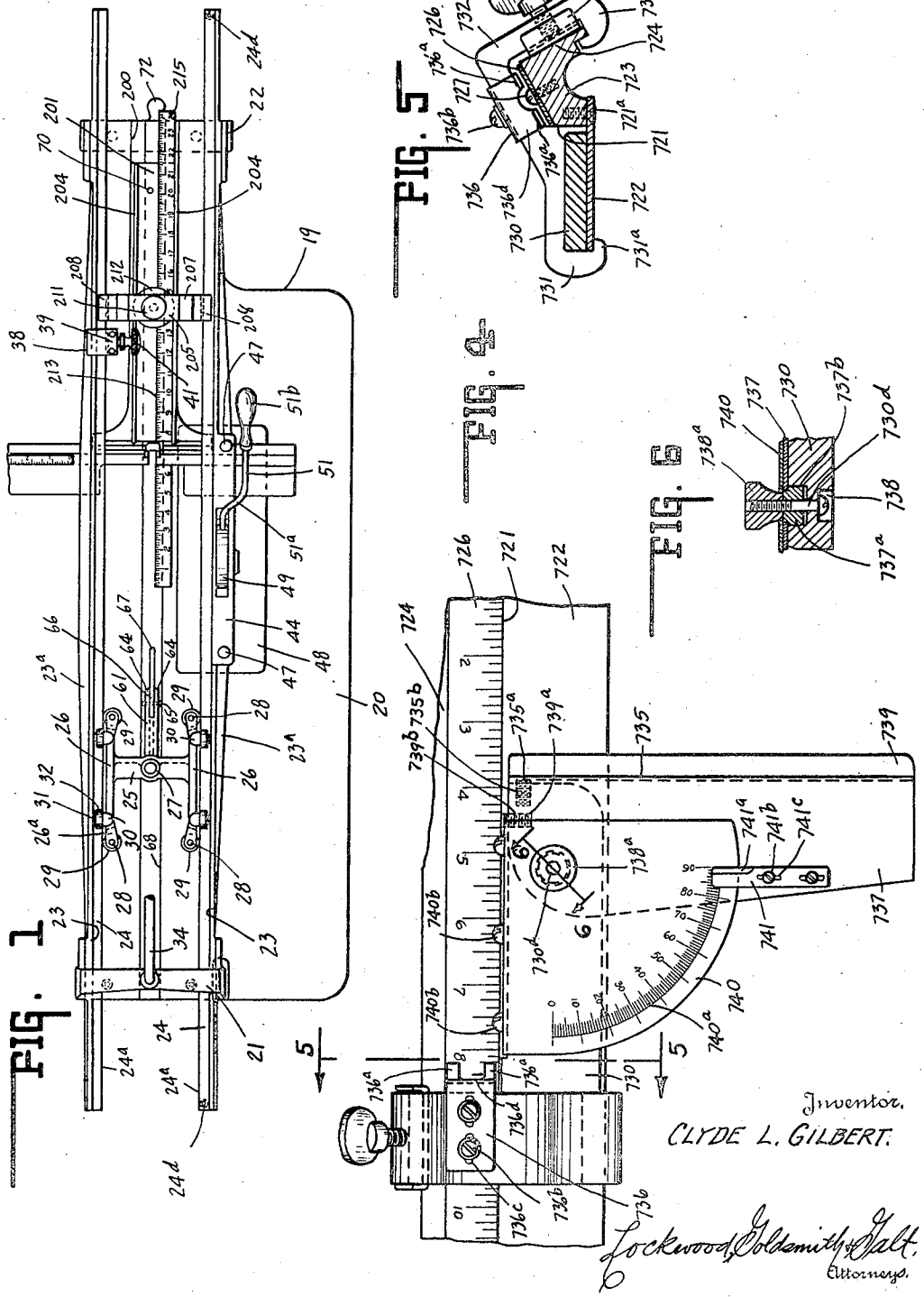


FIG. 1

FIG. 5

FIG. 6

Inventor.
CLYDE L. GILBERT.

Lockwood, Goldsmith & Galt.
Attorneys.

Aug. 25, 1942. C. L. GILBERT 2,294,335

SCORING DEVICE FOR SAMPLE PAPER BOXES

Filed Sept. 23, 1940 3 Sheets-Sheet 2

FIG. 2

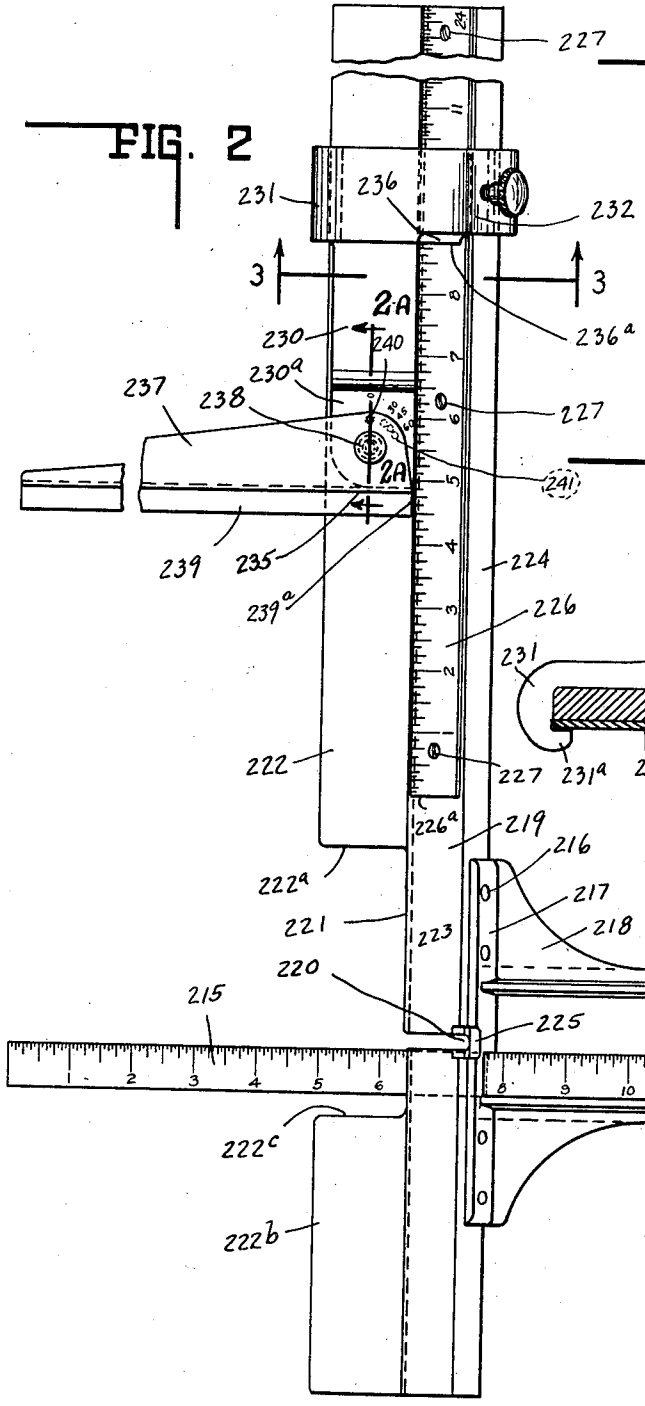


FIG. 2-A

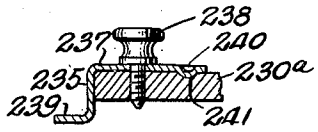
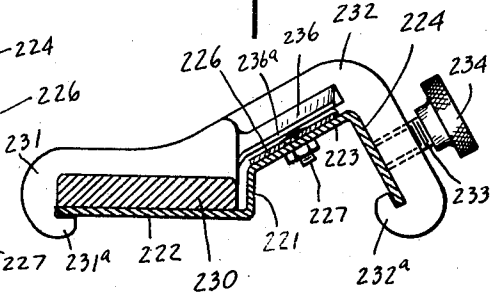


FIG. 3



Inventor.
CLYDE L. GILBERT.

By Lockwood, Goldsmith & Galt,
Attorneys.

Aug. 25, 1942. C. L. GILBERT 2,294,335

SCORING DEVICE FOR SAMPLE PAPER BOXES

Filed Sept. 23, 1940 3 Sheets-Sheet 3

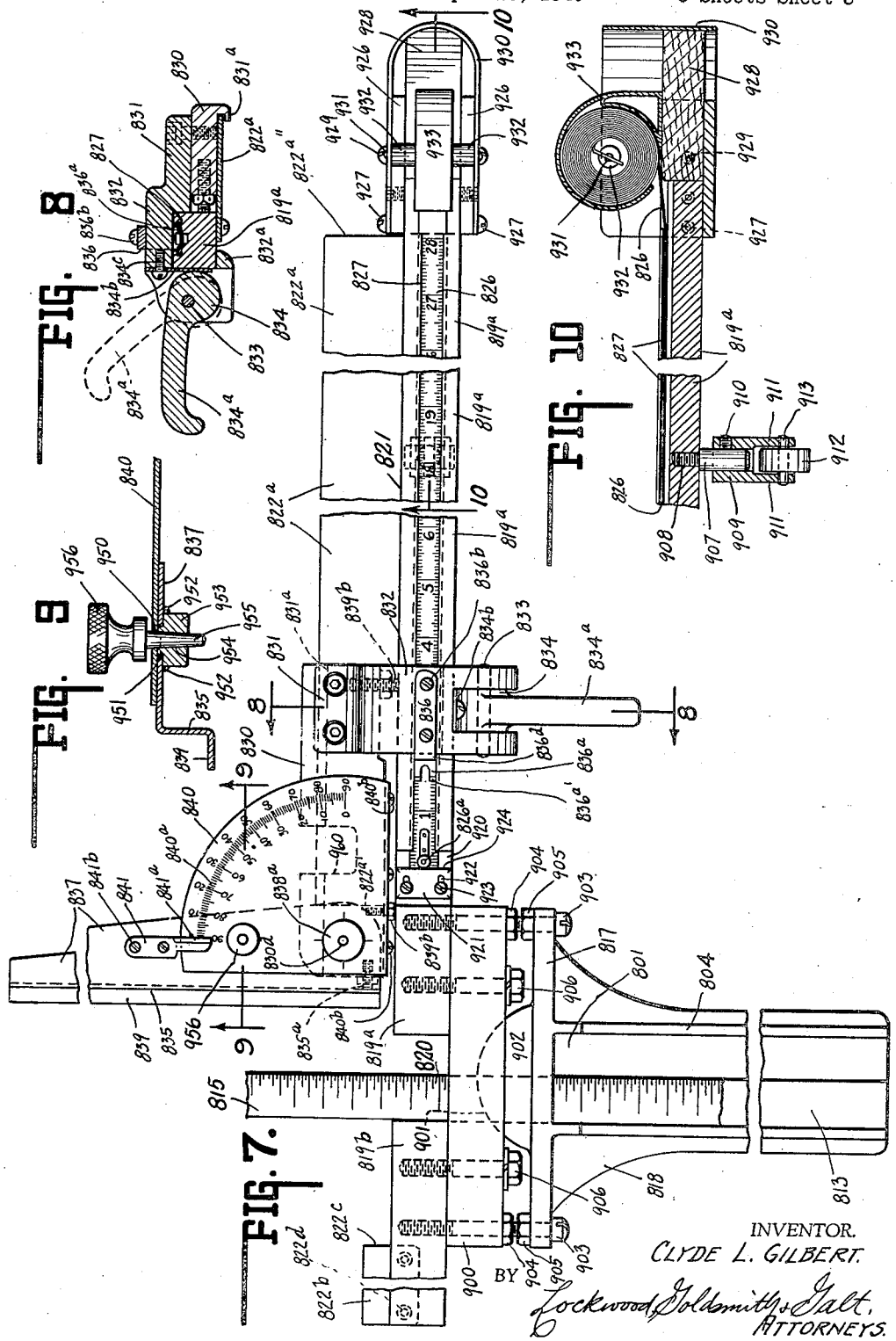


FIG. 7.

FIG. 8

FIG. 9

FIG. 10

INVENTOR.
CLYDE L. GILBERT.
BY Lockwood, Goldsmith & Galt,
ATTORNEYS.

Patented Aug. 25, 1942 2,294,335

UNITED STATES PATENT OFFICE

2,294,335

SCORING DEVICE FOR SAMPLE PAPER BOXES

Clyde L. Gilbert, Terre Haute, Ind.

Application September 23, 1940, Serial No. 357,875

40 Claims. (Cl. 164—73)

This invention relates to a cutting and scoring device. This application, insofar as Figs. 1 to 6 herein are concerned and insofar as claims 1 to 18 herein are concerned, is a division of my copending application entitled "Scoring device for sample paper boxes," Serial No. 221,990, filed July 29, 1938, allowed March 30, 1940, and now Patent No. 2,225,630, dated December 24, 1940.

Insofar as the additional figures are concerned and the additional detail claims are concerned, as well as the additional description, this application is a continuation-in-part of and constitutes improvements upon the copending application disclosure.

The machine basically disclosed in the aforesaid copending application is a machine in which there is incorporated mechanism for lining, marking, creasing, cutting, perforating, bevel cutting, etc., materials parallel or angular, as well as transverse to the longitudinal axis of the machine.

For a more complete disclosure of the field to which this invention is directed, its utility and advantages, reference is had to all of the preliminary description set forth in the first fourteen paragraphs of the aforementioned patent and expressly made a part hereof.

Inasmuch as the aforementioned application, Serial No. 221,990, contains a complete disclosure of the subject matter of Figs. 1 to 6 herein, see Figs. 9, 10, 24, 25 and 26 of Serial No. 221,990, the same is made a part hereof. Reference will now be had to the third species (Figs. 7–10 inclusive) of the basic invention and in this third form, it is to be noted that the body and head structure, as these terms are defined by analogy in the copending application and used relative to Figs. 7 to 10 herein, are of separable character and are provided with an adjustable connection for accurate alignment.

Also, herein, the protractor structure has been provided with a positive lock, see Fig. 9, for its 90° positioning (Fig. 7, lower protractor scale) so that, except for uneven wear, the straight edge **835** arrangement will always be at 90° to the support portion **830** when adjusted to the 90° position relative to linear scale **827** and parallel edge **821** and will be retained in that position.

Another feature of the third species and which may be utilized in either of the other two species is the vertically adjustable anti-friction caster wheel type support provided for the free end of the elongated structure most remote from the zero position of the linear scale.

Another feature of the third species consists in the adjustable rule arrangement and its association with the protractor clamp and head structure as will be more fully pointed out hereinafter.

A further feature of the invention is the adjustable stop for the offset zero position of the linear scale structure.

Other objects and features specific to this species, as well as the objects and features common to the three species, will be more fully pointed out hereinafter in following description.

The full nature of the invention will be understood from the accompanying drawings, the following description and claims;

Fig. 1 is a top plan view of one embodiment of the invention, the T-shaped aligner and straight edge arrangement being broken away at the free end thereof.

Fig. 2 is a top plan view of the aligner and straight edge portion of one species of the device.

Fig. 2A is a sectional view of a yielding detent structure.

Fig. 3 is an enlarged transverse sectional view taken on line **3—3** of Fig. 2 and in the direction of the arrows.

Fig. 4 is a plan view of a modified and second species form of the protractor arrangement and associated parts.

Fig. 5 is a sectional view taken on line **5—5** of Fig. 4 and in the direction of the arrows.

Fig. 6 is a sectional view taken on line **6—6** in Fig. 4 and in the direction of the arrows.

Fig. 7 is a top plan view of the third species of the combination protractor and straight edge and associated parts.

Fig. 8 is a transverse sectional view taken on line **8—8** of Fig. 7 and in the direction of the arrows.

Fig. 9 is an enlarged transverse sectional view of the 90° protractor stop and locator arrangement, same being taken on line **9—9** of Fig. 7 and in the direction of the arrows.

Fig. 10 is a longitudinal sectional view taken on line **10—10** of Fig. 7 and in the direction of the arrows and of the free end of the straight edge arrangement, adjustable rule arrangement and caster wheel support.

Herein, the term "knife" does not necessarily mean a blade for cutting and, as previously set forth, the term '"knife" is used in its broad sense.

In the drawings, the numeral **20** indicates a base plate. A pair of standards **21** at one end and **22** at the opposite end of said base plate suitably support in spaced relation a pair of tracks **23**. These tracks are of T-shaped section. Herein, the two standards **21** are shown connected to-

gether and the standards 22 may be similarly connected. The trackways, as stated, are T-shape in cross-section and the inwardly directed ledge portion 24 is provided with the inner face 24a and upper and lower parallel faces.

One rail 24 includes at each end a bumper or resilient stop 24d for carriage engagement. This includes a headed bolt screwed into the rail and having the exposed body portion enveloped by a rubber or like sleeve.

A carriage includes a transverse portion 25 and, at each end, the same terminates in an elongated portion 26. The carriage supports a handle 27 and a knife carrier. Each arm 26 at each end is bifurcated as at 26a and a shaft 28 pivotally supports in the bifurcated portion a roll 29 that engages the inner face 24a of the adjacent track member.

Adjacent each of the bifurcations and extending vertically therefrom, is an arm 30 and the same terminates in a trunnion 31 that mounts a roller 32. The two rollers 32, in vertical alignment, engage the upper and lower surfaces of the trackway. In this manner, the carriage structure is definitely located and supported by the trackways, vertical movement of the carriage relative thereto being prevented by the rollers 32 and transverse or horizontal movement of the carriage relative thereto being prevented by the rollers 29. These rollers may be of hardened rubber or fibre or any other suitable material.

To limit the sliding movement of the carriage to prevent interference with other mechanism, hereinafter to be described, there may be provided one or more stops and herein one of the same includes a C-shaped slide having the track embracing arm portions 38 and the connecting portion 39. The same is suitably apertured and a headed clamp screw is adapted to clamp said stop to one of the rails, the central portion 39 constituting the abutment to limit the travel of the carriage.

Reference will now be had to Figs. 1, 2 and 3, wherein there is illustrated a T-aligner and straight edge arrangement including a protractor addition. The base portion 20 is provided with a groove 200 in its upper face and this groove extends from adjacent uprights 22 to approximately the stock clamping structure shown in said patent. It may, however, if desired, be coextensive with the length of the base. The T-shaped structure includes a central portion which is recessed on its under face and the latter includes an upward extension. This is to provide clearance for the cutting or creasing knife.

The body portion 201 includes a pair of parallel, elongated and longitudinal extending ribs 204. The body portion 201 may be moved longitudinally in the groove 200. It is secured in adjusted position by means of a second clamp structure. This clamp structure is substantially channel shape in elevation and includes the central portion 205. Two upwardly and outwardly directed arms 207 each terminates in a C or channel shaped portion 208, the latter slidably receiving in the groove formation thereof the inwardly projecting portion 24 of the adjacent rail.

A threaded shank with a knurled head portion 211 advances the clamp 207—208 toward or away from the portion 201 of the T-shaped aligner. The lower end of the threaded shank rotatably supports a pressing plate or disc 212 which bears upon the two ridge portions 204 and when the shank is threaded down sufficiently, the body portion 201 of the T-shaped aligner is rigidly clamped in the ways formed by the groove 200 and in the adjusted position.

The upper face of the body portion 201 is provided with a groove 213 which slidably receives a metallic rule 215. This rule underlies the clamping member 212, and the latter, even when clamping, does not interfere with the sliding rule.

Extending transversely of the body portion 201 and suitably secured to the same as at 216 by means of the flanged base portion 217, reenforced by the web portion 218, is the head portion of the T-structure. The latter is designated generally by the numeral 219. In alignment with the longitudinal axis of the portion 201 there is provided a slot or notch 220. The purpose of this is to provide clearance for the creasing knife when the carriage is moved toward the T-aligner and is partially superposed relative thereto. When thus positioned, the relieved portion of the creasing knife is arranged to clear the portion 219 and the width of the slot 220 is such that it is adapted to receive the depending portion of said knife or that portion closest to the base plate.

The transverse portion of the T-aligner is shown most clearly in Figs. 2 and 3 and to which specific reference is now made although the same is shown in Fig. 1. The transverse portion includes a channel having an upstanding portion 221, a laterally projecting shelf 222, an upwardly and laterally extending portion 223 and an angularly depending portion 224. The shelf 222 is shown terminating at 222a. Another shelf portion 222b terminates at 222c. The two shelves are coplanar and the spacing therebetween is coincident with the notch 220. The portion 217 includes a complementary notch reenforcement 225, see Fig. 2.

A scale 226 is suitably secured, as indicated at 227, to the right-hand wing of the transverse portion of the T-aligner. An adjustable stop structure is slidably supported on the right-hand wing and includes a base portion 230 which is extended laterally as at 231 and 232. Each of these portions terminates in the ends 231a and 232a, respectively, that are slidably associated with the underfaces of the portions 222 and 224, as shown in Fig. 3.

Portion 232 mounts a threaded shank 233 having a knurled head 234 whereby the stop fixture shown in Fig. 3 may be rigidly clamped to the right wing of the T-aligner. When thus clamped, the forward edge 235 or its equivalent of the member 230 constitutes the abutment and guide against which the material to be operated upon may bear.

The portion 232 includes a gauge element 236 and this gauge element or rather the edge 236a thereof is spaced from the edge 235 a distance identical to the distance the end 226a of the rule 226 is spaced from the longitudinal central axis of the body portion 201, so that the position of the stop 235 may be accurately read upon the scale 226.

In the present invention, the stop and straight edge 235 is shown formed upon a separate element, for convenience termed a protractor arm and designated by the numeral 237, the same being pivotally mounted as at 238 and overlying the elevated portion 230a of the portion 230 of the adjustable stop structure. The arm 237 not only provides the abutting surface 235 but is provided with a shelf 239 so that a piece of material may lie upon shelves 222, 222b and 239 and be squared. Note that the rule 215, see Fig. 2, is offset with reference to the notch 220 and the like, so that

this rule is available for indicating the length of line of crease or score or cut of the appropriate knife when the carriage is moved with the knife in operating relation.

The arm 237 mounts a yielding detent structure 240, see Fig. 2A, and there is provided in the raised portion 230a a suitable number of sockets or recesses for detent reception. These sockets are indicated by the numeral 241. Herein, four are illustrated and the detent is in the position wherein the protractor arm positions the abutting or guiding surface 235 transverse to the abutting or guiding face 221 of the head portion of the T-shaped aligner. When the detent arrangement is associated with the adjacent recess 241, the abutment or aligning face 235 is positioned at 30° from the position shown in Fig. 2. When the detent is positioned in the next recess 241, the aligning face 235 will be positioned at 45° to the position shown in Fig. 2, and when the detent is positioned in the last recess, the arm 237 will have its face 235 positioned at 60° to the position shown in Fig. 2.

If desired, the face 235 may be suitably relieved as well as the shelf 239 and the arm 237 may be sufficiently offset, all to provide clearance for the portion 231 and in that event the protractor arm may be positioned so as to lie parallel to the rule 226 and at 90° to its original position as shown in Fig. 2. The edge 239a of the shelf 239 serves as a stop for it engages the face 221 of the right wing of the T-shaped aligner.

Whenever desired, the length of the right wing may be elongated beyond that illustrated and, if desired, the same may be provided with an adjustable foot structure at the end thereof, not shown, for support purposes in the event the entire device is supported upon a work bench or table. Inasmuch as the majority of operators are right-handed, the base 20 is relieved, as indicated at 19 in Fig. 1. This permits the operator to more closely approach the handle 27 for operation of the knife structure when the supporting bench or work table is correspondingly relieved.

Reference will now be had to Figs. 4 to 6 inclusive, therein there is illustrated a modified form of the invention shown in Figs. 2 and 3. In the last mentioned figure, numerals of the 200 series indicate certain parts. In Figs. 4 to 6 inclusive, wherever possible, similar numerals of the 700 series indicate like or equivalent parts. This form of the invention differs in two respects from that shown in Figs. 2 and 3. In this form there is an adjustable indicator for reading the offsetting of the slidable stop structure. This is most clearly shown in the left-hand portion of Fig. 4.

Another modification of the invention shown in Fig. 2 is illustrated in Figs. 4 and 6 and relates to the protractor arrangement. A supplementary modification is the wide bearing clamping arrangement illustrated most clearly in Fig. 5 as distinguished from the form shown in Fig. 3 for in the latter the bearing is direct from screw 233 while in Fig. 5 the bearing is by "shoe" member 733.

In Figs. 4 to 6, inclusive, 721 indicates an upstanding portion or rather the confronting face thereof, 723 an upwardly and laterally inclined portion and 724 an angularly extending depending portion. There is suitably secured as at 721a an outwardly and laterally extending shelf 722. A scale 726 is suitably secured as indicated at 727 to the portion 723.

An adjustable stop structure corresponding to that shown in Figs. 2 and 3 is also herein illustrated and includes a base portion 730 which is extended laterally as at 731 and at 732, these being oppositely directed portions. Each of these portions terminates in an end, such as 731a and 732a, respectively, that underlie portions 722 and 724 and are slidably associated with the undersurfaces of such portions, as shown in Fig. 5. The portion 732 threadedly mounts a thumb screw 734 which is swiveled in or bears upon a U-shaped bearing plate, shoe or clamping member 733 interposed between the outer face of the portion 724 and the portion 732. By this means the stop structure is rigidly secured in the adjusted position upon the lateral wing of the aligner structure, shown in Figs. 4 to 6, inclusive.

Portion 732 adjustably supports a gauge element 736 which is provided with a pair of aligned slots 736c adapted to receive the clamping screws 736b having threaded engagement with the slidable stop structure. The gauge element is offset downwardly as at 736d and is provided with two projecting portions 736a which constitute the cooperating or reading indicator for reading upon the scale the spacing of the stock stop construction. As previously described with reference to Figs. 2 and 3, the indicator offsetting corresponds to the offsetting of the scale with reference to the median plane of operation. In this embodiment of the invention, the stop is indicated by the numeral 735. It is formed as a separate element and essentially consists of a protractor arm 737 provided, if desired, with a shelf portion 739. This protractor arm is suitably mounted upon the body portion 730 of the stop engaged structure.

The body 730 has secured to it as at 740b a quadrant type scale member 740 having an angle scale designation from 0 to 90°, indicated by the numeral 740a. The protractor arm carries a reading element or indicator 741 provided with a pair of aligned slots 741c and the indicator is clamped to the arm 737 by means of the screws 741b screwed into the arm 737. The edge 741a of this indicator is the reading edge thereof.

As shown in Fig. 6, the body portion 730 is recessed as at 738 and seated therein is a screw 730d and the same mounts a knurled nut 738a which nut bears upon a locating collar 737a seated in the recess 737b formed in the body portion 730 of the stop structure. This collar portion 737a is welded or otherwise secured to the protractor arm 737. The scale quadrant 740 overlies the same and thus it will be noted that threading down the nut 738a will rigidly clamp the protractor arm 737 to the body portion 730 of the stop structure in the adjusted position, the scale being fixed in position with reference to the base portion 730, as indicated at 740b, the scale aperture clearing the nut. Collar 737a in socket 737b is the swivel.

For exactness in initial location, there is provided the threaded apertures 735b and 739b in the body portion 730, see Fig. 4, and seated therein are the headless set screws 735a and 739a. Thus, with respect to the pivotal mounting of the protractor arm and the initial positioning of the locating edge 735 and the initial positioning of the scale and also for compensating for any misalignment between the edge 721 and the slidable stop structure, these headless set screws locate the respective parts in the initial exact positions. Therefore, when the indicator 741 reads 90° on the protractor arm, the edge 735 will be exactly 90° to the edge 721.

Reference will now be had to Figs. 7 to 10

inclusive, and herein numerals of the eight hundred series, similar to numerals of the four hundred series employed in Figs. 4 to 6 inclusive and numerals of the two hundred series employed in Figs. 1 to 3 inclusive will indicate similar or like parts.

In Figs. 7 to 10, the T-aligner and straight arrangement includes the protractor addition. The base **20**, see Fig. 1, includes groove **200** between the track supporting uprights. The body portion **801** in Fig. 7 includes the parallel, elongated and longitudinally extending ribs **804** similar to ribs **204**, see Figs. 1 and 2, for clamp disc **212** engagement. The upper face of body **801** is recessed or grooved as at **813** similar to groove **213** in Figs. 1 and 2 to receive a slidable metallic rule **815**.

Extending transversely of the body portion **801** at the carriage end thereof and suitably secured to the same is the cross bar **900**. This is arcuately grooved in its body portion confronting face as at **901** to seat the arcuate and longitudinally aligned tongue **902**. A pair of bolts **903** by means of nuts **904** and **905** adjustably but rigidly connected members **900** and **801** together.

The head portion of the T-shaped aligner herein includes two longitudinally aligned bars **819***a* and **819***b* spaced apart as at **820**. Bar **819***b* includes a projecting shelf portion **822***b* with the short face **822***c* and secured to bar **819***b* as at **822***d*.

Bolts **906** suitably secure the adjacent spaced ends of bars **819***a* and **819***b* to the portion **900**. The bolts **903** also may serve as connections therebetween. In this manner members **819***a*—**819***b* and **900** constitute a rigid bar structure with the opening **820** therebetween. The adjustment beforementioned including the recess or slot and tongue arrangement insures accurate transverse positioning of the transverse bar portions relative to portion **801** and the longitudinal axis of the machine.

Similarly secured to bar **819***a* is the shelf **822***a* terminating at **822***a'* adjacent spacing **820** and at **822***a''* at its opposite end and adjacent the free end of bar **819***a*. This bar, see Figs. 7 and 9, and as previously suggested may include a support structure. Herein, same includes a depending member **907** threaded into the bottom face of bar **819***a* as at **908**. A tubular member **909** is slidably mounted thereon and held in adjusted position by set screw **910**. The lower end of member **909** below the lower end of member **907** is relieved or slotted to form depending ears **911** and therebetween is mounted a roller **912** carried by axle **913** in turn carried by the lower ends of the ears. In this manner, the T-aligner structure may be readily moved upon the table or work bench and the machine in a direction parallel to carriage travel as set forth in said copending patent.

In Fig. 7, it will be noted that bar **819***a* is reduced at **920** and mounted therein is a zero or stop block **921** having parallel and elongated openings **922** therethrough which receive clamping bolts **923** threaded into bar **819***a*. The face **924** is the zero position, as hereinafter pointed out, and for the scale **826**.

Scale **826**, see Figs. 7, 8 and 10, is flexible and is slidable in channel **827** in the top face of bar **819***a*. This channel is cross-shaped in section, see Fig. 8, so that the side edges of the rule **826** ride below the top face of bar **819***a* and cannot escape from said channel. The lower recession of the channel is provided for clearance for the finger piece **826***a* at the zero end of the rule which, for initial positioning (zero positioning) as hereinafter pointed out, contacts stop block **921** at face **924** thereof.

It will be recalled that rule **226**, see Figs. 2 and 3, and rule **726**, see Figs. 4 and 5, are rigid with the supporting bar thereby differing from the form last described. This rule **826** is flexible and is of magazine type. Herein, see Figs. 7 and 10, at the free end of the bar **819***a* there is secured a rule magazine support and guard structure.

In said figures, **926** indicates two spaced members secured together with the bar **819***a* therebetween as at **927** and secured together with spacer **928** therebetween and in alignment with bar **819***a* as by means **929**. A U-shaped guard **930** is also secured in position by means of members **927** and **929**.

This guard member **930** is apertured at opposite sides to support member **931** which serves as a magazine support. Spacing sleeves **932** align the magazine **933** with the bar channel for tape, rule, or scale movement. With this arrangement, the zero end of the tape can be positioned anywhere on bar **819***a* and the surplus be received by the magazine, the purpose and advantage of such positioning being set forth hereinafter.

Reference will now be had to Figs. 7 and 8. The adjustable stop structure **830** is slidably associated with the plate portion **822***a* as shown in Fig. 8. Projecting laterally and upwardly therefrom are portions **832** and **831**, respectively. Portion **830** includes portion **831***a* and portion **832** includes portion **832***a* for embracing the connected plate and bar structure **822***a*—**819***a*.

Portion **832** is bifurcated at its free end and mounts a pivot **833** in turn mounting cam **834** having the handle or tail portion **834***a*. This cam bears against a flat spring **834***b* secured at **834***c* to portion **832** in the bifurcation thereof. When the cam is tilted as shown in dotted lines in Fig. 8, the stop member **832** is released from bar **819***a* and can be shifted longitudinally thereon. When the cam is positioned as shown by the full lines, this stop member is clamped to said bar.

Suitably secured as at **836***b* to the upper portion of member **832** and in alignment with the channel in bar **819***a* is member **836** having a depending portion **836***d* terminating in a pair of parallel portions **836***a* having end faces **836***a*1. These faces **836***a*1 are adapted to engage face **924** of zero stop **921** for zero positioning.

Since herein slots **922** are elongated, the openings in member **836** to receive volts **836***b* need not be elongated as are the openings **736***c* in member **736**, see Fig. 4.

Portion **830** is provided with adjustable bearings **839***b* which are comparable to bearing **739***b* in Fig. 4 and for a like purpose. The quadrant-sector protractor plate **840** is suitably secured to member **830** as at **840***b*. The arm **837**, having the shelf **839** connected thereto at **835**, see Figs. 7 and 9, is pivotally supported on member **830** at **830***d* and yieldingly secured in adjusted position by member **838***a* in a manner similar to that illustrated in Fig. 6.

An indicator **841** having reading edge **841***a* is secured to arm **837** at **841***b* and cooperates with scale **840***a* on protractor plate **840**. An adjustable stop or bearing **835***a* is interposed between members **830** and **837** to insure accurate positioning.

Herein, protractor plate **840** includes an aper-

ture 950 in alignment with the 90° position of arm 839 relative to the edge of portion 822a. Arm 837 includes an aperture 951 and secured to the underface of said arm as at 952 is a socketed member 953, the socket 954 being tapered. A tapered pin 955 with head 956 is adapted to seat in openings 950 and 954 when 90° positioning is desired. The taper formation insures accurate positioning at all times for this position. For any intermediate position, this tapered pin is removed. The protractor arm is clamped as at 830d—838a in any other position.

To insure clearance and permit arm 837 to collapse for the free edge of flange 839 to lie parallel or at a slight angle to the adjacent edge of ledge 822a, member 830 is relieved at 960 to nest the member 953. Only the upper face of member 830 and below the protractor plate need be so nested.

Referring to Fig. 7, the distance between the zero line of the machine, see dotted line in recess 820, and face 924 is the same as the distance between face 835 and faces 836a1. So when faces 836a1 and 924 abut and block 921 is adjustably secured, the face 835 should register with the zero line of the machine.

Now if a score, crease, etc., is desired, parallel to that line and one and one-half inches therefrom, scale 826 has its free end abut block 921 and face 836a on member 836 registers with the one and one-half mark on the scale. Member 830 is then clamped to bar 819a and face 835 then is one and one-half inches distant from the zero line.

So far, operation is very similar to the other two forms. However, if a second line is desired at a greater distance and the difference is given, the present form permits the rule to be moved from the zero position so that faces 836a1 and the zero end of the rule register. Then the clamp is released and the structure shifted on the bar 819a until faces 836a1 register with the distance difference mark on rule 826. No mental addition is thus required as is the case with the other two forms described.

Of course, it is understood the scale 826 and structure 832—830, etc., have relative movement without interference and the scale 826 is frictionally held in any adjusted position, but may be manually adjusted as desired.

While the invention has been illustrated and described in great detail in the drawings and foregoing description, the same is to be considered as illustrative and not restrictive in character.

The several modifications described herein, as well as others which will readily suggest themselves to persons skilled in this art, are all considered to be within the broad scope of the invention, reference being had to the appended claims.

The invention claimed is:

1. In a machine which guides a tool and the like, the combination of a body portion having a zero linear position, an aligner including an elongated lateral arm on the body portion and extending transversely of such zero linear position, the arm having a scale arrangement directed longitudinally thereof and having its scale zero offset an appreciable distance from the zero linear position, a slidable stop slidable on the lateral arm toward and away from the zero linear position and including an abutment portion having a straight edge portion of appreciable length and angular to the longitudinal direction of the arm and scale and adapted for tool guidance, said abutment portion having an indicating portion juxtapositioned to the scale arrangement and offset from the abutment straight edge portion in an amount equal to the offsetting of the scale zero from the zero linear position.

2. In a machine for guiding a tool and the like, the combination of a body portion having a zero linear position, an aligner including an elongated lateral arm on the body portion and extending transversely of such zero linear position, the arm having a scale arrangement directed longitudinally thereof and having its scale zero offset an appreciable distance from the zero linear position, a slidable stop slidable on the lateral arm toward and away from the zero linear position and including an abutment portion adapted for tool guidance and having an indicating portion juxtapositioned to the scale arrangement and offset from the abutment portion in an amount equal to the offsetting of the scale zero from the zero linear position, the aligner including another arm directed oppositely from the linear zero position and longitudinally aligned with the first mentioned arm.

3. In a machine for guiding a tool and the like, the combination of a body portion having a zero linear position, an aligner including an elongated lateral arm on the body portion and extending transversely of such zero linear position, the arm having a scale arrangement directed longitudinally thereof and having its scale zero offset an appreciable distance from the zero linear position, a slidable stop slidable on the lateral arm toward and away from the zero linear position and including an abutment portion adapted for tool guidance and having an indicating portion juxtapositioned to the scale arrangement and offset from the abutment portion in an amount equal to the offsetting of the scale zero from the zero linear position, the aligner including another arm directed oppositely from the linear zero position and longitudinally aligned with the first mentioned arm, both arms being of shelf character.

4. In a machine for guiding a tool and the like, the combination of a body portion having a zero linear position, an aligner including an elongated lateral arm on the body portion and extending transversely of such zero linear position, the arm having a scale arrangement directed longitudinally thereof and having its scale zero offset an appreciable distance from the zero linear position, a slidable stop slidable on the lateral arm toward and away from the zero linear position and including an abutment portion adapted for tool guidance and having an indicating portion juxtapositioned to the scale arrangement and offset from the abutment portion in an amount equal to the offsetting of the scale zero from the zero linear position, the aligner including another arm directed oppositely from the zero linear position and longitudinally aligned with the first mentioned arm, the arms being spaced apart at their adjacent ends, such spacing being coincident with the zero linear position.

5. In a machine for guiding a tool and the like, the combination of a body portion having a zero linear position, an aligner including an elongated lateral arm on the body portion and extending transversely of such zero linear position, the arm having a scale arrangement directed longitudinally thereof and having its scale zero offset an appreciable distance from the zero linear po-

sition, a slidable stop slidable on the lateral arm toward and away from the zero linear position and including an abutment portion adapted for tool guidance and having an indicating portion juxtapositioned to the scale arrangement and offset from the abutment portion in an amount equal to the offsetting of the scale zero from the zero linear position, and a protractor arm pivotally carried by the slidable stop.

6. In amachine for guiding a tool and the like the combination of a body portion having a zero linear position, an aligner including an elongated lateral arm on the body portion and extending transversely of such zero linear position, the arm having a scale arrangement directed longitudinally thereof and having its scale zero offset an appreciable distance from the zero linear position, a slidable stop slidable on the lateral arm toward and away from the zero linear position and including an abutment portion adapted for tool guidance and having an indicating portion juxtapositioned to the scale arrangement and offset from the abutment portion in an amount equal to the offsetting of the scale zero from the zero linear position, and a protractor arm pivotally carried by the slidable stop, said protractor arm being of shelf character.

7. In a machine for guiding a tool and the like, the combination of a body portion having a zero linear position, an aligner including an elongated lateral arm on the body portion and extending transversely of such zero linear position, the arm having a scale arrangement directed longitudinally thereof and having its scale zero offset an appreciable distance from the zero linear position, a slidable stop slidable on the lateral arm toward and away from the zero linear position and including an abutment portion adapted for tool guidance and having an indicating portion juxtapositioned to the scale arrangement and offset from the abutment portion in an amount equal to the offsetting of the scale zero from the zero linear position, a protractor arm pivotally carried by the slidable stop, and means for yieldingly retaining said protractor arm in adjusted tilted position relative to the stop.

8. In a machine for guiding a tool and the like, the combination of a body portion having a zero linear position, an aligner including an elongated lateral arm on the body portion and extending transversely of such zero linear position, the arm having a scale arrangement directed longitudinally thereof and having its scale zero offset an appreciable distance from the zero linear position, a slidable stop slidable on the lateral arm toward and away from the zero linear position and including an abutment portion adapted for tool guidance and having an indicating portion juxtapositioned to the scale arrangement and offset from the abutment portion in an amount equal to the offsetting of the scale zero from the zero linear position, a shelf type protractor arm pivotally carried by the slidable stop, and means for retaining said arm in any one of a plurality of tilted positions relative thereto but permitting forcible tilting of said protractor arm into another position.

9. In a machine for guiding a tool and the like, the combination of a body portion having a zero linear position, an aligner including an elongated lateral arm on the body portion and extending transversely of such zero linear position, the arm having a scale arrangement directed longitudinally thereof and having its scale zero offset an appreciable distance from the zero linear position, a slidable stop slidable on the lateral arm toward and away from the zero linear position and including an abutment portion adapted for tool guidance and having an indicating portion juxtapositioned to the scale arrangement and offset from the abutment portion in an amount equal to the offsetting of the scale zero from the zero linear position, a protractor arm pivotally carried by the slidable stop, and cooperating indicating means carried by the protractor arm and stop, one cooperating portion of said means including a scale arrangement and the other including an indicator.

10. In a machine for guiding a tool and the like, the combination of a body portion having a zero linear position, an aligner including an elongated lateral arm on the body portion and extending transversely of such zero linear position, the arm having a scale arrangement directed longitudinally thereof and having its scale zero offset an appreciable distance from the zero linear position, a slidable stop slidable on the lateral arm toward and away from the zero linear position and including an abutment portion adapted for tool guidance and having an indicating portion juxtapositioned to the scale arrangement and offset from the abutment portion in an amount equal to the offsetting of the scale zero from the zero linear position, a protractor arm pivotally carried by the slidable stop, and a cooperating wear compensating lock type connection between the arm and stop when the arm is positioned parallel to the zero linear position and at 90° to the direction of stop movement.

11. In a machine for guiding a tool and the like, the combination of a body structure having a predetermined zero linear position, an angular aligner movable parallel to the zero position including a lateral arm, a scale arrangement on the arm offset from the zero position, a slidable stop upon said arm having an abutment portion and an indicating portion juxtapositioned to the scale arrangement and offset a like distance from the abutment portion, and means for clamping said stop in adjusted position upon said arm portion.

12. In a machine for guiding a tool and the like, the combination of a body structure, a pair of spaced track means thereabove, a T-aligner therebetween and slidable on the structure parallel to the track means, the tail portion lying parallel and the head portion transverse to the track means, and a slidable stop on the head portion and having an abutment for stock location.

13. A machine as defined by claim 12, characterized by the addition of a rule bar carried by the base structure parallel to the track means, and the head portion being correspondingly relieved upon its lower face for rule clearance.

14. A machine as defined by claim 12, characterized by the head portion being of shelf character, the shelving being of interrupted character in juxtaposition to the track means.

15. In a machine for guiding a tool and the like, the combination of a body structure, a pair of spaced track means thereabove, a T-aligner therebetween and slidable on the structure parallel to the track means, the tail portion lying parallel and the head portion transverse to the track means, a slidable stop on the head portion and having an abutment for stock location, and a protractor arm pivotally carried by the stop.

16. A device as defined by claim 15, characterized by the addition of a rule bar carried by the base structure parallel to the track means, and

the head portion being correspondingly relieved upon its lower face for rule clearance.

17. A machine as defined by claim 15, characterized by the head portion being of shelf character, the shelving being of interrupter character in juxtaposition to the track means.

18. A machine as defined by claim 15, characterized by the head portion being of shelf character, the shelving being of interrupted character in juxtaposition to the track means, and said protractor arm being of shelf character.

19. In a machine for guiding a tool and the like, the combination of a body structure having a predetermined zero linear position, an angular aligner movable parallel to the zero position and including a lateral arm, a slidable stock stop upon the lateral arm and having an indicating portion and a stock abutment, a scale arrangement carried by the arm, and a stop portion carried by the arm for indicating portion engagement for zero positioning.

20. In a machine for guiding a tool and the like, the combination of a body structure having a predetermined zero linear position, an angular aligner movable parallel to the zero position and including a lateral arm, a slidable stock stop upon the lateral arm and having an indicating portion and a stock abutment, a scale arrangement carried by the arm, and a stop portion carried by the arm for indicating portion engagement for zero positioning, one of said portions being adjustably mounted.

21. In a machine for guiding a tool and the like, the combination of a body structure having a predetermined zero linear position, an angular aligner movable parallel to the zero position and including a lateral arm, a slidable stock stop upon the lateral arm and having an indicating portion and a stock abutment, a scale arrangement carried by the arm, and a stop portion carried by the arm for indicating portion engagement for zero positioning, said scale arrangement being of the extensible type.

22. In a machine for guiding a tool and the like, the combination of a body structure, having a predetermined zero linear position, an angular aligner movable parallel to the zero position and including a lateral arm, a slidable stock stop upon the lateral arm and having an indicating portion and a stock abutment, a scale arrangement carried by the arm, a stop portion carried by the arm for indicating portion engagement for zero positioning, and a magazine carried by the remote end of the lateral arm for scale arrangement reception.

23. A machine as defined by claim 12 characterized by the addition of a caster wheel support for T-aligner and remote from the base structure.

24. In a machine for guiding a tool and the like, the combination of a body structure having a predetermined zero linear position, an angular aligner movable parallel to the zero position including a lateral arm, a scale supported by said arm, a stop slidable upon said arm and adapted for cooperation with the scale, and lever operable cam clamping means for clamping said stop in adjusted position upon said arm portion.

25. In a machine for guiding a tool and the like, the combination of a body structure having a predetermined zero position and an angular aligner, the head portion thereof extending transverse to that position and the base portion extending parallel thereto, means for clamping the aligner and structure together in adjusted position, and adjustable means connecting said portions together to insure true transverse positioning of the head portion relative to the zero position.

26. In a machine for guiding a tool and the like, the combination of an elongated body having a predetermined zero linear position, a tool guiding member movable parallel to that position and including a tool guiding portion, an extensible scale and supported by the body, and a magazine for the scale and carried by the body remote from the zero position, the member having operative association with the scale for member position spacing relative to the zero position and slidable on the body between the magazine and zero position.

27. A machine as defined by claim 26, characterized by the addition of a U-shaped guard for the magazine and carried by the body.

28. In a machine for guiding a tool and the like, the combination of an elongated body having a predetermined zero linear position, a tool guiding member movable parallel to that position and including a tool guiding portion, an extensible scale and supported by the body, and a magazine for the scale and carried by the body remote from the zero position, the member having operative association with the scale for member position spacing relative to the zero position and slidable on the body between the magazine and zero position, the body including T-shaped scale receiving groove.

29. A machine as defined by claim 28, characterized by the addition of a U-shaped guard for the magazine and carried by the body, and a scale guide supported by the magazine for scale guidance therefrom to said groove.

30. In a machine for guiding a tool and the like, the combination of a base, a body structure confined to movement into parallel positions thereon, an elongated lateral arm on the body structure, the body and arm having a predetermined zero, a scale arrangement carried by the arm and extending longitudinally thereof, the zero of said scale arrangement being offset from the predetermined zero, and a slidable stop upon said arm having an abutment portion adapted for tool guidance and an indicating portion juxtapositioned to the scale arrangement, said indicating portion being offset from the abutment portion an amount equal to the distance between the two zero positions.

31. In a machine for guiding a tool and the like, the combination of a base, a body structure confined to movement into parallel positions thereon, an elongated lateral arm on the body structure, the body and arm having a predetermined zero, a scale arrangement carried by the arm and extending longitudinally thereof, the zero of said scale arrangement being offset from the predetermined zero, and a slidable stop upon said arm having an abutment portion adapted for tool guidance and an indicating portion juxtapositioned to the scale arrangement, said indicating portion being offset from the abutment portion an amount equal to the distance between the two zero positions, the arm being of shelf character.

32. In a machine for guiding a tool and the like, the combination of a base, a body structure confined to movement into parallel positions thereon, an elongated lateral arm on the body structure, the body and arm having a predetermined zero, a scale arrangement carried by the arm and extending longitudinally thereof, the

zero of said scale arrangement being offset from the predetermined zero, and a slidable stop upon said arm having an abutment portion adapted for tool guidance and an indicating portion juxtapositioned to the scale arrangement, said indicating portion being offset from the abutment portion an amount equal to the distance between the two zero positions, the aligner including another arm directed oppositely from the first mentioned zero and longitudinally aligned with the first mentioned arm.

33. In a machine for guiding a tool and the like, the combination of a base, a body structure confined to movement into parallel positions thereon, an elongated lateral arm on the body structure, the body and arm having a predetermined zero, a scale arrangement carried by the arm and extending longitudinally thereof, the zero of said scale arrangement being offset from the predetermined zero, and a slidable stop upon said arm having an abutment portion adapted for tool guidance and an indicating portion juxtapositioned to the scale arrangement, said indicating portion being offset from the abutment portion an amount equal to the distance between the two zero positions, the aligner including another arm directed oppositely from the first mentioned zero and longitudinally aligned with the first mentioned arm, both arms being of shelf character.

34. In a machine for guiding a tool and the like, the combination of a base, a body structure confined to movement into parallel positions thereon, an elongated lateral arm on the body structure, the body and arm having a predetermined zero, a scale arrangement carried by the arm and extending longitudinally thereof, the zero of said scale arrangement being offset from the predetermined zero, and a slidable stop upon said arm having an abutment portion adapted for tool guidance and an indicating portion juxtapositioned to the scale arrangement, said indicating portion being offset from the abutment portion an amount equal to the distance between the two zero positions, the aligner including another arm directed oppositely from the first mentioned zero and longitudinally aligned with the first mentioned arm, the arms being spaced apart at their adjacent ends, the spacing being coincident with the first mentioned zero.

35. In a machine for guiding a tool and the like, the combination of a base, a body structure confined to movement into parallel positions thereon, an elongated lateral arm on the body structure, the body and arm having a predetermined zero, a scale arrangement carried by the arm and extending longitudinally thereof, the zero of said scale arrangement being offset from the predetermined zero, a slidable stop upon said arm having an abutment portion adapted for tool guidance and an indicating portion juxtapositioned to the scale arrangement, said indicating portion being offset from the abutment portion an amount equal to the distance between the two zero positions, and a protractor arm pivotally carried by the slidable stop.

36. In a machine for guiding a tool and the like, the combination of a base, a body structure confined to movement into parallel positions thereon, an elongated lateral arm on the body structure, the body and arm having a predetermined zero, a scale arrangement carried by the arm and extending longitudinally thereof, the zero of said scale arrangement being offset from the predetermined zero, a slidable stop upon said arm having an abutment portion adapted for tool guidance and an indicating portion juxtapositioned to the scale arrangement, said indicating portion being offset from the abutment portion an amount equal to the distance between the two zero positions, and a protractor arm pivotally carried by the slidable stop, said protractor arm being of shelf character.

37. In a machine for guiding a tool and the like, the combination of a base, a body structure confined to movement into parallel positions thereon, an elongated lateral arm on the body structure, the body and arm having a predetermined zero, a scale arrangement carried by the arm and extending longitudinally thereof, the zero of said scale arrangement being offset from the predetermined zero, a slidable stop upon said arm having an abutment portion adapted for tool guidance and an indicating portion juxtapositioned to the scale arrangement, said indicating portion being offset from the abutment portion an amount equal to the distance between the two zero positions, a protractor arm pivotally carried by the slidable stop, and means for yieldingly retaining said protractor arm in adjusted tilted position relative to the stop.

38. In a machine for guiding a tool and the like, the combination of a base, a body structure confined to movement into parallel positions thereon, an elongated lateral arm on the body structure, the body and arm having a predetermined zero, a scale arrangement carried by the arm and extending longitudinally thereof, the zero of said scale arrangement being offset from the predetermined zero, a slidable stop upon said arm having an abutment portion adapted for tool guidance and an indicating portion juxtapositioned to the scale arrangement, said indicating portion being offset from the abutment portion an amount equal to the distance between the two zero positions, a shelf type protractor arm pivotally carried by the slidable stop, and means for retaining said arm in any one of a plurality of tilted positions relative thereto but permitting forcible tilting of said protractor arm into another position.

39. In a machine for guiding a tool and the like, the combination of a base, a body structure confined to movement into parallel positions thereon, an elongated lateral arm on the body structure, the body and arm having a predetermined zero, a scale arrangement carried by the arm and extending longitudinally thereof, the zero of said scale arrangement being offset from the predetermined zero, a slidable stop upon said arm having an abutment portion adapted for tool guidance and an indicating portion juxtapositioned to the scale arrangement, said indicating portion being offset from the abutment portion an amount equal to the distance between the two zero positions, a protractor arm pivotally carried by the slidable stop, and cooperating indicating means carried by the protractor arm and stop, one cooperating portion of said means including a scale arrangement and the other including an indicator.

40. In a machine for guiding a tool and the like, the combination of a base, a body structure confined to movement into parallel positions thereon, an elongated lateral arm on the body structure, the body and arm having a predetermined zero, a scale arrangement carried by the arm and extending longitudinally thereof, the zero of said scale arrangement being offset from

the predetermined zero, a slidable stop upon said arm having an abutment portion adapted for tool guidance and an indicating portion juxtapositioned to the scale arrangement, said indicating portion being offset from the abutment portion an amount equal to the distance between the two zero positions, a protractor arm pivotally carried by the slidable stop, and a cooperating wear compensating lock type connection between the arm and stop when the arm is positioned parallel to the first mentioned zero and at 90° to the direction of stop movement.

CLYDE L. GILBERT.