

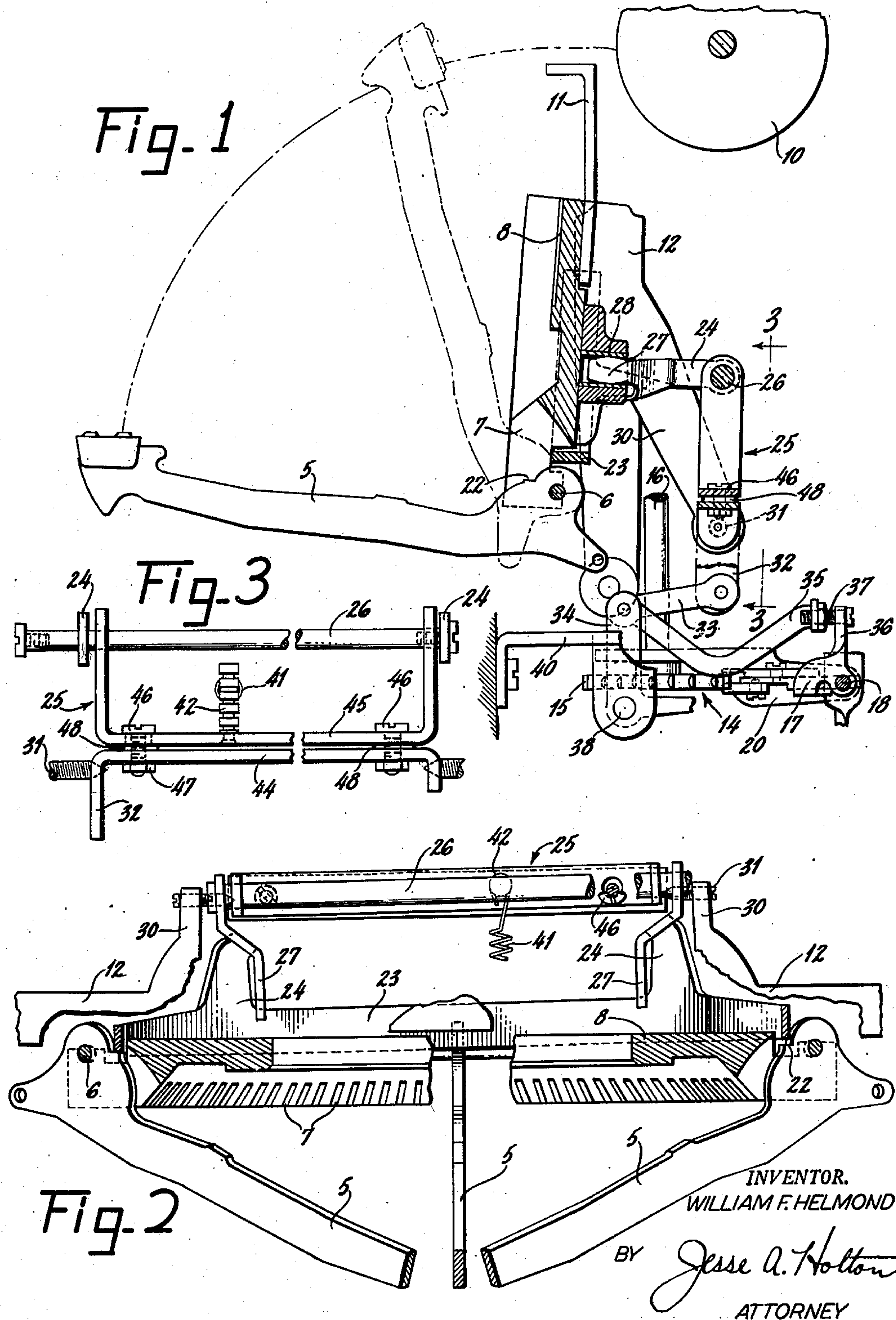
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LETTER-FEED MECHANISM FOR TYPEWRITERS AND LIKE MACHINES

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LETTER-FEED MECHANISM FOR TYPE-
WRITERS AND LIKE MACHINES

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This invention relates to letter-feed mechanisms for typewriters and like machines, and has reference particularly to the mechanism thereof, including a universal bar, for operating the escapement.

The invention has application especially in letter-feed mechanisms wherein the escapement is operated by the type-bars engaging and actuating an arcuate universal bar on the type-bar segment. An object of the invention is to provide in such mechanism a simple and readily manipulative means for effecting adjustment of the arcuate universal bar for accurate spatial relation with the bar-engaging portions of all of the type-bars.

Another object is to provide means by which the position-relation of substantially any length portion of the curved universal bar with respect to the heel portions of the type-bars may be varied, to attain the desired uniformity of the escapement-actuating stroke for all the type-bars.

A further object is to provide adjustment means capable of tilting the plane of the universal bar face with which the type-bar heels engage, on both vertical and horizontal axes, to thus afford universal adjustment capable of compensating for any face-wise misalignment of the universal bar which may occur.

With the above and other objects in view, the invention will now be described with reference to the drawing wherein one embodiment which the invention may assume in practice is shown for the purposes of illustration.

In the drawing:

Fig. 1 is a vertical sectional view taken on a fore-and-aft plane about midway of the typewriter embodying the invention, with portions of the escapement mechanism being shown in elevation.

Fig. 2 is a plan view of the structure embodying the invention, portions being broken away, and showing certain of the type-bars held in a partly operated position to facilitate adjustment of the universal bar, and,

Fig. 3 is a fragmentary rear elevational view, taken on line 3—3 of Fig. 1.

The type bars 5 in the usual complement are each pivoted on an arcuate pivot rod 6 and are guided in radial slots 7 of a type-bar segment 8 to cause their type heads to strike at a common typing point on the platen 10, as defined by a type guide 11. In the embodiment shown case shift is effected by shifting the type-bar segment, although it will be apparent that the

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invention is also applicable to platen-shift typewriters. A type-basket shift being shown, the segment 8 is therefore carried on a shift frame 12 guided for up-and-down movement in the usual manner.

By means not shown the platen 10 is mounted for horizontal travel in line-typing or letter-feed direction, actuated by the usual spring drum not shown. The letter-feed steps of the platen carriage are controlled in the usual manner by an escapement mechanism generally indicated at 14, the escapement wheel 15 of which is operatively connected to the platen carriage by the usual means including a vertical shaft 16.

Cooperating with the escapement wheel 15 are the usual escapement dogs carried on a dog rocker 17 pivoted at 18 on a stationary bracket 20, which also provides a journal for shaft 16. For each letter-feed step of the platen carriage, the dog rocker 17 first swings downward and then backs up in a vibratory motion, bringing the escapement dogs alternately into coaction with the teeth of the escapement wheel 15, to thus effect one step of feed in the well known manner.

The train of mechanism by which the dog rocker 17 is thus vibrated for each typing stroke of the type-bars will now be described. Each type-bar 5 has a shoulder or heel portion 22 adapted to engage the front edge or face of a universal bar 23 when the actuated type-bar reaches the position shown in dot-and-dash outline in Fig. 1. During the remainder of the type-bar stroke to the platen, the universal bar 23 is actuated rearwardly to effect the first phase of the escapement operation, the second phase occurring during the initial return of the type-bar 5, during which the universal bar 23 becomes restored to its normal position under influence of spring means later described.

To conform to the arcuate arrangement of the type-bar pivots on rod 6, the universal bar 23 is also arcuate, in parallelism with pivot rod 6. As shown best in Fig. 2, the universal bar 23 includes two rearwardly extending arms 24 which at their rear ends are flexibly connected to a rockable bail frame 25 by means of a pivot pin 26, see Fig. 3. The arms 24 also include portions 27 offset inwardly therefrom, Fig. 2, and forming forwardly projecting prongs slidably engaged in suitable recesses 28, Fig. 1, in the segment-shift frame 12 and by which the universal bar 23 is mounted and guided for fore-and-aft sliding movement, in conjunction with

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the rockable frame 25. Extending rearwardly from the shift frame 12 are two bracket arms 30 which carry trunnions 31 providing a pivotal axis for the rocking of frame 25. The lower part of frame 25 includes an arm 32 to which a link 33, Fig. 1, connects one arm of a lever 34. A second link 35 connects the lever 34, and therefore the link 33, to an arm 36 reaching upwardly from the dog rocker 17, by means of an adjustable connection 37. The lever 34, pivoted at 38 to a stationary bracket 40, forms part of a mechanism not of concern in respect to the present invention. In the operation of the linkages 33, 35, in transmitting the movement of the universal bar 23 to the dog rocker 17, the upstanding arm of lever 34 acts merely as a guide for the pivotal connection between the said two links.

It will now be seen that rearward movement of the universal bar 23 by any operated type-bar 5 causes the bail frame 25 to rock clockwise about pivots 31, as viewed in Fig. 1, swinging its depending arm 32 leftwardly. This motion, transmitted through links 33, 35, causes the dog rocker 17 to rock downwardly in the first phase of escapement operation. The return or restoration of this mechanism is effected by a spring 41 pulling on an upstanding post 42 on the bail frame 25, see Figs. 2 and 3, by which the universal bar 23 assumes its normal forward position as the operated type-bar 5 begins its return stroke. The restoring effect of spring 41 is transmitted through linkage 33, 35, to the dog rocker 17 and thus causes the latter to complete the second phase of escapement operation.

The means by which adjustability of the universal bar 23 with respect to the type-bar heels 22 is effected to assure a uniform escapement-actuating stroke for all of the type-bars, will now be described.

As shown best in Fig. 3 the bail frame 25 embodies a two-piece structure comprising a lower part 44 and an upper part 45 secured together by suitable means such as the screws 46. The plane at which the two parts 44, 45 are joined is preferably close to the axis formed by the two trunnions 31 and is generally parallel to said axis. In the preferred construction shown, each frame part 44, 45 is fabricated from flat metal strip stock bent into a U-form and assembled so that the intermediate elements or webs of the two parts confront each other. In the construction shown, the web of frame part 44 has two tapped holes to receive the screws 46, a nut 47 locking each screw in tightened position. Where the screws pass through the web of frame part 45, at least one of the holes is a clearance hole. In the construction shown, the hole for the rightward screw 46, as viewed in Fig. 2 is a clearance hole substantially larger than the diameter of the screw, whereas the hole for the leftward screw, in the frame part 45, snugly fits the screw. It will also be noted that a washer or pack of shims 48 surrounds each screw 46 and serves as an adjustable spacer between the confronting faces of the webs of the two frame parts 44, 45.

The construction of the bail frame 25 as just described affords two kinds of adjustment for the universal bar 23. The two modes of adjustment enable tilting the plane of the front face of the universal bar on a vertical axis for one adjustment and on a horizontal axis for the other, or various combinations of both.

Considering first the adjustment by which tilting of the front plane of the universal bar 23

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on a vertical axis is effected, reference is had to Fig. 2. It will be observed that the two outermost type-bars and a medial type-bar are being held in a partly actuated position at which each should contact the front face of the universal bar and begin to actuate same. In order to demonstrate this mode of adjustment, the rightward portion of the universal bar is shown as requiring substantial adjustment to bring its front face to such position where it would be contacted by the heel portion 22 of the rightward type-bar; that is, where it would have the same relation to the type-bar heel 22 as that of the leftward type-bar. This discrepancy may be readily corrected by loosening the screw 46 at the rightward portion of the bail frame 25 and thereafter swinging frame part 45 forward about the other or leftward screw 46 until the clearance between the rightward portion of the universal bar 23 in relation to the type-bar heel is taken up, after which the rightward screw 46 is tightened to secure the adjustment. Thus, this mode of adjustment enables the mechanic to bring the front face of the universal bar into parallel alignment with the composite faces presented by the heels 22 of all of the type-bars.

If the discrepancy shown in Fig. 2 occurs at the opposite or leftward portion of the universal bar, the adjustment afforded at the rightward screw 46 is first utilized to bring the universal bar into an evenly spaced or parallel relation with both outside type-bar heels. The universal bar front face is thus positioned so that it is uniformly spaced with respect to all the type-bar heels 22, and such spacing may now be taken up by a further adjustment. This is effected by varying the adjustable connection 37, Fig. 1, in the appropriate direction, while maintaining the dog rocker 17 in its normal or inactive position, to advance or retract the front face of the universal bar until it assumes the desired position with respect to the type-bar heels 22. The adjustment afforded by the connection 37, being transmitted to the universal bar through the medium of the bail frame 25, assures a corresponding adjustment at both ends of the bar.

The other mode of adjustment by which to tilt the universal bar about a horizontal axis will now be described. This tilting adjustment may be either uniform across the entire bar or may be effected to varying extents for the leftward and rightward portions of the bar, which in effect would give the arcuate bar a transverse twist.

Referring to Fig. 1, it will be noted that the prong of arm 27 within the recess 28 is barrel-shaped and that said prong is about midway between the upper and lower extremes of the universal bar 23. This in effect affords a pivotal mounting, on a horizontal axis, for each lateral half of the universal bar. It may also be noted that, in a horizontal direction as shown in Fig. 2, the rightward prong 27 is disposed at a point about midway of the rightward half of the universal bar and the leftward prong 27 is about midway of that half of the bar. Referring now to Fig. 3, it will be seen that by varying the spacing between the flanges of the two frame parts 44, 45, the axis of pivot pin 26 will be correspondingly raised or lowered. Considering this now in the Fig. 1 showing, it will be observed that as the axis of pivot 26 is raised it will cause the corresponding lateral portion of the universal bar to be tilted about an imaginary axis formed by the barrel-shaped prong 27. Thus by using

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washers 48 of proper thickness or adding or withdrawing shims, the required upward or downward adjustment of the axis 26, with a corresponding tilt of that half of the universal bar 23, may be effected. In a similar manner appropriate adjustments may be made for the other half of the universal bar to give that half the required tilting adjustment about a horizontal axis. It will be readily seen that if the faulty position of the universal bar requires a tilt adjustment uniformly across the bar, this may be effected by adding or withdrawing shims to the same extent for both the leftward and rightward screws 46.

What is claimed is:

1. In a typewriting or like machine, an elongate universal bar operable by the type-bars of the machine, a universal-bar-operated mechanism, and an operating train between the universal bar and the bar-operated mechanism, said operating train comprising a rockable bail frame connected to the universal bar at two points on the bail frame spaced lengthwise of said bar and connected at a third point with the bar-operated mechanism, said bail frame including two complementary frame sections, and means adjustably connecting said frame sections to afford adjustment of at least one of the two universal-bar-connected points toward or from the universal bar and toward or from the rocking axis of said frame.

2. In a typewriting or like machine, an elongate universal bar operable by the type-bars of the machine, a universal-bar-operated mechanism, and an operating train between the universal bar and the bar-operated mechanism, said operating train comprising a rockable bail frame connected to the universal bar at two points on the bail frame spaced lengthwise of said bar and connected at a third point with the bar-operated mechanism, said bail frame including two complementary frame sections separable along and meeting at a region generally parallel with the rocking axis of said frame, and adjustable means for holding said frame sections together in variable positions relatively to each other.

3. In a typewriting or like machine, an elongate arcuate universal bar operable by the type-bars of the machine, and escapement mechanism, and an operating train between the universal bar and the escapement mechanism, said operating train comprising a two-part bail frame, the first frame part having a pivotal mounting for the bail frame and an arm operatively connected to the escapement mechanism, the second frame part having two arms spaced lengthwise of the universal bar and operatively connected thereto, said frame parts being separable along and meeting at a region adjacent and coextensive with the pivotal axis of the first said frame part, and

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adjustable means for holding said frame parts together in variable positions relatively to each other.

4. In a typewriting or like machine, an elongate arcuate universal bar operable by the type-bars of the machine, an escapement mechanism, and an operating train between the universal bar and the escapement mechanism, said operating train comprising a two-part bail frame, the first frame part having a pivotal mounting for the bail frame and an arm operatively connected to the escapement mechanism, the second frame part having two arms spaced lengthwise of the universal bar and operatively connected thereto, said frame parts being separable along and meeting at a region adjacent and coextensive with the pivotal axis of the first said frame part, and means holding said frame parts together and affording position-adjustment of the second frame part on the first frame part in a direction transverse to the general plane of the bail frame and affording position-adjustment of the second frame part toward or away from the first frame part.

5. In a typewriting or like machine, an elongate universal bar presenting a generally upright arcuate face engageable by the type bars of the machine for moving the universal bar rearwardly, an escapement mechanism, a rockable bail frame having a general plane upright and parallel with the universal bar face, said bail frame reaching upwardly from its rocking axis and having two points spaced lengthwise of the universal bar and articulated to rearward extensions of said bar, said bail frame comprising upper and lower frame parts separable along and meeting at a region adjacent and coextensive with the rocking axis of the bail frame, the lower frame part including the rocking axis and having a pendent arm operatively connected to said escapement mechanism, the upper frame part providing the two points articulated to the universal bar extensions, and means adjustably joining said two bail frame parts for movement of the upper frame part relatively to the lower frame part to vary the positions of said two articulated points either horizontally or vertically for variously adjusting the position of the arcuate face of the universal bar.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,342,186	Seib	June 1, 1920
1,411,604	Barney	Apr. 4, 1922
1,516,922	Helmond	Nov. 25, 1924