

Dec. 5, 1933.

K. JANISZEWSKI

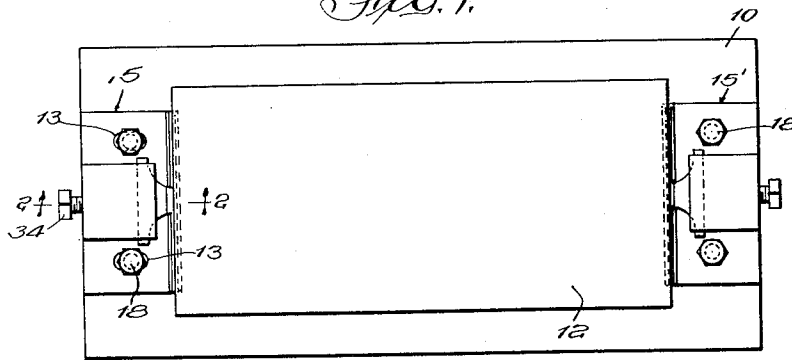
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WORK HOLDING DEVICE

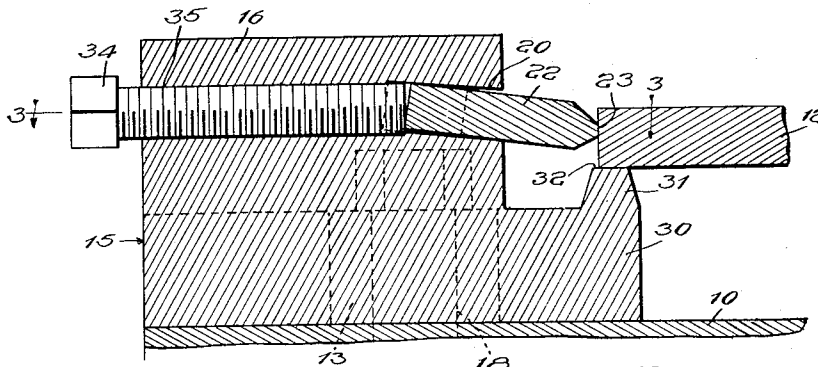
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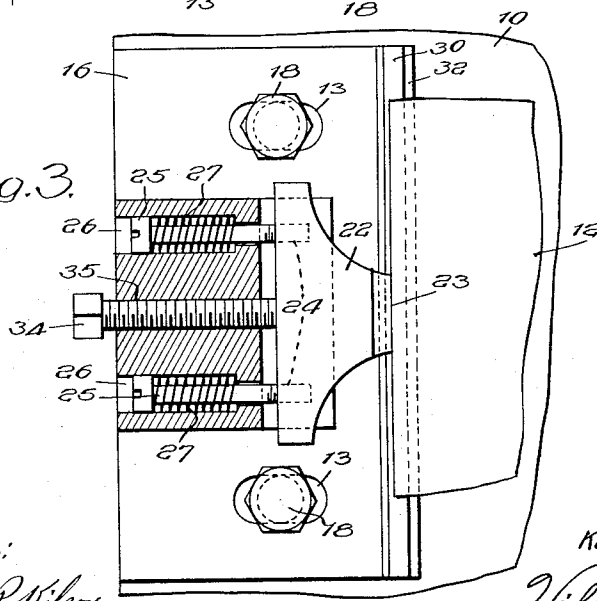
*Fig. 1.*



*Fig. 2.*



*Fig. 3.*



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*William R. Milroy*

Inventor:  
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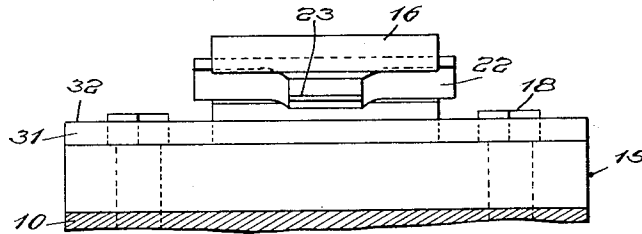
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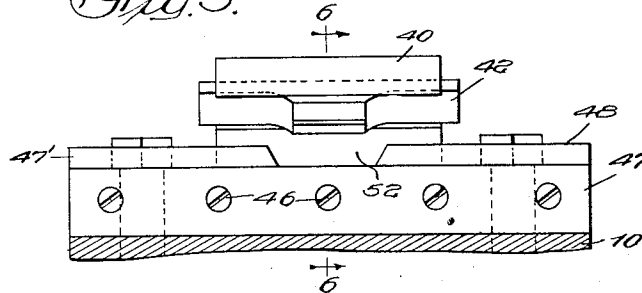
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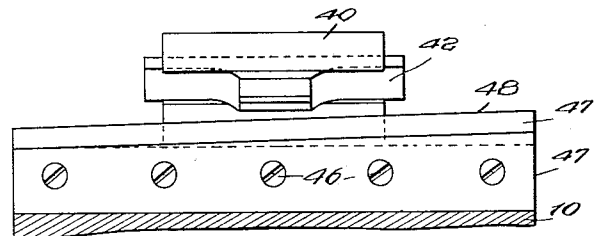
*Fig. 4.*



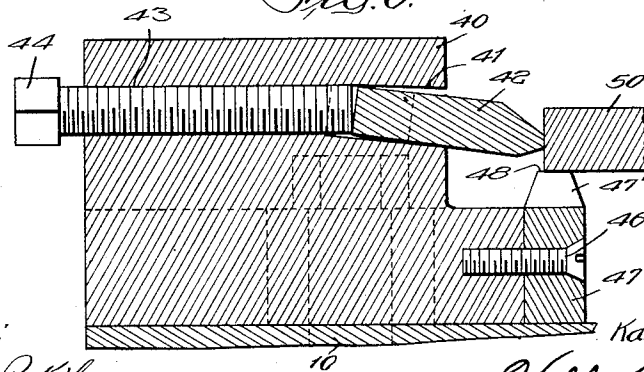
*Fig. 5.*



*Fig. 7.*



*Fig. 6.*



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Fig. 8.

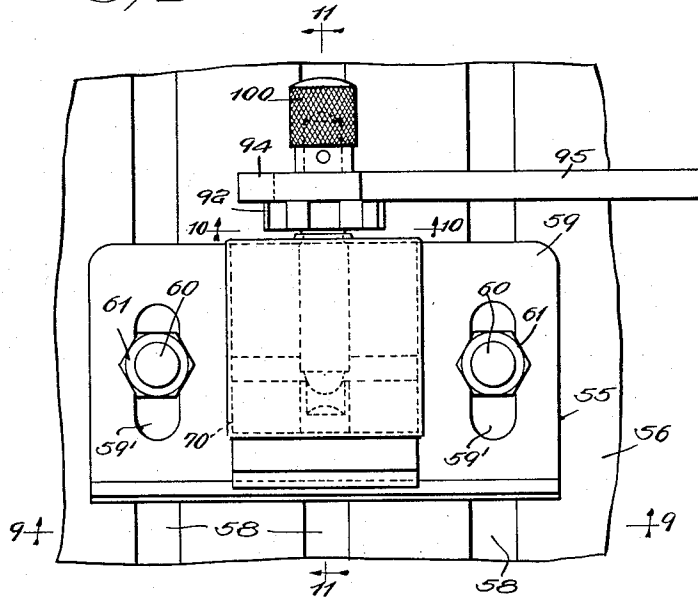
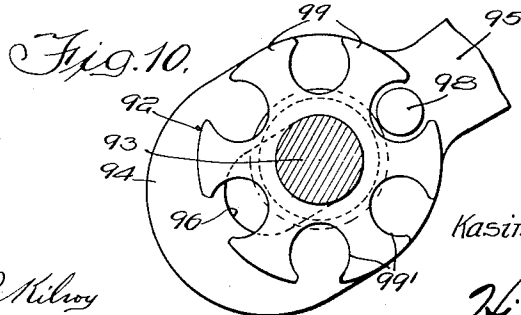
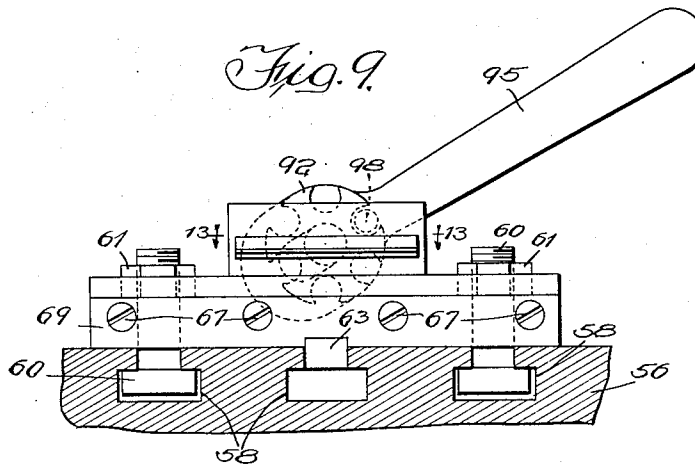


Fig. 9.



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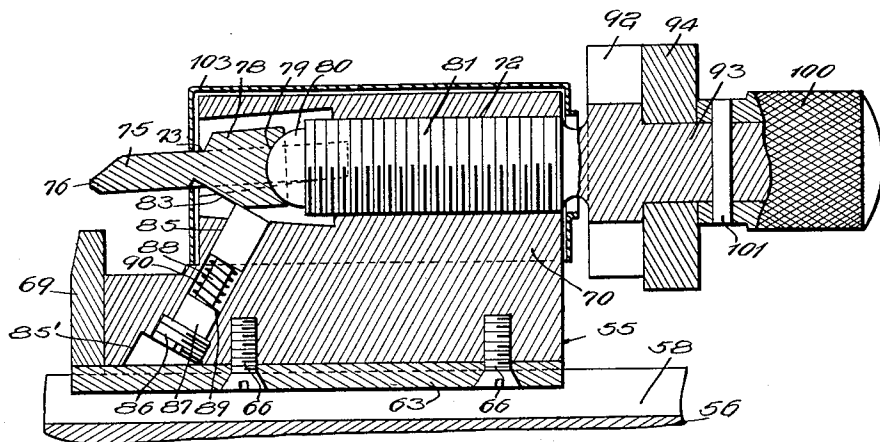
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WORK HOLDING DEVICE

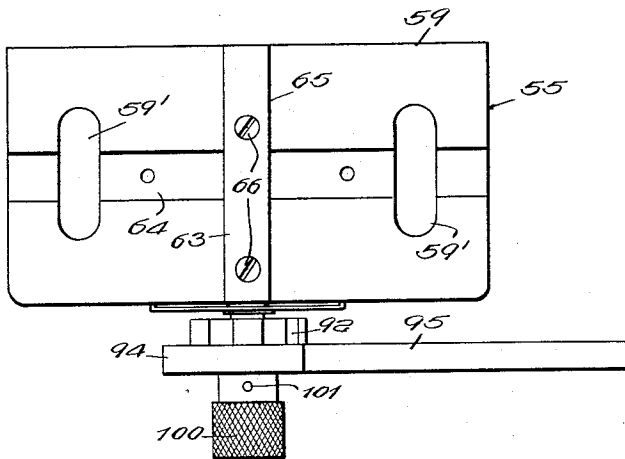
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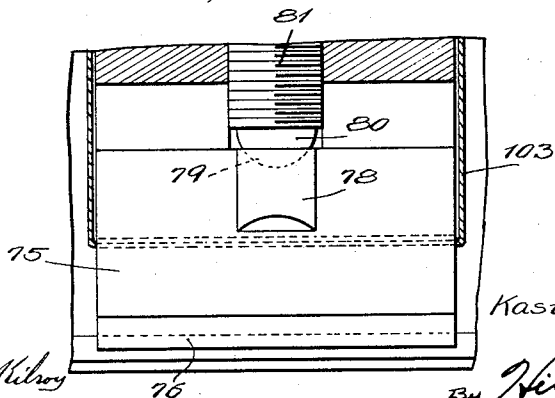
*Fig. 11.*



*Fig. 12.*



*Fig. 13.*



Witness

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## UNITED STATES PATENT OFFICE

1,938,337

## WORK HOLDING DEVICE

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to Superior Tool and Die Company, Milwaukee,  
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Application July 31, 1929. Serial No. 382,548

2 Claims. (Cl. 90—59)

My invention relates to work holding devices and has particularly to do with a device for holding a piece of work on an automatic machine such as a lathe, planer, or other machine of the automatic type, or on a work bench.

An object of my invention is to provide a device for holding a piece of work on an automatic machine or bench in adjusted positions, which device may be adjusted to accommodate work of different sizes and shapes.

A special feature of devices embodying my invention is that they are provided with a movable work supporting member which may be quickly and easily replaced by an operator, whereby a piece of work may be supported at exactly the desired angle with regard to the bed plate of the machine, or work may be supported which has a boss or other irregularity which would interfere with ordinary supports it being merely necessary to carry on hand a plurality of the removable supporting members so that they may be mounted on the device in accordance with the particular angle desired or in accordance with the particular irregularity of the work to be supported.

Many other objects and advantages of the construction herein shown and described will be obvious to those skilled in the art from the disclosure herein given.

To this end my invention consists in the novel construction, arrangement and combination of parts herein shown and described, and more particularly pointed out in the claims.

In the drawings, wherein like reference characters indicate like or corresponding parts:

Fig. 1 is a top plan view of a device embodying my invention mounted on the bed plate of a machine, a piece of work being shown supported by the device;

Fig. 2 is a sectional view taken on the line 2—2 of Fig. 1;

Fig. 3 is a sectional view taken on the line 3—3 of Fig. 2;

Fig. 4 is a front elevation of the device of the preceding figures shown mounted on a bed plate, the latter being shown in section;

Fig. 5 is a view similar to Fig. 4 but showing another embodiment of the invention;

Fig. 6 is a sectional view taken on the line 6—6 of Fig. 5;

Fig. 7 is a view similar to Fig. 5 and showing the same embodiment with a different work supporting member mounted thereon;

Fig. 8 is a top plan view of still another embodiment shown mounted on the table of a machine, the latter being indicated fragmentarily;

Fig. 9 is a sectional view taken on the line 9—9 of Fig. 8;

Fig. 10 is a sectional view taken on the line 10—10 of Fig. 8;

Fig. 11 is a sectional view taken on the line 11—11 of Fig. 8;

Fig. 12 is a bottom plan view of the device of Fig. 8, and

Fig. 13 is a sectional view taken on the line 13—13 of Fig. 9.

Referring first to the embodiment of Figs. 1 to 4 inclusive, a pair of devices 15 and 15' embodying my invention are shown mounted on a bed plate 10 of an automatic machine, the remainder of the machine not being shown, inasmuch as the type of machine is immaterial. The numeral 12 indicates any suitable piece of work upon which it is desired to perform a given operation, which operation will depend upon the type of automatic machine which is involved.

In accordance with my invention, two substantially similar work holding devices are provided at opposite ends of the piece of work 12. Each of the devices 15 and 15' comprises a block 16 provided with a plurality of bolt holes 13 whereby the block may be secured to the bed plate 10 of the machine by means of bolts 18, or other suitable means. The bolt holes of the device 15' are round while the bolt holes 13 of the device 15 are elongated, for a reason which will later become apparent. The block 16 is also provided with a slot 20 whose upper and lower faces, it will be noted in Fig. 2, are disposed angularly to the upper and lower faces of the block 16. The reason for such an arrangement is that a work engaging piece or chuck like member 22 slidably disposed in the slot 20 is thus held in a downwardly and laterally directed position. It is preferred that the upper face of the slot 20 be approximately 3 degrees from the horizontal and that the lower face of the slot be inclined at about 6 degrees from the upper face, as such angles allow a slight play of the chuck 22 and permit its biting into the work. However, such angles are merely mentioned as examples. The chuck 22 has a comparatively narrow work engaging edge 23 formed nearer the lower face of the chuck and has suitable apertures 24 in the rear thereof interiorly threaded to receive screws 25. Suitable apertures 26 are provided in the block 16 in the rear of the slot 16 for housing the screws 25, and coiled compression springs 27 are disposed around the screws 25 so as to resiliently urge them and the chuck member 22 away from the work 12.

A work supporting member 30 is provided on the block which, in this particular embodiment, is preferably formed integrally therewith and has an upwardly extending flange 31 with a flat work supporting face 32.

A backing screw 34 is threaded into the rear of the block 16, threaded apertures 35 in the block in registry with the slot 20 being provided therefor.

It is believed that, from the foregoing description, the advantages and method of operation of the device just described will be obvious to those skilled in the art. In the use of the devices, one of them, say the device 15', is immovably mounted upon the bed plate of the machine, inasmuch as it is provided with round bolt holes, while the other, say the device 15, is adjustably mounted, by reason of its elongated bolt holes, so that it can be moved toward and away from the work 12 in order to engage the same. When the movably or adjustably mounted device 15 has been positioned so that its chuck member 22 slightly engages the work, the screw 34 is then turned up so as to move the chuck member 22 outwardly from the block and thus tightly engaging the work. Once the device has been adjusted as described above, the chuck 22 will always remain fixed due to its three point support, the screws 25 and 34 retaining it against any possible jolting or slippage. Obviously, the screws 25, because of their resilient mounting, will maintain the chuck in proper alignment. When it is desired to change the work 12, it merely becomes necessary to loosen the backing screw 34. The chuck 22 is then immediately automatically drawn back by means of the springs 27, the work is released and a new piece of work may be positioned in the manner described above. It may be desired to provide one device embodying my invention on one side of the work and immovably mounted, while two such devices, adjustably mounted, may be arranged on the opposite side of the work instead of the single device 15. Obviously, such an arrangement provides a three-point support for the work and is highly efficacious.

The embodiment of Figs. 5 to 7, inclusive, is substantially similar to the embodiment described above except that it has a removable work supporting member. Thus, there is a block 40 which is substantially similar to the block 16, with a slot 41 similar to the slot 20 for receiving a chuck-like member 42, which is substantially similar to the member 22. A threaded aperture 43 in the block 40 registers with the slot 41 and receives a screw 44 which normally bears against the chuck-like member 42.

Attached to the block 40 by means of screws 46 or other suitable means, is a removable work supporting member 47 having an upwardly projecting flange 47' with a face 48 for supporting a piece of work 50. The advantage of this construction, whereby the work supporting member 47 is removable, is that, without removing the block 40 from the machine, pieces of work of various shapes may be accommodated by the device and, furthermore, the work may be arranged in various positions, according to the particular operation which is to be performed upon it. Thus, it will be noted in Fig. 5 that a recess 52 is provided in the flange 47' of the work supporting member 47. By this means the device will support a piece of work which has a marginal boss or flange or other projection. It will be obvious, of course, that the recess may be arranged in a wide variety of shapes and proportions and that it need not conform with the particular embodiment shown in Fig. 5.

In Fig. 7, it will be noted that the work supporting edge 48 of the detachable member 47 is disposed at an angle to the bed plate 10 of the machine. It will be readily apparent to those familiar with this art, that such an arrangement is particularly desirable in connection with cer-

tain operations of particular machines, as, for example, when it is desired to impart a bevel to the work by means of a planer, etc. Obviously, the work supporting member may be replaced according to the angle desired to be imparted to the work, without the necessity of removing the entire device. Hence, my device is extremely economical as it only becomes necessary to keep on hand a plurality of work supporting members, which may be mounted as required for a given job.

Referring now to Figs. 8 to 13, there is shown here an embodiment of my invention, indicated generally at 55, shown in Figs. 8 and 9, as mounted on a table 56 forming part of an automatic machine or work bench. The top of the table 56 is provided with a plurality of parallel grooves or keyways 58, which, as best shown in Fig. 9, are T-shaped in cross-section.

The device 55 comprises a base portion 59, which is preferably slotted as at 59', the slots 59' extending entirely through the base member 59 and being elongated. A threaded bolt 60 extends through each of the slots 59' in such a manner that the head thereof is disposed in the cross-portion of the keyways 58, while the shaft of the bolt is disposed in the leg portion of the keyway, as shown best in Fig. 9. A retaining nut 61 is disposed on the screw-threaded end of each of the bolts 60 and it will be readily apparent that, by means of this arrangement, the device 55 may be moved on the table to substantially any desired adjusted position, the heads of bolts 60 riding in the keyways 58. However, it is expedient that the heads of the bolt 60 be slightly smaller in diameter than the width of the keyways 58, and hence, there is some play within these keyways. To offset this condition and make a rigid seat between the device 55 and the table 56, a tongue like member 63 is provided on the device for riding in a keyway 58 intermediate of those in which the bolts 60 are disposed. As shown best in Fig. 12, a groove 64 is provided in the bottom of the base member 59 extending longitudinally thereof, and another similar groove 65 is provided in the base member transversely of the groove 64. The tongue-like member 63 is secured in one or the other of the grooves 64 or 65 by means of screws 66, depending upon the direction in which the device 55 is to be adjusted on the table. It will be understood, of course, that keyways may be provided in the table 56 transversely of the parallel keyways shown, in which transverse keyway the device will be adjusted when the tongue 63 is secured in the slot 64. As shown best in Fig. 9 the tongue 63 fits snugly within the leg portion of the keyway 58.

Secured to the base portion 59 by means of screws 67 or other suitable means is a detachable work supporting member 69 which may be substantially similar to the member 47 shown in Fig. 6.

Preferably integral with the base portion 59 is a block-like member 70 which has a screw-threaded bore 72 in the rear thereof communicating with a slot 73 extending across the front of the bore, which slot seats a chuck-like member 75. The chuck 75 is substantially similar to the member 42 shown in Fig. 6 comprising for the most part a plate having a work engaging edge 76, but also has formed in the rear thereof a substantially cylindrical portion 78. This cylindrical portion extends substantially to the rear edge of the chuck where it is dished out as at 79 to form

a concave seat for a spherical boss 80 formed on the end of a screw 81 threaded into the bore 72.

As best seen in Fig. 11, the slot 73 in the block portion 70 has a cylindrical recess in its top and bottom walls extending substantially from front to rear of the slot 73 and substantially centrally thereof for housing the cylindrical portion 78 of the chuck like member 75. This portion is bevelled at the lower front portion thereof, as indicated at 83. A bore 85 is formed through the base portion 59 and block portion 70 communicating with the lower wall of the cylindrical recess 73, this bore having an enlarged portion 85' at its outer end. As seen best in Fig. 11, this bore 85 is formed at such an angle as to be substantially perpendicular to the bevelled face 83 formed on the chuck like member 75 in the normal operative arrangement of this member. Normally seated within the bore 85 is a screw 86 bearing against a cylindrical plug 87. This plug has a reduced portion 88 about which is coiled a helical compression spring 90, one end of which abuts against the shoulder 89, formed on the cylindrical plug 87 and the other end of which bears against one end of a plunger slidably mounted in the bore 85 and on the reduced portion 88 of the plug 87, the opposite end of the plunger bearing against the bevelled portion 83 of the chuck 75.

Secured to the screw 81 and preferably integral therewith is a ratchet wheel 92 having teeth 99 separated by substantially circular slots 99'. Formed co-axially with the screw 81 on the opposite side of the ratchet wheel 92 from this screw is a shaft 93 on which is rotatably mounted a ratchet member 94 having a crank member 95 preferably formed integrally therewith. As best seen in Fig. 10, the ratchet member 94 has an elongated opening 96 therein whose minor diameter is substantially equal to that of the shaft 93, and formed on the ratchet member is a stud 98 disposable in the slots between the teeth 99 of the ratchet wheel 92. A knurled manipulating member 100 is secured to the shaft 93 by means of a pin 101 on the outside of the ratchet member 94.

A cap 103, preferably formed of sheet metal or the like may be disposed over the block 70 in order to prevent the accumulation of dust and other foreign material around the chuck, etc. (see Fig. 11).

It is believed that the operation of the embodiment just described will be apparent to those skilled in the art from the above explanation. As described above, the device 65 may be adjusted on the table or bench to a preferred position by means of the bolts 60 and tongue 63 engaged in the keyways 58. Assuming that the device has been so adjusted on the table and is in substantially the condition shown in Fig. 11, a piece of work is brought into engagement with the edge 76 of the chuck 75. The screw 81 is moved up as far as possible by means of the knurled manipulating member 100, after which the ratchet 94 may be operated by means of the lever 95 to tighten up the chuck still further. It is believed that the operation of the ratchet will be obvious, the stud 98 on the ratchet member being movable into the spaces 99' between the teeth 99 of the ratchet wheel 92 by reason of the elongated slot 96 in the ratchet member engaging the shaft 93.

As the screw 81 is moved forwardly either by means of the manipulating member 100, or the

ratchet just described, the spherical boss 80 formed on the end of the screw will have a firm but adjustable seat in the cavity formed in the rear of the chuck-like member 75. Hence, the chuck 75 will be moved forward and tilted downwardly by the forward movement of the screw 81, the forward movement of the chuck being resisted by the spring 90 and its tilting movement facilitated by this spring, hence, the edge 76 of the chuck will tend to bite into the work and obtain a very firm seat therein, so that the work will be very firmly secured. As in the embodiment previously described, the angles of the upper and lower faces of the slot 73 are of considerable importance, inasmuch as they permit a certain amount of play in the chuck 75 but, at the same time, restrict its angular movement so that it obtains the maximum securing effect on the work.

It will be obvious that a device of the type just described may likewise be used to obtain a three point support for a piece of work, as described above, and that one of the securing devices may be of the adjustable type while the two on the opposite side of the work are non-adjustable, or vice-versa.

When it is desired to release the work the ratchet and manipulating member may be operated in reverse direction, the spring 90 retracting the chuck as the screw 81 is moved back.

Having thus described my invention, it is obvious that various immaterial modifications may be made in the same without departing from the spirit of my invention; hence, I do not wish to be understood as limiting myself to the exact form, construction, arrangement, and combination of parts herein shown and described or uses mentioned.

What I claim as new and desire to secure by Letters Patent is:

1. In a device of the class described, a member adapted to be secured to the bed plate of a machine, or the like, said member having a slot therein, a work engaging member mounted to tilt and slide in said slot, the upper and lower walls of said slot being disposed at an angle to the horizontal and to each other, means mounted on said slotted member for applying a force to said work engaging member so as to urge it laterally with respect to said slot, and resilient means for applying a force to said work engaging member at an angle to said first mentioned force in a manner to tilt and slide said work engaging member in said slot, said last mentioned force having a component substantially opposite to that of said first mentioned force.

2. In a device of the class described, a supporting member adapted to be secured to the bed plate of a machine, or the like, said member having a slot therein, a work engaging member movably disposed in said slot in a manner to slide therein and to tilt in a substantially horizontal plane with respect thereto, said slot providing vertical play for said work engaging member, means mounted on said slotted member for applying a force to said work engaging member so as to urge it laterally with respect to said slot, and resilient means for applying force to said work engaging member at an angle to said first mentioned force, said last mentioned force having a component substantially opposite to that of said first mentioned force.

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