June 17, 1941. A. RAFTER 2,245,711

BACK BRACE FOR MACHINE TOOL RAMS

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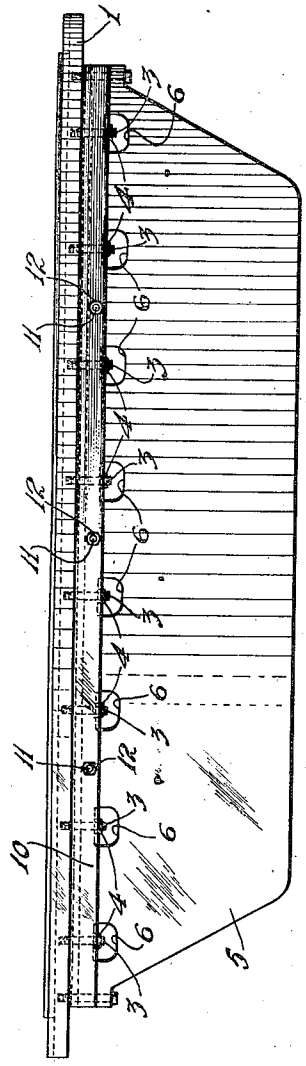

Fig. 1

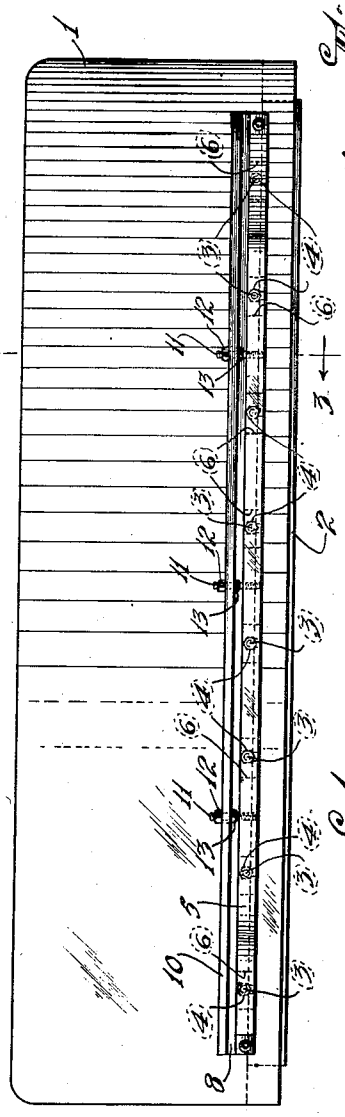

Fig. 2

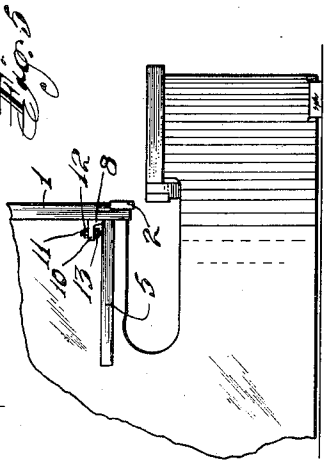

Fig. 5

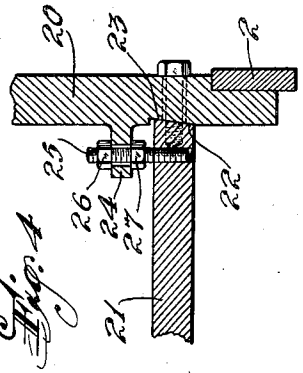

Fig. 4

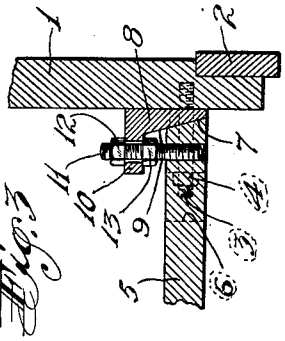

Fig. 3

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BACK BRACE FOR MACHINE TOOL RAMS

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7 Claims. (Cl. 164—47)

This invention relates to machine tools such as press brakes, shears and the like; and more particularly to a provision of means for adjusting back braces for rams used in such machines.

In machines of this type it is necessary to apply a great force, which tends to cause deflections of the ram bodies out of a true straight line. Heretofore, this tendency has been resisted somewhat by the attaching of back braces to the ram in positions to overcome deflections in the direction of lateral bending of the ram. However, such back braces have been found objectionable in that they could not be accurately adjusted from time to time in order to accommodate for deflections which naturally will occur.

The rams themselves also become permanently bent out of a straight line due to various causes, and the operation of a shear, for example, with a ram which is bent even very slightly, is not very satisfactory.

It is, therefore, an object of this invention to provide a back brace or ram, which, instead of being welded to the ram is fixedly secured thereto, and held in place by means of suitable attaching devices, which enable the brace to be adjusted relative to the ram, accurately and conveniently, to straighten out any slight permanent bends in the ram.

It is a further object of this invention to provide between a ram and a back brace, wedge means to adjust the pressure upon the ram, so as to eliminate improper registration of the shear blades.

These and other advantageous objects, which will later appear, are accomplished by the simple and practical construction and arrangement of parts, hereinafter described and exhibited in the accompanying drawing, forming part hereof, and in which:

Fig. 1 is a plan view of a ram having a brace attached thereto by means embodying my invention,

Fig. 2 is an enlarged fragmentary elevational view of the device shown in Fig. 1,

Fig. 3 is a similar sectional view taken on line 3—3 of Fig. 2,

Fig. 4 is a sectional view of a modified form of the invention, and

Fig. 5 is a fragmentary view of a press showing the position of the ram and shears.

Referring to the drawing, there is shown a ram 1 having attached to the lower end thereof a shearing knife 2. Secured to the ram by means of bolts 3 and nuts 4 is a back brace 5 which has a plurality of spaced cut-out portions 6 to enable manipulation of the bolts and nuts.

The brace 5 has the end thereof adjacent the ram machined and bevelled at 7 which cooperates with a wedge 8 having a bevelled side 9 abutting the bevelled edge 7. The wedge 8 is provided with a flange 10 through which pass bolts 11 having thereon adjusting nuts 12 and 13, the bolts 11 threadedly engaging the back brace 5.

The wedge and back brace do not extend the full length of the ram but are spaced from the ends thereof as shown in Fig. 1, the ends of the ram being held in proper position by guides. The tendency to bend occurs in the section covered by the back brace and the wedge. The bending of the ram is very slight but even this minute bending is a serious matter and prevents proper operation of the machine.

In operation, when it is desired to straighten out the ram the bolts 11 and nuts 12 and 13 are manipulated to move the wedge member 8 between the bevelled edge 7 and the ram and thus exert a pressure upon the ram. The back brace 5 is provided with spaced cut-out portions 6 throughout its length so that it will not interfere with the attaching bolts 3.

From the above description it will be seen that substantially uniform pressure is exerted on the ram throughout the length of the wedge 8 which insures the accurate straightening of the ram.

In Fig. 4 is shown a modified form of the invention in which a ram 20 has attached thereto a back brace 21 with the edge of the brace adjacent the ram machined at an angle at 22 to correspond with a similar angle-machined surface 23 on the ram. The extreme ends of the back brace are secured to the ram with body bound bolts or studs to prevent the brace from moving up or down on the ends. Projecting from the ram is a ledge 24 through which passes adjusting bolts 25 having associated therewith adjusting nuts 26 and 27, the bolts 25 being threaded into the back brace 21. By manipulating bolts 25 pressure is exerted by the back brace upon the ram to straighten the ram, thus eliminating improper registration of the shear blades.

From the above description it will be seen that there has been provided a simple and effective device for accurately and quickly straightening a ram throughout its length, the device avoiding practically all errors heretofore present in adjusting devices due to the human element.

The foregoing disclosure is to be regarded as descriptive and illustrative only, and not as re-

strictive or limitative of the invention, of which, obviously, embodiments may be constructed, including many modifications, without departing from the spirit and scope of the invention herein set forth and denoted in the appended claims.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent, is:

1. In combination with a ram, a back brace therefor, means for securing the brace to the ram, said brace having a bevelled edge adjacent the ram, a wedge positioned between the bevelled edge of the brace and the ram, and means for adjustably securing the wedge to the back brace.

2. In combination with a ram, a back brace therefor, means for securing the brace to the ram, the edge of the brace adjcaent the ram being bevelled, a wedge positioned between said bevelled edge and the ram, said wedge having a flange at the upper end thereof, and a plurality of bolts adjustably connecting the wedge to the brace.

3. In combination with a ram, a back brace therefor, means for securing the brace to the ram, wedge means positioned between the brace and the ram, and means to adjustably secure the wedge means to the brace.

4. In combination with a ram, a back brace therefor, means for securing the brace to the ram, wedge means positioned between said brace and ram and means to adjust the position of said wedge means to exert varying pressures on said ram.

5. In combination with a ram, a back brace therefor, and extending along the ram, means for securing the brace to the ram, a wedge member extending the length of the ram and positioned between the brace and the ram, and means to adjust the position of said wedge member.

6. In combination with a ram, a back brace therefor, means for securing the brace to the ram, said brace extending the length of the ram and having the edge thereof adjacent the ram bevelled, a wedge member extending the length of the brace and positioned against said bevelled edge and the ram, and means to adjust the position of said wedge member.

7. In combination with a ram, a back brace therefor, means for securing the brace to the ram, the edge of the brace adjacent the ram being bevelled, a wedge member extending the length of the brace and positioned against said bevelled edge and the ram, said wedge having a flange at the upper edge thereof, and a plurality of bolts threadedly positioned in said flange and back brace to adjustably connect the wedge to the brace.

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