April 30, 1957 V. SCHILHA 2,790,495

WORK LOCATING FIXTURE

Filed Nov. 10, 1954

FIG 1

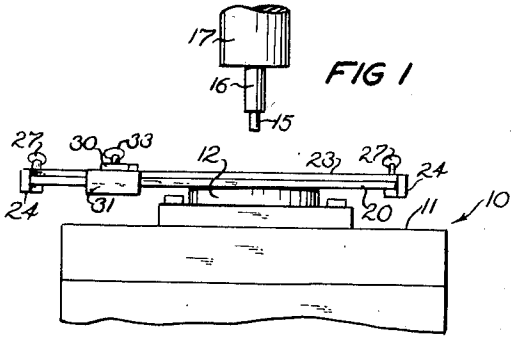


FIG 2

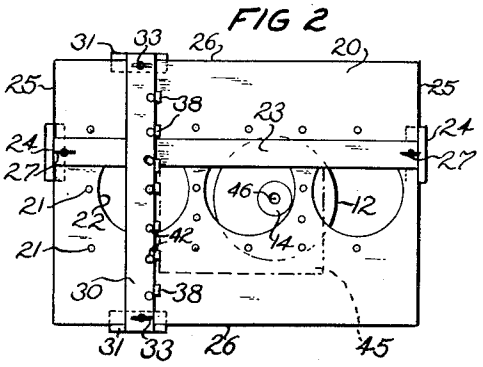


FIG 3

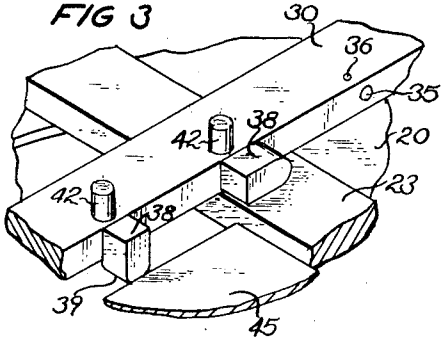
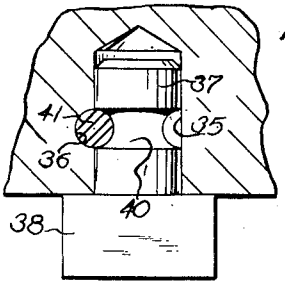


FIG 4



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WORK LOCATING FIXTURE

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6 Claims. (Cl. 164—59)

This invention relates to work locating fixtures particularly those for locating flat stock in punch presses.

In the manufacture of telephone equipment, apparatus units are mounted on panels or plates in many different combinations and arrangements. As a result, the number required of a panel having a particular distribution of mounting apertures may be too small to justify making up special jigs and fixtures for positioning them. In such cases it is necessary to use some device which is adjustable to locate any one of a group of panels but the available devices of this type are either inconvenient to adjust or not well adapted for locating panels of different sizes and thicknesses.

The object of the invention is a work locating fixture of the adjustable type readily adaptable to punch presses for locating material of various thicknesses relative to the punch and die of the press.

With this and other objects in view, the invention comprises a work locating fixture for use in combination with a punch press having a die, the fixture including a rectangular support secured to the press and apertured for the die. The fixture includes upper and lower locating bars disposed at right angles with respect to each other for sliding movement relative to the support, the upper bar having locating elements supported at spaced positions to extend downwardly to the work support to cooperate with the lower bar in locating work relative to the die.

The locating elements of the upper locating bar are pivotally supported in apertures thereof and removably retained in their pivotal positions by pins so that they may be rocked out of position by the lower bar during adjustment thereof relative to the upper bar and the die, yet will move by gravity about their pivots when released by the lower bar to assume their locating positions closely adjacent the rectangular support.

Other objects and advantages will be apparent from the following detailed description when considered in conjunction with the accompanying drawing, wherein:

Fig. 1 is a front elevational view of the work locating fixture mounted in a punch press;

Fig. 2 is a top plan view of the work locating fixture;

Fig. 3 is an enlarged fragmentary isometric view illustrating the portion of the fixture where the upper and lower bars cross providing the locating corner for the work, and

Fig. 4 is an enlarged fragmentary sectional view of a portion of the upper locating bar and retaining pin illustrating the pivotal mounting of the locating elements.

In the present embodiment of the invention, the locating fixture is shown in combination with a punch press indicated generally at **10** and having a bed **11** supporting a die holder **12** in which a die **14** (Fig. 2) is mounted in alignment with a punch **15** of a punch holder **16** supported by a ram **17** of the press.

The work locating fixture includes a rectangular support **20** having a series of small apertures **21** therein for machine screws used in mounting the support on the die holder **12**. Larger apertures **22** are provided so that any

one or more of the apertures **22** may be employed to surround one or more dies **14** in a single or multiple press. A lower locating bar **23** rests upon the upper surface of the support **20** and has its ends welded or otherwise secured to the inner surfaces of angle members **24** which extend around opposing edges **25** of the support. The angle members **24** permit the lower locating bar **23** to slide freely on the upper surface of the work support **20** but will maintain the longitudinal edges of the bar parallel with the edges **26** of the support. Thumb screws **27** disposed in threaded apertures of the lower locating bar **23** may be utilized in locking the bar in any adjusted position by turning the thumb screws until they firmly engage the support **20**.

An upper locating bar **30**, disposed at right angles to the lower bar **23**, has its ends welded or otherwise secured to the top of angle members **31** which are similar in structure to the angle members **24** and extend around the opposing surfaces **26** to permit lateral movement of the upper bar relative to the lower bar and support, but maintain these movements at all times at right angles to the longitudinal edges of the lower locating bars. By mounting the bar **30** on top of the angle members **31**, the upper locating bar is positioned above and closely adjacent the lower bar **23** leaving a space between the upper bar and the support **20** substantially equivalent the thickness of the lower bar. Thumb screws **33** disposed in threaded apertures of the upper locating bar **30** serve to lock the bar in adjusted position when rotated to firmly engage the upper surface of the support **20**.

The right hand portion of the upper locating bar **30** is provided with a plurality of equally spaced parallel horizontally extending apertures **35** and closely adjacent smaller vertically extending apertures **36**. The apertures **35** are adapted to receive spindle-like portions **37** of locating elements **38**. The locating elements **38** are of sufficient length as illustrated in Fig. 3 to extend to positions where their rounded lower surfaces **39** will engage or be positioned closely adjacent the upper surface of the support **20**. Furthermore, by mounting of the spindle portions **37** off center will adapt the elements **38** to move by gravity about their pivots, that is, about the axes of their spindles **37** to assume locating positions completing the space between the upper locating bar and the upper surface of the support **20**. The cross-sectional contours of the elements **38** are such that their widths are substantially equal the thickness of the upper locating bar to permit rocking of any or all of the elements **38** out of the path of the lower bar **23** during adjustment of the lower bar, as illustrated in Fig. 3. The spindle portions **37** have concaved annular grooves **40** therein so that pins **41** when disposed in the apertures **36** will enter their respective grooves **40** and serve to lock the elements **38** in position but free for rocking movement about the axes of their spindle portions. The pins **41** have enlarged and, if desired, knurled upper portions **42** which may be gripped readily by an operator to remove any desired number of the pins to free their associated elements **38** for removal from the upper locating bar **30**.

Considering now the function of the work locating fixture, let it be assumed that the upper locating bar **30** is at its extreme left of the work support **20** and that the lower locating bar **23** is adjacent the bottom portion of the work support. A panel of the size shown at **45** is to have an aperture punched at a point indicated at **46**. To provide for the location of this and other like panels the locating bars are adjusted relative to each other and the support **20** until they provide locating surfaces for two of the edges of the panel, to align the point **46** with the center line of the die **14**. This may be accomplished by locating first the lower locating bar **23**, moving it from its suggested bottom starting position to the position

shown in Fig. 2. During this movement of the lower locating bar, the elements **38** which are in its path will be rocked about their axes or spindle portions **37** to permit the lower bar to move freely into its new position and as the lower bar is moved beyond the various locating elements **38**, they will swing freely into their locating positions. In the present illustration, one of the locating elements **38** remains resting on the upper locating bar. If desired, this element may be left in this position or removed together with the other locating elements which are not needed in locating the work **45** relative to the die. The number of locating elements **38** needed will be determined when the upper locating bar is moved into its position to complete the adjustment of the fixture and to bring the outer surfaces of the locating elements into a plane which determines the position of the adjacent edges of the successive parts **45** as they are fed to the press. When the adjustments have been completed, the thumb screws **27** and **33** are turned to lock their respective bars against accidental movement and the fixture is ready for processing the panels **45**.

When the desired number of panels **45** have been processed and it is desirable to adjust the fixture for parts or panels of different sizes, these adjustments may be made readily without removing the locating elements **38** as they will turn freely on their pivots during movement of the lower locating bar into any position relative to the upper locating bar, assuring the closure of the space beneath the upper locating bar by one or more of the locating elements **38** cooperating with the selected edge of the lower bar to produce a locating corner for panels or work regardless of its size and particularly regardless of its thickness.

It is to be understood that the above described arrangements are simply illustrative of the application of the principles of the invention. Numerous other arrangements may be readily devised by those skilled in the art which will embody the principles of the invention and fall within the spirit and scope thereof.

What is claimed is:

1. The combination with a punch press having a die, of a work locating fixture having a rectangular support secured to the press and apertured for the die, a lower locating bar disposed closely adjacent the work support, guides fixed to the ends of the lower locating bar for sliding interengagement with one set of opposing edges of the work support, an upper locating bar disposed above and at right angles with respect to the lower bar, guides fixed to the ends of the upper locating bar for sliding interengagement with the other set of opposing edges of the work support to support the upper locating bar above the lower locating bar, and locating elements supported against movement by the work at spaced positions by the upper locating bar to extend downwardly therefrom substantially to the work support to cooperate with the lower bar to locate work on the support relative to the die.

2. The combination with a punch press having a die, of a work locating fixture having a rectangular support secured to the press and apertured for the die, a lower locating bar disposed closely adjacent the work support, guides fixed to the ends of the lower locating bar for sliding interengagement with one set of opposing edges of the work support, an upper locating bar disposed above and at right angles with respect to the lower bar, guides fixed to the ends of the upper locating bar for sliding interengagement with the other set of opposing edges of the work support to support the upper locating bar above the lower locating bar, locating elements supported against movement by the work at spaced positions by the upper locating bar to extend downwardly therefrom substantially to the work support to cooperate with the lower bar to locate work on the support relative to the die, and means to pivotally secure the locating elements to the upper bar whereby they may be swung about their pivots by the lower bar when adjusted relative to the work support and upper bar.

3. The combination with a punch press having a die, of a work locating fixture having a rectangular support secured to the press and apertured for the die, a lower locating bar disposed closely adjacent the work support, guides fixed to the ends of the lower locating bar for sliding interengagement with one set of opposing edges of the work support, an upper locating bar disposed above and at right angles with respect to the lower bar, supporting guides fixed to the ends of the upper locating bar for sliding interengagement with the other set of opposing edges of the work support, the upper locating bar having a plurality of laterally extending spaced parallel apertures in a side surface thereof, and locating elements, having spindle-like portions selectively receivable in any of the apertures of the upper locating bar and held against movement by the work, to cooperate with the lower bar to locate work on the support relative to the die.

4. The combination with a punch press having a die, of a work locating fixture having a rectangular support secured to the press and apertured for the die, a lower locating bar disposed closely adjacent the work support, guides fixed to the ends of the lower locating bar for sliding interengagement with one set of opposing edges of the work support, an upper locating bar disposed above and at right angles with respect to the lower bar, supporting guides fixed to the ends of the upper locating bar for sliding interengagement with the other set of opposing edges of the work support, the upper locating bar having a plurality of spaced parallel apertures in a side surface thereof, locating elements having spindle-like portions selectively receivable in any of the apertures of the upper bar to cooperate with the lower bar to locate work on the support relative to the die, the locating elements when supported by their spindle-like portions held against movement by the work and substantially engaging the work support.

5. The combination with a punch press having a die, of a work locating fixture having a rectangular support secured to the press and apertured for the die, a lower locating bar disposed closely adjacent the work support, guides fixed to the ends of the lower locating bar for sliding interengagement with one set of opposing edges of the work support, an upper locating bar disposed above and at right angles with respect to the lower bar, supporting guides fixed to the ends of the upper locating bar for sliding interengagement with the other set of opposing edges of the work support, the upper locating bar having a plurality of spaced parallel apertures in a side surface thereof, locating elements having spindle-like portions selectively receivable in any of the apertures of the upper bar to cooperate with the lower bar to locate work on the support relative to the die, the locating elements when supported by their spindle-like portions held against movement by the work, substantially engaging the work support, and being adapted to be moved about the axes of their spindle-like portions by the lower locating bar during adjustment thereof.

6. The combination with a punch press having a die, of a work locating fixture having a rectangular support secured to the press and apertured for the die, a lower locating bar disposed closely adjacent the work support, guides fixed to the ends of the lower locating bar for sliding interengagement with one set of opposing edges of the work support, an upper locating bar disposed above and at right angles with respect to the lower bar, supporting guides fixed to the ends of the upper locating bar for sliding interengagement with the other set of opposing edges of the work support, the upper locating bar having a plurality of spaced parallel apertures in a side surface thereof, locating elements having spindle-like portions selectively receivable in any of the apertures of the upper bar to cooperate with the lower bar to locate

work on the support relative to the die, the spindle-like portions having annular grooves therein, and retaining pins disposed in apertures in the upper bar to enter the grooves to removably hold the elements against displacement and movement by the work but for free rotation by the lower bar.

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