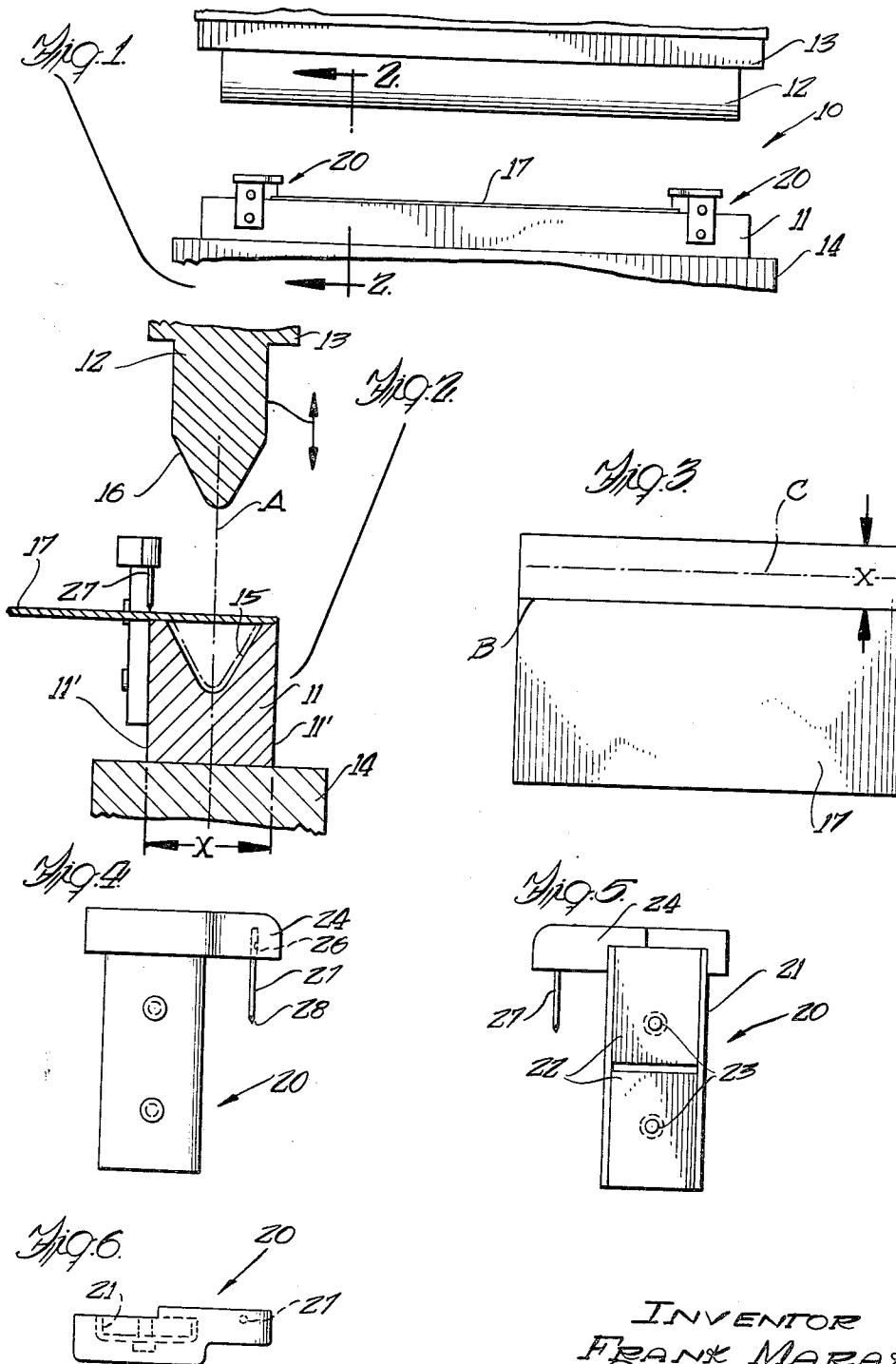


May 21, 1963

F. MARAK
LOCATING TOOL FOR SHEET METAL BENDING AND PROCESS
FOR LOCATING A METAL SHEET FOR BENDING
Filed July 22, 1960

3,090,418



INVENTOR
FRANK MARAK
Paul O. Pippel
ATTORNEY

1

3,090,418

LOCATING TOOL FOR SHEET METAL BENDING AND PROCESS FOR LOCATING A METAL SHEET FOR BENDING

Frank Marak, 3839 S. Lombard Ave., Cicero, Ill.

Filed July 22, 1960, Ser. No. 44,594

2 Claims. (Cl. 153-21)

This invention relates to an indicating or gauging device particularly suitable for locating the bend line on a sheet of metal disposed between a pair of bend dies. The invention also relates to an improved process for locating a bend line on a metal sheet in a bending process.

In conventional bending processes wherein sheet metal is bent into annular forms the customary and conventional machine utilized is the press brake. A press brake generally comprises an upper movable part known as a ram and a lower stationary platen or table toward which the ram is moved during the bending operation and from which the ram is retracted. In utilizing a press brake for bending, an upper die is mounted on the ram and a lower die is secured to the platen. The lower die is generally provided with a V-shaped notch or slot and the upper die comprises a V-shaped forming punch which presses a sheet metal piece into the recess for forming an angle. The dies have a vertically extending imaginary central plane which is located centrally between the laterally disposed vertical parallel sides of the upper and lower die members. In the bending operation of the metal sheet it is necessary that the bend line on the metal be disposed exactly coincident with the vertical bend plane of the dies in order to secure the accurate flange dimension which is desired. In the past it has been necessary to utilize a ruler or tape measure to measure inwardly to establish the vertical central plane of the dies so that the bend line could be placed coincident when the metal sheet is inserted between the dies. This type of measurement is extremely inaccurate but for years has been the only manner in which the bend plane could be established and in most instances the resultant tolerances were much too great for the desired accuracy. Also such a measurement is obviously impractical for operations where it is desired to secure high speed production.

It is a prime object of this invention to provide an improved indicating or gauging device which is utilized in connection with a metal sheet to be bent and which will expeditiously and easily help in the determination of placing the sheet metal bend line exactly coincident with the central bending plane of the dies utilized.

Another object is the provision of a gauging device for assisting in the gauging of sheet metal in connection with bending dies, the said device being quickly and easily attached by means of magnets permitting the devices to be supported on the sides of a bending die.

A still further object is the provision of an accurate needle type gauge which is positioned on the sides of a bending die and which assists in the gauging and determining of the bend line in connection with the central bending plane of the forming dies.

A still further object is the provision of an improved process for gauging sheet metal in a bending operation.

These and other objects will become more readily apparent from a reading of the description when examined in connection with the accompanying sheet of drawing.

In the drawing:

FIGURE 1 is a side elevational view of a pair of bending dies including the improved indicating and gauging device in position with a sheet of metal to be bent disposed in operative relation with respect to said dies;

FIGURE 2 is a cross-sectional view taken along the line 2-2 of FIGURE 1;

2

FIGURE 3 is a plan view of a piece of sheet metal ready to be subjected to a bending operation;

FIGURE 4 is a front elevational view of an improved gauging and indicating device;

FIGURE 5 is a rear view of the gauging device shown in FIGURE 4; and

FIGURE 6 is a plan view of the gauging device shown in FIGURE 4.

Referring now to FIGURE 1 a bending apparatus is generally designated by the reference character 10. The bending apparatus comprises a conventional press brake including a lower die 11 and an upper die 12. The upper die 12 is mounted to reciprocate with a conventional press-brake ram 13 and the lower die 11 is adapted to be secured to the platen 14 of a press-brake.

As indicated in the enlarged view of FIGURE 2 the lower die is provided with a longitudinally extending V-shaped groove 15 within which the metal forming operation takes place. The upper die 12 comprises a V-shaped die portion 16 adapted to press the sheet metal into the groove 15 for making an angular bend. The lower die has a transverse width or dimension indicated at X and a vertical imaginary bend line or bend plane designated at A is disposed exactly centrally of the lower die 11 or exactly at one-half dimension X. The lower die 11 is also provided with transversely extending parallel sides 11' which of course are disposed transversely apart the X dimension.

In FIGURE 3 a metal sheet is shown and a scribe line is designated at B, the said line B being disposed parallel to the edge of the sheet a dimension equal to X, which is also the dimension, of course, of the lower die 11. An imaginary bend line is indicated at C the said bend line being disposed exactly one-half the dimension X from the end of the sheet 17.

Referring now to FIGURES 4 through 6, a locating or indicating device is generally designated by the reference character 20. Two of the devices 20 are utilized as shown in FIGURE 1, the only difference between the devices is that the one, is a left hand device and the other is a right hand device. Each device comprises a vertically extending channel-type support 21 which has disposed therein upper and lower magnetic members 22 which are secured to the channel 21 by means of suitable fasteners 23. Each device 20 also comprises a transversely extending arm 24, which projects laterally outwardly with respect to the support 21 and which has thereon a vertically extending bore 26 in which a vertical pin or indicator 27 is positioned. The indicator 27 is of pin or needle-like shape and is provided at its lower end with a pointed end 28. A vertical center line through the indicator 27 and point 28 is adapted to coincide with the inner vertical plane of the support 21. Likewise when secured to the sidewalls 11' the needle or indicator 27 is in exactly the same vertical plane as the sidewall 11' to which it is attached by means of the magnets 22.

Supposing now that a sheet metal piece 17, as shown in FIGURE 3, is to be bent so as to have a formed V-angle at one end of the sheet as shown by the broken line in FIGURE 4. It is necessary to first determine the bend line C since it is this line which must be placed coincident with the vertical plane A in the dies 11 and 12 so that the accurate angle may be formed. Knowing the dimension X, the operator merely scribes the line B on the sheet 17 and then places the sheet metal 17 between the upper and lower dies 11 and 12 as indicated in FIGURE 2. He now places the gauges 20 as shown in FIGURES 1 and 2. The pointed ends of the indicators or needles 27 are in exactly the same plane as the sidewalls 11' and each needle is disposed exactly one-half the dimension X with respect to the vertical plane A. He now merely moves the sheet 17 until the

line B is immediately underneath the pointed indicators 27 and the sheet metal 17 now has the imaginary bend line C disposed exactly coincident with the vertical plane A whereupon the ram 13 can be lowered. The ram 13 and die 12 are now lowered to engage the sheet metal and to form the same within the recess 15 whereupon an accurate bend is formed.

Supposing now that the sheet metal 17 is to be bent a considerable distance from its outer edge then the operator merely determines where the imaginary bend line is to be placed and measures one-half the dimension X to determine the scribe line B and again places the same between the dies and accurately gauges the bend line by means of the gauging devices 20.

Thus it is obvious that the gauging devices are exceedingly well-suited for high production and that they will immediately and efficiently gauge each sheet metal piece which is to be bent. The devices can easily be removed from the press-brake if so desired and do not in any way interfere with the operation of the press-brake units.

Thus it is believed that an improved article of manufacture and process have been described and it must be understood that the objects of the invention have been fully achieved. Changes and modifications may be made in the structure and process without departing from the spirit of the invention as disclosed or from the scope thereof as defined in the appended claims.

What is claimed is:

1. A process of locating a sheet of metal in forming dies for forming an angle bend on said sheet, said dies comprising upper and lower die members, the lower die member having a certain transverse width dimension and having a central vertical bending plane, measuring inwardly from the edge of said sheet the transverse width dimension of the lower die and scribing a line on said

sheet, placing said sheet between the upper and lower dies, placing a pair of pointed end indicators against said lower dies with the pointed ends disposed above the sheet at opposite ends thereof whereby the dimension between the bending plane and said pointed ends equals one half the width dimension of the lower die, and aligning said pointed ends with the scribed line whereby a bend line on said sheet is coincident with said central bending plane.

2. A process of locating a sheet of metal in forming dies for forming an angle bend on said sheet, said die comprising upper and lower die members, the lower die member having a front flat face defining a vertical plane, said lower die member having a certain transverse width and a central vertical bending plane, measuring inwardly from the edge of said sheet to determine the bend line of said sheet, scribing a line on said sheet parallel to said bend line and disposed inwardly from said bend line one-half the transverse dimension of said lower die, placing said sheet between said upper and lower die members, supporting an indicator adjacent said lower die, said indicator having an indicating element positioned above said sheet and including a point in the plane of said front face, and positioning said sheet with the scribed line in alignment with said point of said indicating element whereby said bend line is coincident with said central bending plane.

References Cited in the file of this patent

UNITED STATES PATENTS

2,422,800	Ransom	June 24, 1947
2,429,387	Buchheim	Oct. 21, 1947
2,510,768	Williamson	June 6, 1950