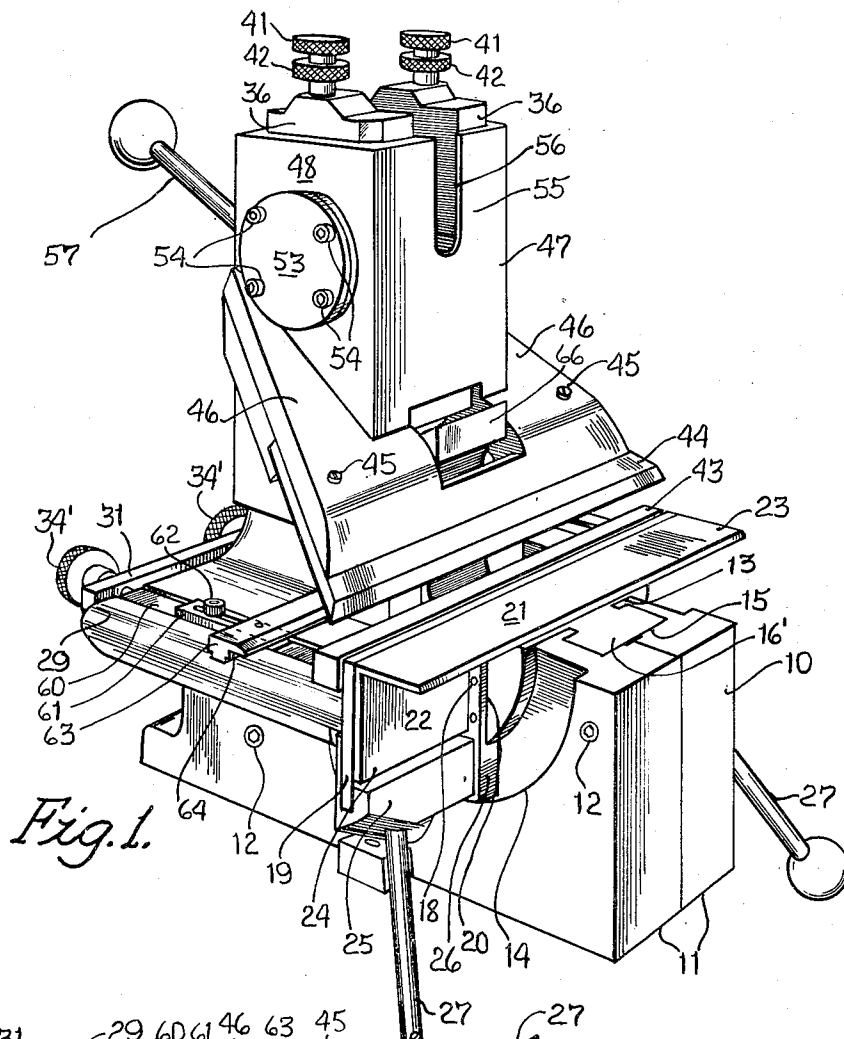
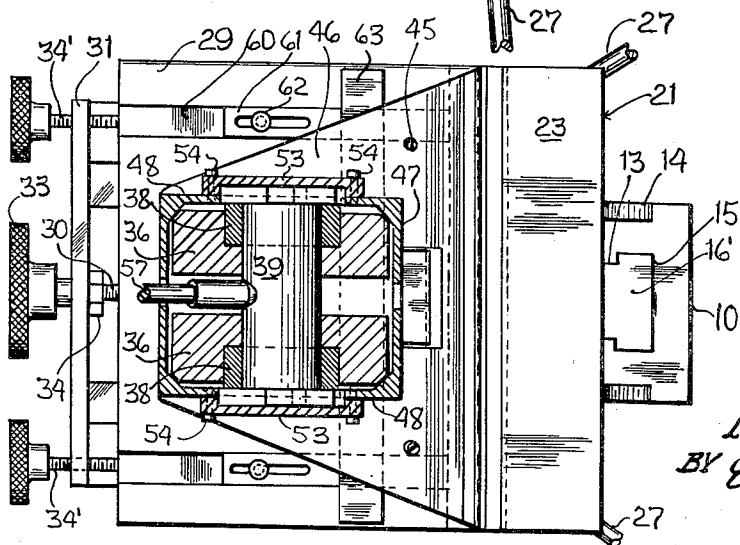


Filed March 4, 1949

MACHINE FOR BENDING SHEET METAL

2 Sheets-Sheet 1



INVENTOR.
Frank Fennell
BY *Carune E. Brady*
His Attorney.

Sept. 12, 1950

F. FENNELL

2,521,840

MACHINE FOR BENDING SHEET METAL

Filed March 4, 1949

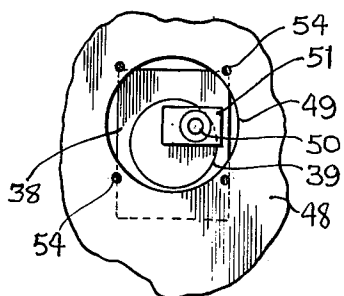


Fig. 5.

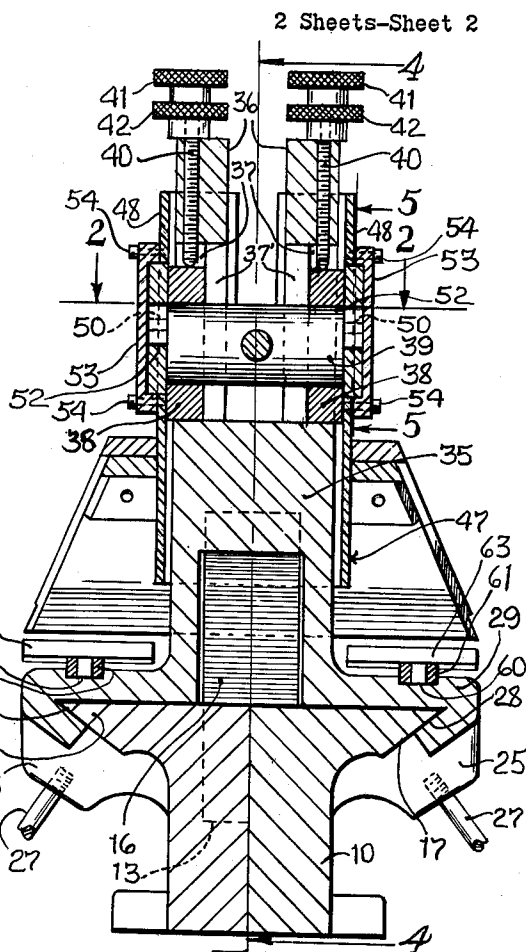


Fig. 3.

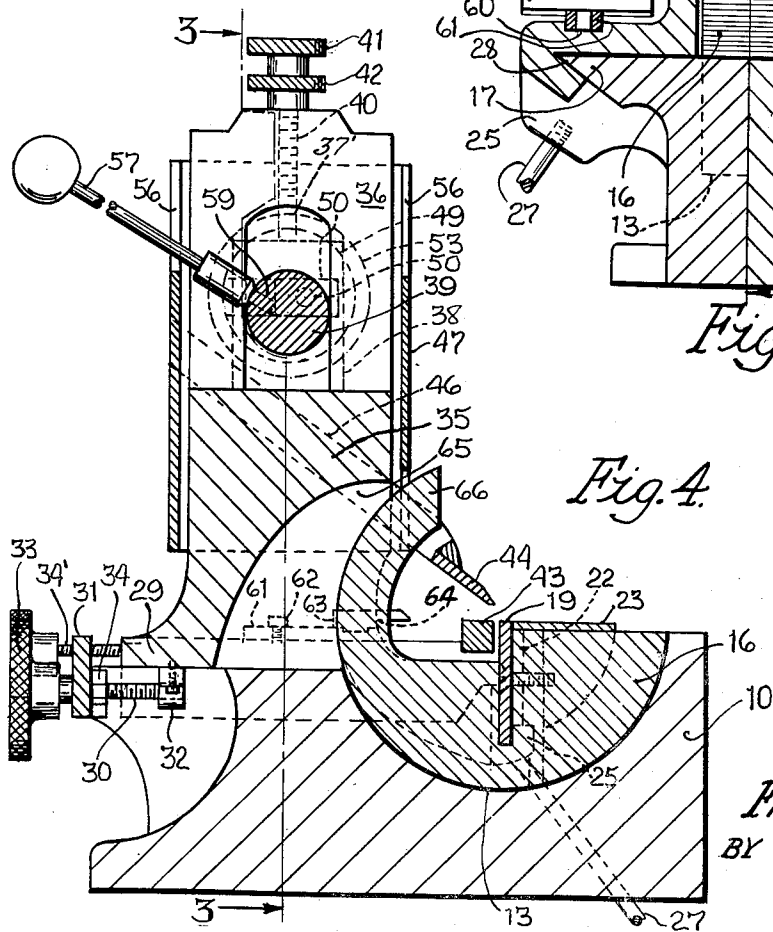


Fig. 4.

INVENTOR.
Frank Fennell
 BY *Clarence E. Hardy*
 His Attorney.

UNITED STATES PATENT OFFICE

2,521,840

MACHINE FOR BENDING SHEET METAL

Frank Fennell, Chicago, Ill.

Application March 4, 1949, Serial No. 79,711

3 Claims. (Cl. 153-16)

1

This invention relates to improvements in a machine for bending sheet metal and has particular reference to bending sheet metal into a square or rectangular shape for forming boxes or the like.

While my invention has special reference to such a machine, it is not to be limited to that purpose, for an object of the invention is to provide a machine of this character which will effectively bend sheet metal efficiently and with the minimum degree of effort on the part of the operator.

My improved bending machine will be especially useful in bending the overlapping corners of the metal designed to form the corners of boxes. It is, therefore, an equally important object of the invention to provide a machine which will effectively and efficiently accomplish this purpose.

A further object of the invention is to provide a bending machine which is easy to operate and one which can be manufactured at an economical cost.

Yet another object of the invention is to provide a machine of this character which may be expeditiously adjusted to accommodate material of various widths and lengths.

Other objects will appear hereinafter.

The invention consists in the novel combination and arrangement of parts to be hereinafter described and claimed.

The invention will be best understood by reference to the accompanying drawings showing the preferred form of construction, and in which:

Fig. 1 is a perspective view of the bending machine embodying my invention;

Fig. 2 is a sectional detail view taken substantially on line 2-2 of Fig. 3;

Fig. 3 is a sectional detail view taken substantially on line 3-3 of Fig. 4;

Fig. 4 is a sectional detail view taken substantially on line 4-4 of Fig. 3; and

Fig. 5 is a fragmentary sectional detail view taken substantially on line 5-5 of Fig. 3.

The several objects of my invention are accomplished by the preferred form of construction shown in the accompanying drawings, in which drawings a base is indicated at 10. This base in the present instance comprises confronting complementary sections 11 secured together by suitable connecting bolts 12. This base 10 provides a semi-circular recess 13. In the opposite outer side walls, there are provided arcuate grooves 14. The base of this recess 13 is enlarged as at 15 to provide with the recess

2

13 in the base 10 a substantially T-shaped groove in cross section.

A mounting block 16 shaped to conform to the recess 13 for mounting in this recess for rotation about a horizontal axis is provided with a rib 16' substantially T-shaped in cross section to conform to the shape of the groove 15 in which it is movably mounted. On this mounting block 16 is fixed as at 18 a bending blade 19, the center portion of which is notched as at 20 so that the blade 19 will straddle the mounting block 16.

Associated with the bending blade 19 is a stiffening plate 21 comprising a vertical flange 22 notched so as to straddle the mounting block 16. This stiffening plate 21 further includes a horizontal flange 23. The vertical flange 22 abuts against the blade 19 and, in the present structure, the lower edges 24 of this flange 22 rest upon elongated shoulders 25 provided by lateral extensions of the mounting block 16. These shoulders 25 provide inwardly extended lugs 26 which ride in the grooves 14. To these shoulders 25 are secured, in any suitable manner, hand rods 27 whereby the block 16 may be rotated relative to the recess 13 to move the stiffening plate 21 against the work.

The opposite longitudinal edges of the base section 11 are tapered as at 17 and have slidable engagement with similarly tapered grooves 28 formed in the longitudinal edges of a carriage plate 29 adapted to be moved longitudinally of the base 10. This movement is accomplished by means of a screw shaft 30 carried for rotation by a bar 31 formed as an integral part of the base 10. The thread-bearing portion of this shaft has threaded engagement with a nut 32 carried by the carriage plate 29. A suitable finger knob 33 is formed as a part of this screw shaft.

Upon rotation of the finger knob 33, the shaft 30 will be rotated to impart slidable movement to the carriage plate 29 and thereby effect adjustment of this plate in a predetermined adjusted position with respect to the base 10. The shaft 30 is prevented from longitudinal movement with respect to the bar 31 by a disc 34 fixed on the screw shaft 30. The carriage plate 29 is latched in a predetermined adjusted position with respect to the base 10 by latch screws 34' carried by the bar 31. Extending upwardly from and formed as an integral part of the carriage plate 29 is a post 35. The upper end portion of this post 35 defines spaced side plates 36, each of which is provided with sockets 37

3

and slots 37' opening into the sockets. Mounted in these sockets 37 for adjustment therein are bearing blocks 38. These bearing blocks 38 rotatably support a shaft 39 which extends transversely of the post 35. The bearing blocks 38 are adjustably arranged in the sockets 37 by screw shafts 40, each of which has as an integral part thereof a finger knob 41 and a latch bolt 42 for latching the screw shaft 40 in an adjusted position.

The carriage plate 29 at its forward end provides a clamping jaw element 43 having its top surface arranged in the same plane as the horizontal flange 23 of the stiffening plate 21. Co-operating with this jaw element 43 to hold the work to be bent is a jaw 44 secured as at 45 to a supporting plate 46 formed as an integral part of a sleeve 47. This sleeve 47 embraces the post 35 for movement relative thereto. The opposite side walls 48 of this sleeve 47 are provided with openings 49.

The shaft 39 provides trunnions 50. These trunnions 50 are eccentrically mounted with respect to the long axis of shaft 39. Mounted on these trunnions 50 are blocks 51. These blocks 51 are arranged for slidable movement in guide grooves 52 provided in cover plates 53 for the openings 49. These cover plates 53 are secured to the adjacent side walls 48 of the sleeve 47 as at 54.

The opposite side walls 55 of the sleeve 47 are provided with aligned slots 56 arranged in alignment with a space between the plates 36 for the reception of a handle 57. This handle 57 is secured as at 59 to the shaft 39.

In operation, the screw shafts 40 are adjusted with respect to the bearing blocks 38 to permit the jaw 44 to be spaced from the jaw 43, a distance slightly greater than the thickness of the metal to be bent. This is accomplished by adjusting the screws 40 relative to the plates 36 and then latching them in place by the latch bolts 42. By rotating the handle 57 in a clockwise direction as viewed in Fig. 4, the bearing blocks 38 will be elevated into contact with the screw shafts 40, whereupon, on further rotation of the shaft 39 by manual operation of the handle 57, the sleeve 47 will be moved upwardly relative to the post 35, disposing the jaw 44 a predetermined distance from the jaw 43.

The opposite longitudinal edges of the carriage plate 29 are provided in their top surfaces with guiding grooves 60. In these grooves 60 for longitudinal movement with respect thereto are blocks 61 connected to the carriage plate 29 by bolt and slot connection 62. Each of these blocks 61 carries a limiting bar 63 having an undercut portion providing a stop shoulder 64. By adjusting the limiting bar 63 relative to the carriage plate 29, the work to be operated upon may be accurately positioned with the line of the bend properly related to the jaws 43 and 44.

By adjusting the carriage plate 29 relative to the base 10, the jaw 43 may be disposed a distance from the blade 19 equivalent to the thickness of the sheet to be folded, thereby to properly locate the bending blade 19 with respect to the line of fold of the material to be bent, with the result that an accurate folding operation may be performed according to the desired location of the line of fold or bend. Without such arrangement, it is clearly obvious that the bend might take place on a line short of the predetermined line of bend of the work.

This bending operation is accomplished by

4

grasping the hand rods 27 to rotate the stiffening plate 21 in a counter-clockwise direction as viewed in Fig. 4. It will be noted particularly in Figs. 1 and 4 that the post 35 and adjacent front walls of the sleeve 47 are undercut as at 65 to provide a clearance for the extended portion 66 of the mounting block 16.

By the use of a machine constructed in accordance with the disclosure herein, various sizes and lengths of material may be bent. My machine is especially useful for bending the end portions of the side walls of metal boxes, which end portions are bent to overlap the side walls of such boxes and corners. The device is especially useful in connection with small bending operations and is capable of operating upon relatively thick material. It is sturdy, comprising the minimum number of parts, which affords economical manufacture.

While I have illustrated and described the preferred form of construction for carrying my invention into effect, this is capable of variation and modification without departing from the spirit of the invention. I, therefore, do not wish to be limited to the precise details of construction set forth, but desire to avail myself of such variations and modifications as come within the scope of the appended claims.

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

1. For a combination comprising a base having a recess formed therein substantially semi-circular in side elevation and a groove extending around said recess and substantially T-shaped in cross section, a mounting block mounted for rotation about a horizontal axis within said recess and provided with a T-shaped rib mounted for movement in the groove, said mounting block carrying a bending blade, a gripping structure movably carried by the base and including a post extending upwardly therefrom, a sleeve embracing the post and movable relative thereto, said gripping structure including a jaw carried by said structure in cooperative relation with respect to the bending blade and a jaw carried by the sleeve in cooperative relation with respect to said first-named jaw, means for rotating said block and said blade relative to said jaws, and means for moving said sleeve relative to said post to move the jaw carried thereby into work-gripping position with respect to the jaw carried by said gripping structure.

2. For a combination comprising a base having a recess formed therein substantially semi-circular in side elevation and a groove extending around said recess and substantially T-shaped in cross section, a mounting block mounted for rotation about a horizontal axis within said recess and provided with a T-shaped rib mounted for movement in the groove, said mounting block carrying a bending blade, a gripping structure movably carried by the base and including a post extending upwardly therefrom, a sleeve embracing the post and movable relative thereto, said gripping structure including a jaw carried by said structure in cooperative relation with respect to the bending blade and a jaw carried by the sleeve in cooperative relation with respect to said first-named jaw, means for rotating said block and said blade relative to said jaws, means for moving said sleeve relative to said post to move the jaw carried thereby into work-gripping position with respect to the jaw carried by said gripping structure, and means for adjusting said

5

gripping structure relative to said base to vary the relative position between the jaw carried by said structure and said bending blade.

3. For a combination comprising a base having a recess formed therein substantially semi-circular in side elevation and a groove extending around said recess and substantially T-shaped in cross section, a mounting block mounted for rotation about a horizontal axis within said recess and provided with a T-shaped rib mounted for movement in the groove, said mounting block carrying a bending blade, a gripping structure movably carried by the base and including a post extending upwardly therefrom, a sleeve embracing the post and movable relative thereto, said gripping structure including a jaw carried by said structure in cooperative relation with respect to the bending blade and a jaw carried by the sleeve in cooperative relation with respect to said first-named jaw, means for rotating said block and said blade relative to said jaws, means for moving said sleeve relative to said post to move the jaw carried thereby into work-gripping

6

position with respect to the jaw carried by said gripping structure, means for adjusting said gripping structure relative to said base to vary the relative position between the jaw carried by said structure and said bending blade, and means for latching said gripping structure in an adjusted position with respect to said base.

FRANK FENNELL.

REFERENCES CITED

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

UNITED STATES PATENTS

Number	Name	Date
72,478	Gleason	Dec. 24, 1867
677,933	Bright	July 9, 1901
1,194,602	Curtis	Aug. 15, 1916
1,382,464	Blum	June 21, 1921
1,744,391	Kuehn	Jan. 21, 1930
2,025,360	Simmons	Dec. 24, 1935
2,401,031	Wanasek	May 28, 1946
2,438,319	Kilham	Mar. 23, 1948