

Aug. 26, 1930.

L. S. PLATOU

1,774,155

SHEET METAL WORKING MACHINE

Filed Nov. 26, 1928

2 Sheets-Sheet 2

Fig. 3

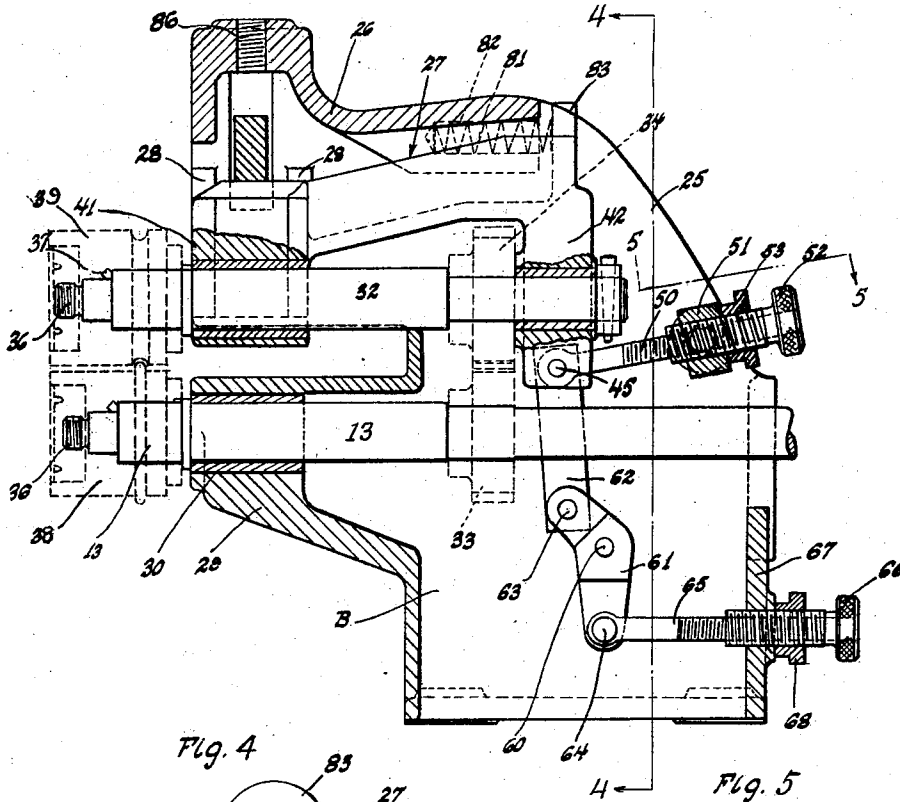


Fig. 4

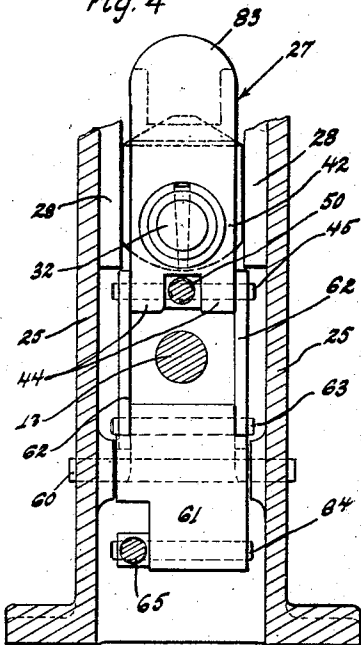
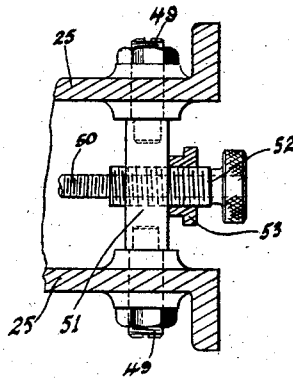


Fig. 5



Inventor

Leiv S. Platou.

H. B. Loring

Attorney

384

UNITED STATES PATENT OFFICE

LEIV S. PLATOU, OF SOUTHLINGTON, CONNECTICUT, ASSIGNOR TO THE PECK, STOW AND WILCOX COMPANY, OF SOUTHLINGTON, CONNECTICUT, A CORPORATION OF CONNECTICUT

SHEET-METAL-WORKING MACHINE

Application filed November 26, 1928. Serial No. 321,810.

The present invention relates to a machine for performing on sheet metal or sheet-metal articles various operations, among which may be mentioned those of crimping, bending, turning, wiring, elbow edging, collar edging, burring, slitting, and trimming.

An aim of the present invention is to provide an improved machine of this sort by means of which the various operations of which it is capable may be very accurately carried out with expedition and economy, which means that the machine has a high rate of production and the various operations are carried out at a lower cost.

Another aim of the invention is to provide a small, compact and efficient machine for carrying out the various operations, and which is very simple in construction and arrangement.

A further aim of the invention is to provide a machine of this sort which may be quickly and easily adjusted and operated.

Other objects will be in part obvious and in part pointed out more in detail hereinafter.

The invention accordingly consists in the features of construction, combination of elements and arrangement of parts which will be exemplified in the construction hereinafter set forth and the scope of the application of which will be indicated in the appended claims.

In the accompanying drawings, wherein is shown one of the many embodiments which the present invention may take:

Figure 1 is a side elevational view of my improved machine;

Fig. 2 is a front elevational view thereof;

Fig. 3 is a view taken longitudinally and centrally through the machine;

Fig. 4 is a transverse view taken substantially on line 4—4 of Fig. 3; and

Fig. 5 is a detail view showing the means for longitudinally adjusting the upper arbor, this view being taken substantially on line 5—5 of Fig. 3.

Referring to the drawings in detail, A denotes generally the base of the machine; B, the frame in which the arbors hereinafter described are located; C, a gear box secured

to the rear end of the frame B; and D, a platform pivoted on the base A and carrying an electric motor designated by the letter E. Obviously, the construction and arrangement of these parts or elements may be varied and changed without departing from the scope of the present invention, and the machine may be driven from any suitable source of power. The motor E is shown for purposes of exemplification only. It may be stated that preferably the machine is motor driven as illustrated, so as to provide a compact, complete machine or unit of relatively small size, and which is capable of being easily transported.

In the present illustrative disclosure, there is mounted in the gear box a transverse shaft 10 having a worm 11 meshing with the worm wheel 12 secured to the rear end of the lower arbor 13. One end of the shaft 10 is provided with a stepped pulley 14 which is driven by the motor E through a belt 15. The platform D, carrying the motor E, is pivoted on the base A, as at 16, and a spring 17 is provided for normally urging the platform D in a direction to keep the belt 15 taut. The machine, as previously stated, is of relatively small size and may be mounted on a bench or the like, the bench being shown by dotted lines in the drawings, and being designated by the numeral 18.

The frame B is of hollow construction and has a pair of parallel side walls 25 connected at their upper ends by a transverse wall 26. These side walls, at their upper ends, project forwardly or overhang so as to provide a head in which are guides or ribs 28 for guiding the head or forward end of the rocking box 27 hereinafter described more in detail.

Extending forwardly of the frame, and located beneath the head thereof, is a bearing portion 29 having an opening in which is located a bearing sleeve 30 in which is rotatably mounted the lower arbor or spindle 13. The rear end of this spindle extends into and is journaled in the gear box C and carries the worm wheel 12.

The upper arbor or spindle, designated by the numeral 32, is journaled in the rocking

box 27 and is driven from the lower arbor 13 through the gears 33 and 34. The arbors 13 and 32 may be provided at their forward projecting ends with any suitable means or arrangement for receiving and securing the cooperating tools thereof. In the present illustrative disclosure, each of these arbors is shown as having a threaded portion 36 adapted to receive a nut so as to hold the tool in place. Also, each of the arbors may be provided with a pin 37 or other suitable means for preventing rotation of the tool with respect to the arbor on which it is mounted. In Fig. 3, there is shown, in dotted lines on the arbors 13 and 32, bead rolls 38 and 39, respectively, it being understood, however, that these rolls are shown by way of illustration only, for, as previously pointed out, the machine is capable of carrying out various operations and will, therefore, be equipped with a number of interchangeable pairs of tools.

In accordance with the present invention, the upper arbor 32 is journaled in a bearing member herein referred to as a rocking box which is pivotally mounted on a transverse axis so as to permit the forward end of the upper arbor to be swung vertically towards and away from the tool on the lower arbor. Furthermore, the bearing member or rocking box, together with the upper arbor carried thereby, is mounted for vertical adjustment so that the angular relation between the two arbors may be changed, depending upon the particular operation to be performed.

Furthermore, the bearing member, together with the upper arbor carried thereby, is mounted for adjustment generally in the direction of the lengths of the arbors so as to permit proper matching of the tools when they are operating upon the work. For most operations, the rocking box will be so adjusted that, during the normal operation of the machine, the two arbors will be generally parallel, but in some instances, as, for example, when a fading or vanishing crimp is desired on the end of a stove pipe or the like, the arbors are adjusted so that the crimping rolls will be inclined towards one another. In the present illustrative disclosure, the rocking box or member is adapted to swing on a pivoted member or pin, and the location of this pivoted member or pin is adjusted through two instrumentalities, one of the instrumentalities being for the purpose of adjusting the rocking box vertically, and the other one forwardly and rearwardly.

Referring more particularly to the drawings, the bearing member or rocking box is located between the side walls 25 of the frame and has a generally horizontally extending portion, a head 41 on the forward end thereof, and a depending arm 42 at the rear thereof. The head 41 and the arm 42 have aligned openings in which is journaled the upper

arbor 32. It is understood that this arbor rotates in the bearing box, but has no longitudinal movement relative thereto. The head 41 of the rocking box slidably fits between the ribs 28 on the overhanging forward ends of the side walls 25. The lower end of the arm 42 is recessed so as to provide a pair of ears 44, and, extending transversely through these ears and this recess, is a pivot member in the form of a pin 45.

For the purpose of adjusting the rocking box, together with the upper arbor carried thereby, back and forth, that is, generally longitudinally of the arbors, the following arrangement is provided: The numeral 50 designates an eye-bolt or adjusting screw, the head of which is located between the ears 44. The pin 45 extends through the head of this screw. Pivoted for turning movement on studs 49 is a block 51 having a threaded opening which receives a sleeve screw 52. This screw 52 has an external thread running in one direction and adapted to be screwed into the opening of the block 51, and it has an internal thread running in the opposite direction and adapted to receive the thread of the adjusting screw 50. For the purpose of securing the sleeve screw 52 in adjusted position, a lock nut 53 may be provided.

For the purpose of adjusting the pin 45 vertically and thus determine the angularity between the arbors when the tools are in operating position, the following arrangement is provided: Pivoted on a pin 60 is a lever 61, one arm of which is connected by a pair of links 62 to the pin 45. The links are pivotally connected to the lever 61 by means of a pin 63. Connected to the other arm of the lever 61 by a pin 64 is an adjusting screw 65 which is screwed into a sleeve screw 66 similar in construction and arrangement to the sleeve screw 52. The sleeve screw 66 is threaded in an opening in the rear wall 67 of the frame B. 68 is the lock nut. The frame B has, in at least one of its side walls, an opening 69 with which the pin 64 is adapted to be brought into registry or alignment as hereinafter described more in detail.

In accordance with the present invention, I have provided means whereby the forward end of the rocking box may be quickly and easily depressed at will so as to bring the upper tool into operative relation with the lower tool, and also means are provided for positively moving the upper tool into operative relation to the lower one and holding it in such position.

Referring to the drawings, 75 designates a lever extending across and adapted to engage the upper end of the head 41 of the rocking box. This lever is pivoted to the frame B, as at 76, and extends transversely through suitable openings in the frame B. Connected to the outer end of the lever is a link 77, the lower end of which is connected

to the foot-treadle lever 78 pivoted at one end, as at 79, and carrying on its other end a suitable foot-treadle 80. The rocking box 27 is normally urged by a spring 81 in a direction to raise the forward end of the rocking box and thus move the upper tool away from the lower one. This spring 81 may be located in a bore 82 in the upper wall 26 of the frame B. The spring engages a lip or abutment 83 extending upwardly from the rear end of the rocking box. The lever 78 and the lever 75 are normally urged upwardly by a spring 84, one end of which may be connected to the lever 78 and the other end to the bench or support 18 on which the machine is located. There may be interposed in this spring a suitable turnbuckle or other suitable adjusting device (not shown) for varying the tension of the spring. The numeral 85 designates a screw threaded into an opening 86 in the head of the frame. The lower end of this screw is adapted to engage the lever 75. The upper end of the screw carries a handle 87. 88 are suitable lock-nuts.

The manner in which the machine is set up or adjusted and its mode of operation will now be briefly described. For most operations of which the machine is capable, it will be found desirable to have the upper arbor 32 substantially parallel to the lower arbor 13 during normal running condition; that is, when the tools provided on these arbors are cooperating to manipulate the work.

In this event, the shafts are brought substantially into parallelism by turning the sleeve screw 66 until the pin 64 is in alignment or registry with the opening 69 in the side of the frame. After this is done, the forward end of the rocking box is depressed either by means of the treadle or by means of a screw 85, so that the upper arbor is parallel to the lower arbor as shown in the drawing, and then the sleeve screw 52 is turned to adjust the rocking box backwardly or forwardly as the case may be so as to bring the upper tool into proper longitudinal relation to the lower tool. The machine having now been set up, the piece of work is placed between the lower tool and the raised upper tool and then the upper arbor is depressed either through the instrumentality of the treadle 80 or through the screw 85. If the operation to be performed is relatively simple and can be quickly carried out, the foot-treadle will be preferably used to operate the upper arbor. The screw 85 may be used as a stop to adjustably limit upward movement of the rocking box. If the operation requires a relatively longer length of time, the upper arbor may be depressed by turning the screw 85 in the proper direction. When the screw is thus turned, the lower end thereof will bear against the lever 75 and force that lever, together with the head of the rocking box with which it is in engagement, downwardly.

When the pressure on the foot-treadle is relieved, or when the screw 85 is turned upwardly, as the case may be, the spring 81 causes the forward end of the rocking box to swing upwardly and the foot-treadle and lever 75 are raised by the spring 84.

In some instances, as previously stated, it is desirable to have the tools, when in operating relation, disposed at an angle to one another; for example, where a fading or vanishing crimp is desirable on the end of a stove pipe, the upper crimping roll should be disposed at an angle to the lower cooperating crimping roll.

In this event, the pin 45 about which the rocking box pivots is lowered, so that, when the box is depressed, the arbors are at an angle to one another. The pin is thus lowered by turning the sleeve screw 66 in the proper direction to feed the adjusting screw 65 backwards, resulting in the lever 61 being swung in an anti-clockwise direction. When this lever is so swung, the links 62 are lowered. The pin 45 is, of course, moved in a slight arc struck about the center about which the block 51 swings. The upper arbor is then longitudinally adjusted by turning the sleeve screw 52 so as to bring the tools in proper registry.

As many changes could be made in the above construction and many apparently widely different embodiments of this invention could be made without departing from the scope thereof, it is intended that all matter contained in the above description or shown in the accompanying drawing shall be interpreted as illustrative and not in a limiting sense.

It is also to be understood that the language used in the following claims is intended to cover all of the generic and specific features of the invention herein described and all statements of the scope of the invention which, as a matter of language, might be said to fall therebetween.

I claim as my invention:

1. In a machine of the character described, a frame, a fixed arbor therein, a rocking box, an arbor in said rocking box, and a member, on which said box is pivoted and mounted for adjustment towards and away from said fixed arbor and for adjustment longitudinally thereof.

2. In a machine of the character described, a frame having spaced parallel side walls, a fixed arbor journaled in and projecting forwardly from said frame, a rocking box above said fixed arbor and located between the side walls of said frame, an arbor journaled in said rocking box and generally parallel to said fixed arbor, a transverse pin on which said rocking box is mounted for rocking movement in a direction towards and away from said fixed arbor, and means for supporting said pin and adjusting the same ver-

tically and longitudinally of said fixed arbor.

3. In a machine of the character described, a frame, an arbor therein, a bearing member mounted for pivotal movement, an arbor in said bearing member generally parallel to said first arbor, means for adjusting said bearing member vertically, and means for adjusting said bearing member generally longitudinally of said first arbor.

4. In a machine of the character described, a frame, an arbor therein, a rocking box having a pivotal point about which it is adapted to swing towards and from said arbor, an arbor in said rocking box, means for vertically adjusting the pivotal point of said rocking box, and means for adjusting said pivotal point longitudinally of said first arbor.

5. In a machine of the character described, a frame, a fixed arbor therein, a rocking box within said frame above said arbor, an arbor journaled in said rocking box, a pin on which said rocking box is mounted for swinging movement, means for adjusting said pin vertically, and means for adjusting said pin generally longitudinally of said fixed arbor, said adjusting means cooperating to hold said pin in each of its adjusted positions.

6. In a machine of the character described, a frame, an arbor therein, a bearing member mounted for pivotal movement, an arbor journaled in said bearing member, means including a screw for vertically adjusting said bearing member, and means including an adjusting screw for longitudinally adjusting said bearing member.

7. In a machine of the character described, a frame, a fixed arbor therein, a bearing member, a pivot element about which said bearing member is adapted to rock, an arbor in said bearing member, means including a screw connected to said pivot element for vertically adjusting the same, and means including a screw connected to said pivot element for longitudinally adjusting the same.

8. In a machine of the character described, a frame, an arbor therein, a rocking box in said frame mounted for pivotal movement towards and away from said arbor, an arbor journaled in said rocking box, means for adjusting said rocking box longitudinally and including an adjusting screw associated with said box and a sleeve screw cooperating with said adjusting screw, and means for adjusting said rocking box vertically and including an adjusting screw associated with said rocking box and a sleeve screw cooperating with said adjusting screw.

9. In a machine of the character described, a frame, an arbor therein, a rocking box having a pivotal point about which it is adapted to swing towards and from said arbor, an arbor journaled in said rocking box, means for adjusting said rocking box longitudinally, said means being pivotally mounted in

said frame to permit said rocking box to be adjusted vertically, and means for adjusting said rocking box vertically and arranged to permit said rocking box to be adjusted longitudinally.

10. In a machine of the character described, a frame, an arbor journaled therein, a rocking box having a pivotal element about which it is adapted to swing towards and from said arbor, an arbor in said rocking box, means for adjusting said rocking box longitudinally and including a screw connected to said pivotal element and supported for pivotal movement about an axis parallel to the axis about which said rocking box swings; and means for adjusting said rocking box vertically and including a pivoted lever, a link between said lever and rocking box, and means for adjusting said lever.

11. In a machine of the character described, a frame, a fixed lower arbor therein, a rocking box in said frame and mounted for swinging movement towards and away from said arbor, an arbor journaled in said rocking box, a pin constituting the pivotal point of said rocking box; means for adjusting said pin longitudinally of said fixed arbor and including a block pivotally mounted in said frame, a sleeve screw in said block, and an adjusting screw between said sleeve screw and pin; and means for adjusting said rocking box vertically and including a lever pivoted in said frame, links between said lever and pin, an adjusting screw connected to said lever, and a sleeve screw carried by said frame and cooperating with said adjusting screw.

12. In a machine of the character described, a frame having an opening in its side wall, a fixed arbor, a rocking box in said frame, an arbor journaled in said rocking box, a pivotal element about which said rocking box swings, means for adjusting said pivotal element generally longitudinally of said fixed arbor, and means for adjusting said rocking box vertically and including an element adapted to be brought into registry with said opening to indicate that said arbors in normal running position are parallel.

13. In a machine of the character described, a frame, an arbor journaled therein, a rocking box in said frame pivoted at one end, an arbor journaled in said rocking box, a lever pivoted in said frame extending across and adapted to engage against the top of the forward end of said rocking box, a foot-treadle connected to said lever for operating the same, and a screw in said frame above said lever and adapted to engage said lever, said screw having a handle for turning the same.

14. In a machine of the character described and comprising a unitary structure having a base, a frame on said base, an arbor journaled in said frame, a rocking box in said frame, an arbor journaled in said rocking box, a gear box connected to said frame, a

shaft in said gear box, gearing between said shaft and first arbor, a pulley on said shaft, a platform pivoted on said base, an electric motor on said platform, a belt between said motor and pulley, and a spring normally urging said platform in a direction to maintain said belt taut.

15. In a machine of the character described, a frame, a fixed arbor journaled in said frame, a rocking box in said frame, an arbor journaled in said rocking box, a pivot member on which said rocking bar is mounted for rocking movement in a direction towards and away from said fixed arbor, and means for supporting said member and for adjusting the same vertically and longitudinally of said fixed arbor, said pivot member, rocking box and second arbor being adjustable as a unit.

LEIV S. PLATOU.