(No Model.)

T. W. STEWART.

METAL BENDING MACHINE.

No. 375,512. Patented Dec. 27, 1887.

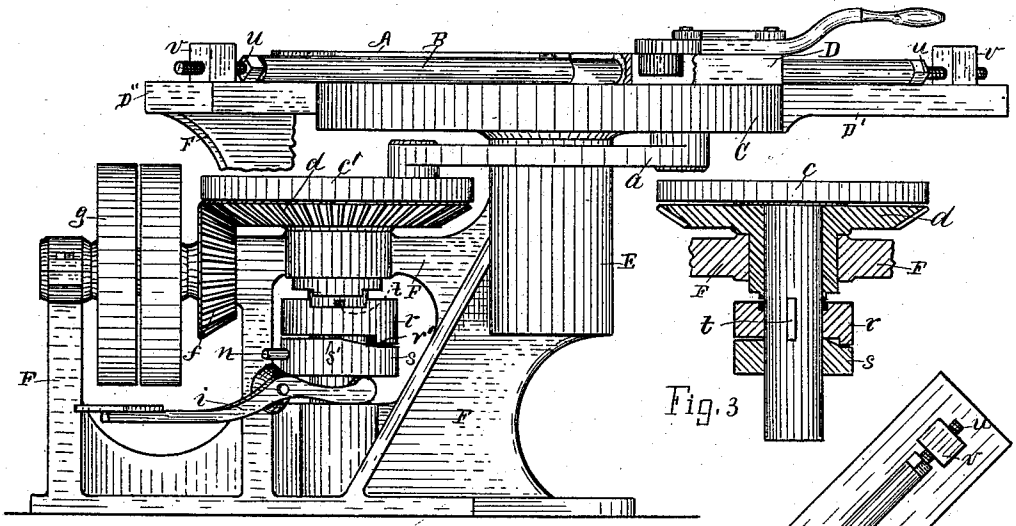

Fig. 1

Fig. 3

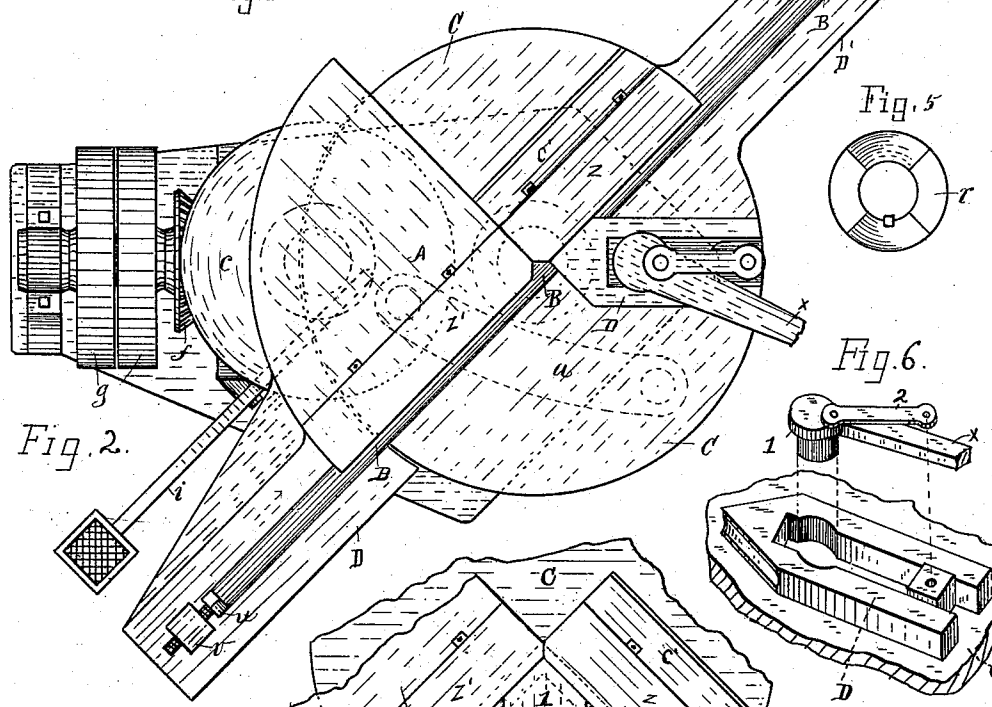

Fig. 2

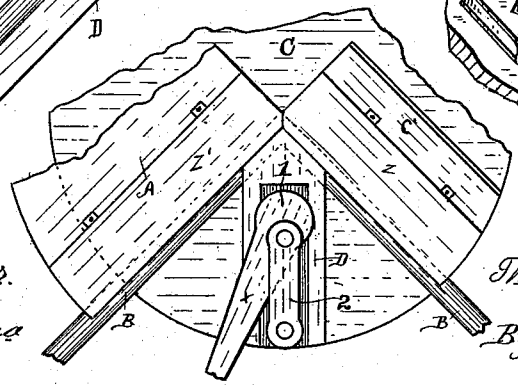

Fig. 4

Fig. 5

Fig. 6

Witnesses.
John C. Perkins.
Geo. W. O'Harra

Inventor.
Thomas W. Stewart
By Lucien C. Hart
atty.

UNITED STATES PATENT OFFICE.

THOMAS W. STEWART, OF KALAMAZOO, MICHIGAN.

METAL-BENDING MACHINE.

SPECIFICATION forming part of Letters Patent No. 375,512, dated December 27, 1887.

Application filed September 5, 1887. Serial No. 248,868. (No model.)

To all whom it may concern:

Be it known that I, THOMAS W. STEWART, a citizen of the United States, residing at Kalamazoo, county of Kalamazoo, State of Michigan, have invented a new and useful Metal-Bending Machine, of which the following is a specification.

This invention has for its object certain improvements, below described and claimed, some of them being more particularly designed to adapt the machine to be run by power mechanism.

In the drawings forming a part of this specification, Figure 1 is an elevation; Fig. 2, a plan; Fig. 3, a vertical section of parts in Fig. 1, near the shaft of the disk C; Fig. 4, a broken detached view of Fig. 2, illustrating the operation. Fig. 5 is a plan of a lettered detail in Fig. 1; and Fig. 6 shows lettered details, in perspective, below described.

Referring to the lettered parts of the drawings, F is a frame supporting the parts of the machine. The axis of the disk C has bearings in the box E, attached to the frame. This oscillating disk C has a laterally-projecting arm, D′, corresponding to the fixed shelf D″ on the opposite side, when the machine is in its normal condition, prior to operating. The shelf D″ and the arm D′ have screw-threaded lugs V, through which are passed the headed screws U, the heads of said screws coming against the ends of the metal bar to be bent. (See B, Fig. 2.)

Just above the disk C, so as to clear the same, is a block, A, rigidly attached to the shelf D″. The edge of this block may be grooved or recessed to receive the bar lying parallel with it; or the groove may be made in a die, Z′, or supplemental block, and said die may be detachably secured, as in Figs. 2 and 4. When dies are used, one may have a concave groove, another a square groove, and so on, according to the shape of the bar B. The bar is here shown round. The disk C has a raised portion, *c′*, having a front edge on a like plane with the edge of the block A. The above description, as to the edge of the block A, will apply to the front edge of the raised portion *c′*; or dies may here be employed, as at Z, and like the above-described dies Z′. A sliding block, D, is shown operated by an eccentric-lever, X, said block D being grooved in the edges of its V-shaped end to fit the bar B.

The block D is longitudinally slotted or forked. The forward end of said slot is enlarged laterally, thus making a hole into which a downwardly-projecting lug, 1, of lever X, Fig. 1, is inserted and turns. A strap, 2, is pivoted to this round end of the lever X at one side of the axial center, and the other end of the strap is pivoted to the disk C. Thus when the lever X is swung the block D slides. The last-named end of the strap 2 is more properly pivoted to a raised portion of the disk C, as indicated in Fig. 6 at 3. Fig. 6 also shows the slotted sliding block D, and the groove in its V-shaped end appears in this figure.

Fig. 4 shows how the bar B has been bent at right angles by swinging the arm D′ and disk C around until the edges of the dies Z and block D strike against the edges of the die Z′. The outer contiguous corners of the dies Z′ Z are beveled off to admit of this movement. Of course other than right angles can be bent by making a greater or less movement of the disk C. In this case it will be necessary to shape the end of the block D accordingly. In like manner a curve may be bent in the metal by making a concave recess in the block A or the die Z′, and using a die on the disk C, having a convex end to enter said recess and force the metal therein. This is not here shown.

The disk C is operated by a crank-disk, C′, and a connecting-rod, *a*, Figs. 1 and 2. The shaft of the crank-disk C′ passes loosely through the bevel-gear *d* beneath, Figs. 1 and 3. The collar *r* slides up and down on the shaft of gear *c*, and revolves with said shaft, being held by a spline, *t*. The upper end of the collar *r* is mortised to fit detachably a tenon on the end of the hub of gear *d*. The collar *s* below collar *r* is loose on the shaft, and is prevented from turning by the projection *n*, which impinges against a standard of the frame F. The contiguous ends of the collars *s r* each have a raised and depressed portion which operate as follows:

Power is applied to the gear *d* by gear *f* and band-wheel *g*. The operator bears down on the treadle *i* with his foot. This raises the

collars *s r*, and the upper one engages the gear *d*, which causes the crank-disk C to turn, and the operation of bending commences. Of course the collar *r* also turns, and as soon as the raised portions *r' s'* of the collars register with each other, the treadle is entirely released, thus lowering the collar *s*. Then, as soon as the raised part *r'* of the collar *r* registers with the depressed part of the collar *s*, the collar *r* will lower and disengage from the hub of the gear *d*, which action stops the operation just at the moment the bending is completed. If found necessary, a spring may be employed to tilt the treadle *i* to its normal position in Fig. 1, and also to cause the collars to fall; but ordinarily, when the machine stands vertical, as shown, the weight of the collars brings them down, as stated.

Having thus described my invention, what I claim is—

1. The combination of a frame having a shelf to sustain one end of the bar to be bent, and having a fixed raised portion, an oscillating disk having an arm and the raised portion, a sliding block for clamping the bar against said raised portion, a rotatable crank-disk to which power is to be applied, and a connecting-rod pivotally attached to the crank-disk and to the oscillating disk, substantially as set forth.

2. In combination, a supporting-frame, the oscillating forming-disk, and means for sustaining and clamping the bar to be bent, the rotatable crank-disk, the connecting-rod connecting the forming-disk and crank-disk, the engaging power-gear, the collars, the contiguous edges of which have raised and depressed portions, the upper collar adapted to form a clutch engagement with the gear on the shaft of the crank-disk, the lower collar having a stop to prevent it from turning, and a foot-treadle for raising said collars, substantially as set forth.

3. In combination, a supporting-frame, the oscillating forming-disk, means thereon and on the frame for sustaining and clamping the bar to be bent, a crank-disk, a gear through which the shaft of the crank-disk passes, a power-gear engaging the former-named gear, and a clutch mechanism for locking the shaft of the crank-disk and its gear together and adapted to automatically disengage when the operation of bending the bar is completed, substantially as set forth.

In testimony of the foregoing I have hereunto subscribed my name in presence of two witnesses.

THOMAS W. STEWART.

Witnesses:

GEO. O. B. HALL,

ALBERT SIKKENGA.