(No Model.)

3 Sheets—Sheet 1.

H. SENGER.

MACHINE FOR FORMING SHEET METAL.

No. 504,628. Patented Sept. 5, 1893.

Fig. 1.

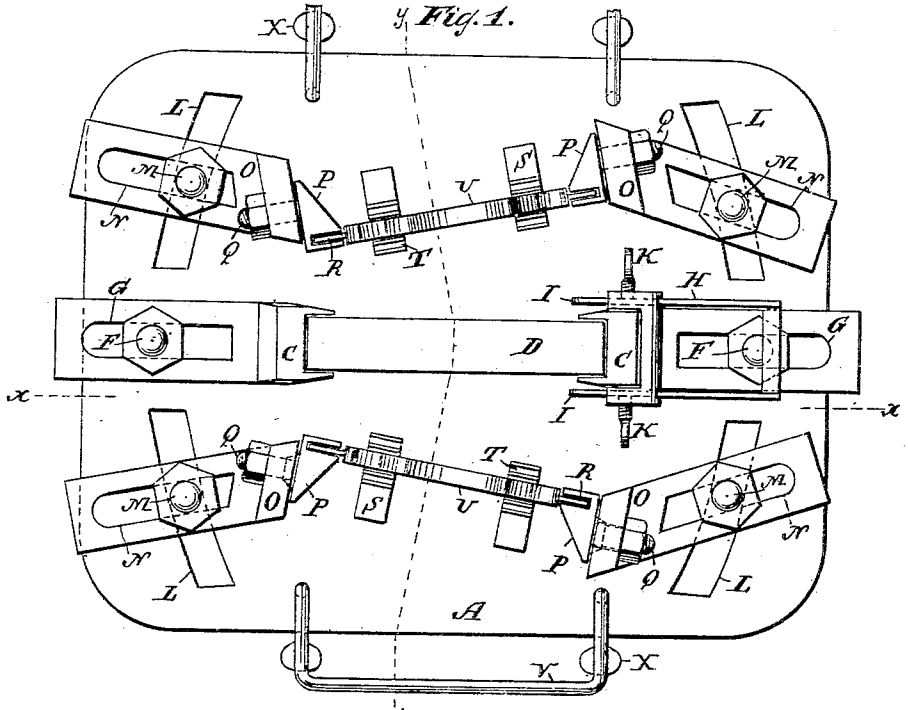
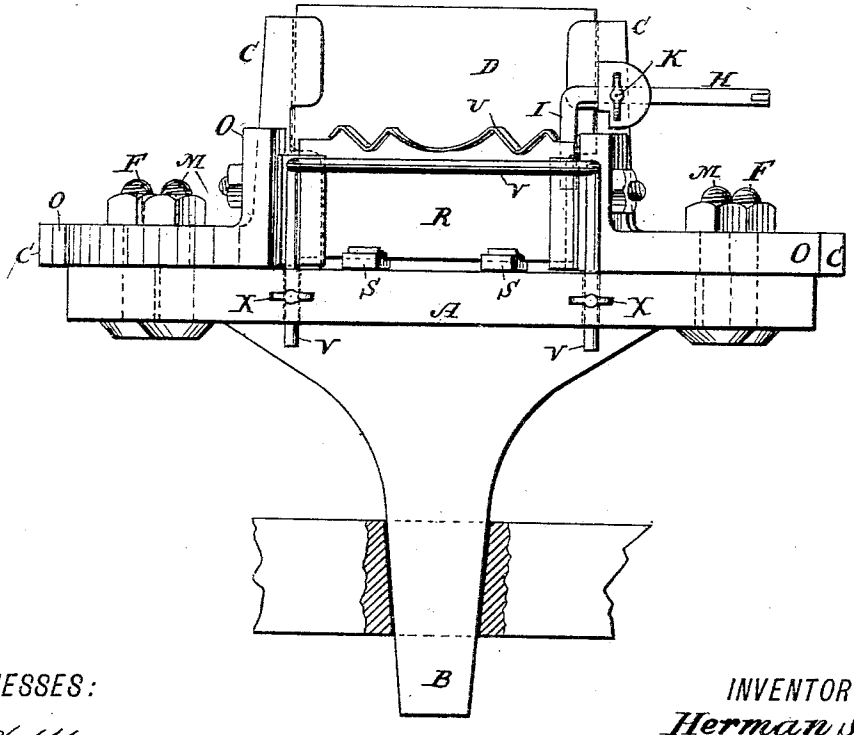


Fig. 2.



WITNESSES:

E. Wolff.

Chas. E. Foenzgen.

INVENTOR:

Herman Senger.

BY

Hauff & Hauff

ATTORNEYS.

(No Model.) 3 Sheets—Sheet 2.

H. SENGER.

MACHINE FOR FORMING SHEET METAL.

No. 504,628. Patented Sept. 5, 1893.

Fig. 3

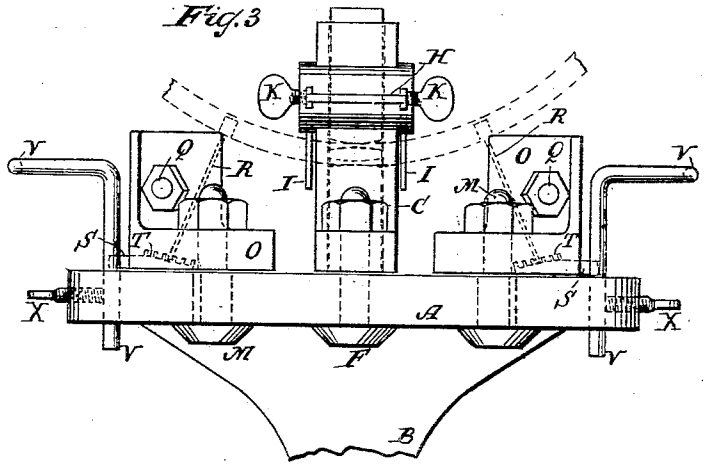


Fig. 4.

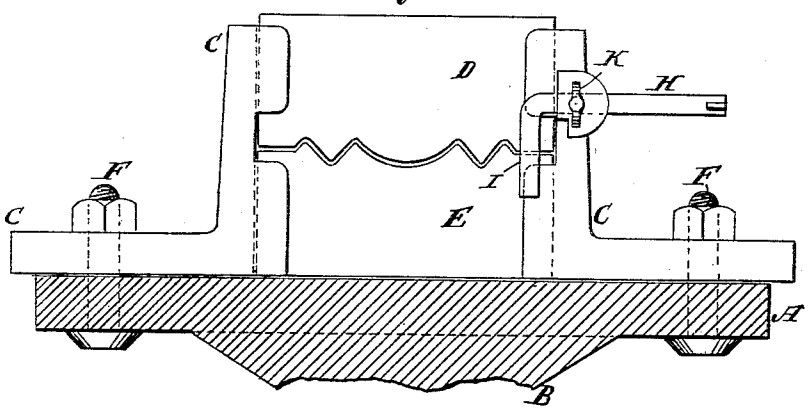
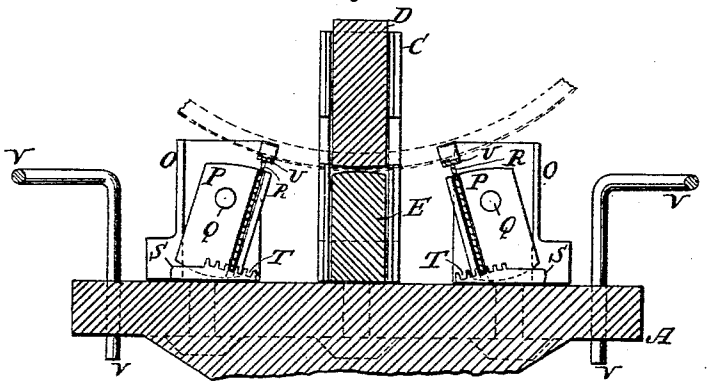


Fig. 5.



WITNESSES:

E. Wolff.

Chas. E. Pomeroy.

INVENTOR:

Herman Senger.

BY

Hauff & Hauff

ATTORNEYS.

(No Model.)

3 Sheets—Sheet 3.

H. SENGER.

MACHINE FOR FORMING SHEET METAL.

No. 504,628. Patented Sept. 5, 1893.

Fig. 6.

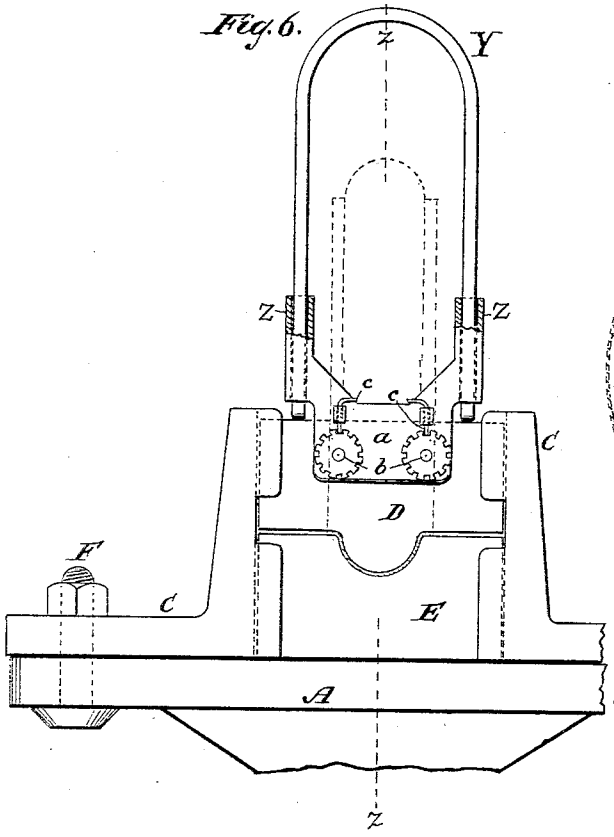
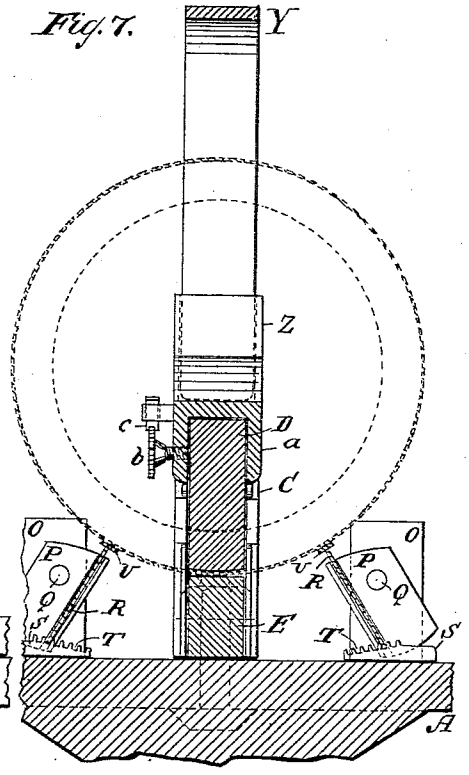


Fig. 7.



WITNESSES:

E. Wolff.

Chas. E. Poorsgrn.

INVENTOR:

Herman Senger.

BY

Hauff & Hauff

ATTORNEYS.

UNITED STATES PATENT OFFICE.

HERMAN SENGER, OF JERSEY CITY, NEW JERSEY.

MACHINE FOR FORMING SHEET METAL.

SPECIFICATION forming part of Letters Patent No. 504,628, dated September 5, 1893.

Application filed June 1, 1893. Serial No. 476,205. (No model.)

To all whom it may concern:

Be it known that I, HERMAN SENGER, a citizen of the United States, residing at Jersey City, in the county of Hudson and State of New Jersey, have invented new and useful Improvements in Machines for Forming Sheet Metal, of which the following is a specification.

The object of this invention is to provide a machine for forming sheet metal into various shapes and the invention consists in the novel features of construction pointed out in the following specification and claims and illustrated in the annexed drawings in which—

Figure 1 is a plan view of the machine. Fig. 2 is a face elevation of Fig. 1. Fig. 3 is side elevation of Fig. 1. Fig. 4 is a section along *x x* Fig. 1. Fig. 5 is a section along *y y* Fig. 1. Fig. 6 is a face elevation of dies with an attachment. Fig. 7 is a section along *z z* Fig. 6.

In the drawings the letter A indicates a bed or support which can be suitably secured in a work bench or other rest by a horn or attachment B. To the bed A are secured the die holders C into which the dies D E can be readily slipped or dropped. When a piece of sheet metal is inserted between the dies D E and pressure exerted as by striking the upper die with a hammer the interposed sheet metal will be bent or shaped to correspond to the dies. Said dies are made counterparts of one another to properly coact in shaping the sheet metal. The holders C are secured to the bed by suitable screws or fastenings F and by providing the holders C with slots G (Fig. 1) for the passage of the screws or bolts F the holders C can be properly adjusted for various dies. One of the holders is shown provided with slots or eyes for the insertion of a gage H made in shape of a fork or horse shoe so that its open or gaging portions I will straddle or lie on opposite sides of the dies and can be moved past the edge of the dies so that the work when consisting of a narrow strip will be properly gaged along only a part of the die. The set screws K enable the gage H I to be properly adjusted. The bed A has slots L (Fig. 1) for the passage of bolts or fastenings M which also pass through slots N in arms or supports O. The slots L N enable the supports O to be variably adjusted with relation to one another and to the dies D E.

To the supports O are connected the holders P by suitable rotary or swivel connections Q such as a bolt and nut. The holders P are slotted for the reception of shapes R which can be slipped or dropped into the holders P so as to rest on the bed A. The shapes R thus rest on the bed A and can be supported either in upright position or at any suitable tilt or angle by suitably swiveling or turning the holders P. In addition to the swiveling holders P the slots L N offer further means of adjustment so that the shapes R can be set as required by the character of the work. The shapes R can also be further adjusted by wedges or blocks S placed under the shapes between the latter and bed A so as to suitably raise the shapes from the bed as required. The blocks S are shown provided with grooves T in which the shapes R rest or engage so as not to slip. The shapes are made to correspond to the lower die, as for example the die E, so that said shapes will suitably guide the work as it is fed through the dies. An economical way of forming the shapes is to cut them from suitable light material such as sheet metal so that said shapes will form counterparts of the lower die. When the shape of the work is to be in reverse so that the dies D E are transposed, whereby the upper die becomes the lower one, the shapes R have to be slipped out of their holders and exchanged for such shapes as are counterparts of the die which is now underneath. Two shapes are shown located at opposite sides of the dies or of one of the dies, but one shape may at times form a sufficient guide for the work, it being preferable however to have two as giving the operator more freedom for his hands and facilitating control of the work. The efficiency of the shape R may be increased by soldering or securing to the edge of the shape a rim or band U.

In case long pieces of work are being operated on it is convenient to employ bifurcated rests V readily formed from wire the legs of which can be slipped or adjusted to proper height in eyes or holes in the bed A and fixed in position by set screws X. The bifurcated rests V are efficient aids in supporting and

steadying long pieces of work beyond the shapes R. Sometimes it is desired to form work on the machine into circular form with small diameter and when such work curves around above the upper die no sufficient space is left between the work and the upper edge of the upper die for the insertion or manipulation of a hammer or tool for exerting the proper pressure on the upper die. In such case an arm or attachment Y (Fig. 6) can be employed which is forked or horse shoe shaped so that the work can curve or bend around between the legs of the forked attachment Y as indicated by dotted lines in Figs. 6 and 7. The branches or legs of this attachment are inserted or slipped into sleeves or seats Z extending from the die holder *a*, which is secured to the die D by screws or fastenings *b*. The heads of the screws are notched and the holder *a* has locks or bolts *c* which can engage the notches of the heads of screws *b* to prevent the latter loosening or unscrewing during the hammering or operation of the machine. The work coming from between the dies can now circle or curve into the space between the legs of the attachment Y while the required hammering or pressure can be applied at the upper or closed part of said attachment above the work, which latter is thus not interfered with while at the same time the upper die can be suitably pressed or hammered toward the lower die.

The dies D E are generally somewhat expensive to make so in case of light work or of work the character of which has not to be frequently repeated I have found it economical to replace the dies by shapes which can be cheaply cut from sheet metal and being provided with a rim as U will do efficient work for a time, although in case of heavy work or long continued operation dies of suitable metal such as cast iron or cast zinc are requisite.

The operation of the machine is simple and readily understood. The work is inserted between the dies and said dies are suitably hammered or pressed together and the work as it is shaped by the dies is passed along to bring fresh parts of the work to the dies, the shapes R supporting the work in process of formation and imparting curvature in longitudinal direction to the work as said shapes are set, the machine being capable of turning out work either straight or curved in longitudinal direction as required.

What I claim as new, and desire to secure by Letters Patent, is—

1. The combination with a bed or support A, and co-acting dies D and E, of supports O arranged at one side of the dies, pivoted or swiveled shape-holders P mounted on said supports, and a shape R detachably mounted in the pivoted or swiveled holders, substantially as described.

2. The combination with a bed or support A and coacting dies D E of a shape arranged on one side of one of the dies, holders for maintaining the shape in upright position, and a block S adapted for insertion between the bed and the shape, said block having grooves or recesses for the insertion or engagement of the shape substantially as described.

3. The combination with a bed or support and coacting dies of a shape, swiveling holders at the sides of the shape and supports for the holders adjustably secured to the bed substantially as described.

4. The combination with a bed and coacting dies of a shape, swiveling holders for the shape, supports for the holders, and screws or fastenings for securing the supports to the bed, said supports and bed being suitably slotted for the passage of the screws to make the supports adjustable in various directions substantially as described.

5. The combination with coacting dies of one or more shapes arranged in proximity to the dies and a gage made to straddle one of the dies so as to be capable of being set within the edge of the die substantially as described.

6. The combination with a bed or support, and co-acting dies, of shapes arranged at opposite sides of the dies, the bifurcated rests V having legs which are vertically adjustable in openings in the bed or support for supporting the work in proximity to the shapes, and devices engaging the legs of the said rests for rigidly securing them in their adjusted position, substantially as described.

7. The combination with coacting dies and a bed or support for the dies of an actuating arm or attachment Y for one of the dies, said attachment being slotted or forked to allow bending or circling of the work substantially as described.

8. The combination with coacting dies and a bed or support therefor of an actuating arm or attachment Y for one of the dies, a holder for the arm or attachment, a screw for securing the holder to the die said screw being provided with a notched head, and a latch for engaging the notched screw head to hold the screw locked substantially as described.

9. The combination with coacting dies and a bed or support therefor of a forked actuating arm or attachment for one of the dies and a holder for connecting the arm to the die said holder being provided with sleeves or seats for the insertion of the forked arm substantially as described.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

HERMAN SENGER.

Witnesses:
WM. C. HAUFF,
E. F. KASTENHUBER.