

E. & A. G. CHILDREN.
Machine for Cutting and Forming Sheet-Metal
Fence-Barbs.

No. 212,091.

Patented Feb. 11, 1879.

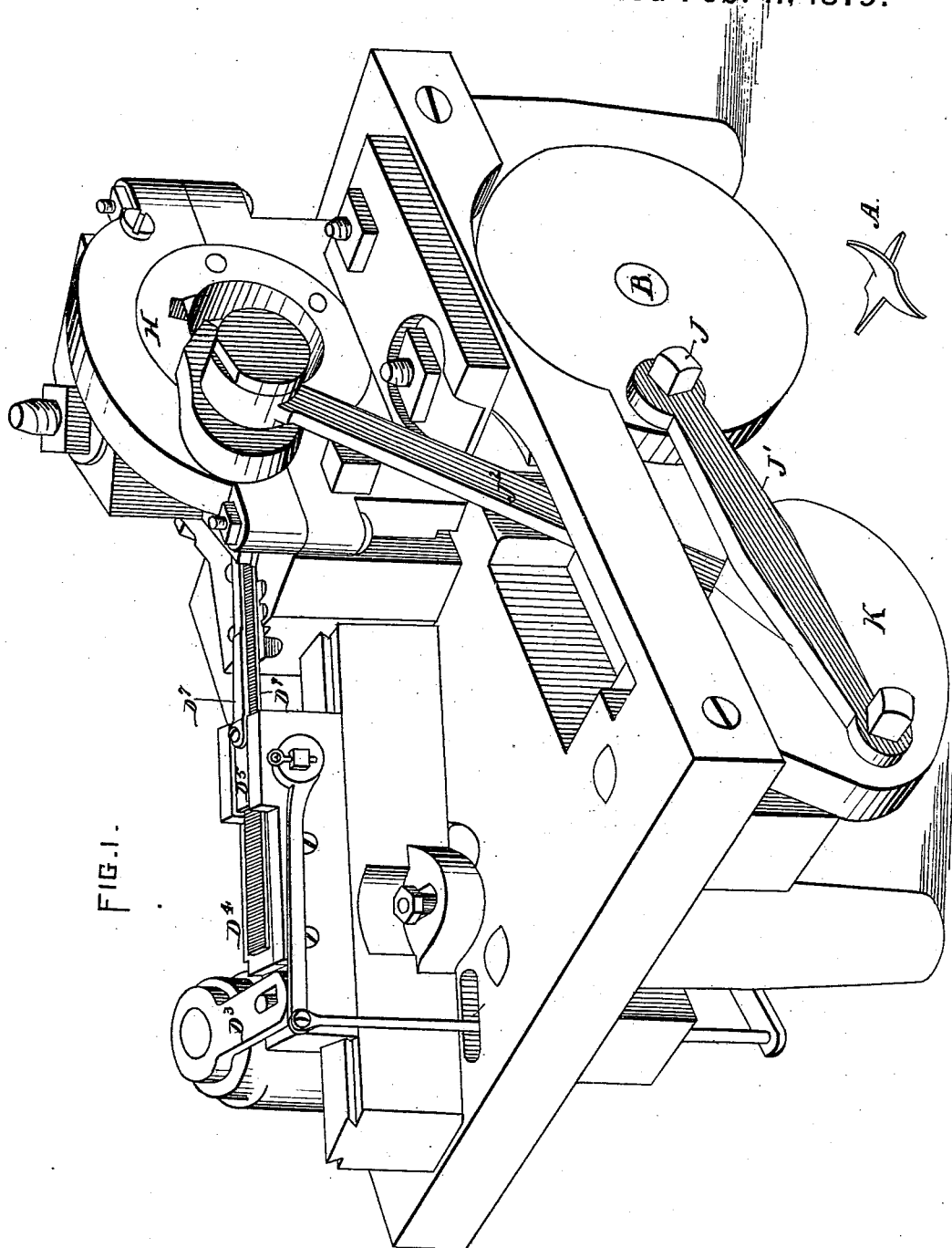


FIG. 1.

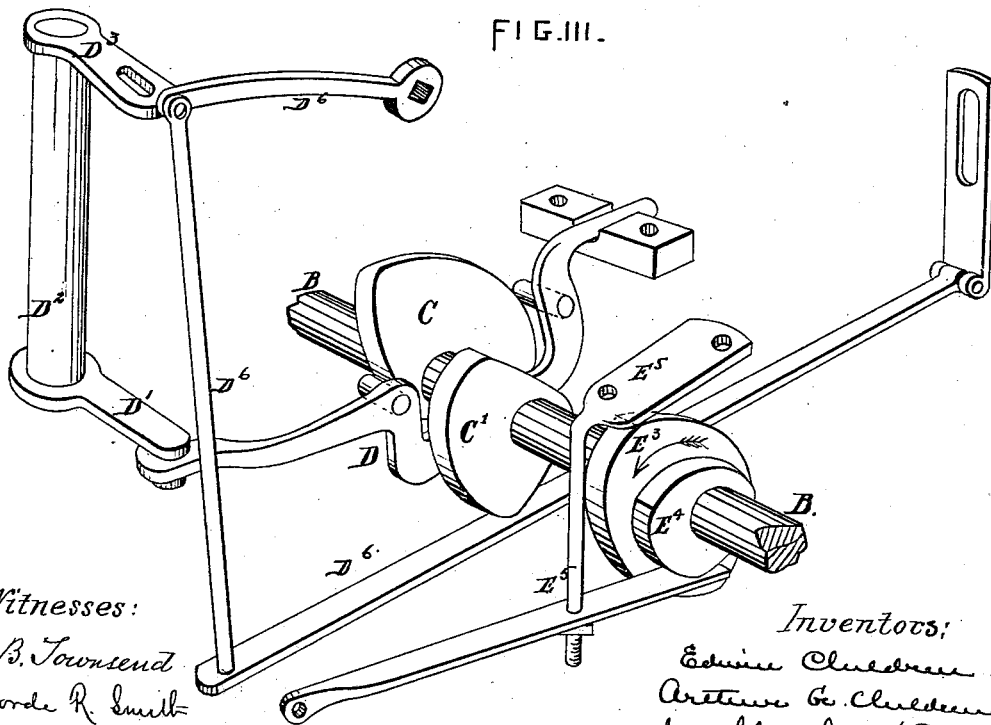
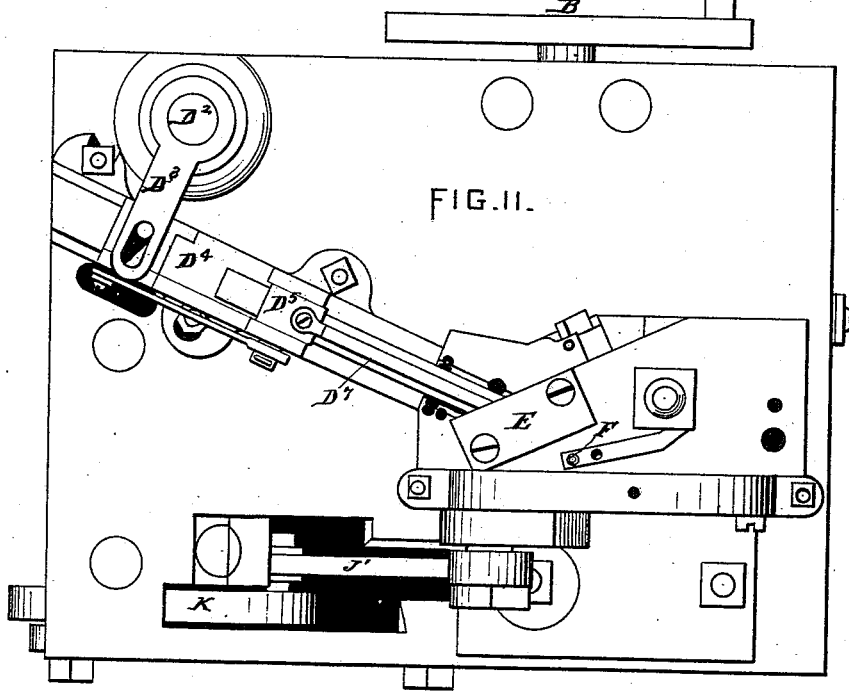
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Inventors:
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FIG. IV.

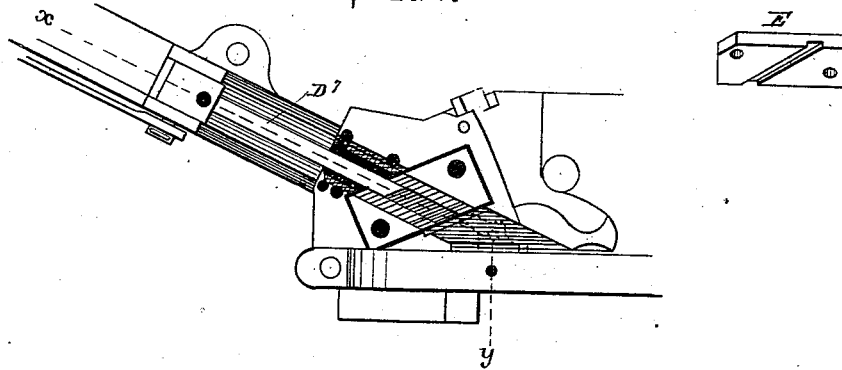


FIG. V.

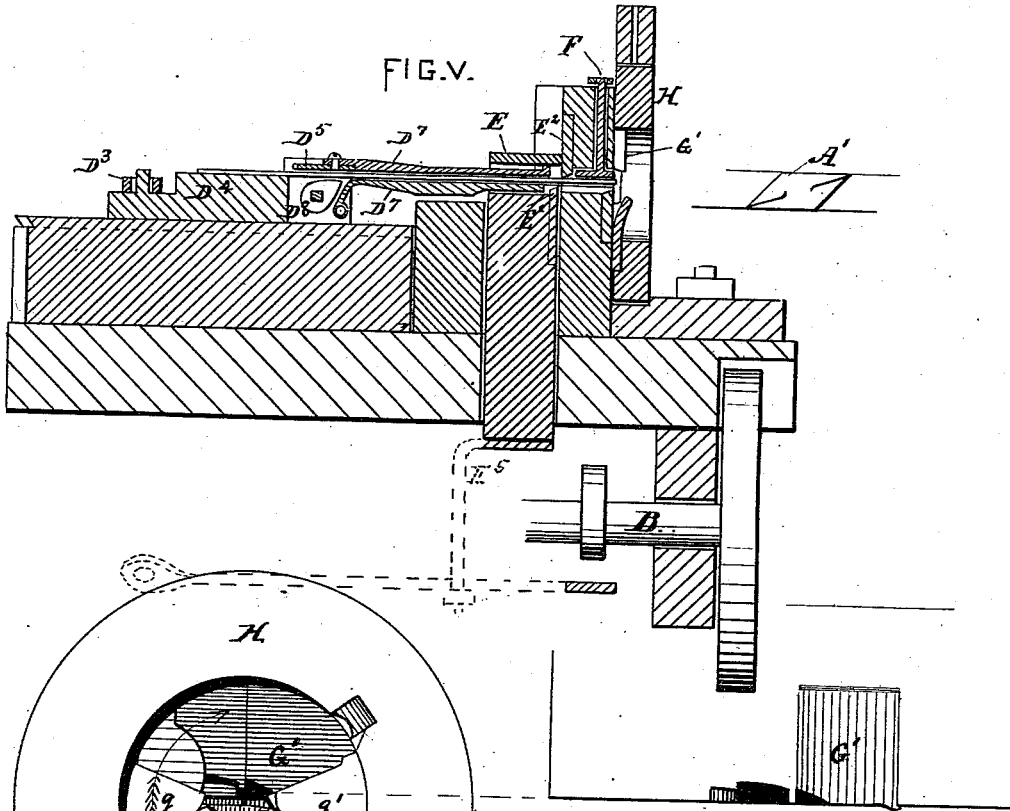
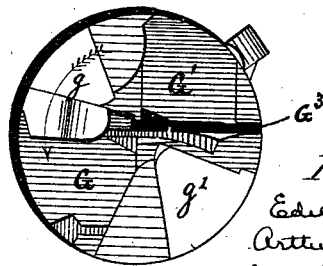
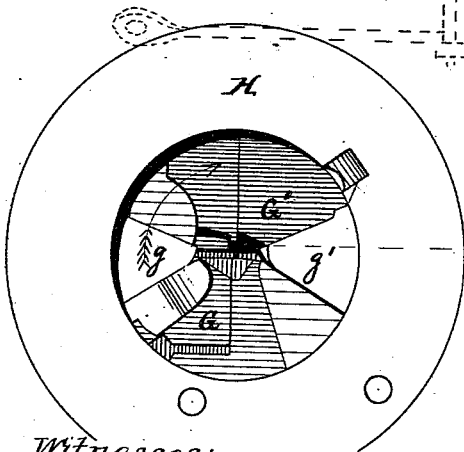


FIG. VI.



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UNITED STATES PATENT OFFICE

EDWIN CHILDREN AND ARTHUR G. CHILDREN, OF DUNLEITH, ILLINOIS.

IMPROVEMENT IN MACHINES FOR CUTTING AND FORMING SHEET-METAL FENCE-BARBS.

Specification forming part of Letters Patent No. 212,091, dated February 11, 1879; application filed April 30, 1878.

To all whom it may concern:

Be it known that we, EDWIN CHILDREN and ARTHUR G. CHILDREN, of Dunleith, Jo Daviess county, State of Illinois, have invented certain Improvements in Machines for Cutting and Forming Sheet-Metal Fence-Barbs, of which the following is a specification:

The nature of the invention will be understood from the following description of the construction and operation of the machine shown in the drawings.

Figure 1 of the said drawings is a perspective view of the machine, and also of one of the completed barbs. Fig. 2 is a top or plan view of the machine. Fig. 3 is a perspective diagram of the principal shaft and its cams. Fig. 4 is a fragmentary plan view of the feed, cutting-die, and presser-foot. Fig. 5 is a sectional view of the machine on the line *xy* of Fig. 4. Fig. 6 shows three detail views of the cutting and forming dies.

Like letters of reference wherever used throughout all the figures denote like parts.

The style of barb which my machine is adapted to make is what is known as the "Frentress four-point sheet-metal barb." Diamond-shaped blanks, cut diagonally from a flat bar or band of sheet metal, are slit at the acute angles, as shown at Fig. 5, *A'*, and the slit parts bent in opposite directions, forming the completed barb like that shown at Fig. 1, *A*.

The first operation of the machine, taking the natural order, is the feeding of the strip of sheet metal to the dies, which is accomplished by the mechanism now to be described, in such manner that the length of a single barb, counting such length as the distance from one of the acute angles to one of the obtuse angles, is fed at each operation, and an operation is completed at each revolution of the main shaft *B*.

Upon said shaft *B* is a pair of cams, *C C'*. The cam *C* imparts a reciprocating motion to the slide *D*, which is connected by an arm, *D¹*, to a rock-shaft, *D²*, having another arm, *D³*, connected to the sliding reciprocal carriage *D⁴*, upon which is borne the strip of sheet metal to be fed to the dies. The strip lying upon the carriage passes under a stationary plate, *D⁵*, below which is a griping-cam, *D⁶*, that

clamps the strip from beneath up against the plate lightly at all times, except when the carriage is moving back from the dies. This griping-cam is operated by the connections *D⁶* from the eccentric *C'*, above mentioned as one of a pair upon the main shaft *B*. The result of this mechanism is that the strip clamped by the griper is fed forward the distance that the carriage moves, and being seized in front by a severing knife or die, presently to be described, is there held while the carriage returns to take a fresh hold. In order that there may be no break in the feed, and no dropping or displacement of the strip as it is being used up, I lead the strip from the griping-cam and carriage to the dies between a pair of guide-bars, *D⁷*, one above and one below the strip.

The strip is led by the guide-bars into a horizontal slot which passes through a vertically-moving head, *E*. The lower lip of this slot, at the side nearest the dies, is provided with a cutting-edge, *E¹*, which is opposed to a stationary cutting-edge, *E²*, upon the frame of the machine. A pair of cams, *E³ E⁴*, give an up-and-down movement to the head *E* from the shaft *B* by connections *E⁵*. This movement is so timed that the knife or cutting edge *E¹* in the sliding head rises and severs the strip diagonally just as the feed-carriage has finished its backward movement, and just before the strip is fed forward. The diamond-shaped blank thus cut off from the strip is pushed forward beneath a spring presser-foot, *F*, by the strip being fed after it, until it comes into position to be acted upon by the slitting and forming dies in advance.

The slitting and forming of the blank are done at a single operation by two pairs of dies operating in different directions. Each pair of dies consists of a stationary and a moving die. The stationary dies *G G¹* are secured to the frame of the machine, the upper one, *G¹*, having its cutting-edge below, and the lower one, *G*, its cutting-edge above. The moving dies *g g¹* oppose the stationary dies, and are carried in a shell, *H*, which makes a partial rotation. The stationary and moving dies are thus opposed to each other to act with a shearing cut, so that when the blank is in place and the shell *H* rotated in such manner as to carry

the die g' upward and the die g downward, their action in conjunction with the stationary dies will be to slit the diamond-shaped blank at the acute angle at each end. The forming action of these dies, although difficult to describe, will be readily understood by any one conversant with the art of cutting sheet metal with shears, the tendency of the blades, as they pass in making the cut, being to carry the metal upon one side of the cut in one direction and upon the other side in the other direction, producing the curve of the metal, as it is called. In short, the moving blade g' carries with it half of the slit angle of the diamond at one end in its upward course, and g carries the same half at the other end in its downward course; and as the other side of the blank is not tightly clamped, but lies in a cavity, G^3 , the bend divides itself between the two halves of the two acute angles and produces the symmetrical barb. The amount of bend may be made to vary as the motion of the dies is changed, or as they are ground or set.

The required reciprocating motion of the dies is produced as follows: A crank, J , upon the shaft B is connected by a pitman, J^1 , to a wrist-pin upon the quadrant K , which is connected by a pitman, J^2 , from another wrist-pin to the rotary shell H . We have described everything about this rotary holder or shell H which is necessary to its successful operation. Difference is made between the distance from the centers of the quadrant and crank to cause the well-known reverse or swing action, which produces the required reversal of the shell, while the dead-centers produce the required pauses. As fast as the barbs are formed and the knives reverse they are discharged from

the machine by the feeding forward of the succeeding blank.

We claim—

1. The combination of the feed, the cutting-dies which sever the blank from the bar or strip, and the shearing-dies for slitting and forming the barb, the latter located in advance of the severing-dies, so that the feed of the bar crowds forward the severed blanks to position in the shears, substantially as specified.

2. The pair of shearing-dies, the moving blades of which move in opposite directions, in combination with a mechanism for holding and guiding the severed blank thereto, substantially as specified.

3. The dies for slitting and forming the barb, in combination with a cavity in which the barb lies loosely while being sheared and formed, substantially as specified, to permit the bend of the points to divide itself between the two halves of the blank.

4. The combination, with the forming-dies and the severing-dies, of the feed-carriage, gripping-cam, guide-bars, and the mechanism for operating the same, in the manner and with the timing specified.

5. The combination of the shaft B , cams C C' , slide D , arm D^1 , rock-shaft D^2 , arm D^3 , carriage D^4 , plate D^5 , gripping-cam D^6 , guide-bars D^7 , moving head E , cutting-edge E^1 , cutting-edge E^2 , cams E^3 E^4 , connections E^5 , presser-foot F , dies G G^1 g' g , shell H , crank J , pitman J^1 , quadrant K , and pitman J^2 , substantially as specified.

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