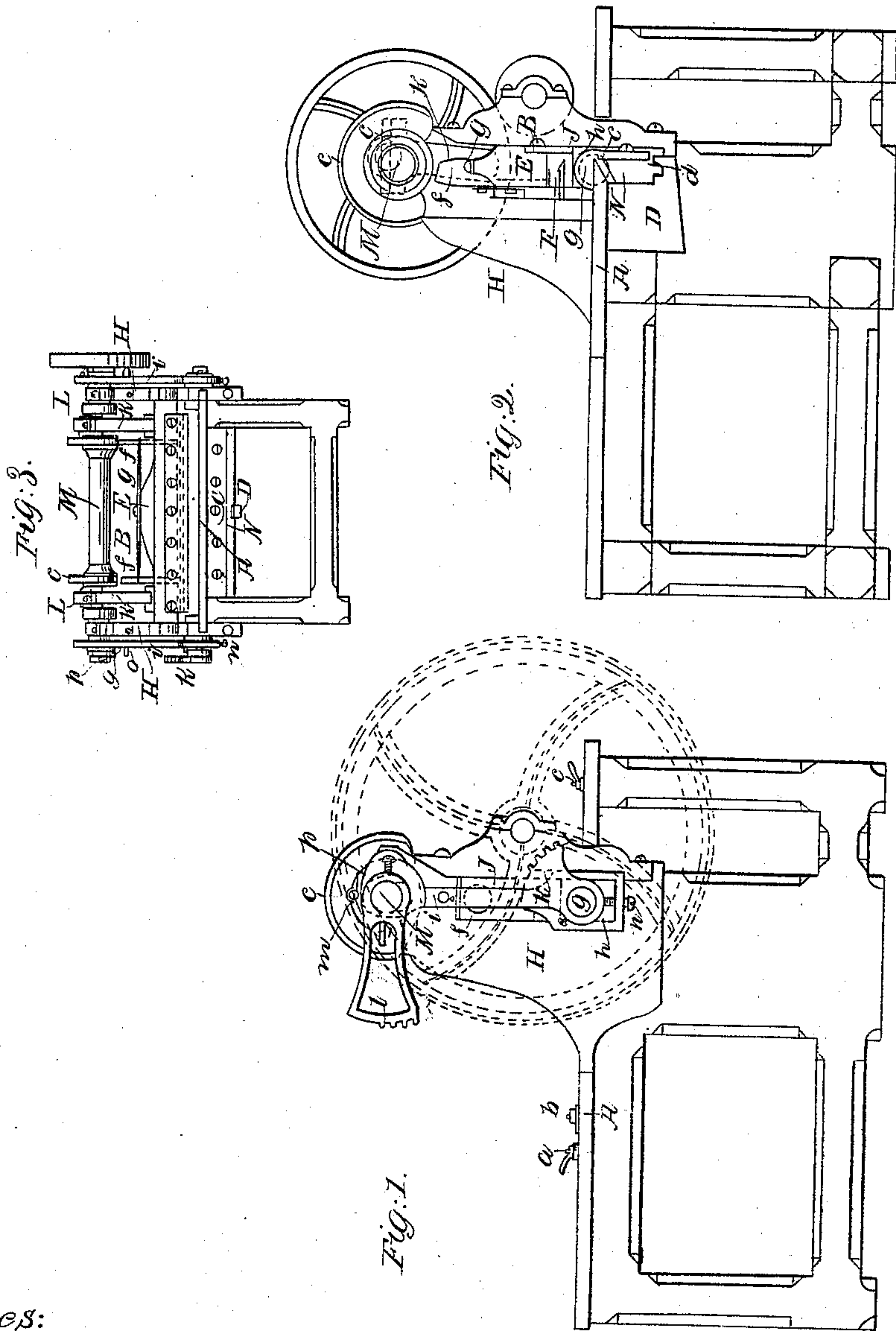


A. G. Gray,
Edging Sheet-Metal.

N^o 80,725.

Patented Aug. 4, 1868.



Witnesses:
Thomas Yankin.
Charles J. Baleman.

Inventor:
A. G. Gray

United States Patent Office.

A. G. GRAY, OF ST. JOHN, NEW BRUNSWICK, ASSIGNOR TO HIMSELF AND
JAMES T. MAGEE, OF THE SAME PLACE.

Letters Patent No. 80,725, dated August 4, 1868.

IMPROVED MACHINE FOR CUTTING AND FOLDING SHEET METAL.

The Schedule referred to in these Letters Patent and making part of the same.

TO ALL WHOM IT MAY CONCERN:

Be it known that I, A. G. GRAY, of St. John, in the British Province of New Brunswick, have invented a new and useful Machine for Cutting and Folding Sheet Metal; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the accompanying drawings, forming a part of this specification.

The nature of my invention consists in arranging a knife, with a vertical reciprocating motion, in advance of a pressure-bar of thin recessed section, and with a reciprocating and rocking lower knife and folder, in order to cut and fold by one operation sheets of metal; in so combining these arrangements that the cutting or folding can be done separately; and in the several details of these arrangements:

In the drawings—

Figure 1 is a side elevation of the machine, as it would be constructed for cutting and folding blanks for stove-pipe, and on the scale of an eighth.

Figure 2 is a longitudinal vertical section of said machine, on the same scale, and

Figure 3 is an end elevation facing the knife, on a scale of a sixteenth.

Upon a strong frame, having a bed-plate, A, we erect two side frames, H, having guides, I, cut in them. In these guides reciprocates the cutter-head, E, carrying on its forward side knife B, and operated by connecting-rods K, worked by cranks L on the shaft M. This knife delivers its cut against knife C, fastened to folder N of the section shown in fig. 2, and having a notch and tongue, as shown at *d*, in the centre of its length, to engage with fixed pawl D, to hold the knife firmly when employed as a knife. This folder is hung upon trunnions G, held in trunnion-blocks *h*, which are fitted into outer connecting-rods *i*, and held in place or loosed by coupling-screw *n*.

Upon the connecting-rod *i*, which is eccentrically vertically slotted around shaft M, are fixed two pins, *m* the lifting-pin, and *o* the depression-pin, and upon the trunnion G is firmly fixed the rocker *k*, a segmental toothed gear, as drawn. This rocker is operated by rocker-gear, *l*, on shaft M, which also carries two cams, *p*, engaging the lifting-pin *m*, and *q* engaging the depression-pin *o*, which serves to raise or depress the connecting-rod *i*, and, by consequence, the trunnions G, when the coupling-screw *n* is set up.

Upon the cutter-head E is affixed a spring, *g*, the ends of which fit in notches in standards *f* of the pressure-bar, and serve to lift it when said standards are not depressed by cams *e*.

The pressure-bar F is of the section shown in fig. 2, having a bevelled edge projecting forward towards the rear side of the lower knife.

Let us now suppose that we desire to operate the machine.

Coupling-screw *n* is set up, and the parts are in the position shown in fig. 1. Gauge *c* is set to the desired width for a pipe-blank, and a piece of sheet metal fed forward to press against it. The shaft M being then revolved, cranks L and connecting-rods K depress the cutter-head E, carrying with it pressure-bar F, and the metal is cut off, depression-cams *q* and pins *o* compelling the folder N to remain fixed and firm, and present the edge of lower knife C fairly for a cut. Rocker-gear *l* will now be perpendicular.

Upon further revolution of shaft M, lifting-cam *p* engages with pin *m* and raises the folder N, so that the metal is folded up at right angles with the edge of the pressure-bar, but as, on the completion of a half revolution, the cutter-head will begin to rise, at such time the cams *e* engage the ends of standard *f*, and hold down the pressure-bar, while the cutter-head rises against the spring *g*.

By the time that folder A has risen far enough to make the right-angle turn in the metal, rocker-gear *l* will have engaged with rocker *k*, which will have been lifted into gear, while the folder will have been lifted out of its engagement with fixed pawl D, and on continuing the movement will fold the metal down upon the bevelled edge of the pressure-bar.

When the rocker-gear disengages from the rocker, the action of gravity will carry back into the perpen-

dicular the folder N, hung as it is by trunnions placed near its upper edge, and upon further revolution of shaft M, the lifting-pin and cam will disengage, depression-pin and cam engage, and the machine return to the first position.

By this means we cut off a blank and fold the edge of a succeeding blank. To fold the other edge, the blank is set with its folded edge against gauge *a*, its taper adjusted by eccentric gauge *b*, and the knife in descending will take a taper shaving from the edge of the plate, and the edge will then be folded, as already described.

If desired to use the machine for cutting alone, coupling-screw *n* is loosed, and the folder will then not be raised by the connecting-rods *i*. If desired to fold without cutting, the sheet of metal must be fed only to the edge of the knives.

I have described my invention as constructed for heavy work, but it is obvious that for lighter work variations in details might be made, so as to obtain the reciprocating rectilinear motions by treadles and levers, and the rocking or folding motion by a rock-lever, operated by hand.

So I claim as my invention, and desire to secure by Letters Patent—

1. The rectilinear reciprocating cutter-head E and knife B, as arranged, with an independent pressure-bar, F, of the cross-section shown, and a rectilinear reciprocating and rocking lower knife and folder, substantially as described.

2. The connecting-rod *i*, having its opening about shaft M elongated vertically, as arranged, with trunnion-blocks *h*, coupling-screw *n*, lifting and depression-pins *m* and *o*, and cams *p* and *q*, substantially as and for the purpose described.

3. The pressure-bar F, having notched standards *f*, as arranged, with cutter-head E, spring *g*, and cams *e*, as and for the purpose described.

4. The arrangement of the pressure-bar F, as described, in combination with the rectilinear reciprocating and rocking folder N, carrying knife C, substantially as described.

A. G. GRAY.

Witnesses:

THOS. WM. CLARKE,

E. A. RAYMOND.