2 Sheets—Sheet 1.

W. GIBB.

MACHINE FOR FORMING SPLIT KEYS.

No. 185,441. Patented Dec. 19, 1876.

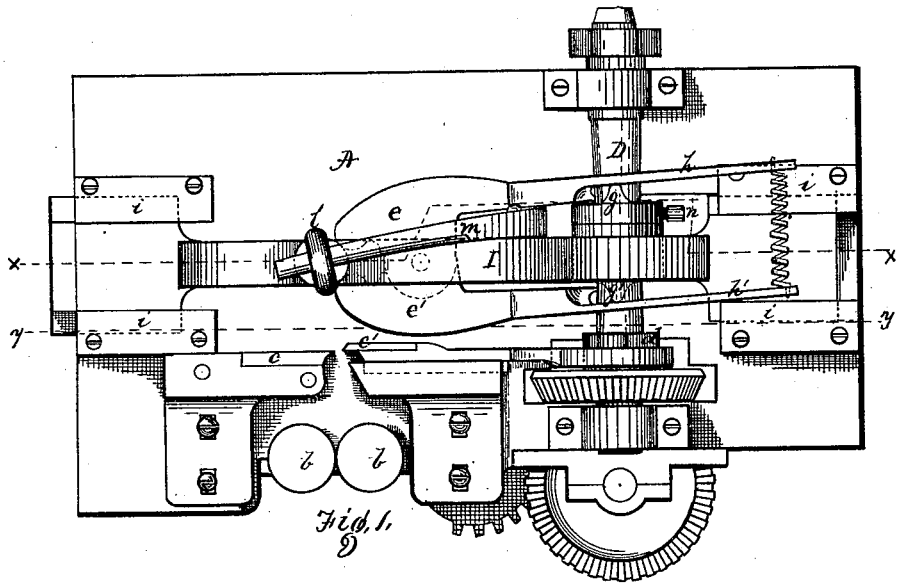

Fig. 1.

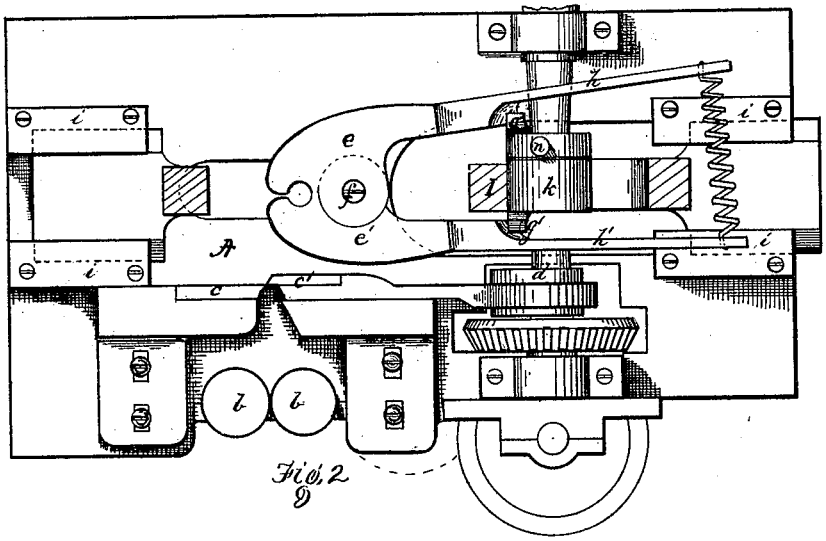

Fig. 2.

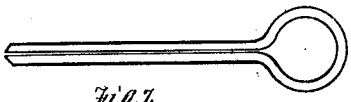

Fig. 3.

WITNESSES.

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2 Sheets—Sheet 2.

W. GIBB.

MACHINE FOR FORMING SPLIT KEYS.

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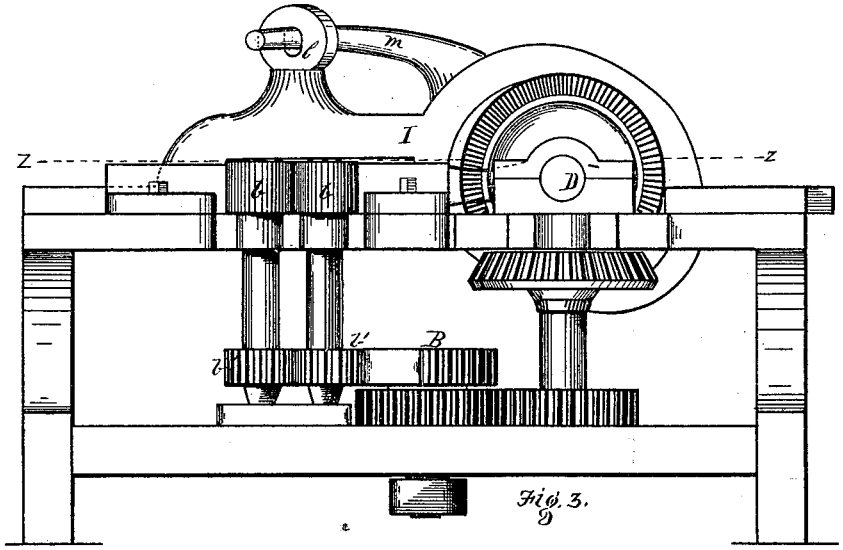

Fig. 3.

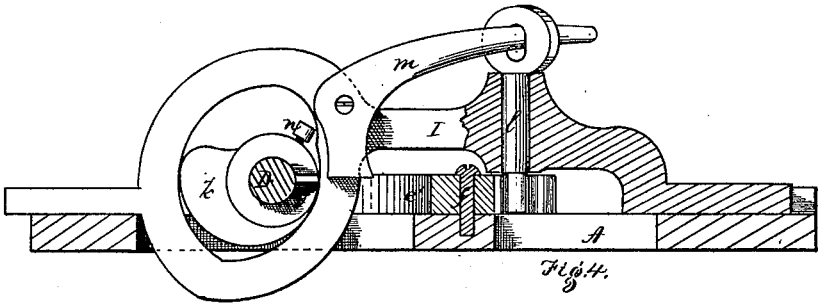

Fig. 4.

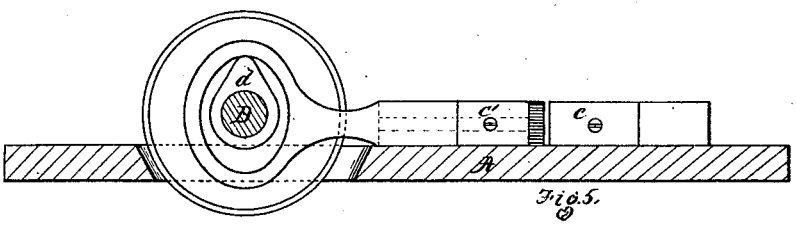

Fig. 5.

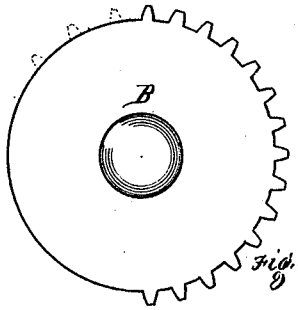

Fig. 6.

Witnesses.

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L. C. Fitler.

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UNITED STATES PATENT OFFICE.

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IMPROVEMENT IN MACHINES FOR FORMING SPLIT KEYS.

Specification forming part of Letters Patent No. **185,441**, dated December 19, 1876; application filed September 23, 1876.

To all whom it may concern:

Be it known that I, WALTER GIBB, of Allegheny, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Machines for Forming Split Keys and like articles; and I do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawing, forming part of this specification, in which—

Figure 1 is a top view of a machine embodying my invention. Fig. 2 is a similar view, portions of the main yoke and slide being broken away to show the bending-jaws. Fig. 3 is a side elevation as seen from the feeding side of the machine. Fig. 4 is a longitudinal vertical section on the line *x x*, Fig. 1. Fig. 5 is a similar section on the line *y y*, Fig. 1; and Fig. 6 is a detached view of the changeable driving-cog of the feed mechanism. Fig. 7 represents a split key.

Like letters refer to like parts wherever they occur.

My invention relates to that class of machinery employed for bending and forming metals, and though especially adapted for the manufacture of split keys, yet contains features equally applicable to bending-machines generally. It consists, first, in combining with the feed mechanism a mutilated cog, or equivalent gearing, so as to obtain an intermittent feed, and in making said gearing detachable or changeable, so that the length of material fed may be varied at pleasure; secondly, in combining with a changeable feed mechanism adjustable cutters, so that the cut may be varied with the feed, to obtain blanks of different lengths, as desired; thirdly, in the combination of the bending or forming jaws with the traveling slide and vertically-retractible mandrel, its pivoted lever, and cam mechanism to both, feed the blank to the bending-jaws, and assist in bending and forming the blank.

I will now proceed to describe my invention, so that others skilled in the art to which it appertains may apply the same.

In the drawing, A indicates a suitable frame or table for supporting the operative devices. *b b* are a pair of feed-rolls, journaled in the frame A, and having pinions *b'* upon their shafts, one of said pinions gearing with a mutilated pinion, B, which is driven from the main shaft D by intermediate gearing. As the length of the blank or the amount of material fed forward is dependent on this mutilated pinion B, I so connect it to its shaft that it may be detached and replaced by a pinion having less or more teeth, accordingly as a longer or shorter blank is required.

Upon the bed or table, and near the feed-rolls, are secured, by set-screws, two adjustable or sliding blocks, to one of which the fixed knife *c* is attached, while the other serves as a guide for the traveling blade *c'*. The blades are, preferably, arranged as shown, to obtain a shear-cut, *c'* being provided with a yoke, and actuated by a cam, *d*, upon the main shaft D, the cam *d* being made sufficiently wide to give room for the lateral play of the yoke when the knives are adjusted to vary the cut. *e e'* are bending-jaws, pivoted to the bed A, as at *f*, and operated by cams *g g'* on shaft D. The jaws *e e'* are hollowed out to correspond to the mandrel employed therewith, and with regard to the shape to be produced. They are also extended back or provided with tail-pieces *h h'*, connected by a spring, which causes the jaws to open when released by the cams.

Instead of connecting the rear of the jaws by a spring, as shown, other well-known mechanism may be employed for that purpose, such as a spring on the bed A.

I is the main cam yoke or slide, movable in guides *i*, and operated from the main shaft D by a cam, *k*, on the shaft. On the forward part of I is inserted vertically a loose pin or mandrel, *l*, which is controlled by a pivoted lever, *m*, actuated by a cam, *n*. The pin or mandrel *l* occupies such a position on the slide as will bring it between the bending-jaws *e e'* when the slide I is at or near one extreme of its travel, and carry it beyond the jaws and line of feed of the blank when the slide is at the other extreme of its travel; and the cam *n* of its lever *m* is so arranged relatively to the cams of the bending-jaws and main yoke or slide I that it trips or raises the mandrel, and discharges the formed article at the time the

bending-jaws cease to operate, and before the forward stroke of slide I commences. At or before the slide completes its full forward stroke the lever *m* is released by cam *n*, and mandrel *l* falls beyond the line of feed, so that on the return stroke of the slide I the mandrel feeds or forces the blank into the bite of the bending-jaws, thus acting both as a former or mandrel and a blank-feeder.

In case the mandrel should not fall by its own weight when the lever is released by cam *n*, it will be forced down by the short arm of lever *m* coming in contact with the bending-jaws at the time the slide or cam yoke completes its forward stroke.

The operation of the devices is as follows: A mutilated pinion, having sufficient number of teeth to feed the bar the requisite distance at each revolution of the pinion, is placed in the position of B, and the shears are adjusted accordingly. A rod or bar is then entered between the feed-rolls, and is by them fed forward a certain distance, when the shears are operated by cam *d*, severing a blank from the rod. The blank thus severed is bent and forced into the bite of the jaws *e e'* by the travel of mandrel *l*, the jaws being closed by the cams *g g'* on the shaft D, so as to bend the iron around the mandrel. At the instant the jaws are released by cams *g g'* the cam *n* trips or elevates the mandrel *l*, discharging the article fully formed.

By my improved machinery split keys and similar articles of any required length may be accurately and rapidly formed.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. The combination of the detachable mutilated pinion and its short shaft with the driving-pinion and pinion of the feed-rolls, substantially as and for the purpose specified.

2. The combination of the adjustable shears with the feed-rolls, adapted, by mechanism substantially as specified, to feed different lengths of a rod or bar to said shears, substantially as and for the purpose specified.

3. The combination of the pivoted bending-jaws *e e'*, the vertically retractible mandrel *l*, the reciprocating slide I, the mandrel-lever pivoted on the slide I, and suitable cam mechanism for operating the same, substantially as and for the purpose specified.

In testimony whereof I, the said WALTER GIBB, have hereunto set my hand.

WALTER GIBB.

Witnesses:

F. W. RITTER, Jr.,

H. J. SCHLUTZ.