

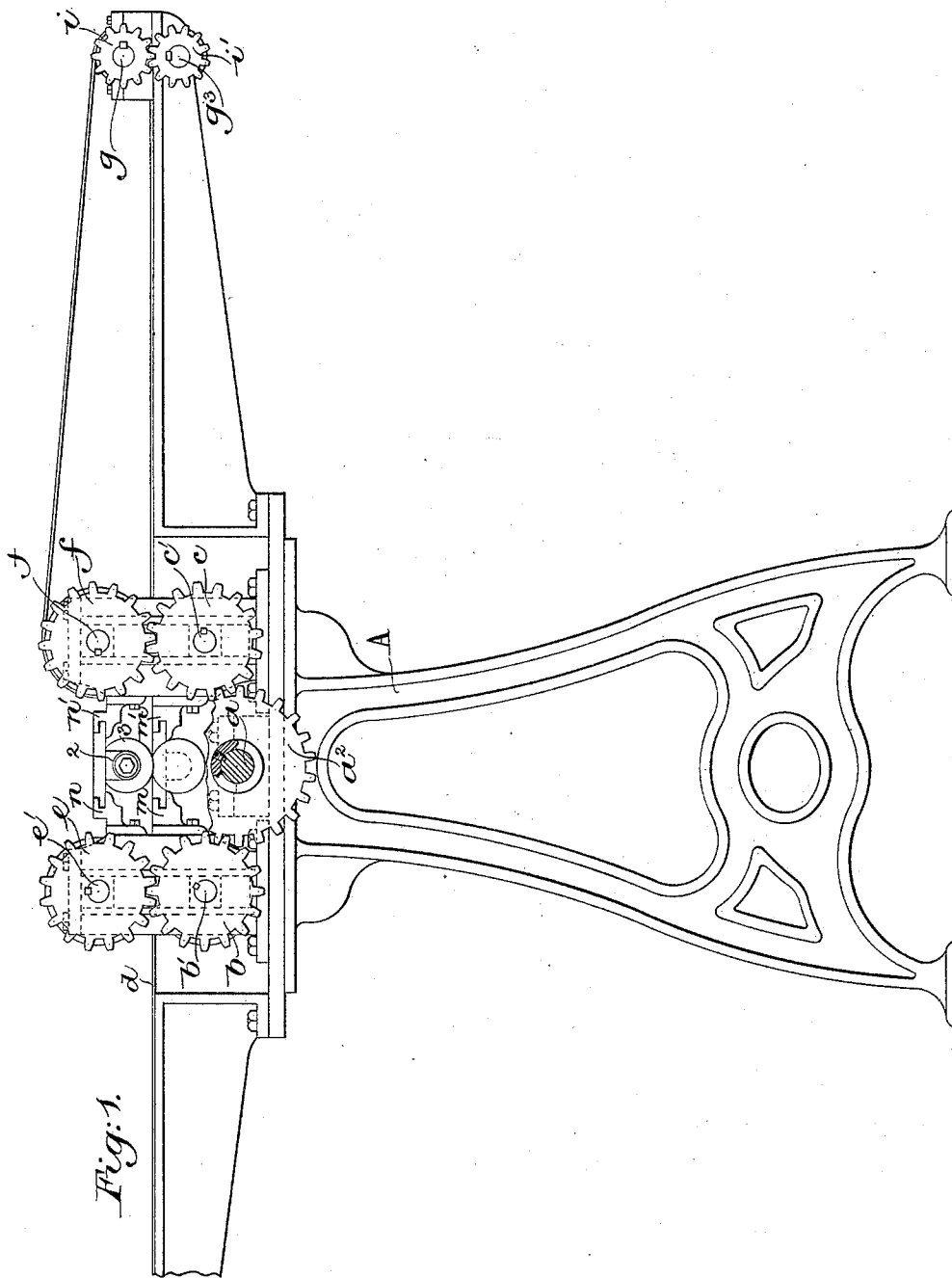
(No Model.)

3 Sheets—Sheet 1.

D. A. RITCHIE.  
MACHINE FOR CUTTING SHEET METAL.

No. 467,646.

Patented Jan. 26, 1892.



Witnesses.  
Edward F. Allen.  
Fred S. Grindle, Jr.

Inventor.  
David A. Ritchie,  
by Crosby & Gregory Attys

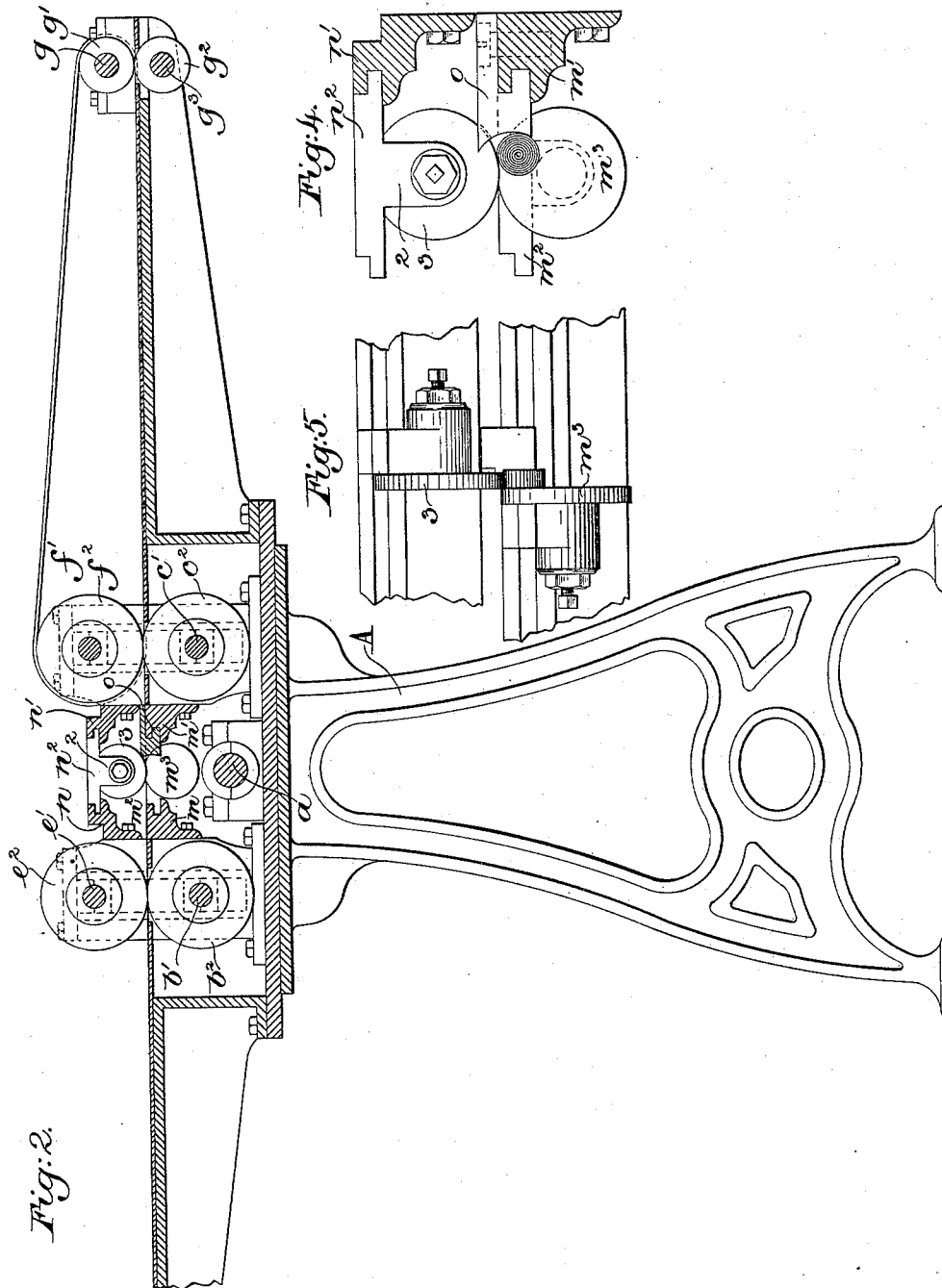
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3 Sheets—Sheet 2.

D. A. RITCHIE.  
MACHINE FOR CUTTING SHEET METAL.

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Witnesses:  
Edward F. Allen.  
Fred S. Greenleaf.

Inventor:  
David A. Ritchie  
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(No Model.)

3 Sheets—Sheet 3.

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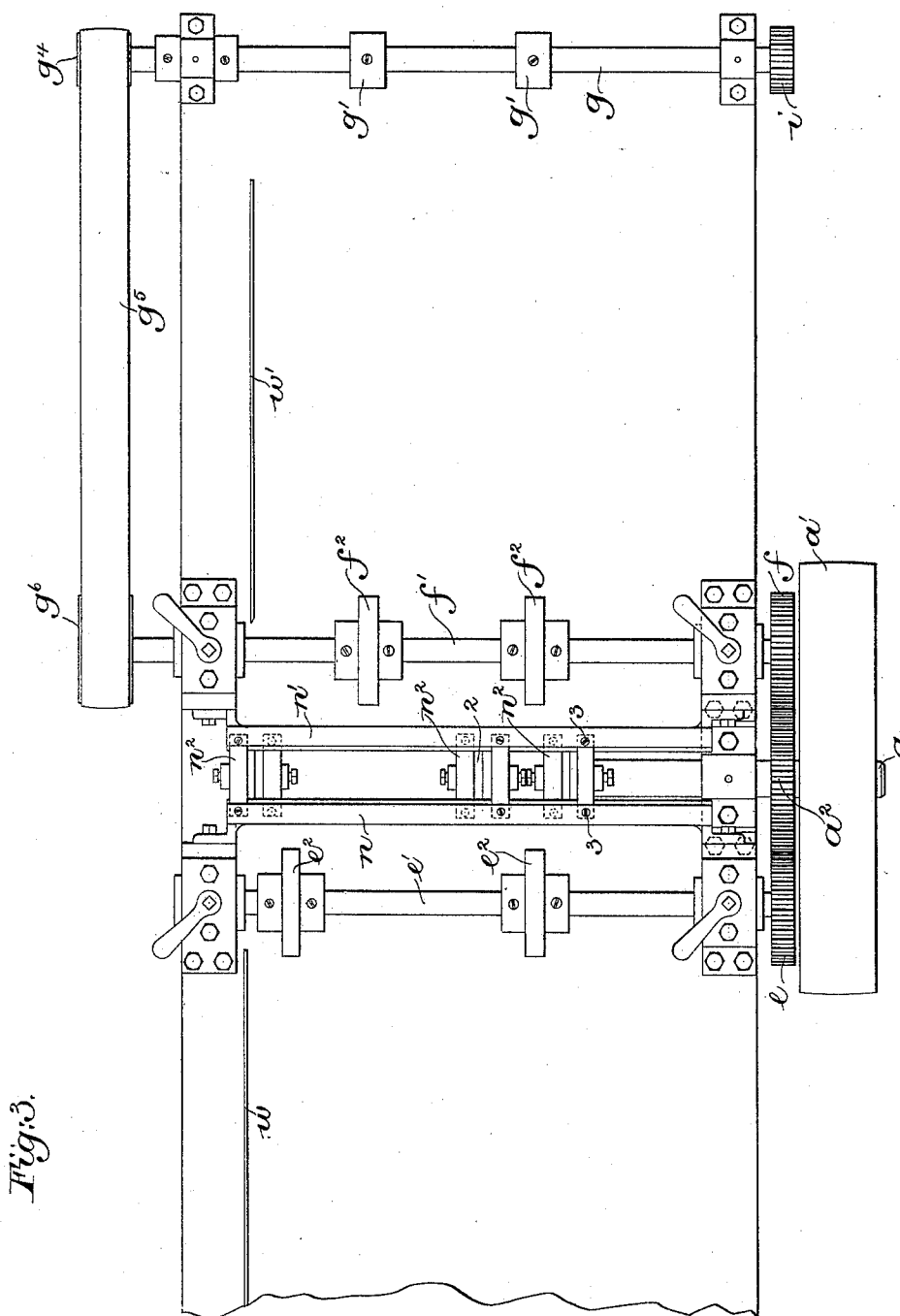


Fig. 3.

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Fred S. Greenleaf

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David A. Ritchie

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# UNITED STATES PATENT OFFICE.

DAVID A. RITCHIE, OF CAMBRIDGE, MASSACHUSETTS.

## MACHINE FOR CUTTING SHEET METAL.

SPECIFICATION forming part of Letters Patent No. 467,646, dated January 26, 1892.

Application filed May 18, 1891. Serial No. 393,116. (No model.)

*To all whom it may concern:*

Be it known that I, DAVID A. RITCHIE, of Cambridge, county of Middlesex, State of Massachusetts, have invented an Improvement in Machines for Cutting Sheet Metal, of which the following description, in connection with the accompanying drawings, is a specification, like letters and figures on the drawings representing like parts.

This invention has for its object to improve the construction of machines for cutting sheet metal, such as sheet-tin, galvanized iron, and the like; and it consists in details of construction to be hereinafter pointed out in the claims at the end of this specification.

Figure 1 shows in side elevation a machine for cutting sheet metal embodying this invention; Fig. 2, a vertical longitudinal section of the machine shown in Fig. 1; Fig. 3, a plan view of the machine shown in Fig. 1; Figs. 4 and 5, a detail to be referred to.

The main frame-work A is of suitable construction to support the operating parts. The main shaft *a*, having its bearings in the main frame-work, has secured to it a driving-pulley *a'*, and also a toothed gear *a*<sup>2</sup>, which meshes with pinions *b c*, located at opposite sides of said gear *a*<sup>2</sup> and secured to shafts *b' c'*, supported in suitable bearings in the main frame-work below the table *d* of the machine. The pinions *b c* engage, respectively, the gears *e f*, secured to shafts *e' f'*, parallel with and above the shafts *b' c'*. The power-driven shafts *b'* and *e'* have arranged on them two or more narrow feed-wheels, as *b*<sup>2</sup> *e*<sup>2</sup>, designed to co-operate with each other and serving to positively feed the material forward. Suitable drawing-wheels *c*<sup>2</sup> *f*<sup>2</sup> are arranged on the shafts *c' f'*, which, co-operating with each other, act to draw the material or carry it forward. All the feed-wheels and drawing-wheels may be made adjustable longitudinally on their shafts. Another shaft *g* has its bearings in the main frame-work at or near the rear end of the table *d*, said shaft *g* carrying drawing-rollers *g'*, which co-operate with similar rollers *g*<sup>2</sup>, secured to a shaft *g*<sup>3</sup>, parallel with the shaft *g'*. A belt-pulley *g*<sup>4</sup> is secured to the shaft *g*, over which passes a belt *g*<sup>5</sup>, which also passes over a belt-pulley *g*<sup>6</sup>, secured to the shaft *f'*. A toothed wheel *i* is secured to the opposite end of the shaft

*g*, which meshes with a toothed wheel *i'*, secured to the shaft *g*<sup>3</sup>, by means of which said shaft is rotated.

To suitable upright portions of the frame-work, between the feed-wheels and drawing-wheels, bars *n n'* are bolted or otherwise secured, which are recessed, as best shown in Fig. 2, to present, when taken together, an inverted-T slot or passage, in which is placed one or more blocks *n*<sup>2</sup> of suitable shape to fit said passage and be moved freely therein, three such blocks being herein shown, and each block has depending from it an ear, as 2, which supports a cutting-roller 3. Below said bars *n n'* similar bars *m m'* are secured to said upright portions of the frame-work, which are recessed, like unto the bars *n n'*, to present an inverted-T slot or passage, and in said slot or passage suitable blocks *m*<sup>2</sup> are placed and adapted to be moved freely, three being herein shown, each said block supporting a cutting-roller *m*<sup>3</sup>, like unto the cutting-rollers 2. The cutting-rollers are slightly offset to co-operate and cut the sheets of metal as said sheets are fed forward thereto by the power-driven feeding-wheels *b*<sup>2</sup> *e*<sup>2</sup> and withdrawn therefrom by the power-driven drawing-wheels *c*<sup>2</sup> *f*<sup>2</sup>. On one of the bars, as *m'*, for instance, just ahead of the cutting-rollers, a clearance-block *o* is located, (see Figs. 2 and 4) as herein shown, consisting of a block shaped to fit the passage in said bar *m'* and extending upward to a point just at or above the junction of the cutting-edges of the rollers, said block having a curved face adjacent to said cutting-rollers, so that when cutting the sheets of metal the small narrow chip or waste removed by cutting is directed by said clearance-block downwardly, so as not to obstruct the progress of the material or operation of the machine. The blocks *n*<sup>2</sup> *m*<sup>2</sup> may be moved along in the raceways to occupy different parts thereof to cut the material into strips of different widths, and set-screws 3 3 are provided for holding said blocks at any desired points.

By making the guiding or directing face of the clearance-block *o* curved, as shown, the narrow strip of waste material is not only directed downwardly, but is rolled up, as shown in Figs. 4 and 5, although I do not desire to limit myself to the employment of a clearance-block curved in this manner, as it

may be otherwise shaped and still accomplish substantially the same result.

By making the feed-wheels narrow, as shown, the sheet of metal is fed forward 5 evenly and accurately, even though said sheet has a tendency to buckle or bend, and also, should the sheet of metal contain "buckles" or "plaits" or should the sheet be longer on one side than the other, said narrow feed- 10 wheels will feed the same forward without swerving the sheet. If long rolls or rolls contacting with substantially the entire surface of the sheet are employed instead of narrow feed-wheels, as shown, this result cannot be 15 accomplished.

By employing the positively-driven drawing-rolls  $g'g^2$  the table is kept free and clear, as all the material will be carried forward between these rolls and discharged. The material to be cut is positively fed forward by the 20 narrow feed-wheels and the cutting-rolls remain idle, being moved only by the material passing between them.

On the table, near one side thereof, suitable 25 gages  $w w'$  are located, which materially assist in guiding the material to the feed and drawing wheels.

I claim—

1. In a machine for cutting sheet metal, idle 30 cutting-rolls, combined with positively-driven feed-wheels located at one side thereof and positively-driven drawing-wheels at the opposite side thereof, substantially as described.

2. In a machine for cutting sheet metal, the table, the feed and drawing wheels, and idle 35 cutting-rolls for feeding and cutting the material, combined with the drawing-rolls  $g'g^2$  or equivalent, located at or near the rear end of the table, substantially as and for the purposes set forth. 40

3. In a machine for cutting sheet metal, a main shaft, a toothed gear  $a^2$  thereon, positively-driven shafts  $b' e'$  and narrow feed-wheels thereon, positively-driven shafts  $c' f'$  and narrow drawing-wheels thereon, the parallel bars  $nn'$  and  $mm'$ , recessed as described, 45 blocks arranged thereon, and idle cutting-rolls borne by said blocks, substantially as described.

4. In a machine for cutting sheet metal, idle 50 cutting-rolls and positively-driven feed-wheels and drawing-wheels, combined with the clearance-block shaped substantially as described, and for the purposes set forth.

5. In a machine for cutting sheet metal, 55 adjustable idle cutting-rolls, combined with adjustable positively-driven feed-wheels and adjustable positively-driven drawing-wheels, substantially as described.

In testimony whereof I have signed my 60 name to this specification in the presence of two subscribing witnesses.

DAVID A. RITCHIE.

Witnesses:

BERNICE J. NOYES,  
EDWARD F. ALLEN.