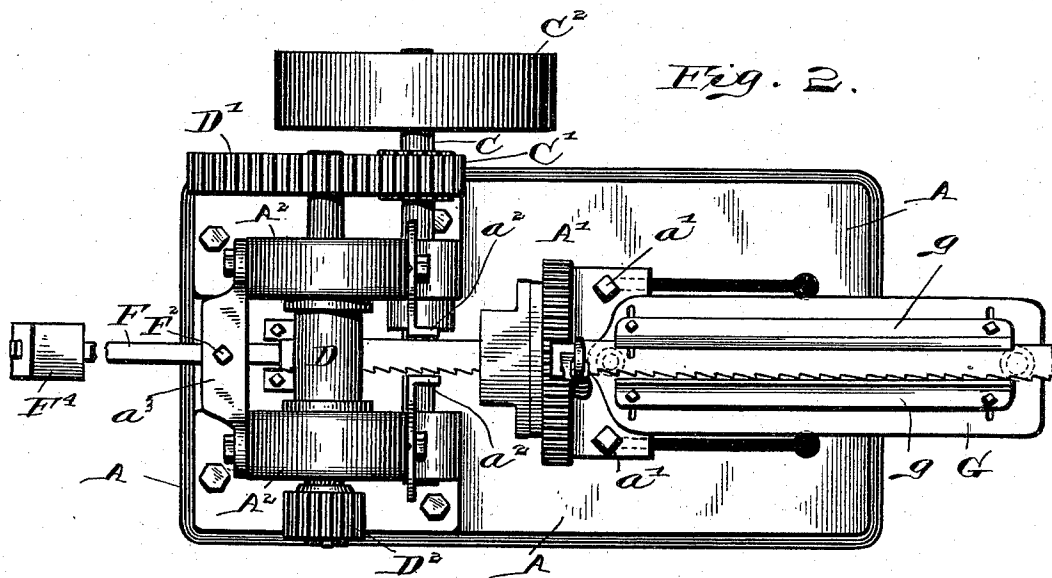
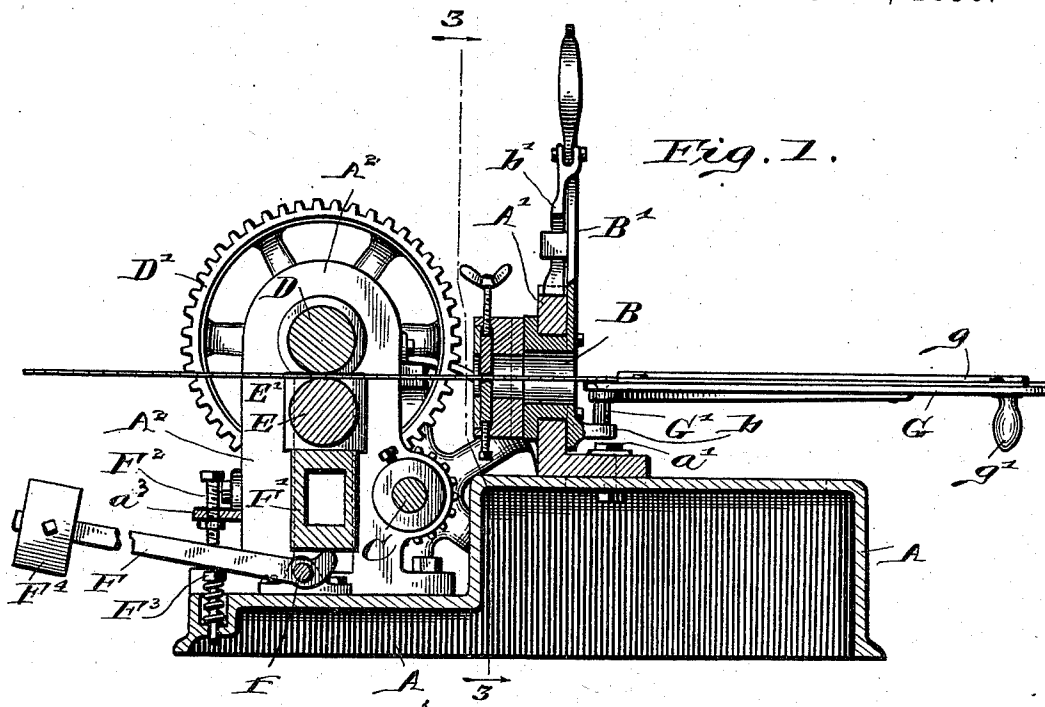


2 Sheets—Sheet 1.

No. 573,955.

Patented Dec. 29, 1896.



34.13. nearly.
J. A. Walsh

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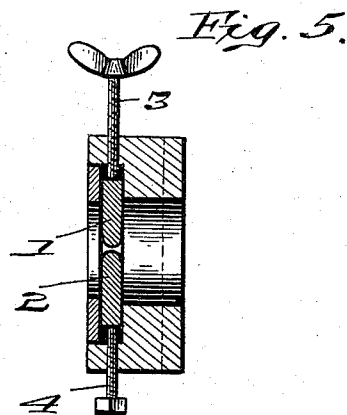
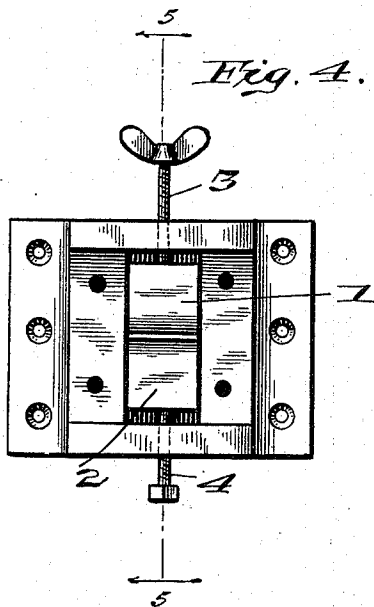
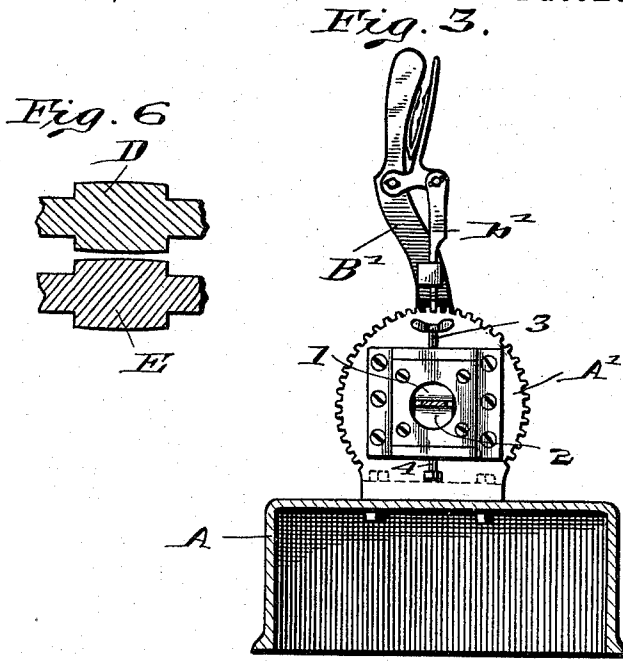
(No Model.)

2 Sheets—Sheet 2.

E. C. ATKINS & R. COYLE.
METAL STRAIGHTENING MACHINE.

No. 573,955.

Patented Dec. 29, 1896.



WITNESSES:

H. B. Neely
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INVENTORS
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UNITED STATES PATENT OFFICE.

ELIAS C. ATKINS AND ROBERT COYLE, OF INDIANAPOLIS, INDIANA, ASSIGNORS TO THE E. C. ATKINS & COMPANY, OF SAME PLACE.

METAL-STRAIGHTENING MACHINE.

SPECIFICATION forming part of Letters Patent No. 573,955, dated December 29, 1896.

Application filed February 24, 1896. Serial No. 580,549. (No model.)

To all whom it may concern:

Be it known that we, ELIAS C. ATKINS and ROBERT COYLE, citizens of the United States, residing at Indianapolis, in the county of Marion and State of Indiana, have invented certain new and useful Improvements in Metal-Straightening Machines, of which the following is a specification.

In the manufacture of saws, and particularly long narrow saws, such as band-saws, the plate becomes twisted and distorted in various ways. The edges in shearing and toothing become stretched, making them longer than the central portion. As is well known, it is necessary before finishing the saws to make the plate straight and true and to equalize the tension.

Our present invention consists in an improved machine for the purposes indicated. Such a machine is illustrated in the accompanying drawings and will be hereinafter fully described, after which the novel features will be pointed out in the claims.

Referring to the accompanying drawings, which are made a part hereof, and on which similar letters and numerals of reference indicate similar parts, Figure 1 is a longitudinal sectional view of the machine referred to; Fig. 2, a top or plan view of the same; Fig. 3, a transverse sectional view as seen from the dotted line 3 3 in Fig. 1; Figs. 4 and 5, a detail elevation and central section illustrating the form and construction of the guide and dies more plainly, and Fig. 6 a detail section showing the relation of the two rolls.

In said drawings the portions marked A represent the framework of the machine; B, the rocking head carrying the guiding-dies; C, the driving-shaft; D, a preferably stationary molding-roll; E, an adjustable molding-roll; F, a roll-adjusting lever, and G an adjustable guide-table.

The frame A may be of any suitable form or construction and carries the bearings and mechanism of the machine. A standard A' of said frame is adapted to carry the rocking head containing the guide-dies, and standards A² carry the rolls and the driving-shaft. Upon said standards A² are also guides a²,

between which the strip of metal passes on its way to the rolls D and E. These guides serve to direct said strip of metal in just the manner desired, so that the action of the rolls shall be the proper one. It frequently happens that the stretching of the plate in its previous manipulation is greater upon one side than the other, and in such cases the highest point of the rolls needs to be a little to one side of the center of the plate, and all this can be determined by a proper adjustment of these guides a².

The rocking head B is mounted in a bearing in a standard A' on the frame A and is held to adjusted position therein by a latch b', which engages with a toothed segment on said standard and is mounted on the lever or handle B', which lever or handle B' extends outward from and is preferably formed integrally with or secured rigidly to said rocking head. Said rocking head, as most plainly shown in Figs. 4 and 5, contains guide-dies 1 and 2, which are rendered adjustable by adjusting-screws 3 and 4, the adjacent surfaces of said dies approaching each other to a distance substantially equal to the thickness of the plate to be treated. The standard A', on which this rocking head B is mounted, is adjusted toward and from the rolls, as is most plainly indicated in Fig. 2, by means of its securing-bolts a' entering slots in the face of the frame A. Obviously by loosening said bolts the whole structure can be slipped longitudinally and secured at the point desired by retightening the bolts.

The driving-shaft C is mounted in suitable bearings in the lower part of the standard A² and operates through a spur-pinion C' thereon and the corresponding spur gear-wheel D' on the shaft of the roll D to drive said roll. Said driving-shaft is itself driven by a belt running from some suitable source of power (not shown) to the pulley C² thereon.

The roll D is mounted in preferably stationary bearings in the upper portions of the standards A² of the frame A and is driven as just described, and, through the spur-pinion D² on the opposite end of its shaft and a corresponding pinion on the adjacent end of the

shaft of the roll E, operates to drive said roll E. These rolls have convex surfaces for purposes which will be hereinafter explained.

The roll E is similar to the roll D and is driven therefrom as just described. It is mounted in adjustable bearings E', which are mounted in slideways in the standards A². By means of the adjustments provided the surfaces of the two rolls may be secured at such distances apart as the character of the work to be operated upon requires.

The lever F is mounted on a pivot-fulcrum f, carried by bearings mounted on the frame A and operates on the bearings E' either directly or through intermediate blocks F', as shown in Fig. 1. A stop-screw F² is mounted in a suitable bracket a³ on the standard A² and limits the movement of this lever in one direction, so as to secure the amount of rolling action desired on the metal being treated. It is preferably supported to substantially the operative position by a spring-support F³. A weight F⁴ is secured thereon and may be adjusted nearer to or farther from the outer end, so as to impart greater or less force to the lever in its work of forcing the rolls toward each other.

The table G receives the strip of metal plate to be operated upon and guides it into the machine, being provided on its upper surface with adjustable guides g. The table as a whole is mounted on a pivot G', by which it is enabled to be swung sidewise. A handle g' may be provided by which the operator may move it as desired. The object of this sidewise movement is to guide the plate under varying conditions to secure the best results, and it is usually operated by hand, as, owing to the inequalities in the plates, the operative must be in continuous attendance and vary the machine whenever required. In order that the table and the guides thereon may at all times correspond to the angle of the rocking head, said rocking head is provided with a bracket b to receive and carry the pivot G'.

In the operation of this machine the metal plates (usually plates of steel such as band-saws are made from) are inserted in the guides g on the table G and enter between the rolls. The edges of such plates, as before stated, in shearing and toothing become more or less stretched, leaving too much tension on the center, and the plates become twisted and distorted in various ways and from various causes. After the plate is so inserted the machine is adjusted to the work required by placing the required pressure on the rolls and tilting the guide-table and rocking head to the desired angle, of course adjusting the head-carrying standard to the proper distance from the rolls. The combined action of the guide-dies in the rocking head and the rolls when set at an angle with each other is of course a twisting action, and this angle being adjusted opposite to the twist already in the plate the result is to take out the twist and

to that extent straighten the plate. As before stated, the rolls themselves are convex on their surfaces, so that the central portion exerts greater pressure on the saw-plate than the portions at the ends or between the ends and the center. The highest portions of the rolls being brought against the portion of the metal which has been least affected in the previous operations operate to stretch such metal and thus equalize the tension throughout the plate. The result of these combined operations is that the plate issues from the machine straightened and with its tension equalized.

By means of the various adjustments which we have provided, as above described, great exactness and nicety of operation may be secured.

Having thus fully described our said invention, what we claim as new, and desire to secure by Letters Patent, is—

1. The combination, in a metal-straightening machine, with suitable guide-dies, of a pair of convex-surface rolls, whereby the central portion of the metal may be stretched at the same time the metal is straightened, substantially as set forth.

2. The combination, in a metal-straightening machine, of a pair of guide-dies, a pair of straightening and stretching rolls, a lever F whereby one of said rolls is held flexibly toward the other, and an adjusting-screw F² whereby said roll is held up to a certain predetermined position, substantially as shown and described.

3. The combination, in a metal-straightening machine, of the pair of guide-dies, a pair of convex-surface straightening and stretching rolls, one of which is held toward the other by a lever, said lever, and an adjustable weight on said lever, whereby said roll is supported yieldingly and its pressure may be varied, substantially as set forth.

4. The combination, in a metal-straightening machine, of a pair of straightening and stretching rolls, a pair of guide-dies, a rocking head in which said guide-dies are mounted, an arm extending out from said rocking head, a latch mounted on said arm or lever, and a segment with which said latch may engage, substantially as shown and described.

5. The combination, in a metal-straightening machine, of a pair of straightening-rolls, a pair of guide-dies, a rocking head in which said guide-dies are mounted, a pivoted table, and guides on said pivoted table between which the metal plate may pass, substantially as shown and described.

6. The combination, in a metal-straightening machine, with the straightening-rolls and guide-dies, of an adjustable guide-table carrying guides and carried on the same structure carrying said guide-dies, whereby the guide-table may be adjusted to correspond with the guide-dies, substantially as shown and described.

7. The combination, in a metal-straightening machine, of a pair of convex-surfaced straightening and molding rolls, guide-dies mounted in a rocking head, and adjustable
5 guides secured to the standards of the frame adjacent to the rolls, whereby the metal can be guided so that the highest point of the rolls may bear upon any desired portion of its surface, substantially as shown and described.

In witness whereof we have hereunto set our hands and seals, at Indianapolis, Indiana, this 18th day of February, A. D. 1896.

ELIAS C. ATKINS. [L. S.]
ROBERT COYLE. [L. S.]

Witnesses:

CHESTER BRADFORD,
JAMES A. WALSH.