

(No Model.)

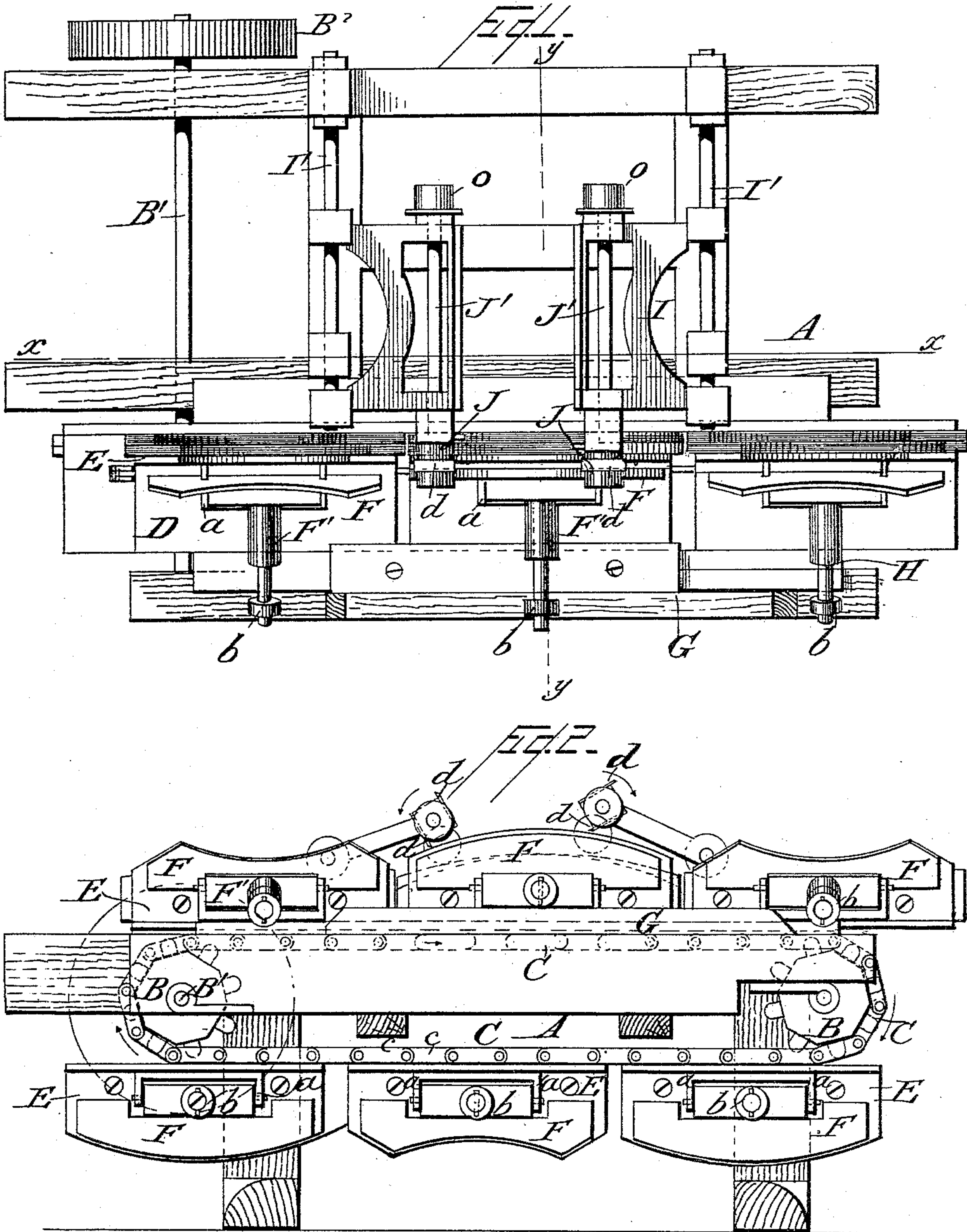
2 Sheets—Sheet 1.

W. & G. M. REID.

SELF-FEEDING MACHINE FOR SHAPING IRREGULAR FORMS.

No. 401,459.

Patented Apr. 16, 1889.



Witnesses,

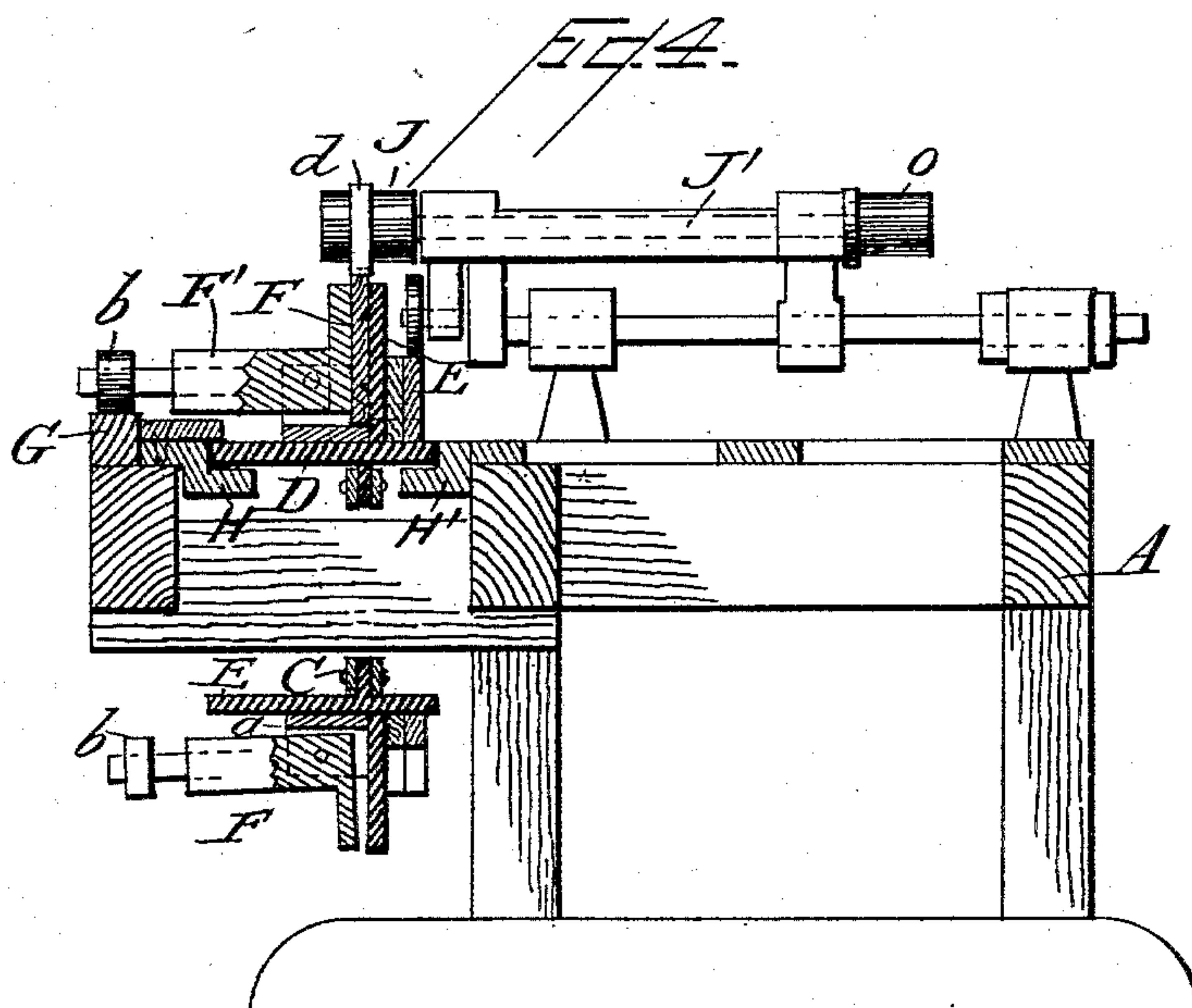
*H. H. Schott*  
*W. L. Boyden.*

Inventor,

*William Reid*  
*George M. Reid*  
By their Attorney  
*John C. Parker*

2 Sheets—Sheet. 2.

Patented Apr. 16, 1889.



Inventors.

Inventors,  
William Reid  
George M. Reid  
By their Attorney  
John L. Tasker.



# UNITED STATES PATENT OFFICE.

WILLIAM REID, OF WEST HEBRON, NEW YORK, AND GEORGE M. REID, OF RUTLAND, VERMONT, ASSIGNORS TO WILLIAM REID, OF WEST HEBRON, NEW YORK.

## SELF-FEEDING MACHINE FOR SHAPING IRREGULAR FORMS.

SPECIFICATION forming part of Letters Patent No. 401,459, dated April 16, 1889.

Application filed June 28, 1888. Serial No. 278,474. (No model.)

*To all whom it may concern:*

Be it known that we, WILLIAM REID and GEORGE M. REID, citizens of the United States, residing, respectively, at West Hebron and Rutland, in the counties of Washington and Rutland, and States of New York and Vermont, have invented certain new and useful Improvements in Self-Feeding Machines for Shaping Irregular Forms; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to an improvement in machines for dressing, shaping, or turning irregular forms, surfaces, or articles—such as chair-rockers, chair-backs, saw-frames, brush-handles, &c.; and it consists in the construction, arrangement, and combination of parts, substantially as will be hereinafter described and claimed.

In the accompanying drawings, illustrating our invention, Figure 1 is a top plan view of the entire machine. Fig. 2 is a side elevation of the same. Fig. 3 is a vertical sectional side elevation on the line *xx* of Fig. 1, looking from the side opposite to that in Fig. 1. Fig. 4 is a cross-section on the line *yy* of Fig. 1.

Like letters of reference designate corresponding parts throughout all the different figures.

A denotes the main frame of the machine, wherein the several mechanical parts of the invention are arranged. The details of the structure of this frame may vary within wide limits; and hence we would state that we are confined to no particular construction thereof, but reserve the liberty of making it in any way that will best suit its purpose and use.

Journalled in each end of the main frame A are suitable wheels for supporting a conveying-bed for the articles to be shaped. These wheels are preferably octagonal sprocket-wheels B B, and the conveying-bed consists, preferably, of a belt or chain, C, having links *c c*, that are pivoted together and are adapted to be engaged by the sprockets on the wheels B B. Upon the shaft B' of one of the wheels B is carried a band-wheel, B<sup>2</sup>, by means of which power is applied for the purpose of actuating the conveying-chain C.

A series of clamps for holding the articles to be shaped or dressed and corresponding in length and shape to said articles are mounted upon the endless conveying-bed C. It is evident, therefore, that said clamps will vary in shape to suit the different articles with which the machine is employed. In the present example of our invention the clamps are adapted for holding chair-rockers, and, in fact, the general arrangement and relation of all the mechanical parts is had with this purpose of shaping chair-rockers in view. However, our invention is by no means limited to this particular purpose.

The present machine is an example merely of one of the mechanical arrangements for carrying the leading ideas of our improvements into practical effect. It is to be esteemed, therefore, as such an example, and the machine will be found susceptible of various modifications in its organization. It is obvious that many such modifications are permissible and readily apparent to the skilled mechanic without departing from the principle of the invention.

The clamps carried on the chain C and used for holding the articles while being acted on by the cutting mechanism, as will be hereinafter described, consist each of the following parts: A flat plate, D, is secured to one of the links *c*. This plate is in general of a rectangular shape and may be of greater or less size. When the link that carries the plate is moving along the distance between the wheels, the plate will be in a horizontal position. Secured to the plate D at right angles thereto is another plate, E, which forms one of the jaws of the clamp. This plate E is located in the drawings on a line at about one-third the width of the plate D from its inner edge; but this specific location is immaterial and we are not confined to it. It is preferable, however, that there be a little space between the inner edge of plate D and plate E for the patterns. Alongside of the plate or jaw E is a plate or jaw, F, that is suitably shaped to permit it to be hinged in a frame, *a*, on plate D, so that the jaw F is vertically movable and capable of binding firmly between itself and the rigid jaw E any object on which the machine is to operate. The jaw F carries



an arm or projection,  $F'$ , rigidly affixed to it and extending outward at right angles and in a horizontal direction. The arm  $F'$  is furnished near its outer end with a roller,  $b$ . The weight of the arm or lever  $F'$  is sufficient (when the clamping device is in the proper position) to open the clamp and release the article which has been previously held in a tight grip. During the progressive motion of the clamps under the actuation of the chain which conveys them the arms  $F'$  will be lifted by the rollers  $b$  coming in contact with a horizontal bar,  $G$ , on the top of the main frame  $A$ . The lifting of the arm  $F'$  will of course force the jaws of the clamps tightly together and cause the articles therein to be firmly grasped. The bar  $G$  is so located with respect to the cutting or shaping mechanism that this action of the clamps in firmly holding the articles in them will take place and be continued while the articles are being operated upon by said cutting or dressing devices. (See the middle clamp in Fig. 1.) When the clamps, however, have passed the cutting devices, the arms will cease to be supported by the bar  $G$ , and hence their weight will automatically open the jaws and release the articles carried. (See the end clamps in Fig. 1.) When the clamps are on the upper portion of the endless chain—that is, when they are passing beneath the dressing mechanism—the plates  $D$  enter and run in gibbed guideways  $H$   $H$ , (see Fig. 4,) which hold them securely and firmly.

$I$   $I$  denote rocker-frames carried on horizontal shafts  $I'$   $I'$ , that are journaled in suitable bearings on the top of the main frame  $A$  of the machine. These frames  $I$   $I$ , being thus supported, are permitted to have a free vertical movement. In the drawings we have shown two of these frames; but we are not confined or restricted to this number. They carry the cutting, dressing, or shaping devices, which act upon the article fed thereto by the endless belt.

$J$   $J$  represent examples of rotary cutters fixed on the ends of horizontal shafts  $J'$ , journaled in the frames  $I$   $I$ , the other ends of said shafts  $J'$  being provided with pulleys  $o$   $o$  for the application of belts whereby the cutters are revolved. The special construction of the rotary cutters  $J$  is seen in the drawings to consist of disks carrying fixedly between them the projecting knives  $d$   $d$ . These cutters  $J$  are made to rotate in reverse directions, as will be seen by observing the direction of the arrows in Fig. 2. The location of the cutters is such that they revolve directly above the endless chain, and hence directly above the articles that are held in the grasp of the clamps carried on said endless chain.

The entire length of the endless chain is supplied with the clamps, so that there is an endless series of clamps. There is a short space between every two clamps to permit them to have freedom of movement. Each alternate clamp has its plate  $E$  convexed on

its upper edge, and also the movable jaw  $F$  of said clamp is correspondingly convexed, so that the clamp is adapted to hold the rocker in such a manner that the cutters may act thereon to dress the convexed edge of the rocker. These clamps may be called the "convex" clamps. The clamps alternate with the convex clamps, have their rigid plates  $E$  concaved on their upper edges, and also the movable jaws  $F$  are correspondingly concaved, so that these clamps are adapted to hold the rocker in such a manner that the cutters may act thereon to shape the concaved portion of the rocker. These clamps may be termed the "concave" clamps.

In order to properly cut the rockers and accurately impart to them or the other articles which are to be dressed the proper form or shape, we provide suitable patterns arranged upon the plates  $D$  between the jaws  $E$  and the inner edges of said plates, upon which patterns travel small wheels  $e$  and  $f$ , (see Fig. 3,) arranged on the frames  $I$   $I$  so as to revolve freely. The patterns or forms consist of plates or thin pieces of wood. They are located in a vertical position and are held in place by being secured to the plates  $E$ . The rollers  $e$  and  $f$  travel upon the upper edges of the patterns. Two of the patterns are placed next to each plate  $E$ , the patterns being placed side by side; hence the roller  $e$  is not exactly in line with roller  $f$ , but the two rollers are sufficiently offset from each other to enable them to travel in paths parallel, although closely adjoining—that is, one roller travels on one row of patterns and the other on the contiguous row. The outline of the patterns is as follows: The convex clamps have each a pair of patterns, (designated by  $M$  and  $N$ .) The upper edge of pattern  $M$  has a portion that is substantially or approximately straight or horizontal, as  $m$ , and also a curved portion,  $m'$ , the straight portion extending about half the length of the pattern and the curved part the remaining half. The pattern  $N$  has a straight portion,  $n$ , on its upper edge and a curved portion,  $n'$ . The two patterns  $M$  and  $N$ , however, are so related that their dissimilar portions may be opposite each other—that is, the straight portion  $m$  of pattern  $M$  will be opposite the curved portion  $n'$  of pattern  $N$ , and also the straight portion  $n$  of pattern  $N$  will be opposite the curved part  $m'$  of the other pattern. The arrangement therefore of the patterns  $M$  and  $N$  is such that they jointly afford a curved path whose outline is convex and substantially parallel to the convex edge of the plate  $E$ ; but said path consists of the two curved parts, as described, and is traveled by the two wheels  $e$  and  $f$ , one of which travels on the pattern  $M$  and the other on pattern  $N$ . Therefore, as the convex clamp passes beneath the cutters the article—such as a chair-rocker—which is carried thereby will be acted on from end to end; but the operation will so progress in consequence of the arrangement of the pat-



terns, as described, that one cutter will act on one half of the rocker and the other cutter on the other half. Thus the cutters cut with the grain of the wood and are prevented from cutting against the grain, which would split and damage the rocker. The concave clamps have each a pair of patterns, (designated by K and L.) The upper edge of pattern K has a portion that is substantially or approximately straight or horizontal, as *k*, and also a curved portion, *k'*, the straight portion extending a proper distance throughout the length of the pattern and the curved part extending the remainder of its length. The pattern L has a straight portion, *l*, on its upper edge and a curved portion, *l'*. The two patterns K and L, however, are so related that their dissimilar portions may be opposite each other, similarly to the location of the dissimilar portions of the patterns M and N, as was explained above. The curved portions *k'* and *l'* of patterns K and L are concave. The arrangement therefore of the patterns K and L is such that they jointly afford a curved path whose outline is concave and substantially parallel to the concave edge of the plate E of the clamp; but said path consists of the two curved parts *k'* and *l'*, one of which is traveled by wheel *e* and the other by wheel *f*. The straight portion of the pattern M on the convex clamp is adjacent to the straight portion of the pattern K of the concave clamp, and the straight portion of the pattern N of the convex clamp is adjacent to the straight portion of the pattern L of the concave clamp; also, the curved portion of pattern M of the convex clamp is adjacent to the curved portion of the pattern K of the concave clamp, and the curved portion of the pattern N of the convex clamp is adjacent to the curved portion of the pattern L of the concave clamp.

In the practical use of our machine the operation is as follows: The operator drops a convex piece, for instance, into the open jaws of the proper clamp—that is, the convex clamp—during the motion of said clamp toward the cutters. The piece is immediately clamped automatically and firmly and presented to a cutter rotating reversely to the ordinary direction given to planers. The small wheel on the rocker-frame that carries this cutter will travel on the curved portion of one of the patterns until the highest point of one of the patterns until the highest point of the convex side of the rocker has been reached and acted on by the cutter, after which the cutter will cease to act on the rocker, because the small wheel will begin to move on the straight portion of the pattern, and this will cause the cutter to be removed from the rocker, and this will prevent the rocker from being split by being cut against the grain. As the wheel passes gradually on to the straight portion of the pattern, so the cutter will be gradually raised from the rocker, and no abrupt motion will occur. Thus the first cutter is not allowed to do more work

upon the rocker, but the latter will now be presented to the next cutter, revolving in an opposite direction, which cutter has been idly revolving while the first cutter has been working, but which now has begun to move on the curved portion of one of the patterns, and hence is so located that it can be brought into play on the rocker to trim the half thereof which was left untrimmed by the first cutter. Said first cutter will revolve idly while the second cutter is working, and it will not operate again until the center of the next rocker is reached, which is a concave one, held by a concave clamp, when the pattern will allow it to descend and do its work. The operations of the cutter with respect to the concave rocker are similar to those just described in the case of the convex side of the rocker. The clamp holding the convex and unfinished piece is armed with small spurs, (see Fig. 4,) which penetrate and hold the piece in place after the clamp opens, and it is thus carried around to the operator's hand, who lifts it out and turns it over and places it in the concave clamp next behind, where it is finished, and this clamp, having no retaining-spurs, will not hold the rocker after it is completed, but the latter will drop therefrom when the arm *F'* acts to automatically open the jaws of the clamp. In dressing long articles—such as wagon-tongues and wagon-thills—a reciprocating motion instead of a continuous feed can be substituted, and thus the necessity of making the machine too large and cumbersome will be prevented.

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

1. In a machine for dressing irregular forms or articles, the combination, with the main frame provided with gibbed ways, of an endless chain running in said ways and carrying automatically-operating clamps, the reversely-rotating cutters beneath which the clamps pass, and the pairs of forms or patterns carried by the clamps, substantially as described.

2. In a machine for dressing irregular forms or articles, two oppositely-rotating cutters, an endless chain carrying the automatically-operating clamps, constructed substantially as described, for holding the articles to be dressed, and the patterns arranged in pairs on the clamps, so that the cutters may act by turns upon the article to avoid splitting it, substantially as described.

3. In a machine for dressing irregular forms or articles, the combination of the reversely-rotating cutters, the rocking frames therefor having rollers, the feeding mechanism, the automatically-operating clamps carried thereby for holding the articles to be dressed, and patterns or forms likewise carried by the feeding mechanism and moving beneath the rollers on the cutter-frames, all substantially as described.

4. In a machine for dressing irregular forms or articles, the combination of the rotating



cutters, the rocker-frames supporting the same, the endless feeding-bed carrying clamps for the articles to be dressed, and consisting of a plate secured to said bed, a rigid jaw thereon, and also a hinged jaw, and suitable patterns on the clamps which co-operate with rollers on the cutter-frames to cause the cutters to act properly on the articles to be dressed, substantially as described.

5. In a machine for dressing irregular forms or articles, the combination, with the main frame having a horizontal bar upon the same and a conveying chain or belt, of a clamp for holding the article to be dressed, consisting of a flat plate secured to the chain, a rigid jaw on said plate, and a movable jaw pivoted to the plate and carrying a projecting arm that rides upon the horizontal bar, substantially as described.

6. In a machine for dressing irregular forms or articles, the combination, with the dressing mechanism and an endless conveying-chain, of clamps for the articles to be dressed, consisting of a flat plate secured to one of the chain-links, a plate rigid thereon forming one jaw, and a movable plate pivoted thereon forming the other jaw, said movable jaw having an arm, and a bar or surface on the main machine-frame on which said arm is adapted to move for the purpose of automatically closing the clamp, substantially as described.

7. In a machine for dressing irregular forms or articles, the combination, with a conveying-chain, C, consisting of links *c* and the sprocket-wheels B B, of a series of clamps carried by said chain, consisting each of a plate, D, a rigid plate, E, secured thereto and forming one of the jaws, a pivoted plate, F, forming the other jaw, and having an outwardly-extending arm, F', furnished with a roller, *b*, and a horizontal bar, as G, on the main frame of the machine, upon which said roller *b* travels, substantially as and for the purpose described.

8. In a machine for dressing irregular forms or articles, the combination of the main frame of the machine, the frames I I, carried on shafts I' I', journaled in the upper portion of said main frame, said frames carrying shafts J' J', having the reversely-rotating cutters J J thereon, and the feeding mechanism for conveying the articles to be dressed to the action of said cutters, the self-operating clamps on said mechanism, and the patterns likewise carried thereby, all substantially as described.

9. In a machine for dressing irregular forms or articles, the combination, with the cutting or dressing devices, of an endless chain and a series of clamps consisting each of a plate secured to one of the chain-links, a rigid plate carried thereby, and a movable plate likewise carried thereby, said plates forming the jaws of the clamp, and said jaws of each alternate clamp being convexed on its upper edge, while

the jaws of the remaining clamps are concaved on the upper edge, substantially as and for the purpose described.

10. In a machine for dressing irregular forms or articles, the combination of the cutters, their frames having rollers, a clamping device, and forms or patterns upon the upper edges of which said rollers travel, said patterns consisting of vertical plates whose upper edges are straight for a portion of their length and curved throughout the remainder, and said patterns being relatively arranged so that their dissimilar portions may be opposite, substantially as described.

11. In a machine for dressing irregular forms or articles, a pair of patterns, M N, said pattern M having its upper edge straight at *m* and curved at *m'*, and said pattern N having its upper edge straight at *n* and curved at *n'*, the dissimilar portions of the two patterns being located opposite each other, in combination with cutter-frames having rollers that travel on the upper edges of the patterns, substantially as described.

12. In a machine for dressing irregular forms or articles, the combination of the cutters, their frames having small rollers, an endless feed-chain carrying suitable clamping devices which are alternately convex and concave, and patterns arranged in connection with said clamping devices, said patterns for the convex clamps consisting of a pair of plates whose upper edges are partially straight and partially convexly curved, and said patterns for the concave clamps consisting of a pair of plates whose upper edges are partially straight and partially concavely curved, all substantially as described.

13. In a machine for dressing irregular forms or articles, the combination of an endless series of clamps which are alternately convex and concave, as described, with a double series of patterns arranged in connection with said clamps, the patterns with the convex clamps having their upper edges straight for a certain distance and convexly curved throughout the remainder, and relatively located so that the curved portion of the one shall be opposite the straight portion of the other, and the patterns with the concave clamps having their upper edges straight for a portion of their length and concavely curved throughout the remainder, and relatively located so that the curved portion of the one shall be opposite the straight portion of the other, substantially as described.

14. In a machine for dressing irregular forms or articles, the combination of an endless chain, C, having link *c*, the sprocket-wheels B, the endless series of clamps carried by said endless chain, and the parallel series of patterns constructed as described and arranged in connection with the clamps, as specified, and the reversely-rotating cut-



ters carried in frames having small rollers that travel on the upper edges of the patterns, substantially as described.

15  
5 In a machine for dressing irregular forms or articles, a series of clamping devices that are alternately convex and concave, in combination with a series of patterns, the patterns for the concave clamps consisting of a pair of plates whose upper edges  
10 are partially straight and partially concavely curved, and the patterns for the convex clamps consisting of a pair of plates whose upper edges are partially straight and partially convexly curved, said patterns of both

kinds of clamps being so arranged with relation to each other that their dissimilar portions shall be opposite each other, substantially as described. 15

In testimony whereof we affix our signatures in presence of two witnesses.

WILLIAM REID.

GEORGE M. REID.

Witnesses as to Wm. Reid:

GEO. ASHLEY,

JAMES BARKLEY.

Witnesses as to Geo. M. Reid:

GEO. DOWNS,

J. B. DONNELLY.