

(No Model.)

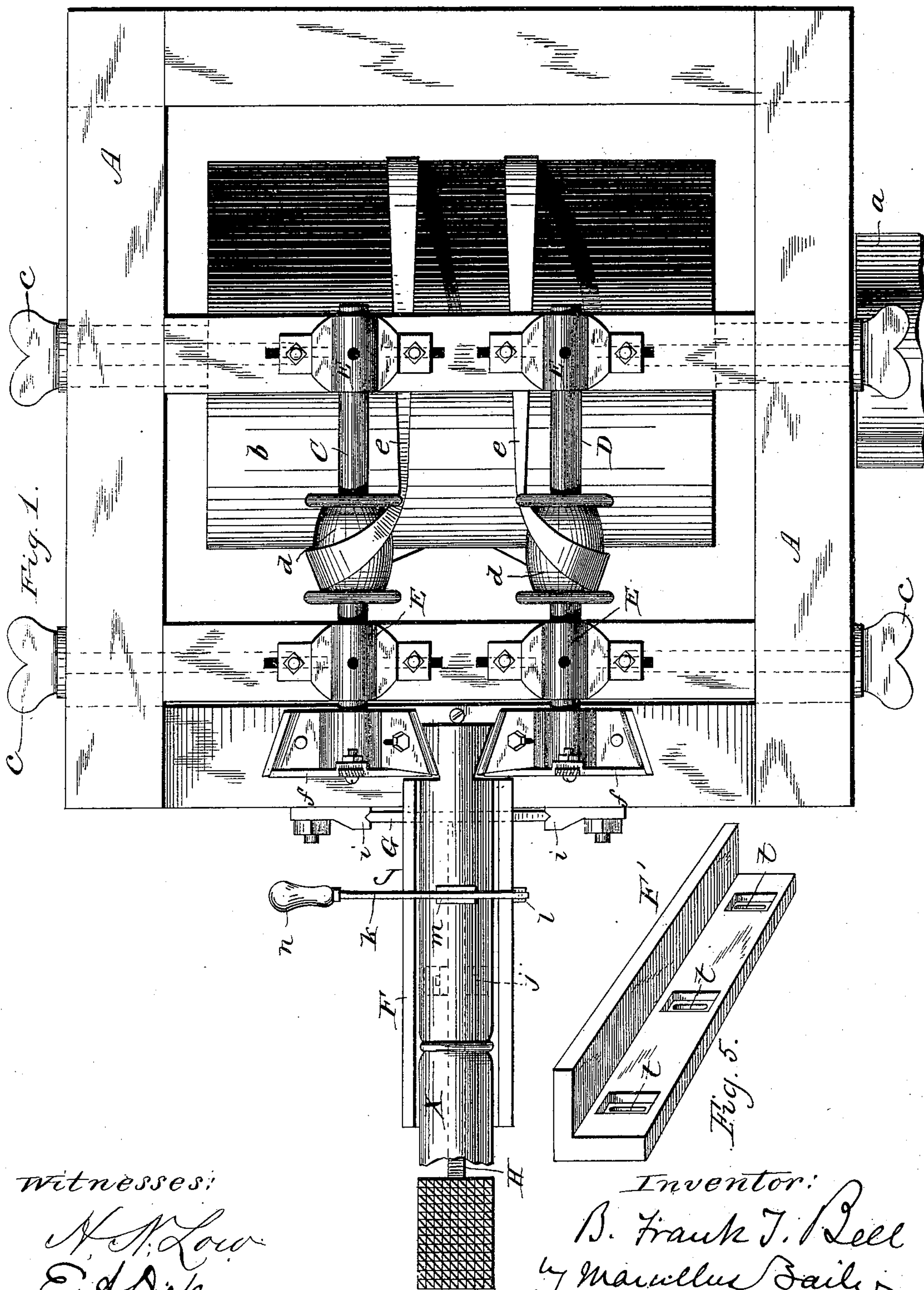
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B. F. T. BELL.

MACHINE FOR DOVETAILING BALUSTERS.

No. 350,575.

Patented Oct. 12, 1886.



Witnesses:

*H. A. Low*  
*E. A. Dick*

Inventor:

*B. Frank T. Bell*  
*by Maxwell Bailey*  
*his attorney*

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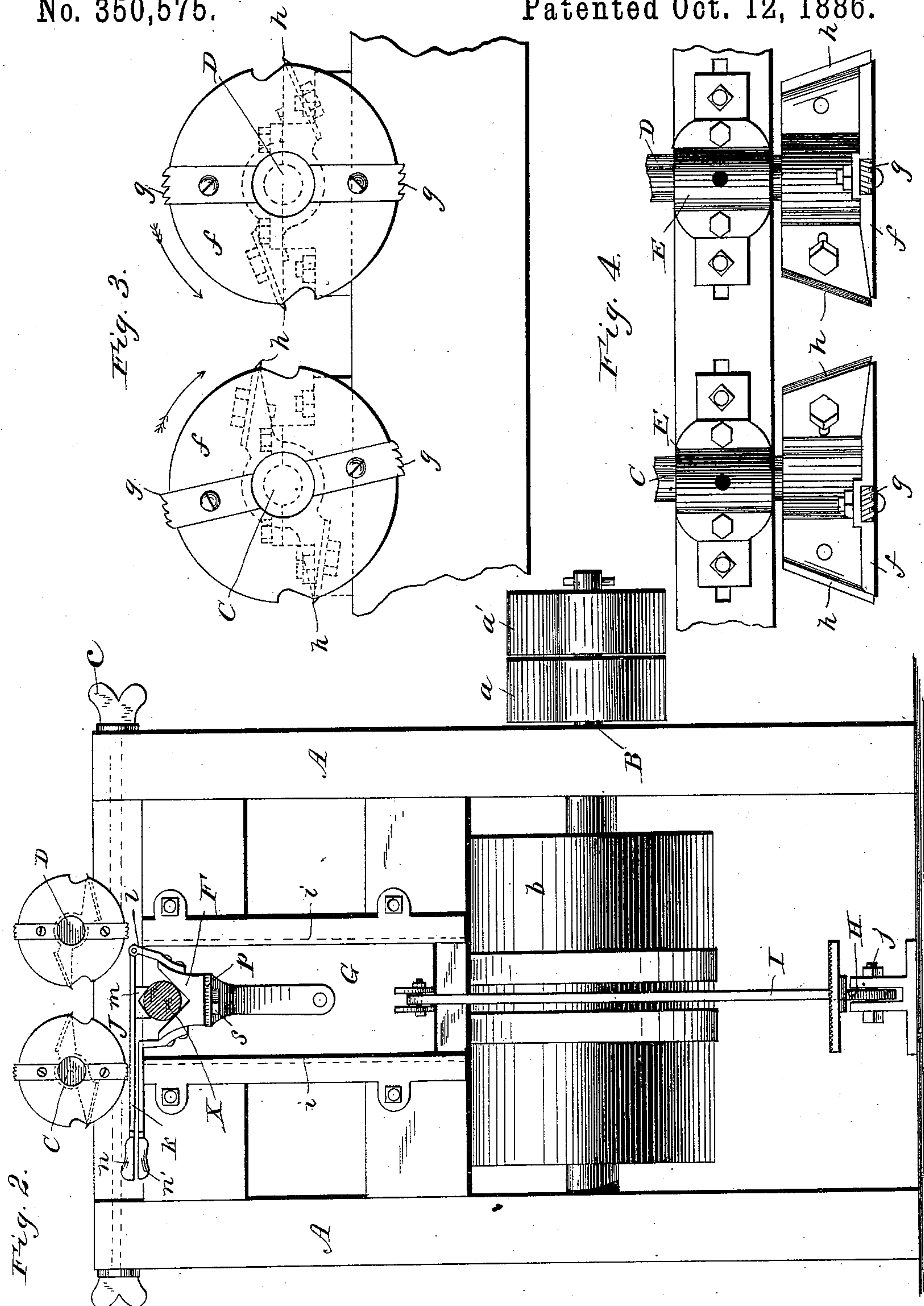
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# UNITED STATES PATENT OFFICE.

B. FRANK T. BELL, OF WASHINGTON, DISTRICT OF COLUMBIA.

## MACHINE FOR DOVETAILING BALUSTERS.

SPECIFICATION forming part of Letters Patent No. 350,575, dated October 12, 1886.

Application filed March 17, 1886. Serial No. 195,581. (No model.)

*To all whom it may concern:*

Be it known that I, B. FRANK T. BELL, of Washington, in the District of Columbia, have invented certain new and useful Improvements in Machines for Dovetailing Balusters, of which the following is a specification.

The object I have in view is to obtain a simple, efficient, and inexpensive machine for dovetailing balusters.

In carrying out my invention I make use of two rotating cutter-heads, somewhat similar in their general organization to the cutter-heads of a tenoning-machine, but with the essential difference that the cutters are so formed and set at such an angle as to make a dovetail cut. These two cutter-heads are set opposite to one another at a suitable distance apart to form the required dovetail upon the end of the baluster which may be passed between them. In conjunction with said cutter-heads, which are arranged side by side in a horizontal plane, I make use of a carriage or cradle for holding the baluster, said carriage or cradle being mounted on a vertically-movable slide operated by treadle or other power, so that it may be moved to and from the cutter-heads. The cradle or carriage moves in a path which is about centrally between the cutter-heads, and it is so formed that the baluster, when laid therein, will center itself, thus permitting of an even dovetail being formed, even though the balusters operated on should vary in diameter.

In the drawings accompanying this specification, Figure 1 is a plan view of my improved machine. Fig. 2 is a front elevation of the machine. Fig. 3 is a front elevation, on an enlarged scale, of the cutter-heads. Fig. 4 is a plan of the same. Fig. 5 represents a modification hereinafter referred to.

The working parts of the machine are mounted and supported in a frame, A, of suitable construction and material.

B is the driving-shaft, furnished with the usual fast and loose pulleys, *a a'*, and with a drum, *b*.

On top of the frame are two parallel shafts, CD, journaled in boxes E, which are movable, so as to bring the shafts nearer together or farther apart, and are adjusted and held in adjusted position by the adjusting-screws *c*. Each shaft is provided with a pulley, *d*, and is belted to the drum *b*, as indicated at *e*, Fig. 1. Upon

the front ends of the shafts are the cutter-heads, which form the dovetail tenon on the end of the baluster. Each cutter-head consists of a face-plate, *f*, upon which are adjustably secured the saws or radial toothed plates *g*, which cut and finish the shoulder of the dovetail, and upon the back or hub of which are mounted in suitable seats the cutter-blades *h*, which cut the tongue of the dovetail. These cutters are flat plates, with their cutting edges set at such an angle as to make a cut that shall be at an angle with the axis of the baluster.

The baluster itself is seen at X in Figs. 1 and 2, and the arrangement of the cutters *h* is clearly shown in Figs. 1, 3, and 4, the direction of rotation of the cutter-heads being indicated by arrows in Fig. 3. These cutters are adjustable, and may be so arranged that their angle of inclination can be varied, so as to cause them to make a cut of more or less obliquity, as desired.

The cradle or carriage for the baluster is represented at F. It is a trough-like device having a V cross-section, the angle of the V being in a vertical line passing centrally between the two cutter-heads. Balusters will center themselves in this cradle or carriage, thus causing a uniform dovetail to be produced, notwithstanding variations in size of the balusters operated on. The cradle is fast to a vertical slide, G, held in ways *i* on the front of the frame, and operated by a treadle-lever, H, pivoted at *j*, and connected at a point on the other side of the pivot from the treadle with the slide by a connecting-rod, I. By depressing the treadle the cradle will be moved upwardly far enough to carry the baluster through the space between the rapidly-revolving cutter-heads, which form the dovetail upon the end of the baluster, as indicated in Fig. 1. By this one movement, and in this simple and expeditious way, the dovetail on the baluster is cut and finished. The baluster is then removed, and by relieving the treadle of pressure the slide is allowed to drop down to its original position. The weight of the slide and cradle and attached parts will suffice ordinarily for this purpose; but an auxiliary weight or spring may be used to assist, if desired. A suitable gage on the cradle should be provided to limit and determine the extent to which the inner end of the baluster



shall project beyond the cradle. In order to hold the baluster firmly in place during the dovetailing operation, I make use of a presser or holder, J, consisting of a lever-arm, *k*, pivoted to a bracket, *l*, on one side of the cradle, and thence extending across and above the cradle. It is provided with a pad, *m*, to bear on the baluster, and with a half-handle, *n*, the other half, *n'*, of which is on a horizontal arm extending laterally from the side of the cradle opposite that on which the lever *k* is pivoted. After the baluster is placed in the cradle the lever-arm is lowered, and the workman, taking the two parts *n' n* of the handle in his hand and pressing them together, forces down the pad or presser *m* upon the baluster.

The cradle shown in the drawings is one which is more particularly adapted for balusters of cylindrical cross-section. For balusters of square or angular cross-section a cradle, *F'*, of the form shown in Fig. 5, can be used. This figure represents a portion of the cradle in perspective. It is substantially L-shaped in cross-section. To apply this the V-shaped cradle, which is held to the bed-piece *p* by bolts *s*, is removed from said bed-piece, and the horizontal portion of the L-shaped cradle is laid upon the bed-piece and secured thereto by the bolts *s*, which pass through transverse slots *t* in the bottom of the L-shaped cradle, the heads on the upper ends of the bolts being received in countersinks in the bottom. The object of this slotted connection is to permit of the lateral adjustment of the L-shaped cradle, so as to accommodate varying sizes of balusters. With this kind of cradle a presser or holder, J, will also be used, having its form changed to adapt it to the particular construction of cradle with which it may be employed.

Having described my improvement, I state, in conclusion, that I do not broadly claim the combination of rotating dovetailing cutter-heads with a carriage or bed movable with reference to the same, for this, I am aware, is not new. In my machine the parts are so arranged as to secure great simplicity of construction, as well as efficiency of operation. The cradle is vertically movable, lifts by a treadle, and drops by gravity; and it is so made as to center the work, while the hold-down J can readily and expeditiously be operated by hand either to press upon or to release the baluster.

What, therefore, I claim as my invention is—

1. The two rotating power-driven cutter-heads provided with cutters for forming the shoulder and tongue of the dovetail, in combination with the vertically-sliding centering-cradle *F*, formed, as described, to center the baluster between the two cutters, and the treadle whereby said cradle is lifted in the direction to carry the end of the baluster up between the cutters, as and for the purposes specified.

2. The combination of the two rotating cutter-heads for forming the shoulder and tongue of the dovetail, the vertically-sliding centering-cradle *F*, the treadle for lifting the same, and the hinged presser or holder J, these parts being constructed and arranged for joint operation as shown and described.

In testimony whereof I have hereunto set my hand this 16th day of March, 1886.

B. FRANK T. BELL.

Witnesses:

EWELL A. DICK,  
MARVIN A. CUSTIS.