3 Sheets—Sheet 1.

E. J. GRANGER.

STAVE-JOINTING MACHINE.

No. 169,635. Patented Nov. 9, 1875.

Fig. 1.

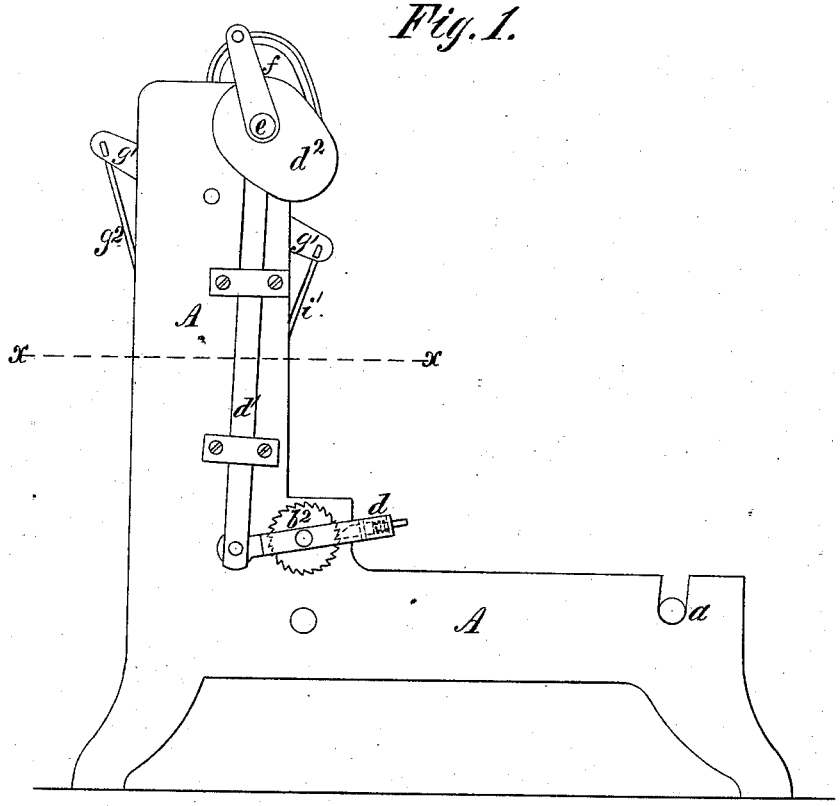
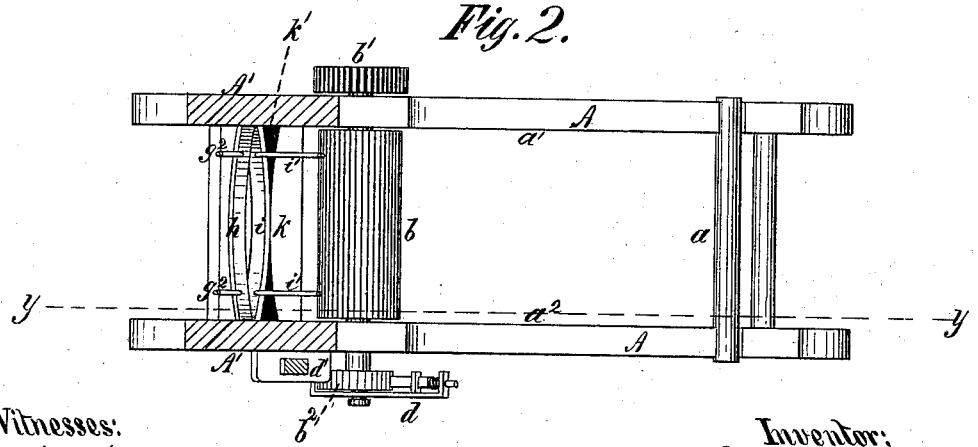


Fig. 2.



Witnesses:

Geo. H. Miatt

Millard Farr

Inventor:

E. J. Granger

Per Edw. E. Lumby

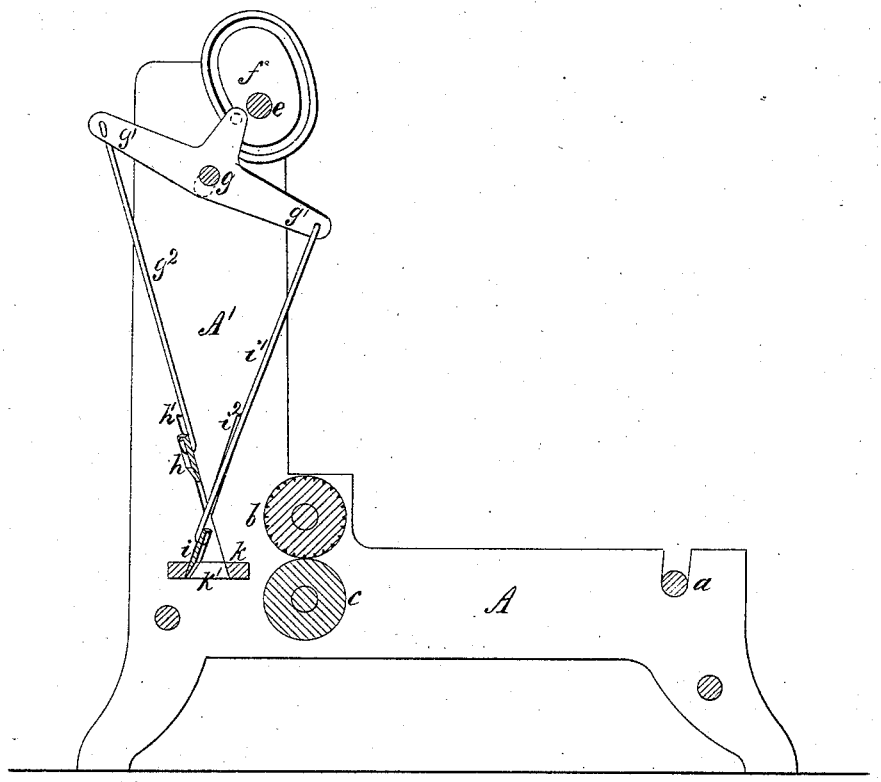
Atty.

E. J. GRANGER.

STAVE-JOINTING MACHINE.

No. 169,635. Patented Nov. 9, 1875.

Fig. 3.



Witnesses:

Geo. H. Miath

Millard Farr

Inventor:

E. J. Granger

Per Edw. E. Crumby

atty.

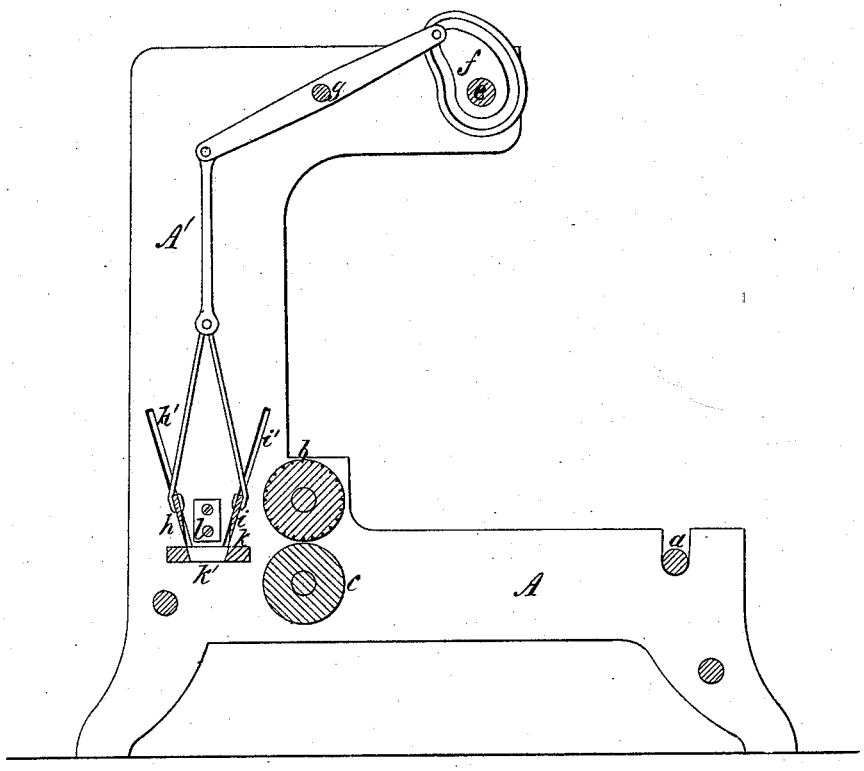
3 Sheets—Sheet 3.

E. J. GRANGER.

STAVE-JOINTING MACHINE.

No. 169,635. Patented Nov. 9, 1875.

Fig. 4.



Witnesses:

Geo. H. Miatt

Millard Farr

Inventor:

E. J. Granger

Per Edw. E. Quimby

Atty.

UNITED STATES PATENT OFFICE.

ELIHU J. GRANGER, OF BROOKLYN, NEW YORK.

IMPROVEMENT IN STAVE-JOINTING MACHINES.

Specification forming part of Letters Patent No. **169,635**, dated November 9, 1875; application filed August 10, 1875.

To all whom it may concern:

Be it known that I, ELIHU J. GRANGER, of Brooklyn, Kings county, New York, have invented a certain Improvement in Stave-Jointing Machines, of which the following is a specification:

The object of my invention is to cut the tapering staves used in the manufacture of barrels from sheets of wood; and my invention consists in suitable devices for feeding, with an intermittent motion, a sheet of wood or veneer, in a direction substantially at right angles to the direction of its fiber, so as to present the outer end of the sheet of wood in suitable position to receive the thrust of two reciprocating curved knives, setting at the proper angles, respectively, to cut the opposite edges of the staves, the curvature of the knives corresponding to the curved edges of the staves.

These knives may be operated alternately, so as to cut the end of the sheet of wood into the proper curve, and then cut off a strip therefrom of the width desired for a stave, or the two knives may be brought down simultaneously upon the surface of the sheet of wood, so as to cut both edges of the stave at once.

The accompanying drawings are as follows: Figure 1 is a side view of my machine. Fig. 2 is a horizontal section through the line $x\ x$ on Fig. 1. Fig. 3 is a vertical section through the line $y\ y$ on Fig. 2. Fig. 4 is a longitudinal vertical section, similar to Fig. 3, showing a modified arrangement of the devices for operating the knives, for the purpose of adapting them to cut both sides of the stave at once.

Referring to the drawings, A represents a substantial frame, furnishing bearings for guide-rollers *a*, upon which a sheet of wood rests while being fed forward to the pair of feed-rollers *b c*. The sides of the frame a^1 and a^2 serve as guides for the sheet. These feed-rollers are geared together by the pinion b^1, which is keyed to the outer end of the shaft of the feed-roller *b*, and engages a similar pinion on the outer end of the under feed-roller *c*.

Intermittent motion is imparted to the upper feed-roller by means of the ratchet-wheel b^2, which derives its motion from the action of the rocking pawl *d*, operated through the link d^1 by the cam d^2 on the driving-shaft *e*. The driving-shaft is also provided with the cam *f*, for operating the rock-shaft *g*, provided with the arms $g^1\ g^1$, from one end of which motion is imparted, by means of the links $g^2\ g^2$, to the knife *h*, for cutting the curve on the outer end of the sheet of wood which is being operated upon. A similar knife, *i*, curved in the opposite direction, derives its motion through the links $i'\ i'$ from the opposite end of the rocking arms $g^1\ g^1$. The ends of the knife-blades engage oppositely-inclined grooves h^1 and i^2, respectively, on the insides of the uprights A′ A′.

The inclination of the grooves for guiding the knives is determined by the angle at which it is desired the staves shall be cut or jointed. This angle, of course, varies in staves intended for barrels of different diameters.

A transverse bed, *k*, is secured between the uprights in the frame, for the purpose of supporting the sheet of wood while it is being subjected to the action of the knives. A longitudinal opening, *k′*, in this bed allows the chips and waste to fall through out of the way, and the inner edges, respectively, of this opening are curved to correspond with the curved knives.

When the two knives are moved simultaneously, being arranged as illustrated in Fig. 4, they are set farther apart, so that, when brought down to their lowest position, the distance between them is equal to the width of a stave. In that case the bed of the veneer or sheet of wood is merely provided with two curved grooves to receive the edges of the knives, and projecting shoulders *l* are arranged between the knife-guides on the frame, for preventing the stave from being lifted by the rising of the knives. Thus each stave is left in position to be dislodged by the sheet of wood or veneer as it is fed forward into position for the cutting of another stave.

I claim as my invention—

In a machine for cutting staves from a sheet of wood, the combination of an intermittent feeding device with two curved knives having reciprocating motions in oppositely-inclined planes, substantially as and for the purpose described.

E. J. GRANGER.

Witnesses:
EDWD. PAYSON,
GEO. W. MIATT.