(No Model.) 3 Sheets—Sheet 1.

T. BRUNO.

STAVE JOINTING MACHINE.

No. 271,682. Patented Feb. 6, 1883.

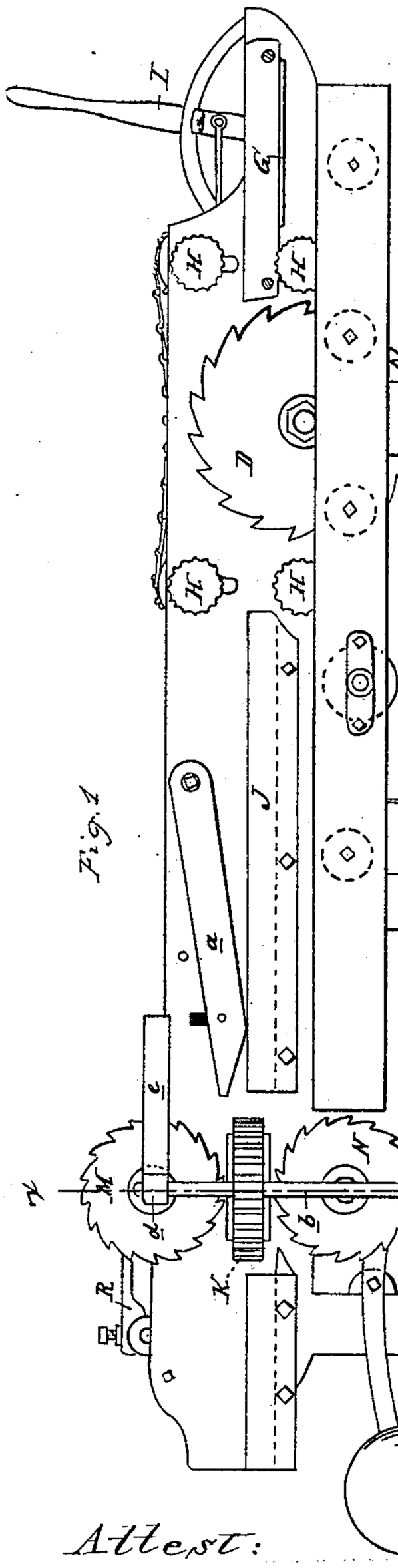


Fig. 1

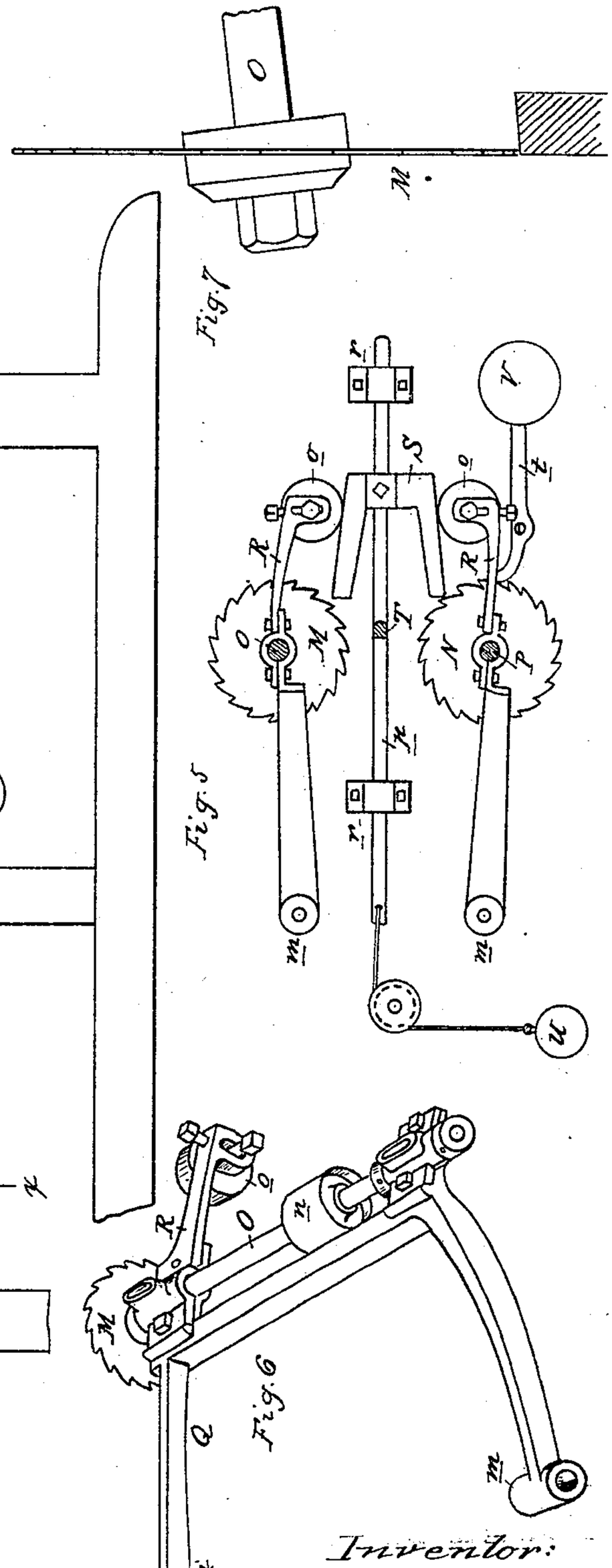


Fig. 7

Fig. 5

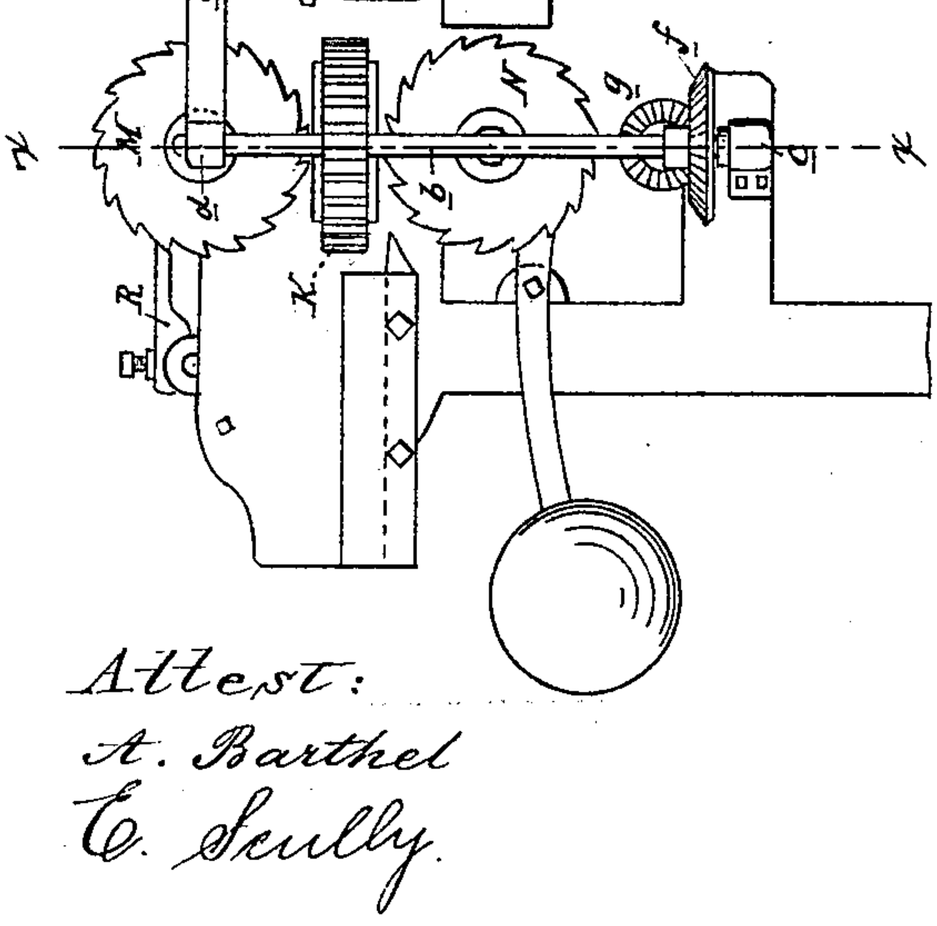


Fig. 4

Fig. 6

Attest:
A. Barthel
E. Scully.

Inventor:
Theodore Bruno
per Thos. S. Sprague
Atty

(No Model.) 3 Sheets—Sheet 2.

T. BRUNO.

STAVE JOINTING MACHINE.

No. 271,682. Patented Feb. 6, 1883.

Fig. 2

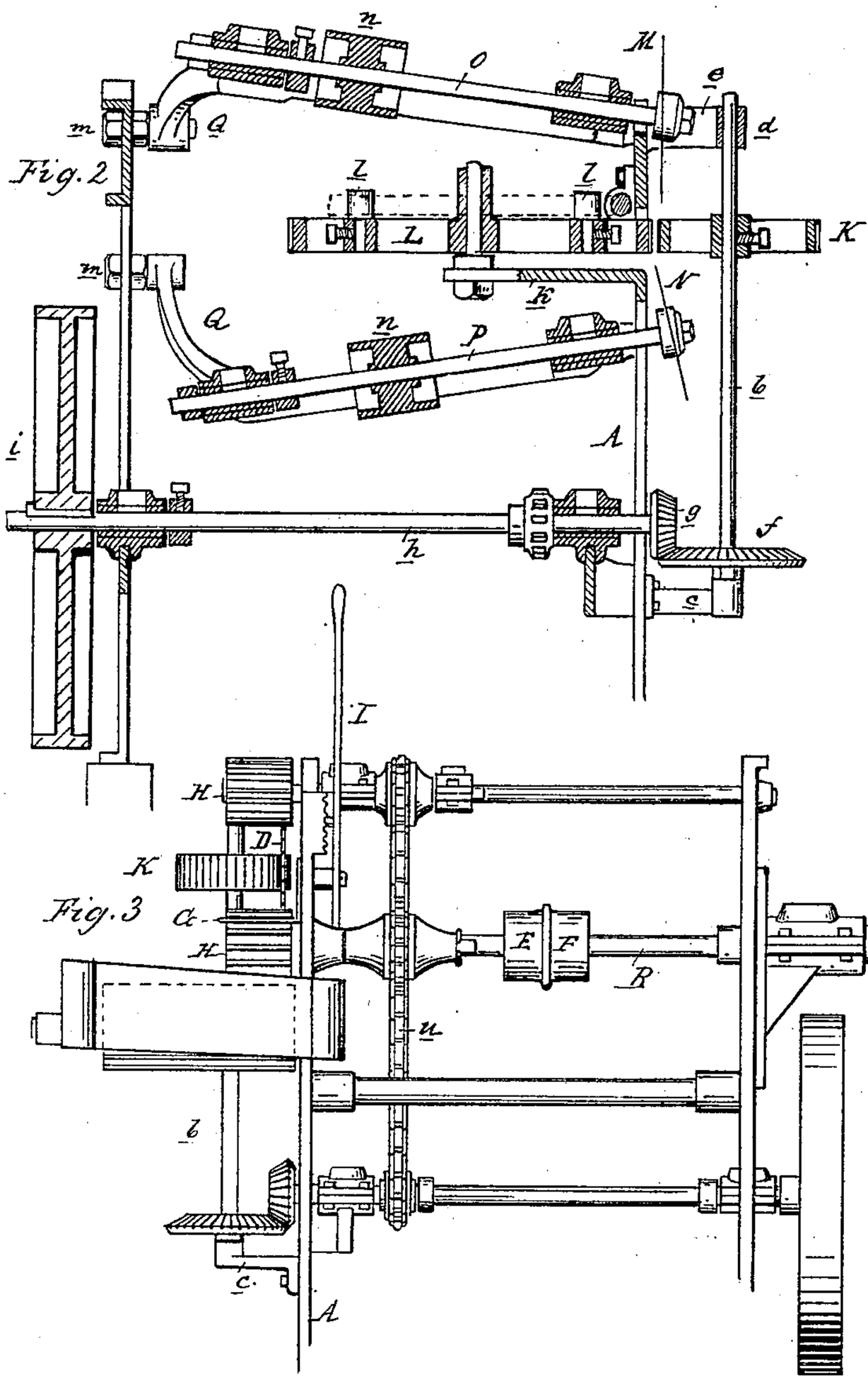
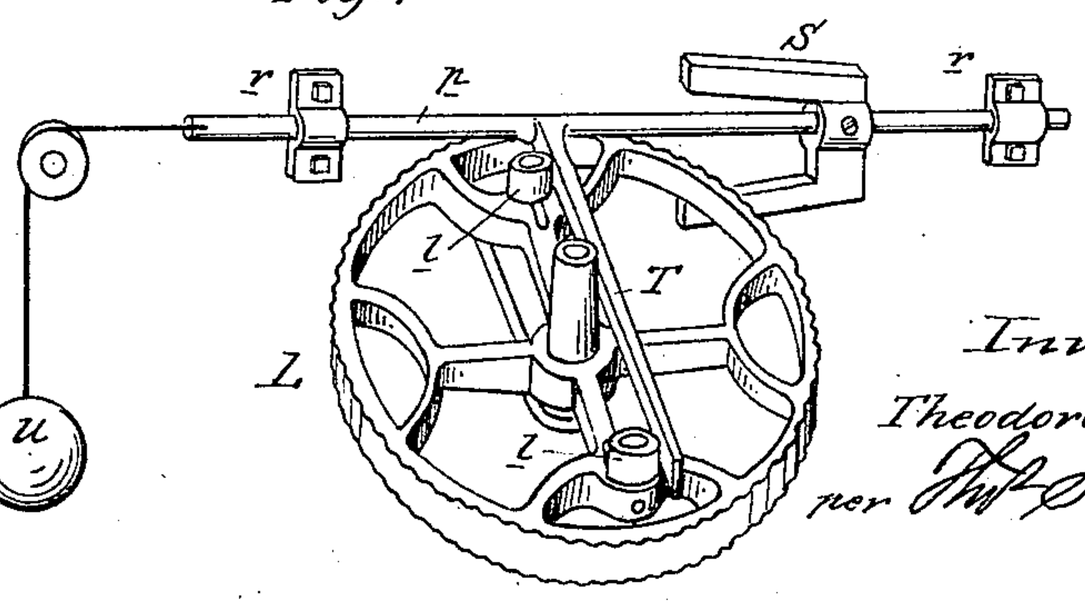


Fig. 4



Attest:
A. Barthel
E. Scully.

Inventor:
Theodore Bruno
per Thos. S. Sprague
Atty

(No Model.) 3 Sheets—Sheet 3.

T. BRUNO.

STAVE JOINTING MACHINE.

No. 271,682. Patented Feb. 6. 1883.

Fig. 8. is a diagram showing the operation of the endless chain.

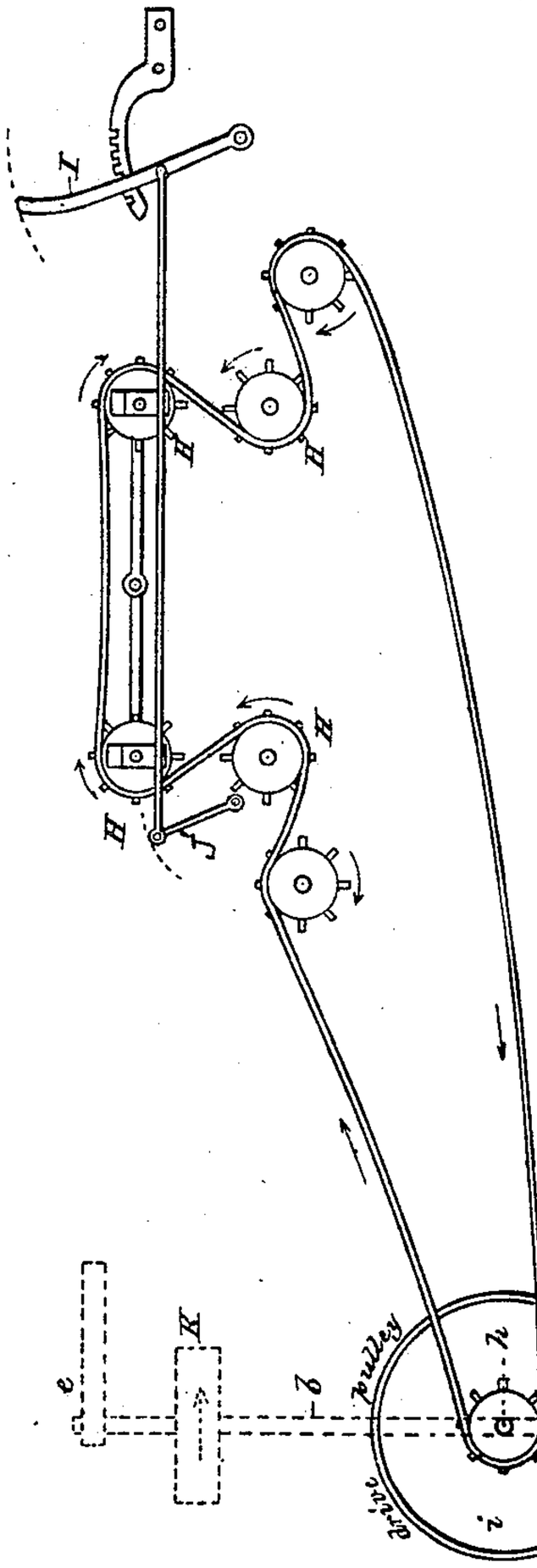
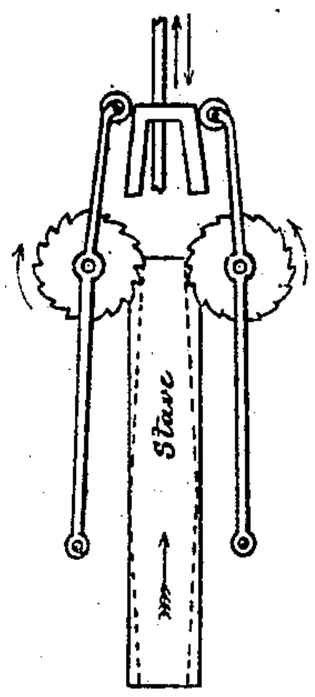


Fig. 9. diagram showing operation of wedge.



Witnesses;
W. F. Robertson.
Wm Turner

Inventor
Theo. Bruno
By T. J. W. Robertson
Attorney

UNITED STATES PATENT OFFICE.

THEODORE BRUNO, OF SAGINAW, MICHIGAN.

STAVE-JOINTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 271,682, dated February 6, 1883.

Application filed June 10, 1882. (No model.)

To all whom it may concern:

Be it known that I, THEO. BRUNO, of Saginaw, in the county of Saginaw and State of Michigan, have invented new and useful Improvements in Machines for Cutting and Jointing Staves; and I hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, which form a part of this specification.

The nature of this invention relates to certain new and useful improvements in that class of machines which are designed for cutting and jointing staves; and the invention consists in the peculiar construction, combination, and operation of the various parts, as more fully hereinafter described. This improved machine cuts the staves in a well-known manner from a bolt of proper dimensions fed to the machine by the operator; but as soon as one stave is separated from the bolt the machine herein described automatically passes it to the devices for jointing, the latter forming an organic part of my improved machine.

My improvements, more particularly hereinafter described, consist, first, in the new and novel manner in which I employ the cutting action of the teeth of a "wabble-saw" in planer-knife fashion for jointing the staves; second, in the mechanical devices for passing the staves through the jointer; and, third, in the combination and arrangement of the different parts which make my machine operative.

Figure 1 is a side elevation. Fig 2 is a cross-section on the line *x x* in Fig. 1. Fig. 3 is an elevation of the front end of the machine. Fig. 4 is a detached perspective view of the devices for operating the jointing-saws. Fig. 5 is an elevation of the reverse side of the elevation shown in Fig. 1. Fig. 6 is a detached perspective view of one of the jointing-saw frames. Fig. 7 is a vertical central section of one of the jointing-saws. Figs. 8 and 9 are detail views, showing the operation of the endless chain and wedge.

In the accompanying drawings, A is the frame, which is employed to support the working parts of my machine.

B is a shaft journaled across the frame near its forward end.

C is the driver, and D the circular saw which cuts the staves from the bolts.

E and F are two pulleys on the same shaft for communicating motion to the jointing-saws by means of proper belts.

G is the guide-plate upon which the stave-bolts are supported when fed to the saw D.

H are feed-rolls adapted to feed the stave-bolts to the saw D. These rolls are arranged in pairs, as shown. The lower roll of each pair runs in stationary boxes, while the upper roll of each pair runs in adjustable boxes, the vertical distance of which from the lower rolls can be controlled and regulated by means of the lever I.

J is a guideway in which the staves cut by the saw D are guided to the jointing-saws, the weight of the arm *a* keeping the staves from accidental displacement.

K (shown in Figs. 1 and 3) is a feed-wheel, fluted on its face, the same as the ordinary feed-roll. It revolves on the vertical shaft *b*, which is stepped at its lower end into the bracket *c*, while its upper end is journaled at *d* into the free end of the leaf-spring *e*.

f is a bevel-gear wheel meshing with the bevel-gear pinion *g* on the shaft *h*.

i is a pulley on the shaft *h*. In the operation of the machine motion is communicated to this pulley from any convenient source by means of a belt, and its motion is transmitted, through the connections just described, to the feed-wheel K.

L is a wheel revolving on the same horizontal plane with the feed-wheel K. It is supported on the bracket *k*, extending from the frame A, and its face is fluted, the same as the feed-wheel K. The faces of the two wheels K and L do not quite touch each other, but if a stave is pushed between them the motion of the feed-wheel K is transmitted to the wheel L through frictional contact with the stave, the spring *e* exerting sufficient pressure for that purpose. Two lugs, *l l*, are placed diametrically opposite each other on the top of the wheel L.

M and N are two circular saws secured to the arbors O and P. These arbors are not parallel to each other, but converge, as shown in Fig. 2, and both are journaled in swinging frames Q, (shown detached in Fig. 6,) which are pivoted to the frame A at *m m*.

n n are pulleys on the arbors O P, by means of which motion is communicated to the saws

M N from the shaft B. Each of the swinging frames Q has secured to it an arm, R, extending rearward, and carrying at its end a friction-wheel, *o*, adjustably secured thereto.

S is a wedge secured to the rod *p*, which latter is adapted to slide to and fro in bearings *r r*, secured to the frame A, as shown in Figs. 4 and 5.

T is an arm extending at right angles from the rod *p*, immediately above the wheel L, as shown in Fig. 4.

U is a weight attached to the end of the rod *p*. Its object is to keep the wedge S in the position shown in Fig. 4, where the arm T impinges against both of the upwardly-extending lugs *l* of the wheel L.

V is a counter-weight secured to the end of a lever, *t*, pivoted to the frame A, and impinging with its inner end against the arm R of the lower jointing-saw frame, thereby keeping its friction-wheel *o* in contact with the lower inclined plane of the wedge S.

In Fig. 7 is shown a side view of one of the jointing-saws. It is a so-called "wabble-saw"—that is, it is hung on its arbor out of true, and for the purposes of this machine its deviation is of sufficiently large degree to joint the stave its whole thickness. The inclination of the arbors O and P gives the required bevel.

To allow my machine to cut and joint staves of different sizes all the necessary parts are provided with suitable adjustments.

In practice motion is given to the driver C upon the shaft B, and thence is communicated by belts to the jointer-saws. The feeding devices are operated by the pulley *i* on the shaft *h*, an endless belt or chain, *u*, driven by sprocket-wheels, communicating the motion to the different feed-rolls. The operator feeds the bolt to the saw D by placing it on the guide-plate G, when the feed-rolls H will advance it upon the saw D, which cuts off a stave. The stave then passes through the guideway until it is forced between the wheels K and L, which firmly hold it while the saws M and N joint it upon its sides. As soon as the stave is forced between the two wheels K and L, the latter wheel is forced to revolve also, and one of the lugs *l* upon the top of said wheel will push the arm T, and thereby the rod *p* and wedge S, the latter forcing the swinging frames, in which the saw-arbors are journaled, apart. After the wheel L has made one-quarter of a revolution the lug *l*, which pushed the arm T ahead, will now allow it to retrograde, and the wedge S being also reversed the swinging saw-frames will draw together. As the circumference of the wheel L is twice the length of the stave, the wheel L will make one-half of a revolution; but should a stave happen to be longer or shorter than required, the wheel L will nevertheless adjust itself to its original position after the operation is finished, owing to the weight U.

As the upper and lower swinging saw-frames are perfect counterparts of each other, and both are guided by the inclined planes of the wedge S, with which the friction-rolls *o* are in constant contact, it will be seen that the jointing-saws M and N will act upon the upper and lower side of the stave precisely in the same manner, the stave being rigidly held during the operation between the wheels K and L, which are pressed together by the action of the spring *e*.

What I claim as my invention is—

1. In a machine for jointing staves, a pair of wabble-saws journaled at an angle from their true axes, and carried by pivoted swinging arms, combined with a wedge operated automatically to change the relative positions of the saws with each other, as desired, and with operating means, substantially as described.

2. In a machine for jointing staves, the wheel L, having lugs *l*, journaled on the bracket *k*, and receiving motion from the wheel K, the reciprocating rod *p*, having arm T and wedge S, and the weight U, combined with the jointing-saws, and operating to automatically govern the relation of said saws to each other, for the purpose set forth.

3. In combination with the wabble-saws M N, hung as described, and journaled upon swinging arms Q, the wedge S, and operating means, whereby the positions of the saws relatively to each other are automatically changed, as described, substantially as set forth.

4. The feed-wheel K, hung upon the vertical shaft *b*, the spring *e*, and the wheel L, having lugs *l*, combined with the wedge S, saws M N, main shaft B, and operating-connection, as set forth.

5. The combination, with the feed-rolls H, &c., arranged in pairs, the upper roll of each pair being movable vertically in its bearings, combined with the chain *u*, of the levers I J′, the rod connecting said levers, and the segmental rack-bar, whereby the upper feed-rolls may be adjusted at will, as set forth.

6. The wheel L, having lugs *l*, the rod *p*, having arm T, and weight U, combined with the wedge S, the pivoted arms Q, shafts O and P, carrying the saws M and N, and the arms R, carrying rollers *o*, the said rollers riding upon the inclines of the wedge S, and the whole arranged to serve as and for the purposes set forth.

THEODORE BRUNO.

Witnesses:
H. S. SPRAGUE,
E. SCULLY.