P. WELCH.

STAVE CUTTING MACHINE.

No. 40,783. Patented Dec. 1, 1863.

Fig: 2

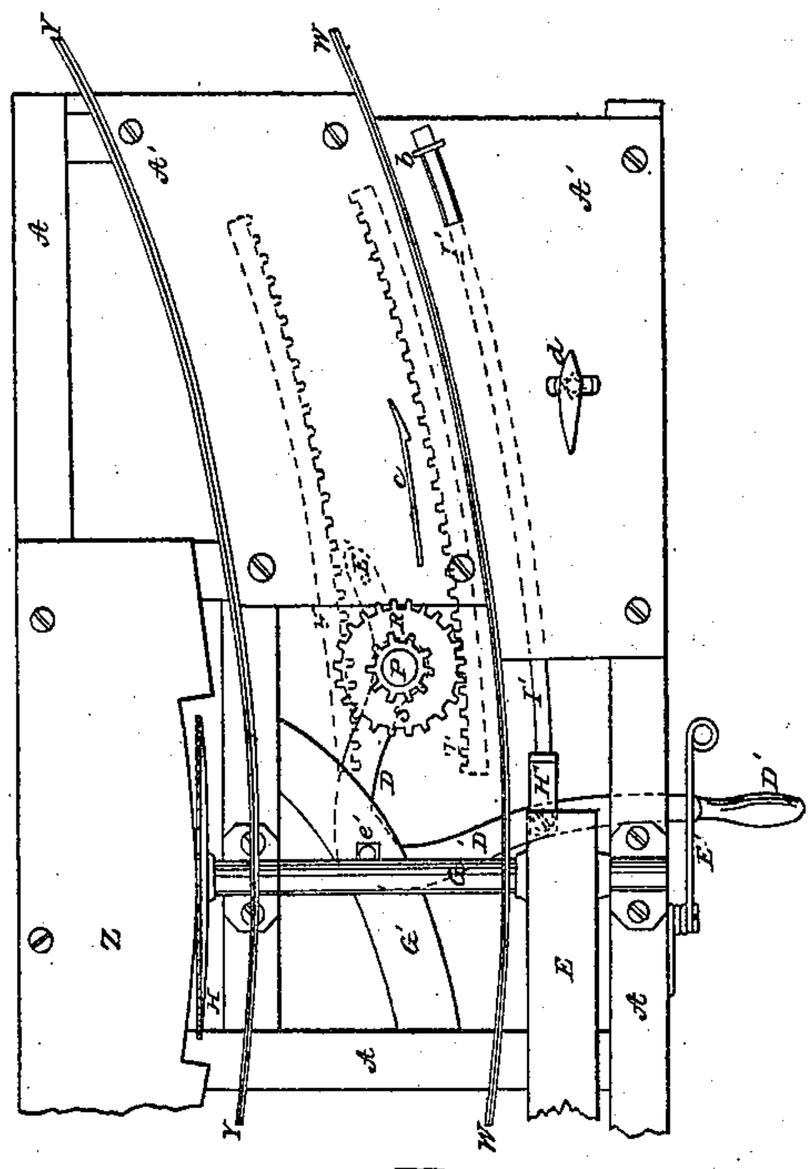

Fig: 3

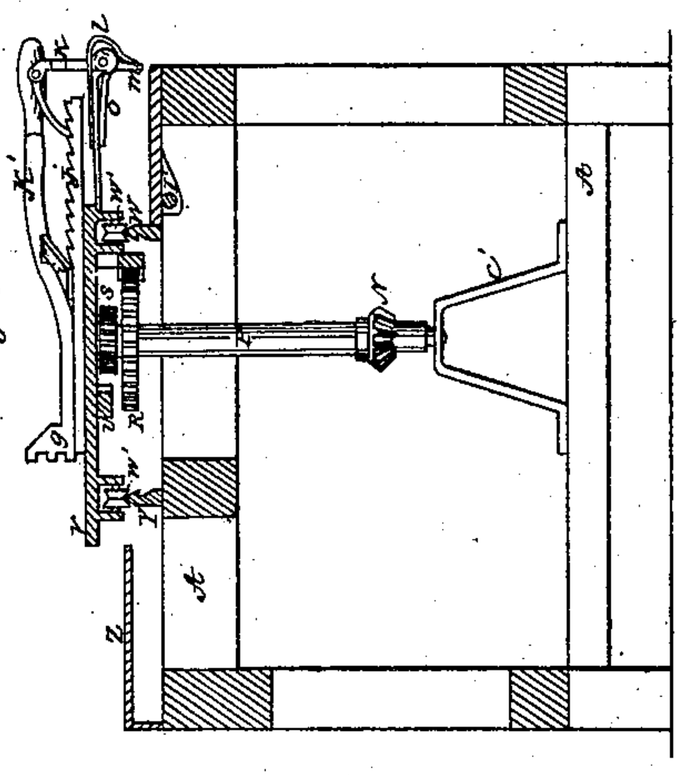

Fig: 1

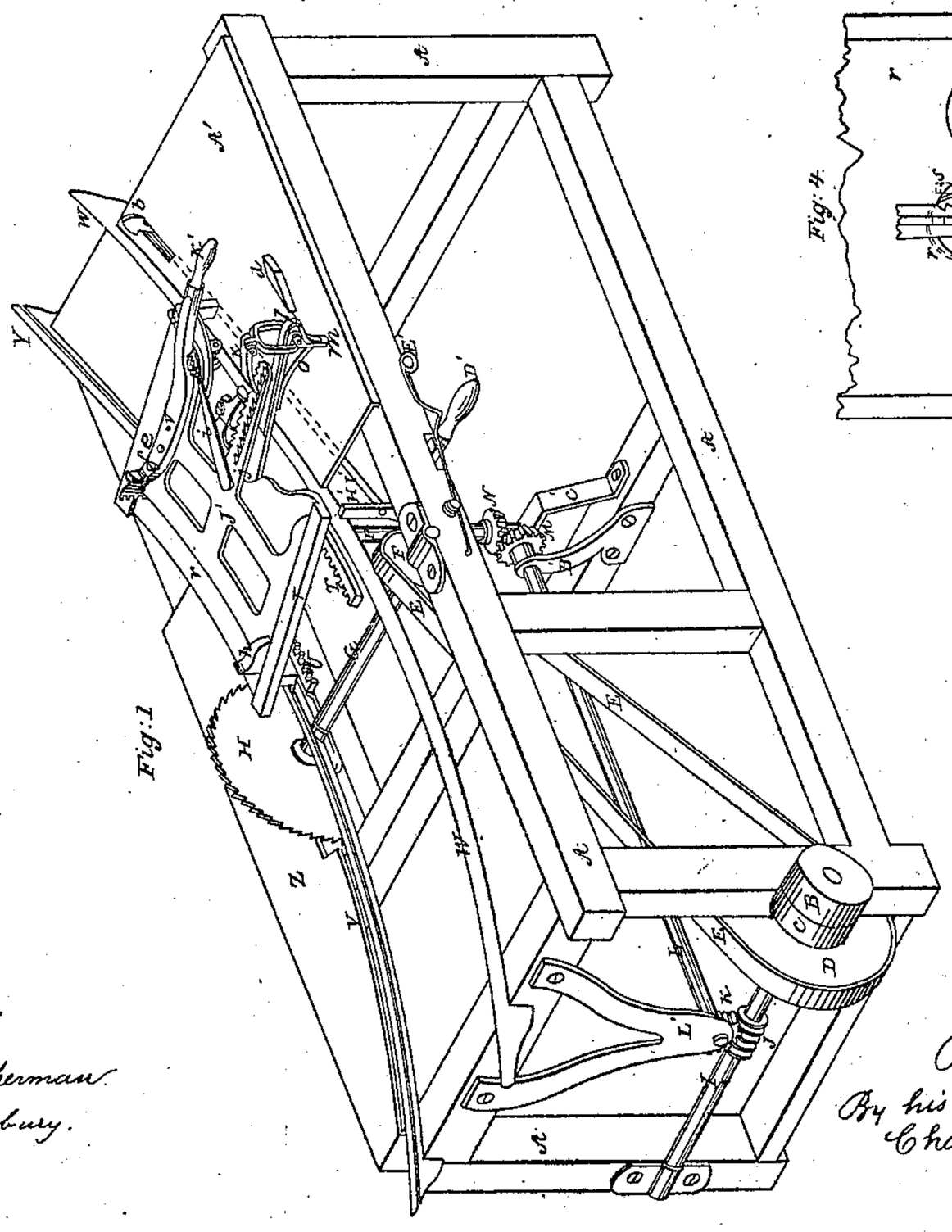

Fig: 4.

Witnesses

Thos. D. Clapperman.
E. R. Stansbury.

Inventor:

Peter Welch
By his Attorney
Chas. F. Stansbury

UNITED STATES PATENT OFFICE.

PETER WELCH, OF OSWEGO, NEW YORK.

IMPROVED STAVE-CUTTING MACHINE.

Specification forming part of Letters Patent No. **40,783**, dated December 1, 1863.

To all whom it may concern:

Be it known that I, PETER WELCH, of Oswego, in the State of New York, have invented a new and Improved Machine for Sawing Staves; and I do hereby declare the following to be a full and correct description of the same, reference being had to the accompanying drawings, in which—

Figure 1 is a perspective view of my improved stave-sawing machine complete. Fig. 2 is a top view of the same, with the carriage removed. Fig. 3 is a transverse section on the line *x x* of Fig. 1, and Fig. 4 is a detail view.

The same part is marked by the same letter wherever it occurs.

This invention relates to that class of machines in which the stave is sawed from the bolt of timber to the proper curve by a dished circular saw; and it consists in an improved automatic mode of moving the carriage back and forth longitudinally to and from the saw without reversing the motion of the driving-shaft, and in an improved arrangement of devices for holding the bolt on the carriage and feeding it transversely to the saw, all substantially as hereinafter more fully described.

To enable others to make and use my stave-sawing machine, I will proceed to describe its construction and operation, referring to the drawings, in which—

A marks the frame of the machine; B, the loose pulley, and C the fast pulley, which receives motion from any suitable prime mover. D is a band-wheel, driving by means of band E the pulley F on the transverse shaft G, to the farther end of which is attached the dished saw H, by which the staves are sawed from the bolt. The band-wheel D is attached to the main shaft I, which has on it the worm J, engaging with toothed pinion K on the end of the longitudinal shaft L. This shaft is supported at either end by the brackets L′ and B′, and carries at its inner end the beveled toothed wheel M, which meshes into a similar wheel, N, on the lower end of upright shaft P. The shaft P (see Figs. 2 and 3) has on its upper end two cog-wheels, R and S, the wheel R being below the wheel S and larger than that wheel, as is clearly shown in the figures. The wheel R is on a level with and in one position engages the curved rack T on the under side of the table V, while the wheel S, in another position of shaft P engages curved rack U, also on the under side of said carriage. These racks are parallel to one another, and are at such a distance that when rack T is engaged by the wheel R the rack U will be out of gear with the wheel S, and vice versa. The shaft P is loosely pivoted on the bracket C′, so as to have free motion in any direction. Its upper end is held by the vibrating arm F′, (shown in dotted lines in Fig. 2,) which is pivoted to the under side of the table A′. It passes through a slot in the end of the bent lever D′, which has its fulcrum at *e′* on the curved cross-framing G′, as seen in Fig. 2. The handle of this lever projects beyond the right side of the machine, and it is held in either its forward or rearward position by the V-shaped spring E′, as clearly shown in Fig. 1. The movements of this lever control those of the shaft P, and throw the wheels R and S, respectively, into and out of gear with their respective racks T and U, alternately. When the lever D′ is moved toward the front or power end of the machine, the wheel R is thrown into gear with rack T, and when said lever is moved toward the opposite end of the machine the wheel S is thrown into gear with rack U. Attached to lever D′ is a curved arm, H′, the upper end of which projects above the level of the rails W and Y, on which the carriage V moves. From arm H′ another arm, I′, runs back in a curved direction under the table to the slot in the rear of the table, through which the pin *b*, attached to arm I′, projects up above the level of the rail W. By moving pin *b* back and forth, in its slot, lever D′ is moved back and forth and the wheels R and S are thrown into and out of gear with their respective racks. The parallel curved rails W and Y support and guide the carriage V, which moves upon them on suitable wheels, *w′*. (See Fig. 3.) To the under side of carriage V the curved racks T and U are attached. They are parallel to each other, but placed at different levels, so as to engage the wheels R and S, respectively. A stop, *t*, on the rear end of the carriage is so placed as to come in contact with the pin *b* when the carriage is near the end of its rearward course, and thus draw back the lever D′ and throw the proper rack and pinion into gear to effect the return of the carriage to the front or power end of the machine. The

spring-catch *c* on the table, Fig. 2, controls the motion of dog *n* by acting against a downward-projecting portion, *s*, of its lower and inner arm. (See Fig. 4.) The stop *d* on the table A′ is adjustable by means of a screw and nut, (shown in dotted lines in Fig. 2,) and controls the movements of the dog *k* by acting on the lower arm, *m*, of said dog. A slide, J′, moves in ways on the top of the carriage V at right angles to the movement of the carriage. It has an arm, *j*, projecting backward, which has a rack on it upper surface, and also one on its side, as seen in Figs. 1 and 4. The upper rack is controlled by the pawl or dog *k*, and the side rack by the dog *n*, which is pivoted to carriage V at *p*, and acted on by spring *r*. The pawl *k* is attached to an arm projecting from the carriage V underneath the arm *j* of the slide, as seen in Fig. 3, and it is held in an upright position by two springs, *l* and *o*, as shown. The lower arm, *m*, of this pawl is operated by the adjustable stop *d*, which retracts it after the carriage has passed the saw, so that when released it will move the slide J′ one tooth nearer to the saw. Attached to one corner of the slide is the fixed dog *h*, Fig. 1, and on its opposite end is fixed the compound dog or lever *g*, which is pivoted to the slide at *f*, and to the lever K′ at *e*. The lever K′ is pivoted to the slide at *v*, and is held in any given position by the spring-rack *i*. The dogs *g* and *h* hold the bolt of timber from which the staves are to be sawed firmly between them.

The operation is as follows: Power being applied to the driving-pulley C, the saw is set in motion by the band E, which drives the pulley F on the saw-shaft. The worm J imparts motion to the pinion K on the end of shaft L, which, by means of bevel cog-wheels M and N, causes the upright shaft P to revolve, together with the two gear-wheels R S, which are attached to its upper end. By means of the lever D′ the smaller wheel, S, is thrown into gear with the rack U, and the carriage V, on which the bolt to be sawed is placed, moved with the proper speed up to and past the saw H, which cuts off a stave from the block. When the carriage gets to the end of its course, the stop *t* on its rear end comes in contact with the upper end of the curved arm H′ and forces the lever D′ forward, so as to throw the larger wheel, R, into gear with rack T, which causes the carriage to return rapidly to its starting-point. Both motions of the carriage are thus effected without reversing the motion of the shaft P. When the carriage has returned to its starting-point, the stop *t* comes into contact with the pin *b*, and again throws the wheel S into gear with the rack U, which carries the carriage again forward past the saw. The bolt of timber from which the staves are to be sawed is placed on the slide J′, where it is firmly held between the dogs *g* and *h*, the dog *h* being securely held in the bolt by means of the rack *i*, which fixes the position of the lever K′. The slide J′ is held firmly in position on the carriage V by means of the two pawls *k* and *n*, the first preventing it from moving backward, and the latter from moving forward. The teeth of the upper rack on arm *j* are placed at a distance apart equal to the thickness it is desired to give to the staves. The dogs or pawls *k* and *n* are controlled, respectively, by the stop *d* on the table A′ and the spring-catch *c*. (See Fig. 2.) As the carriage V is moving back to clear the saw, the lower end, *s*, of dog *n*, (see Fig. 4,) comes in contact with the spring-catch *c*, and the pawl *n* is thrown out of the rack on the side of arm *j*. This leaves the slide free to move toward the saw. The pawl *k* is then retracted the distance of one tooth by its lower end, *m*, coming in contact with stop *d*, and, when released, moves the slide toward the saw a distance equal to the thickness of a stave. As soon as that is effected, the side dog, *n*, impelled by its spring *r*, engages with a tooth of the side rack, and prevents the further advance of the slide toward the saw. It also cooperates with pawl *k* in holding the slide in place, as before described. After the block of timber has been sawed into the whole number of staves it will yield, the pawl *k* is thrown out of its rack, and the slide J′ pulled back by hand, the remnant of the timber removed, and a fresh block inserted for a repetition of the operation.

Having thus fully described my invention, what I claim therein as new, and desire to secure by Letters Patent, is—

1. The combination of the lever D′, shaft P, wheels R and S, and racks T and U, substantially in the manner and for the purpose described.

2. The combination of the double-racked arm *j* with the pawls *k* and *n*, arranged and operating substantially as specified.

3. The combination and arrangement for conjoint operation of the pawls *k* and *n*, the stop *d*, and the spring catch *c*, substantially in the manner and for the purpose described.

The above specification of my said invention signed and witnessed at Chicago, Illinois, this 13th day of October, A. D. 1863.

PETER WELCH.

Witnesses:

J. STANFORD,

ANSON B. JENKS.