

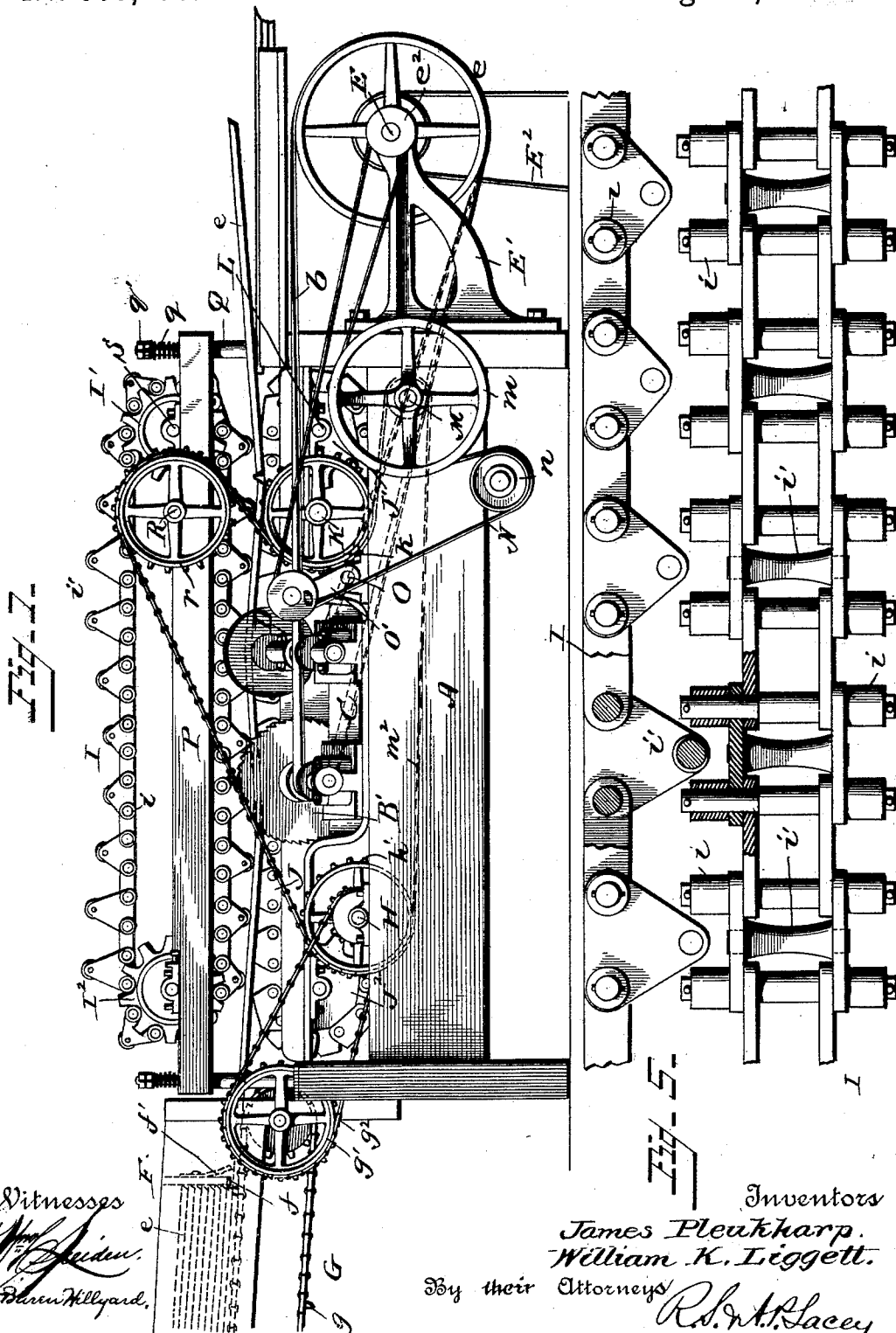
(No Model.)

4 Sheets—Sheet 1.

J. PLEUKHARP & W. K. LIGGETT.
STAVE JOINTING MACHINE.

No. 503,493.

Patented Aug. 15, 1893.



Witnesses
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Van Buren Willard.

Inventors
James Pleukharp.
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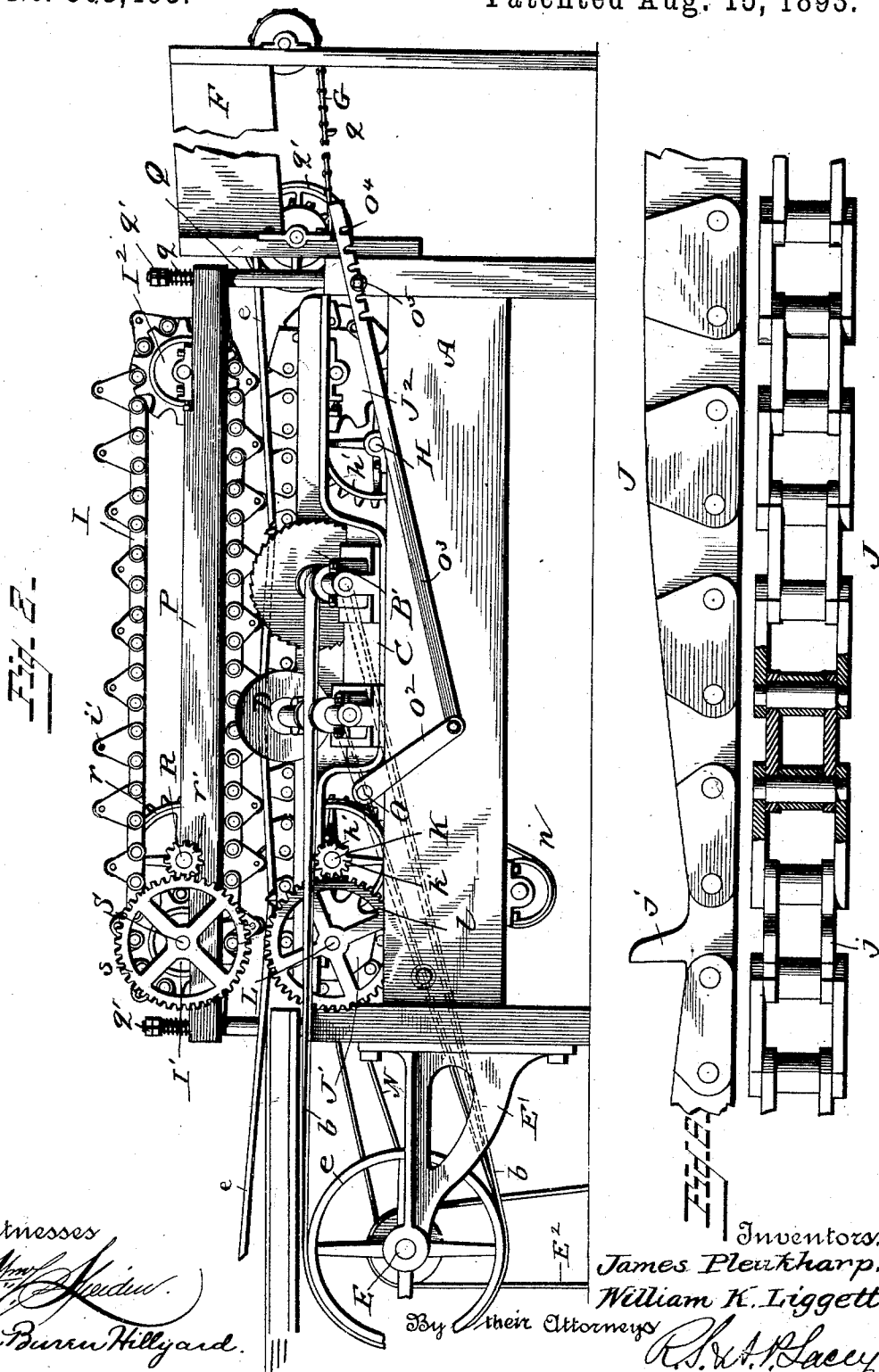
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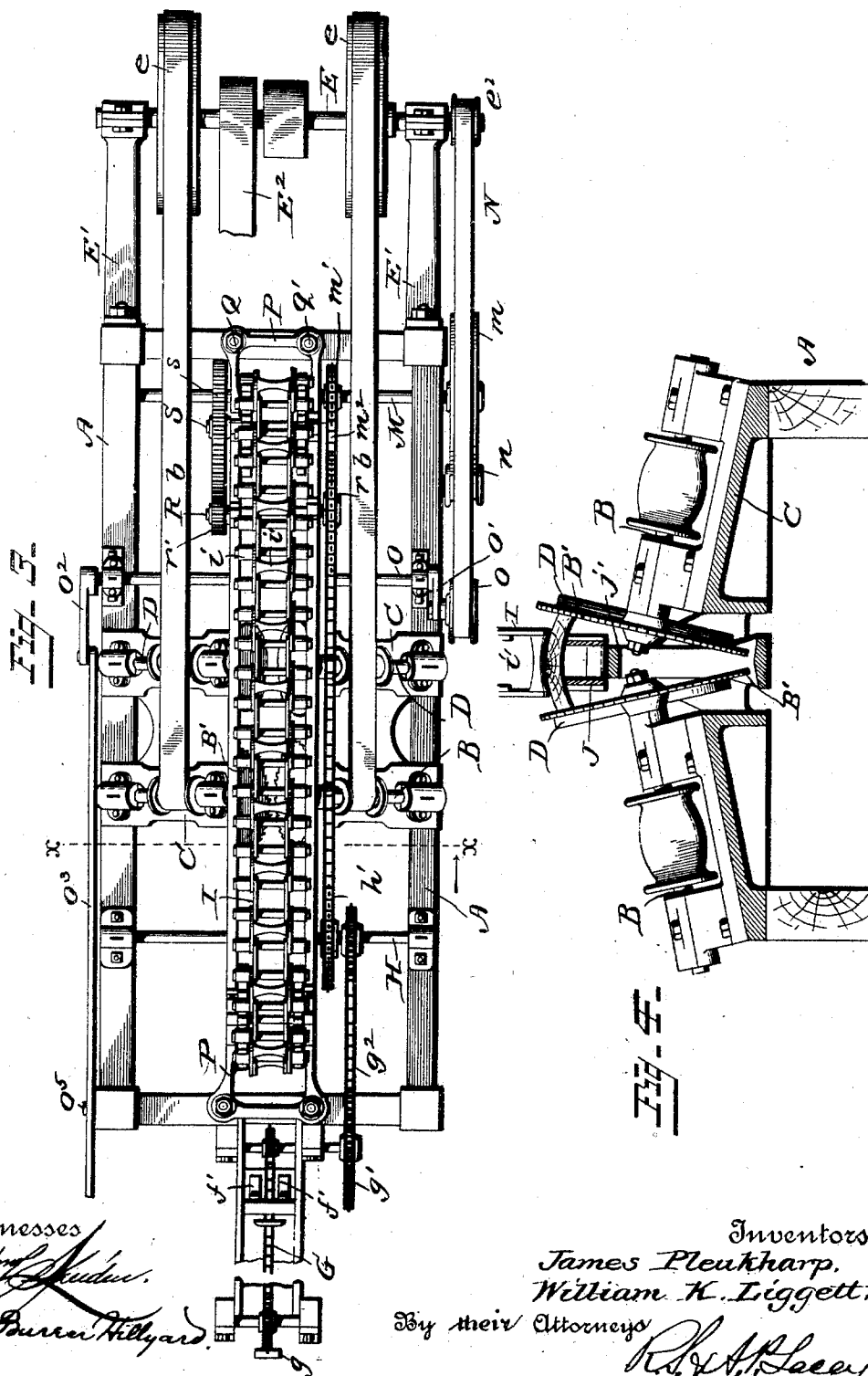
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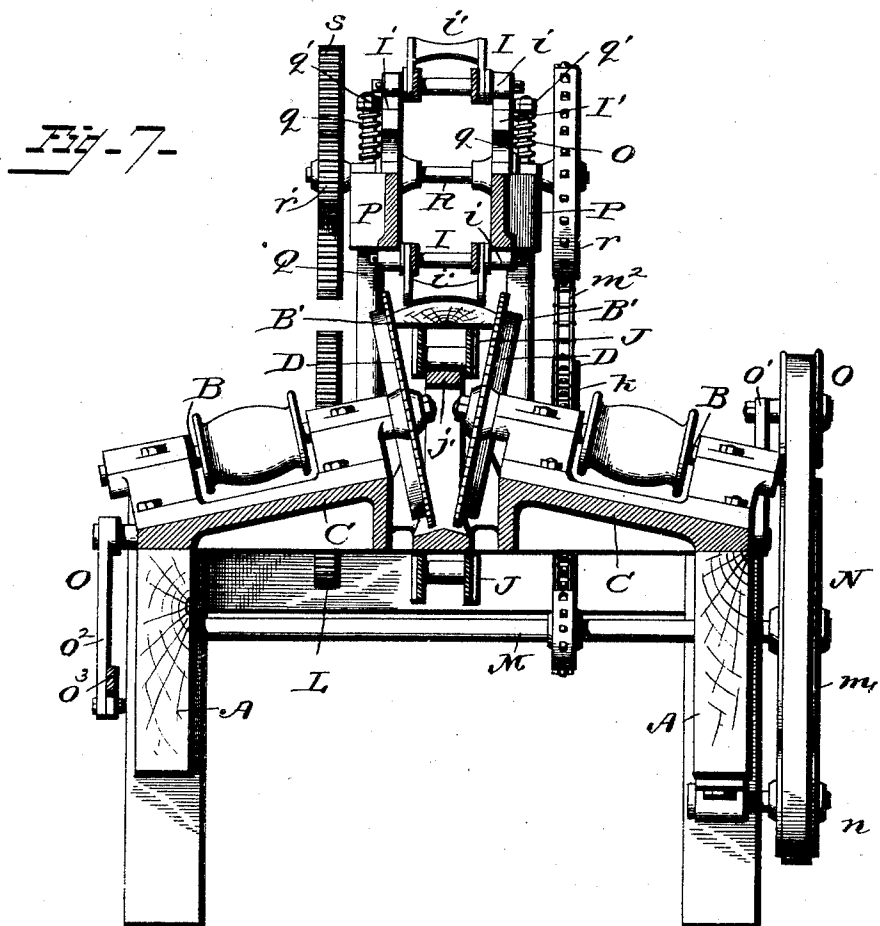
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No. 503,493.

Patented Aug. 15, 1893.



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UNITED STATES PATENT OFFICE.

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ASSIGNORS TO THE PLEUKHARP BARREL MACHINE COMPANY.

STAVE-JOINTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 503,493, dated August 15, 1893.

Application filed January 20, 1892. Serial No. 418,701. (No model.)

To all whom it may concern:

Be it known that we, JAMES PLEUKHARP and WILLIAM K. LIGGETT, citizens of the United States, residing at Columbus, in the county of Franklin, and State of Ohio, have invented certain new and useful Improvements in Stave-Jointing Machines; 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 stave jointing machines; specially designed for jointing the standard staves set forth in Patent No. 451,133 and as an improvement on this class of machinery; and aims to secure a continuous feed of the blanks which form the elements of the barrel, between the saws or cutters, and at the same time give to the said blanks the proper shape which they would assume when set up and bound together to form the barrel.

The improvement consists of the novel features and the peculiar construction and combination of the parts which will be herein-after more fully described and claimed and which are shown in the accompanying drawings, in which—

Figure 1 is a side elevation of a stave jointing machine embodying our invention the forward portion of the hopper and feeder being broken away. Fig. 2 is a reverse side view of the machine the middle portion of the hopper and feeder being broken away. Fig. 3 is a top plan view of the machine, parts being broken away for the sake of clearness. Fig. 4 is a cross section of the upper portion of the machine on the line X—X of Fig. 3 looking in the direction of the arrow. Fig. 5 shows respectively a side elevation and top plan view of a portion of the upper former and carrier, parts being broken away to show the relative arrangement of the elements. Fig. 6 shows respectively a side elevation and top plan view of a portion of the lower former and carrier, parts being broken away in the plan view to show the relative arrangement of the links and coupling pins. Fig. 7 is a cross section of the entire machine on the line X—X of Fig. 3 looking in the direction of the arrow showing the preferred form of stave which is

straight on the inner face between its edges, in place between the formers.

The frame A which may be of any approved form of construction, is preferably composed of corner posts and sides and end bars in the usual manner.

The bed plate C for supporting the jointing devices is mounted on the side bars of the frame and is provided with suitable bearings in which are mounted the saw arbors B and the smoothing cutters D, set to make the proper angles on the staves.

The shaft E provided with pulleys *e* is journaled in brackets E' at one end of the frame A and receives motion from a suitable source of power by means of the endless belt E². The saws B' are driven by means of the endless belts *b b* which pass over suitable pulleys on the saw arbors and over the pulleys *e* on the shaft E.

The smoothing cutters D of any approved form of construction, are provided to remove any splinters or other roughness on the edges of the staves that might be occasioned by the saws.

The hopper F at the receiving end of the machine is suitably constructed to receive the pile of blanks which have already been everted, and has a delivery slot *f* at its lower end through which the blanks are carried to the jointing devices. The spring *f'*—it is preferred to provide two, one on each side of the feeder as shown in Fig. 3—is secured to the end of the hopper and serves to prevent more than one stave at a time being carried forward to the jointing devices. The slot *f* being wide the spring *f'* serves to hold the stave blank down close against the feeder and prevents any loose flopping movement thereof. The feeder is an endless chain G which passes around suitable pulleys or sprocket wheels at the ends of the hopper and which is provided at proper intervals with projection *g* the purpose of which is to engage with the end of the blank at the bottom of the pile and carry the same forward to the traveling formers. One of the shafts supporting the carrier G is extended and provided with sprocket wheel *g'* which receives its motion from shaft H by means of the sprocket chain

g^2 which passes around sprocket wheel g' and a corresponding sprocket wheel on the shaft H.

The traveling formers I and J are constructed to give the proper shape to the blanks both in length and cross sectional area, which shape corresponds to that which the stave will assume when it is in place and forms an element of the completed barrel. The sole purpose of the formers is to give the proper shape to the blanks during the process of jointing and that the latter may be continuous the said formers are made to travel. Inasmuch as one former is the complement of the other and the blanks are firmly held between them, the said formers must travel in the same direction and at a uniform speed.

For simplicity and economy of construction and operation the formers are constructed after the fashion of endless chains and are composed of a series of links which are coupled together. The lower former, shown most clearly in Fig. 6, is composed of a series of links which are connected by cross bars or pins upon which are mounted rollers to relieve friction. Each chain is composed of a series of formers. The link connecting the formers of the lower chain is provided with a projection j which extends up and forms an index to insure the proper position of the stave blanks between the traveling formers and assist the formers in carrying the said blanks forward in a positive manner. The links of the lower former increase in height from the ends to a medial point between the said ends giving the former a convex outline in side elevation. The links are so constructed that the curved outline is continuous. The bed j' supports the upper portion of the former J against the pressure of the former I, and is equal in width to the length of the rollers between the links, so that the latter will embrace the edges of the said bed and maintain the said former in a fixed relative position. The endless chain former J is supported at its ends by pulleys J' and J^2 , the latter being adjustable to take up wear and keep the said chain taut. The transverse shafts K and L are geared together at one end by the pinion k' on shaft K meshing with the gear wheel l on the shaft L. The pulley J' is mounted on shaft L. The shaft K is provided on its opposite end with sprocket wheel k which is driven from shaft M by means of the sprocket chain m^2 which passes around the sprocket wheel m' on shaft M and sprocket wheel k . The shaft M receives motion from shaft E through endless belt N which passes over pulley m and around pulley e^2 on shaft E. This belt N passes around idler n and over pulley o on the crank arm o' at one end of the shaft O, the other end of the said shaft O being provided with a corresponding arm o^2 to which is attached lever o^3 , the latter having notches o^4 which engage with stop o^5 and hold the said lever o^3 and pulley o in the desired position so as to maintain the

proper degree of tension on the said belt N. The upper chain I is composed of a series of connected formers, the links of which gradually diminish in height from the ends to the middle of the said formers proportionate to the increase in height of the corresponding links of the lower former, so as to obtain a uniform space between the complementary formers for the reception of the blanks. The cross bars or pins which couple the links of the former I are extended and the extended ends are provided with rollers i which engage with the parts of the pulleys I' and I^2 which support the chain former I at its ends. The cross pieces i' between the members of a link of the chain and arranged at intervals in the length of the said chain, are concaved in the center and flare gradually toward their ends, the purpose being to conform to the curvature of the outer surface of the stave blanks in cross section. See Figs. 4 and 7. The frame P which sustains the upward pressure on the lower portion of the former I by reason of the rollers i traveling on the lower edge of the said frame, and which supports the said former and the pulleys I' and I^2 , is mounted at its ends upon the reduced portions of standards Q which project up from the frame A. The shoulders at the base of the reduced portions of said standards limit the downward movement of the said frame P, the said frame being adapted to move upward to allow for any variation in the thickness of the stave blanks against the tension of the springs q which are confined between the upper side of frame P and nuts q' on the upper ends of the said standards Q. The nuts q' are adjustable to regulate the tension on the said springs q . The shaft R having sprocket wheel r on one end receives motion from the said belt or sprocket chain m^2 and its other end is provided with pinion r' which is in mesh with the gear wheels s on the shaft S on which the pulley I' is mounted. The frame P is open and the links of former I are constructed to come between the open sides thereof, Fig. 7. The rollers i are preferably flanged at their inner ends as shown most clearly in Fig. 7, and these flanges engage with the inner faces of the sides of the frame P and hold the said former I in a fixed relative position. The sprocket chain m^2 passes around the sprocket wheels k and r and through the mechanism hereinbefore described imparts motion to the two formers I and J, and passes around sprocket wheel k' on shaft H and through the instrumentality of the aforesaid mechanism actuates the feeder G. The parts being set in motion in the manner aforesaid and the stave blanks being placed in the hopper are fed one at a time between the formers I and J by means of which they are given the proper shape and carried forward between the saws B and the smoothing cutters D. The blanks are carried forward one after the other end to end except for the projection j which comes between the contigu-

ous ends of two stave blanks. The operation is continuous and practically automatic because the staves are automatically fed from the hopper to the formers, are shaped by the latter and carried by them to the jointing cutters and delivered by the said formers at the rear end of the machine after the process of jointing.

10 The machine is equally well adapted for staves whether the inner face is straight or curved between the edges.

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

15 1. In a stave jointing machine the combination of complementary endless chain formers, each former of the lower chain having a continuous convex outline, and having a projection *j*, the links composing the upper chain
20 formers being connected by pins which have their ends projected beyond the sides of the links, rollers mounted on the projecting ends of the said pins, and beds to support the opposing portions of the chain formers against
25 the tension of the blanks, the upper bed having portions to embrace the sides of the up-

per chain former and receive the stress of the said rollers, substantially as described.

2. In a stave jointing machine the combination of endless formers, and jointing cutters, 30 of a bed *j'* located between the side bars of the links comprising the lower former, and a bed comprising side bars *P* to embrace the upper former, substantially as described.

3. In a stave jointing machine the combination with the jointing cutters, of endless chain 35 formers to shape the stave blanks and carry them between the jointing cutters, a frame carrying one of the formers, standards for supporting the said frame and provided with 40 stops to limit the movement of the said frame in one direction, springs to hold the frame yieldingly against the said stops, and nuts for adjusting the tension of the said springs, substantially as set forth.

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

JAMES PLEUKHARP.
WILLIAM K. LIGGETT.

Witnesses:

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F. J. DAWSON.