

No. 607,219.

Patented July 12, 1898.

R. COLLEN.

MACHINERY FOR MANUFACTURING CASKS OR BARRELS.

(Application filed Dec. 24, 1897.)

(No Model.)

3 Sheets—Sheet 1.

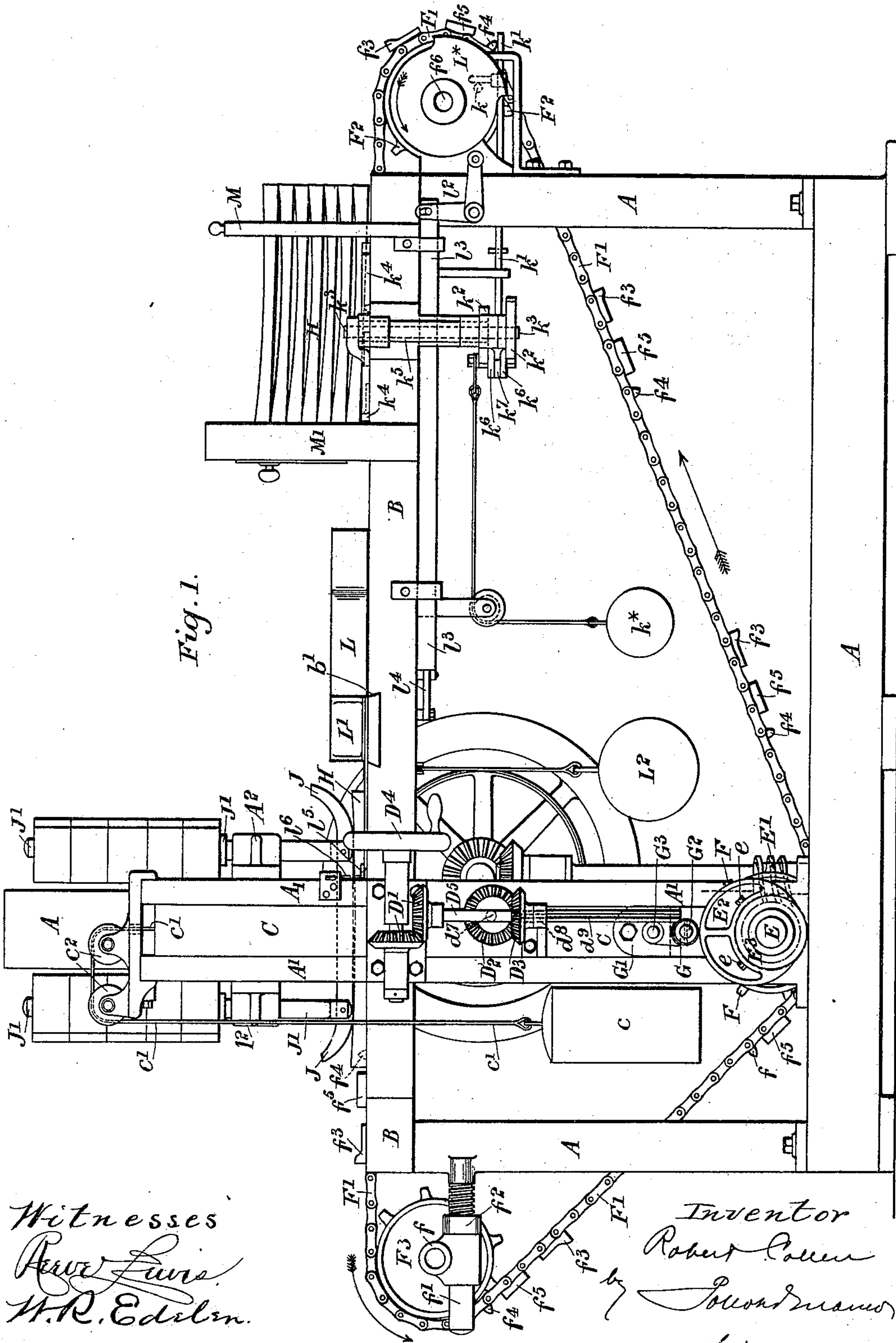


Fig. 1.

Witnesses
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 by *Edward Dumas*
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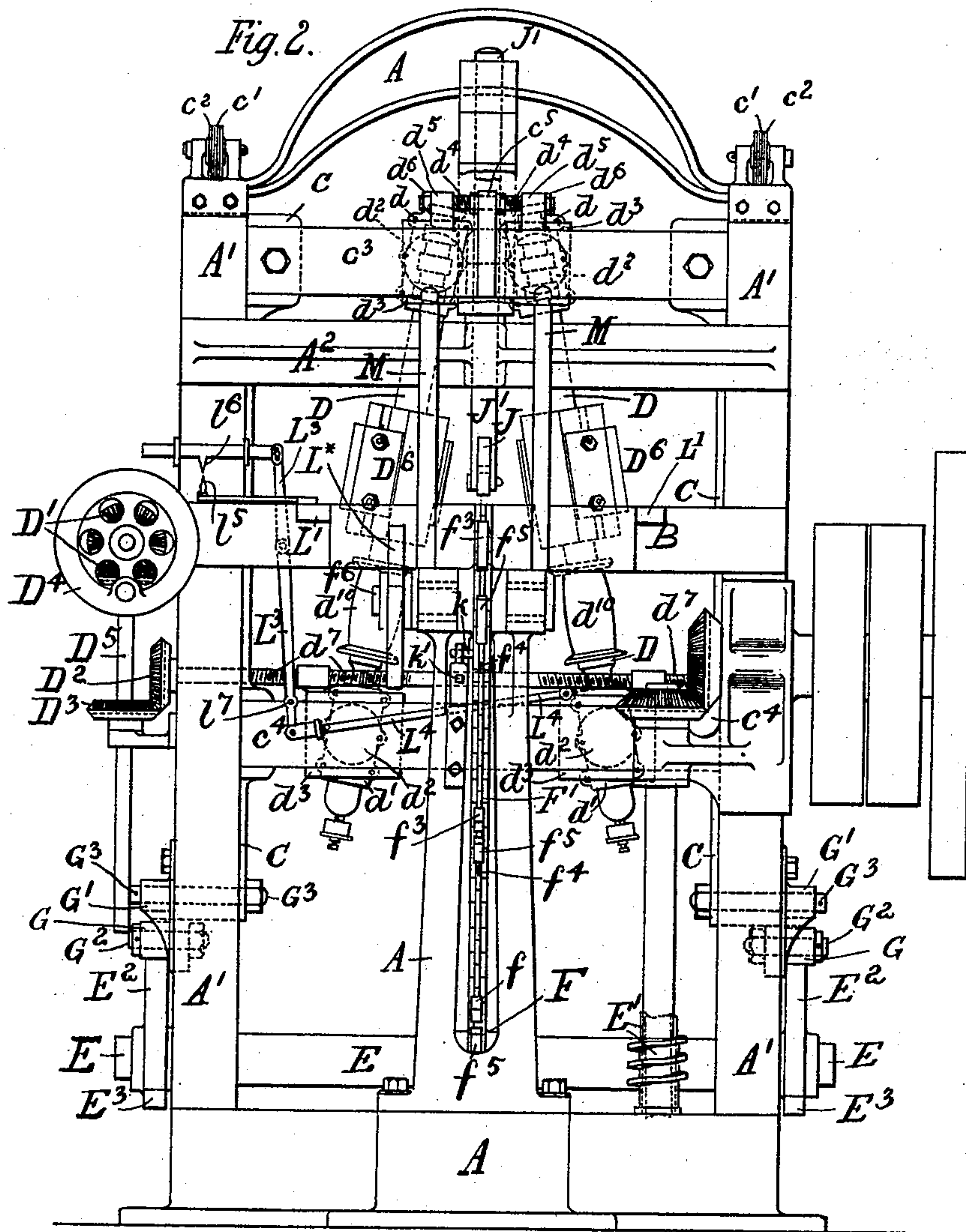
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3 Sheets—Sheet 2.



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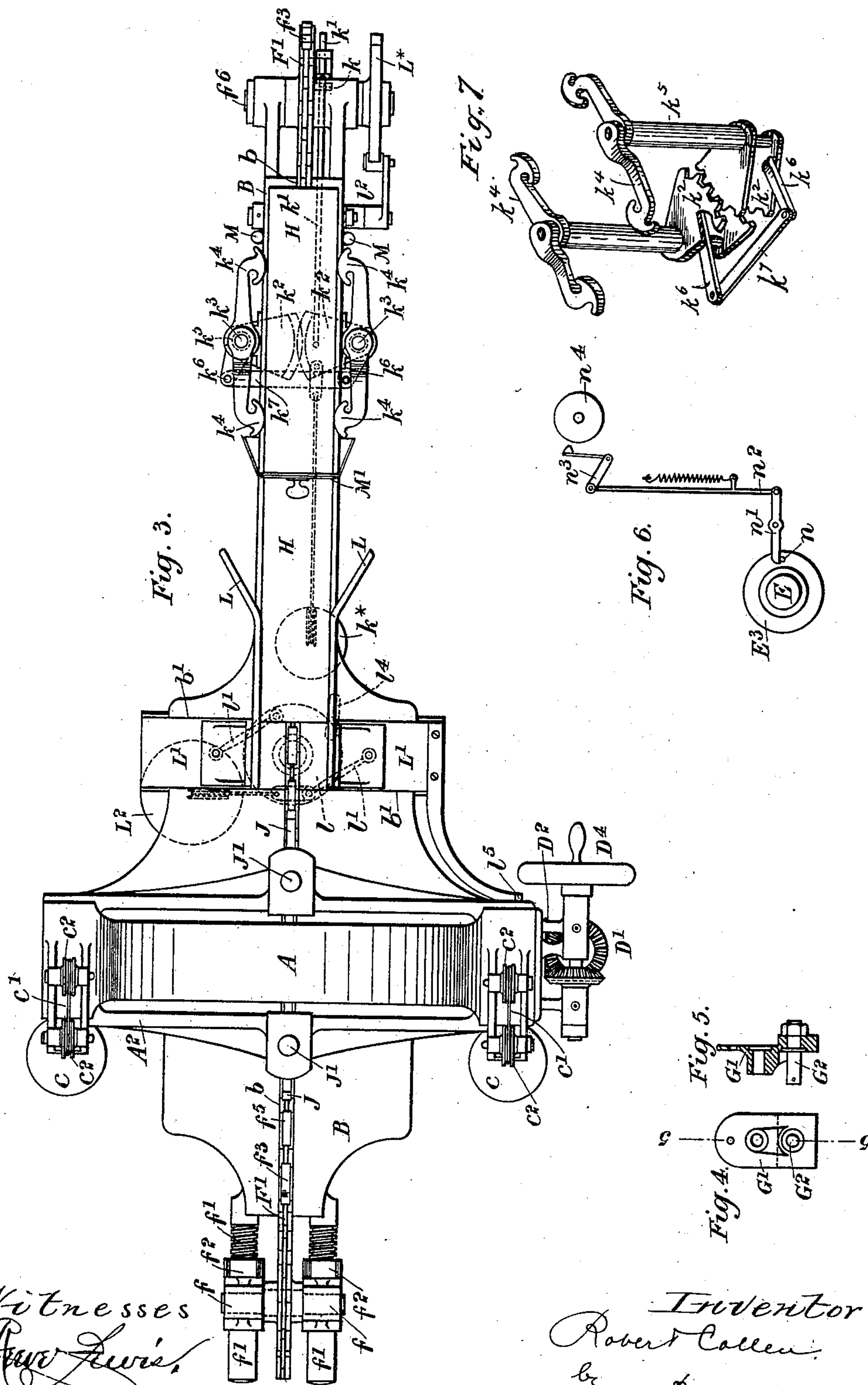
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(No Model.)

3 Sheets—Sheet 3.



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UNITED STATES PATENT OFFICE.

ROBERT COLLEN, OF LONDON, ENGLAND.

MACHINERY FOR MANUFACTURING CASKS OR BARRELS.

SPECIFICATION forming part of Letters Patent No. 607,219, dated July 12, 1898.

Application filed December 24, 1897. Serial No. 663,365. (No model.) Patented in England July 28, 1896, No. 16,670.

To all whom it may concern:

Be it known that I, ROBERT COLLEN, engineer, a subject of the Queen of Great Britain and Ireland, residing at 30 Pigott street, Limehouse, London, England, have invented certain Improvements in Machinery for Manufacturing Casks or Barrels, (for which I have, in conjunction with George Mills, deceased, late of Castor street, Poplar, in the said city of London, obtained a patent in Great Britain, No. 16,670, dated July 28, 1896,) of which the following is a specification.

This invention has for its object to provide a machine for preparing staves for use in the manufacture of casks or barrels of various sizes and shapes and whereby saving in time, labor, and material is effected and more perfect junctions of the parts of the cask is obtained than is the case with machinery hitherto employed for the purpose.

According to this invention the blanks from which the staves are formed, after having all been cut to the same length, are passed through a "jointer" or "jointing-machine," wherein their edges are shaped so that when the staves are put together to form a cask or barrel these said edges will make perfect joints, and the cask or barrel may be of any predetermined form, every stave having approximately the same quantity of wood removed no matter what the initial width may be.

The apparatus herein described is applicable for use in the manufacture of vessels or bodies other than those ordinarily known as "casks"—for example, tubs, vats, tubes, or the like—and I wish it to be understood that whenever in this specification and claims the context admits of such an interpretation the word "cask" or "casks" is intended to include all such structures.

The invention will be best understood by reference to the accompanying drawings, in which—

Figures 1, 2, and 3 are respectively a side elevation, a front end elevation, and a plan, of the improved jointer or jointing-machine, certain parts of the mechanism being omitted from Fig. 2 for the sake of clearness. Fig. 4 is an elevation, and Fig. 5 a vertical section on the line 5 5 of Fig. 4, of a detached portion of the jointer; and Fig. 6 is a diagrammatic view of signaling mechanism for

use in connection with the jointer. Fig. 7 is a perspective view of the centering-arms and their operating connections detached from the supporting-frame and other parts of the machine.

Like letters of reference indicate like parts throughout the several figures of the drawings.

The jointer, as shown in Figs. 1, 2, and 3, comprises a fixed frame A A', to which is screwed a suitable bed or work-table B, and in the vertical portion A' of which frame is guided a movable frame C, carrying two inclined cutter-shafts D. The movable frame C is counterweighted by weights c, attached to it by wire cords, chains, or equivalent c', passing over guide-pulleys c², or springs may be provided instead of the counterweights. The cutter-shafts D are journaled in upper bearings d and lower bearings d', pivoted by means of trunnions d² (shown in dotted lines in Fig. 2) in blocks d³, capable of being adjusted nearer together or farther from each other in the horizontal members c³ c⁴ of the movable frame C. The position of the upper blocks d³ is altered only when the machine is to be adjusted for preparing staves for casks or barrels of different diameters. The position of the lower blocks d³ is generally altered for each stave. The blocks d³ supporting the upper bearings d of the cutter-shafts may be connected together by a right and left handed screw d⁴, which is journaled in a bracket c⁵, secured to the before-mentioned horizontal member c³, and engages with nuts d⁵, secured to the said bearings, lock-nuts d⁶ being provided on the screw d⁴ for securing the blocks in position after adjustment. The blocks d³ appertaining to the lower bearings d' of the cutter-shafts D may be connected together by a right and left handed screw shaft d⁷, pivoted in the movable frame C and operated through bevel-gearing D' D² D³ by means of a hand-wheel or equivalent D⁴, which, like the bevel-wheels D', is mounted on the fixed vertical frame A', a suitable sliding connection—for example, a key or feather d⁸ (shown in dotted lines in Fig. 1) and long keyway or groove d⁹—being provided between the gear-wheel D³ and the shaft D⁵ to admit of the movable frame C, together with the screw-shaft d⁷ and wheels D²

D^3 , ascending and descending, while the bevel-wheels D' , hand-wheel D^4 , and shaft D^5 remain stationary.

The upper ends of the cutter-shafts D are within the bearings d , and these bearings are ribbed and grooved, as indicated in dotted lines in Fig. 2, so as to prevent any endwise movement of the shafts D in the said bearings. The shafts D are, however, free to move longitudinally in the lower bearings d' , this being necessary when the lower ends of the shafts are moved nearer together or farther apart. On the cutter-shafts D are secured flanged pulleys d^{10} , and they are rotated through the medium of belts (not shown in the drawings) passed around these pulleys.

At the lower part of the vertical frame A' is mounted a shaft E , which may be rotated by worm or equivalent gearing E' , and upon this shaft are mounted two cams E^2 for raising and lowering or allowing of the descent of the movable frame C and a sprocket or chain wheel F , which operates an endless chain F' , passing over two rollers or wheels F^2 F^3 at either end of the bed or work-table B . The roller F^3 is adjustable, so as to admit of the chain being slackened or tightened, and for this purpose the bearings f of the roller may be movable on fixed bars or guides f' , on which are threaded nuts f^2 , by turning which latter the necessary tensioning of the chain may be effected. The cams E^2 may be of various shapes, according to the form to be given to the staves and to the casks or vessels formed of said staves, and they are detachably and adjustably mounted on the shaft E —for example, by means of bosses E^3 , fixed on the shaft, and bolts e , screwing into the bosses and passing through slots in the cams E , so as to enable the latter to be readily turned slightly backward or forward or removed for the substitution of other cams when differently-shaped staves are to be produced. The cams E^2 may operate on anti-friction-rollers G , mounted directly on the movable frame C ; but to extend the scope of adjustability of the machine and enable a number of different shapes and sizes of staves greater than would otherwise be possible to be produced in the same machine the said anti-friction-rollers are preferably arranged so that their position on the frame may be adjusted or so that they may be removed and others (of the same or a different size) substituted for them either in the same or a different position. One way of effecting this is, as shown in the drawings, (particularly Figs. 4 and 5,) to detachably secure plates or brackets G' to the lower end of the movable frame C and mount the anti-friction-rollers G either on the pins G^2 , fixed in these plates, or remove the said plates and mount the anti-friction-rollers on the pins G^3 , secured in the movable frame C , the said rollers occupying different positions and the frame being caused to operate between different limits in these two arrangements.

The before-mentioned chain F' works in a groove or slot b in the center of the work-table B , so as to secure it against lateral displacement, and at its outer side, which is adapted to work level with or not project beyond the face of the table B , it is provided with dogs or projections f^3 and blades or spikes f^4 , the former for engaging with the back ends of the staves or stave-blanks H for pushing said staves forward through the machine and the latter for engaging or sticking into the staves at or near their front ends to prevent any lateral displacement of the said staves at these parts. The pressure necessary for inserting the blades or spikes into the staves is provided by an adjustable pressure bar or foot J , pivoted to the lower ends of two vertical weighted bars J' , which are free to slide in guides A^2 on the vertical frame A' . The chain F' , besides having the projections f^3 and blades f^4 , is also provided with projections f^5 , which serve to prevent the staves or blanks H from descending onto the blades f^4 before the back ends of the said staves are engaged by the projections f^3 .

The chain-wheel F^2 at the front end of the machine—that is to say, the end at or near which the stave-blanks are inserted—is provided with a crank-pin k , which, through suitable connections—such, for example, as a longitudinally-movable rod k' —two intermeshing toothed sectors k^2 (one connected to the rod k') and two vertical shafts k^3 intermittently moves two centering-arms k^4 outward from each other on the top of the work-table B , this arrangement being such that when the centering-arms are afterward swung toward each other under the influence of a spring or weight k^5 the blank H then between them is automatically brought to the center of the work-table and in proper position for being moved up to the cutters D^6 on the cutter-shafts D . The two centering-arms k^4 are geared or connected together by the sectors k^2 , so that they always work in unison. Instead of employing only two centering-arms k^4 , as last described, I prefer to use four such arms, as shown in the drawings, so as to operate on opposite ends of the blank, in which arrangement the arms may be mounted two on tubular shafts k^5 and two on the solid shafts k^3 , which pass through the said tubular shafts, the two tubular shafts and the two solid shafts being respectively geared together by sectors k^2 , and one of the solid-shaft sectors and one of the tubular-shaft sectors being operatively connected together by lever-arms k^6 and a link k^7 .

Between the centering-arms k^4 and the vertical frame A' are mounted two guides or cheeks L , secured to plates L' , arranged so as to move transversely in guiding-grooves b' in the work-table B on either side of the center of said work-table. These two guides L are under the control of a spring or weight L^2 , which, through a crank-disk l , to which it is connected, and two links l' , connecting the

crank-disk l with the plates L' , as indicated in dotted lines in Fig. 3, tends to move the said guides together. At proper intervals the guides L are moved farther apart to allow the
 5 stave-blanks to be inserted between them, this operation being effected by a cam L^* , secured on the before-mentioned shaft F^6 , the said cam being arranged to operate the crank-disk l through a bell-crank lever l^2 , connecting-rod
 10 l^3 , and link l^4 .

To one of the guides L or plates L' is connected an index or pointer l^5 , adapted to operate in conjunction with another index or pointer l^6 , connected through a lever L^3 and
 15 link L^4 to one of the before-mentioned blocks d^3 , supporting the cutter-shaft bearings d' . These indices or pointers l^5 l^6 enable the operator by means of the before-mentioned hand-wheel D^4 to adjust the angle or inclination
 20 of the cutter-shafts D , so that the cutters D^6 may always remove approximately the same quantity of wood whatever the initial width of the blank may be.

If the stave-blanks were all of exactly the same width, the two pointers l^5 l^6 would always come into correct register with each other when the plates L were pressing against the edges of the said blanks, and it would then not be necessary to operate the hand-wheel
 30 D^4 . As, however, the stave-blanks generally vary in width and the angles or bevels to be formed on the edges of each stave require to be varied according to the width of the said stave, the position which the pointer l^5
 35 is automatically caused to take up relatively to that occupied by the pointer l^6 serves to readily indicate the direction in which the cutter-shafts should be adjusted so that the desired bevel or angle may be formed on the
 40 stave.

Assuming, for example, that one of the staves is wider than that immediately preceding it, this stave when pressed between the plates L will cause the pointer l^5 to take
 45 up a position which in Fig. 2 would be to the left of the pointer l^6 , and the attendant will then know that he has to turn the wheel D^4 in the particular direction necessary to bring the two pointers into register, by which
 50 operation the two cutter-shafts D are moved outward from each other and the cutters D^6 thereby caused to take up the positions necessary for giving the desired angles to the edges of the staves. When a stave-blank is
 55 narrower than that which immediately precedes it, the pointer l^5 is caused to take up a position which in Fig. 2 would be to the right of the pointer l^6 , and consequently the hand-wheel D^4 has to be rotated in a direction the
 60 reverse of that required in the example last previously cited, whereby the two cutter-shafts are moved closer together. The lever L^3 is provided with two or more holes l^7 or a slot, so as to admit of the link L^4 being con-
 65 nected to it at different parts, and thereby provide for the mechanism being adjusted

for efficiently gaging staves for forming casks or vessels of different sizes.

In front of the centering-arms k^4 a hopper is, or two guide-bars M are, provided for re-
 70 ceiving a stack or pile of stave-blanks H , and between the centering-arms and the before-mentioned cheeks L a preferably adjustable arch or guide M' is provided for allowing only
 75 one blank at a time—viz., the lowermost one—to be removed from the stack and fed through the machine by means of the chain F' . For the sake of clearness the stave-blanks H and arch or guide M' are omitted from Fig. 2.

To indicate to the machine-attendant when
 80 he is free to adjust the position of the cutters D^6 , (by means of the before-mentioned hand-wheel D^4 ,) a bell or other automatically-operating signaling device is employed. This device sounding or operating at or immedi-
 85 ately after the time each stave leaves the cutters prevents the cutters from being accidentally interfered with during the cutting operation. The last-mentioned signaling device may be constructed as shown in Fig. 90
 6, wherein n indicates a crank-pin or tappet fixed in one of the cam-bosses E^3 and adapted at the proper time to engage and disengage a lever n' , connected through a spring-con-
 95 trolled rod n^2 with a bell-hammer n^3 , which when the lever n' is released is caused to strike a gong n^4 .

The before-described apparatus may be modified without departing from the essential features of the invention. For example,
 100 although it is preferred to use a chain, such as F' , for feeding the staves or stave-blanks through the jointing-machine, it may be possible to use a perforated or other flexible band in place of the said chain, and I desire it to
 105 be understood that the word "chain" hereinafter employed in the claims is intended to include all such alternative devices, and, further, although it is desirable to employ
 110 mechanism for intermittently moving the guides or cheeks L outward from each other to admit of the free insertion between them of the stave-blanks before the gaging operation, as previously described, the said mechanism may be dispensed with and the guides or
 115 cheeks caused to move outward by the blanks being forced against and between their outwardly-turned ends.

Having now particularly described and ascertained the nature of this said invention and in what manner the same is to be performed,
 120 I declare that what I claim is—

1. In a "jointer" or jointing-machine for use in the manufacture of casks and the like, the combination with means for holding a
 125 pile of staves or stave-blanks arranged one on top of another, of a chain for successively feeding stave-blanks from the bottom of said pile, said chain having thereon abutments for making contact with the ends of the stave-
 130 blanks respectively, for advancing them with the chain, projections in the rear of said abut-

ments against which the pile rests while the lower stave thereof is being removed, and blades or spikes in the rear of said projections for engaging the staves respectively to prevent displacement thereof from the chain as they are carried forward, said abutments, projections and blades or spikes being disposed at intervals along the chain in sets of three arranged in the order above named, substantially as described.

2. In a "jointer" or jointing-machine, the combination with means for holding a pile of stave-blanks arranged one on top of another, of means for successively feeding stave-blanks from the bottom of said pile, means acting on the lowermost blank of the pile for centering the same, said means consisting of vertically-arranged shafts mounted in suitable bearings on opposite sides of the pile of blanks, centering-arms on the upper ends of said shafts, respectively, adapted to act against opposite edges of the blanks, gearing connecting the vertical shafts, and connections with an operative part of the jointer whereby said shafts are automatically rotated at predetermined intervals to move the centering-arms toward and from each other, substantially as described.

3. In a "jointer" or jointing-machine, the combination with means for holding a pile of stave-blanks arranged one on top of another, of means for successively feeding stave-blanks from the bottom of said pile, means acting on the lowermost blank of the pile for centering the same, said means consisting of two sets of two concentrically-arranged shafts, centering-arms, one carried by each of said shafts, the centering-arms corresponding to the two sets of shafts being located on opposite sides of the pile of stave-blanks respectively, gearing connecting the inner and outer shafts of the sets, respectively, and connections with an operative part of the jointer whereby the shafts are automatically rotated at predetermined intervals to move the free ends of the oppositely-disposed centering-arms toward and from each other, substantially as described.

4. In a machine of the kind described, the combination with a fixed frame, of a movable frame mounted to reciprocate vertically therein and carrying cutters and cutter-shafts, means—such as a hand-wheel and a shaft

mounted on the fixed frame and having a sliding connection with gear-wheels and a shaft on the movable frame—for adjusting one end of the cutter-shafts with relation to each other in accordance with the width of the skives or stave-blanks to be acted upon, two transversely-movable guides or cheeks normally held in and returned to a certain relative position by suitable means—such as a weight—a feed-chain for passing the skives or stave-blanks between the guides or cheeks and to the cutters, an index or pointer movable with said guides, and a second index or pointer operating in conjunction with said first-named pointer and connected to and movable with one of the cutter-shafts whereby the proper adjustment of the cutters in accordance with the width of the skive or stave-blank is indicated, substantially as described.

5. In a machine of the kind described, the combination with the cutter-shafts and cutters, means for adjusting the same in accordance with the width of the skive or stave-blank to be acted upon, and an index or pointer movable with said cutters in the adjustment thereof, of two guides or cheeks between which the skives or stave-blanks are adapted to pass as they are advanced to the cutters, an index or pointer connected therewith and operating in conjunction with the first-mentioned pointer to indicate the proper adjustment of the cutters, and means for automatically moving the guides away from each other at predetermined intervals to allow of the introduction of the stave-blanks therebetween, substantially as described.

6. In a machine of the kind described, the combination with a fixed frame, a reciprocating frame mounted therein and means for reciprocating the latter, of cutters mounted in said reciprocating frame, and devices partly mounted on the fixed frame and partly on the reciprocating frame for adjusting the cutters with relation to each other in accordance with the width of the blank to be acted upon, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

R. COLLEN.

Witnesses:

WILLIAM FREDERICK UPTON,
JOHN EDWARD NEWTON.