(No Model.) 4 Sheets—Sheet 1.

F. MYERS.

STAVE SHAPING AND GAGING MACHINE.

No. 385,678. Patented July 3, 1888.

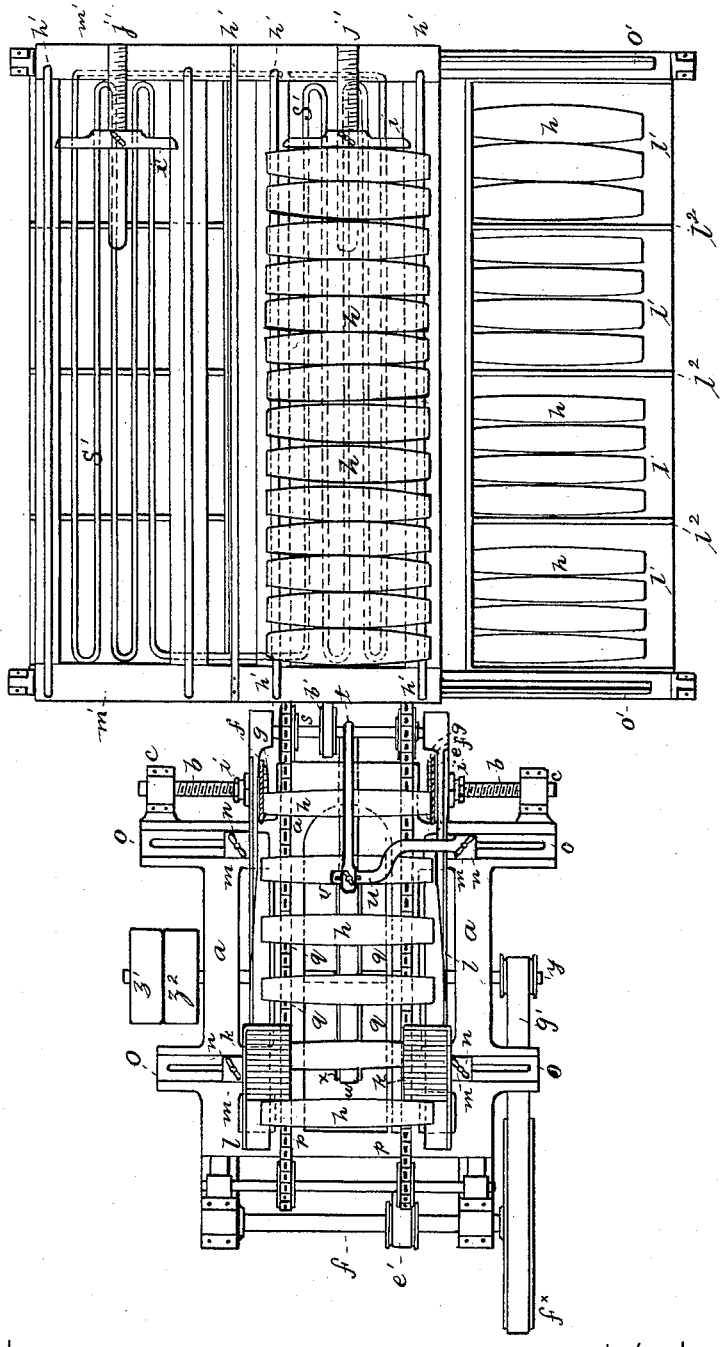


Fig 1.

WITNESSES:

W. J. Morgan.

E. A. Thayer.

INVENTOR:

Fred K. Myers.

By A. P. Thayer,

atty.

(No Model.) 4 Sheets—Sheet 2.

F. MYERS.

STAVE SHAPING AND GAGING MACHINE.

No. 385,678. Patented July 3, 1888.

Fig. 1.

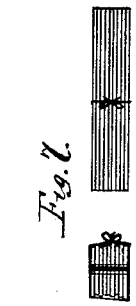


Fig. 3.

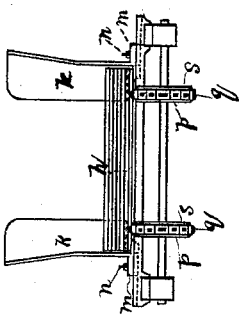
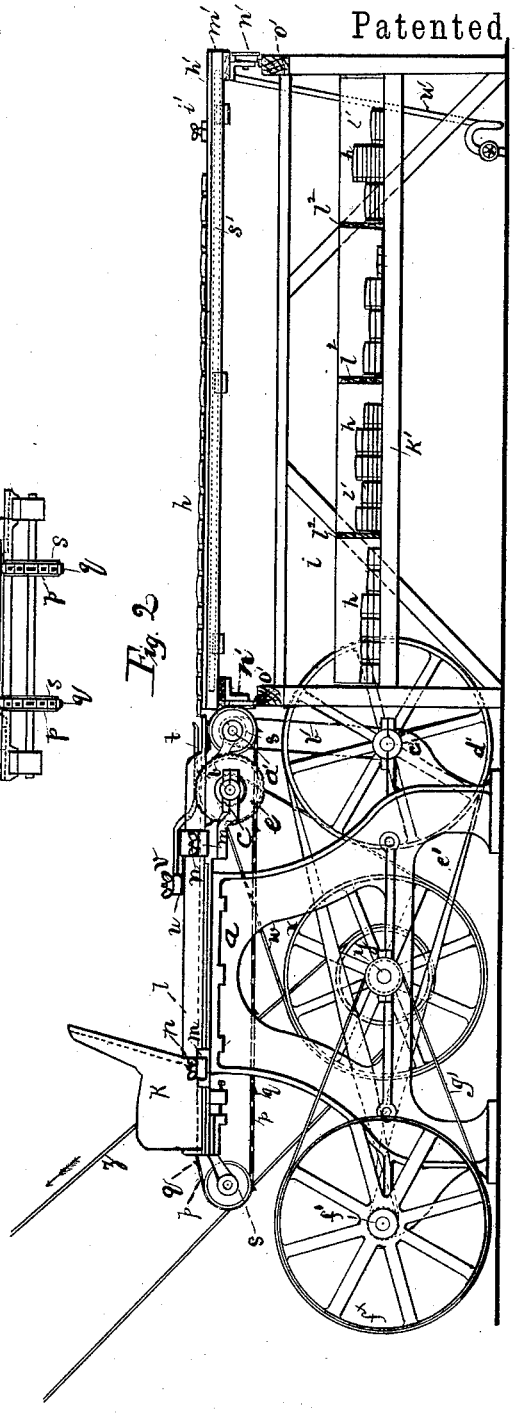


Fig. 2.



WITNESSES:

W. H. Morgan.

E. H. Morgan.

INVENTOR:

Fred K. Myers.

By A. P. Thayer.

atty

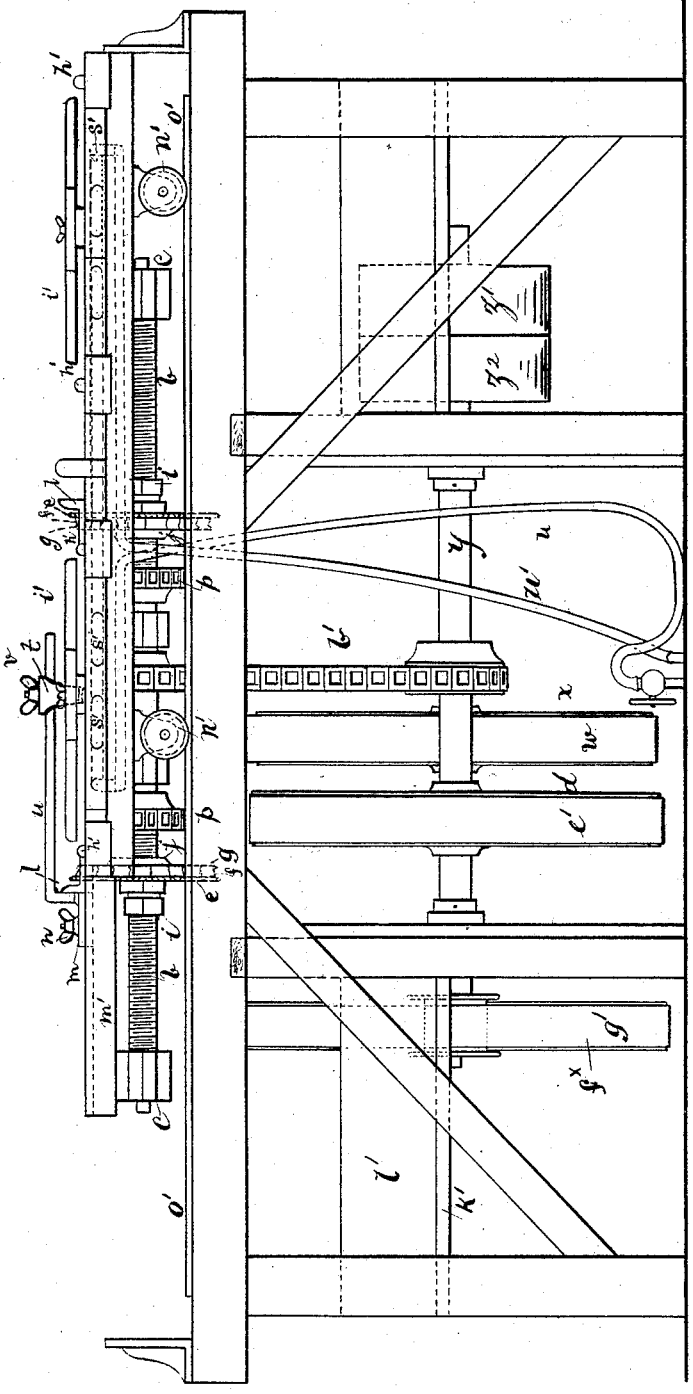
(No Model.) 4 Sheets—Sheet 3.

F. MYERS.

STAVE SHAPING AND GAGING MACHINE.

No. 385,678. Patented July 3, 1888.

Fig. 4.



WITNESSES:

W. J. Morgan.

C. F. Morgan.

INVENTOR:

Fred K. Myers.

By A. G. Thayer. atty

(No Model.) 4 Sheets—Sheet 4.

F. MYERS.

STAVE SHAPING AND GAGING MACHINE.

No. 385,678. Patented July 3, 1888.

Fig. 5.

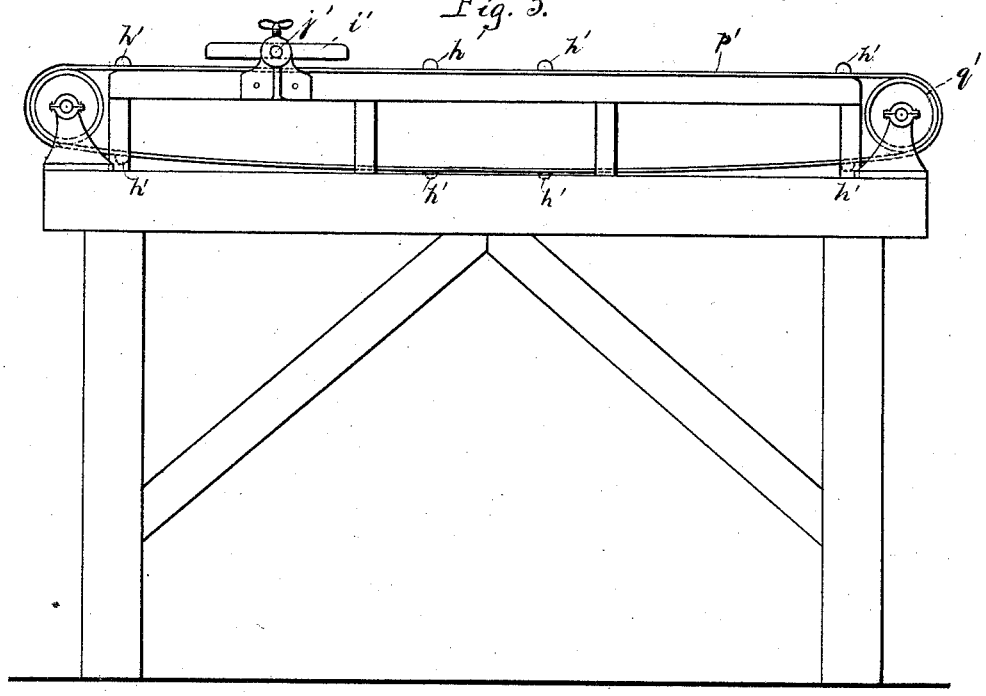
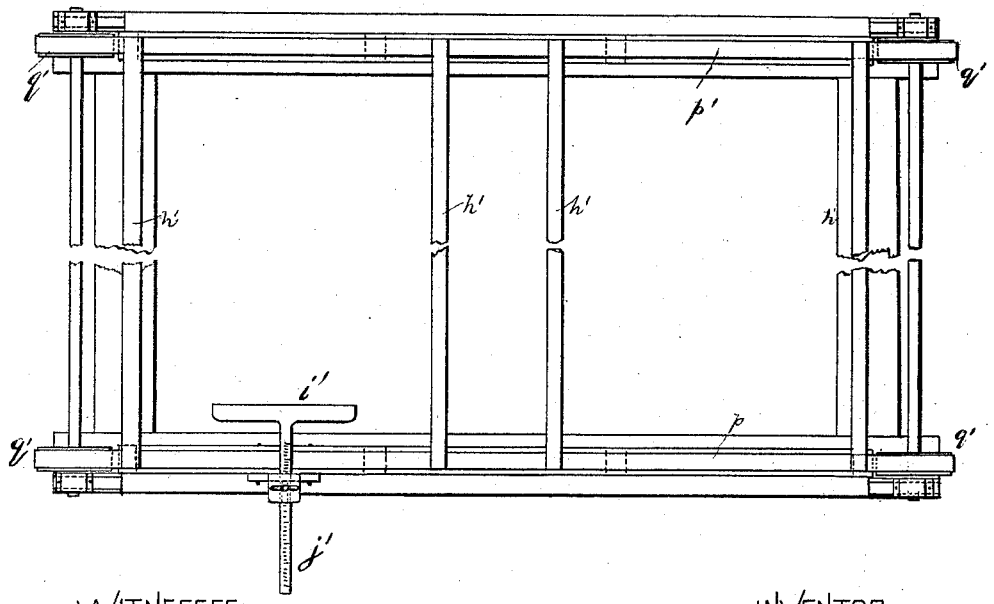


Fig. 6.



WITNESSES:

W. J. Morgan.
Sol. Morgan.

INVENTOR:

Fred't. Myers.
By A. P. Thayer
atty

UNITED STATES PATENT OFFICE.

FREDERICK MYERS, OF LIVERPOOL, COUNTY OF LANCASTER, ENGLAND.

STAVE SHAPING AND GAGING MACHINE.

SPECIFICATION forming part of Letters Patent No. 385,678, dated July 3, 1888.

Application filed January 26, 1885. Serial No. 154,070. (No model.)

To all whom it may concern:

Be it known that I, FREDERICK MYERS, a citizen of the United States, residing at Liverpool, in the county of Lancaster, England, have invented certain new and useful Improvements in Stave Shaping and Gaging Machines; and I 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, reference being had to the accompanying drawings, and to the letters or figures of reference marked thereon, which form a part of this specification.

My invention consists of improved contrivances of machinery for simultaneously trimming, chamfering, and crozing the ends of the staves prior to setting them up in the barrel form, the staves having been previously jointed; also, of a gaging contrivance, in combination with said trimming, chamfering, and crozing machinery, to facilitate the gaging of the requisite quantity of staves for barrels or casks of any predetermined size, and the bundling of the same to facilitate the supplying of the gaged quantities of staves to the barrel-forming machines, in which the staves are set up and trussed.

My invention also consists of improvements in the said gaging apparatus designed to facilitate the use of the same in connection with the trimming, crozing, and chamfering machine, and to utilize it for heating and shrinking the staves while being gaged, all as hereinafter fully described, reference being made to the accompanying drawings, in which--

Figure 1 is a plan view of my improved machine. Fig. 2 is a side elevation of the same. Fig. 3 is a front elevation of the feeding-hopper. Fig. 4 is an end elevation of the machine, on an enlarged scale. Fig. 5 is an end elevation, and Fig. 6 a plan view, of a modified arrangement of the gaging apparatus, also on an enlarged scale; and Fig. 7 is a side and end elevation of a complete batch of staves bundled and tied as I prepare them for the barrel-forming machine.

I provide a suitable table, *a*, and mount a revolving mandrel, *b*, at one end in bearings *c*, and having duplicate end-trimming saws *e*, chamfering-cutters *f*, and croze-cutters *g* mounted on it suitably for trimming, chamfering, and crozing both ends of the staves *h* at the same time, and being adjustable along said mandrel by adjusting-nuts *i* and collars *j*, to set them in different positions for dressing staves of different lengths, and arrange a hopper, *k*, and angle feed guides *l* in connection therewith by making said hopper and guides in two separate parts and mounting them by the flanges *m* and clamp screws *n* in the lateral guide-grooves, *o*, provided therefor in the top of the table *a*, to allow said hopper and guides to be shifted and set in unison with the stave trimming, chamfering, and crozing cutters, and for feeding the staves from the hopper to the cutters in regular succession I provide a couple of endless chains, *p*, having pushing-studs *q* at intervals along them, arranging said chains *p* between the guides *l* on carrying pulleys *s*, and in such relation to the hopper that the chains running under the same will catch the lowermost stave of the pile by their pushing-studs *q* and carry it under the hopper, the rest of the staves of the pile being retained by the hopper, which extends to such near proximity to the chains as to retain all except the lower stave, as represented in Fig. 3.

The cutters are arranged in such relation to the stave-guides that the staves pass over the chamfering and crozing cutters, and all the cutters tend to force the staves upward away from them, to prevent which I arrange a strong spring-presser, *t*, to bear them down and keep them on the guides while passing over the cutters, said presser being mounted on a strong supporting-arm, *u*, so as to range along the middle of the guideway some distance back of the cutters and to bear on the staves at the middle, to press them alike at both ends on the cutters, and the supporting-arm *u* is formed together with one of the guide-flanges, *m*, for a simple means of securing it, and so that the arm may be adjusted with the guide, and the presser is also adjustable along the arm, where it is attached thereto by a clamp-screw, *v*, for centering it.

For driving the cutter-mandrel it is geared by the belt *w* with the pulley *x* on the main driving-shaft *y*, to which the power is applied by the main belt *z* and the fast and loose pulleys z' z^2.

For driving the chain-feeders *p* the shaft a'

of one pair of its carrying-pulleys *s* is geared by the endless driving-chain *b'* with the shaft *c'*, having the large pulley *d'*, geared by the crossed belt *e'* with the shaft *f'*, having a large pulley, $f^{\times}$, that is geared by the belt *g'* with the main shaft *y*, said driving-gear for the feed-chains forming a reducing-train adapted to work the feed chains at the proper low rate of speed for feeding the staves to the cutters, which have the requisite high speed for properly trimming and dressing the staves while passing over them. Instead of discharging the staves thus trimmed, chamfered, and crozed on the floor, I arrange the rails *h'* of a gager in suitable relation to the delivery end of the chain-feeder to receive the staves from it, for the purpose of gaging and sizing said staves in complements or batches for barrels of any desired size, so that said staves, being bundled and delivered as gaged to the barrel-forming machine, will form to the required size in the forming machine, and thus avoid the waste of time and labor customary in specially working in the last stave after the rest of the staves have been arranged and the width of the space has been ascertained, and at a suitable distance along said rails *h'*, I arrange an adjustable stop, *i'*, with a scale, *j'*, by which to set the stop for gaging batches of different breadths for barrels of different sizes, all being so that the staves will be passed directly from the trimming, chamfering, and crozing machine onto the gager and be mainly shifted along the same and disposed thereon for being gaged without handling them, said staves being pushed along the rails one against another by the chain-feeder until the gager is nearly full—that is, until the last stave of the batch is to be supplied.

As the last stave would seldom be the right width as they run through the machine to complete the batch in the exact breadth required, it is important that it be selected and applied by the attendant, for which he first shifts the staves delivered on the gager from the position where they are left by the feeder forward against the stop *i'*, leaving the space to be filled between the last stave delivered on the rails and any approved mark—say the ends of rails *h'*—which space he then quickly fills by a stave selected from a pile of staves of different widths, previously placed conveniently at hand for the purpose. Then he gathers up the batch in a pile ready for delivery to the forming-machine, and ties them, if necessary, to prevent them from being separated before reaching the forming-machine.

To facilitate the selection of the completing-staves of the batches, I arrange a bench, *k'*, alongside of the gager, separated in several divisions, *l'*, by partitions l^2, forming separate receptacles for staves of different widths, from which to obtain the width required at once. These receptacles may be numbered in accordance with the width of the staves they contain, and a scale of lineal measure may be arranged on the gager suitably to show at once the measure of the breadth of the stave wanted to fill the space; but generally the attendant will be able to judge with sufficient accuracy by the eye without such scale. The gaging of the batches of staves may thus be accomplished on a simple gager permanently arranged in the position for reception of the staves from the feeders; but the attendant must act quickly to avoid conflict with the first succeeding stave of the next batch; and I therefore prefer to make duplicate gagers and mount them so that they may be shifted readily to remove the filled gager and retain the empty one to the place of receiving the staves immediately on the reception of the last stave of the batch that is to be delivered from the feeder, thus allowing the attendant much more time to accurately match in the last stave and effectually preventing any conflict with the succeeding stave. For this purpose two sets or pairs of gaging-rails, *h'*, may be placed side by side a suitable distance apart on a frame, *m'*, that may be mounted by truck-wheels *n'* on rails *o'*, for being readily shifted forward and backward along the place of delivery of the staves from the trimming, chamfering, and crozing machine; or two or more sets of such gaging-rails, *h'*, may be arranged on endless belts *p'*, suitably arranged on carrying-pulleys *q'*, to be similarly shifted, as desired; but the truck arrangement represented in Figs. 1 and 2 will probably be preferred.

I propose to arrange steam heating coils *s'* with these gagers, as in Figs. 1 and 2, or in any approved way, so that when the staves are to be immediately transferred to the forming-machine for being set up in the barrel forms the staves may be heated while resting on the gager to shrink them ready for setting up at once, and thus economize the time and labor that would be lost in separately and subsequently heating them. This is feasible when a powerful forming and trussing machine is used that will set up and truss the hoops so tightly that less shrinkage by heat is required than when the forms are set up less tightly.

The steam may be conducted to and from the heating-coils by means of sections of flexible pipes *u'*, connecting them with the permanent steam and waste pipes, respectively.

In using an endless feeder having continuous motion in the forward direction the benches for supporting the staves above the feeder and the stops to prevent the staves from being shifted backward by the reciprocating feeder—such as are described and claimed in my prior application, No. 117,590, filed January 15, 1884—are dispensed with, the staves being in this case piled directly on the angle-guides, along which they are conveyed to the trimming and crozing tools and within reach of the pushing-studs *q* on the chains *p*, and in the hopper composed of the two simple inclined angle-plates *k*, in which the pile of staves rest, so as to be automatically taken by

the feeder without having to be individually supplied to the feeder by the attendant, as in that case.

A complement-gager, combined with the end trimming, chamfering, and crozing mechanism, as I now arrange it, is rightly adapted for completely accomplishing its object to the best advantage in the process of making barrels by machinery, because the complement is only to be defined for meeting the necessities of the barrel-forming machine, to which the staves go next after such trimming, chamfering, and crozing process; whereas a gager combined with an edge-trimmer, which has been done, is much less advantageous, because as the edges of the staves must be trimmed before the ends are, care must be taken to run the batches separately through the end trimming, chamfering, and crozing machine, which entails considerable loss of time by the interruptions between the batches. In my improved arrangement the staves are fed in continuous succession through the machine, and at the same time are gaged as well.

What I claim, and desire to secure by Letters Patent, is—

1. The combination, in a stave trimming, chamfering, and crozing machine, of the laterally-adjustable hopper consisting of the inclined angle-plates *k*, adjustable angle-guides *l*, the endless feeders *p q*, and the duplicate trimming-saws *e*, chamfering-cutters *f*, and chine-cutters *g*, said saws and cutters being laterally adjustable on the mandrel *b*, substantially as described.

2. The combination of the spring-presser *t*, mounted over the middle of the guideway in advance of the cutters, and laterally adjustable on the supporting arm *u*, with the trimming-saws *e*, chamfering-cutters *f*, chine-cutters *g*, endless feeders *p q*, hopper *k*, and angle guides *l*, substantially as described.

3. The combination, with the chamfering and crozing cutters and the feeder of a stave chamfering and crozing machine, of a complement-gager consisting of a receiving-table and a stop-gage arranged with relation to the place of delivery of the staves from said machine, whereby said feeder delivers the staves from the chamfering and crozing machine onto said gager and along the same successively, substantially as described.

4. The combination, with the chamfering and crozing cutters and the feeder of a stave chamfering and crozing machine, of a complement-gager consisting of duplicate receiving-tables and stops arranged with relation to the place of delivery of the staves from said machine, whereby said feeder delivers the staves from the chamfering and crozing machine onto said gager and along one or the other of the said duplicate tables successively, which are transferable laterally to said place of delivery to receive on one while the completed complement is removed from the other, substantially as described.

5. The combination, with the chamfering and crozing cutters and the feeder of a chamfering and crozing machine, of a complement-gager consisting of a receiving-table and stops arranged with relation to the place of delivery of the staves from said machine, whereby said feeder delivers the staves from the chamfering and crozing machine onto said gager and along the same successively, also a bench having a series of divisions for assorted sizes of staves formed in and being part of the structure of the gage-table, substantially as described.

6. The combination, with the chamfering and crozing cutters and the feeder of a chamfering and crozing machine, of a complement-gager consisting of a receiving-table and stops arranged with relation to the place of delivery of the staves from said machine, whereby said feeder delivers the staves from the chamfering and crozing machine onto said gager and along the same successively, also a heating-coil located under the gage-table and having the usual pipe connections with a boiler or other heater, for heating and shrinking the staves while being gaged, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

FREDERICK MYERS.

Witnesses:
WILLIAM PIERCE,
WILLIAM FITZSIMONS.