(No Model.) 3 Sheets—Sheet 1.

J. W. ANGUS.

APPARATUS FOR STEAMING STAVES FOR BARRELS.

No. 553,801. Patented Jan. 28, 1896.

Fig. 1.

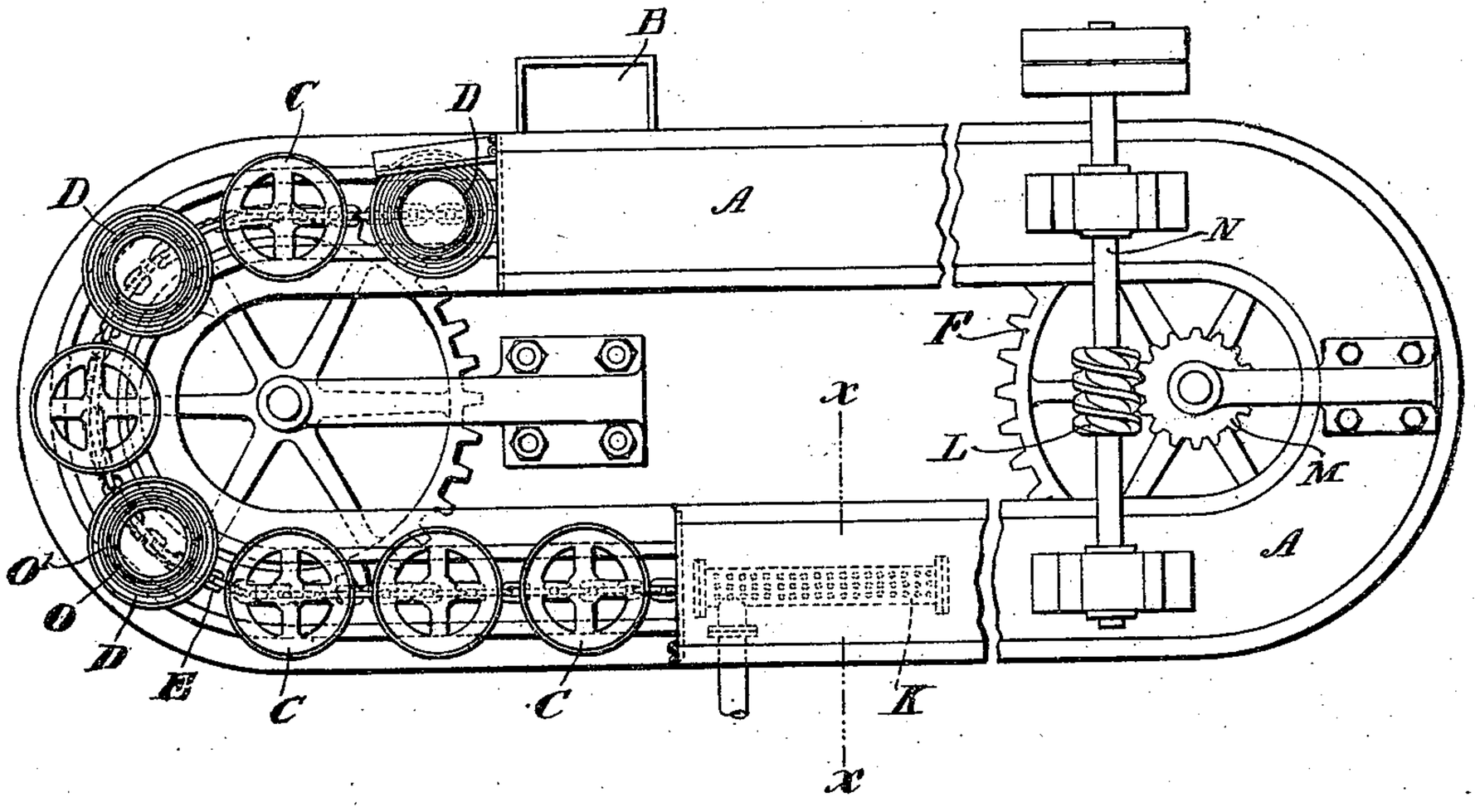
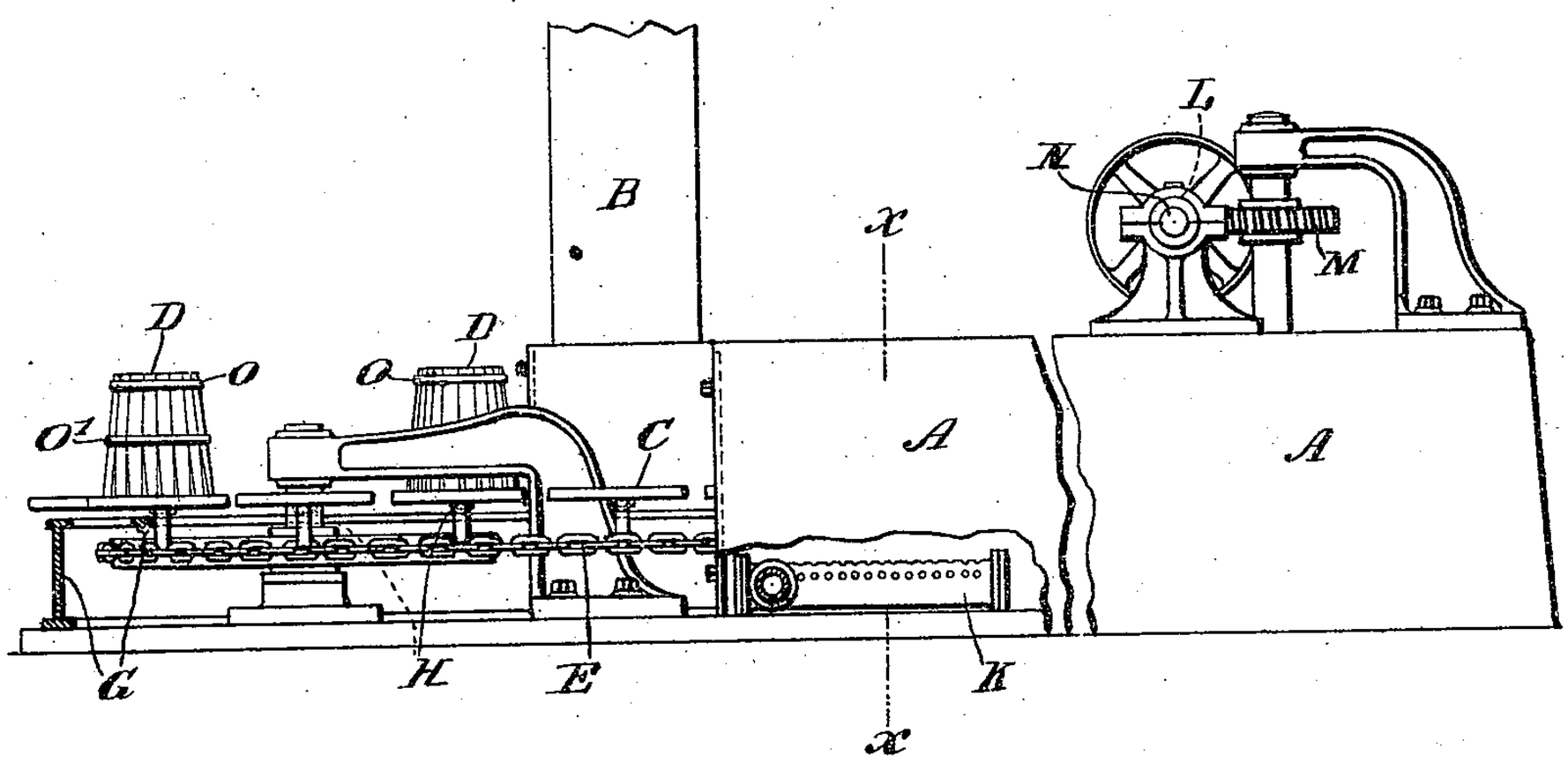


Fig. 2.



Witnesses:
Thomas M. Smith.
Louis Winterberger.

Inventor.
Jos. W. Angus,
By J. Walter Douglass
Attorneys.

(No Model.) 3 Sheets—Sheet 2.

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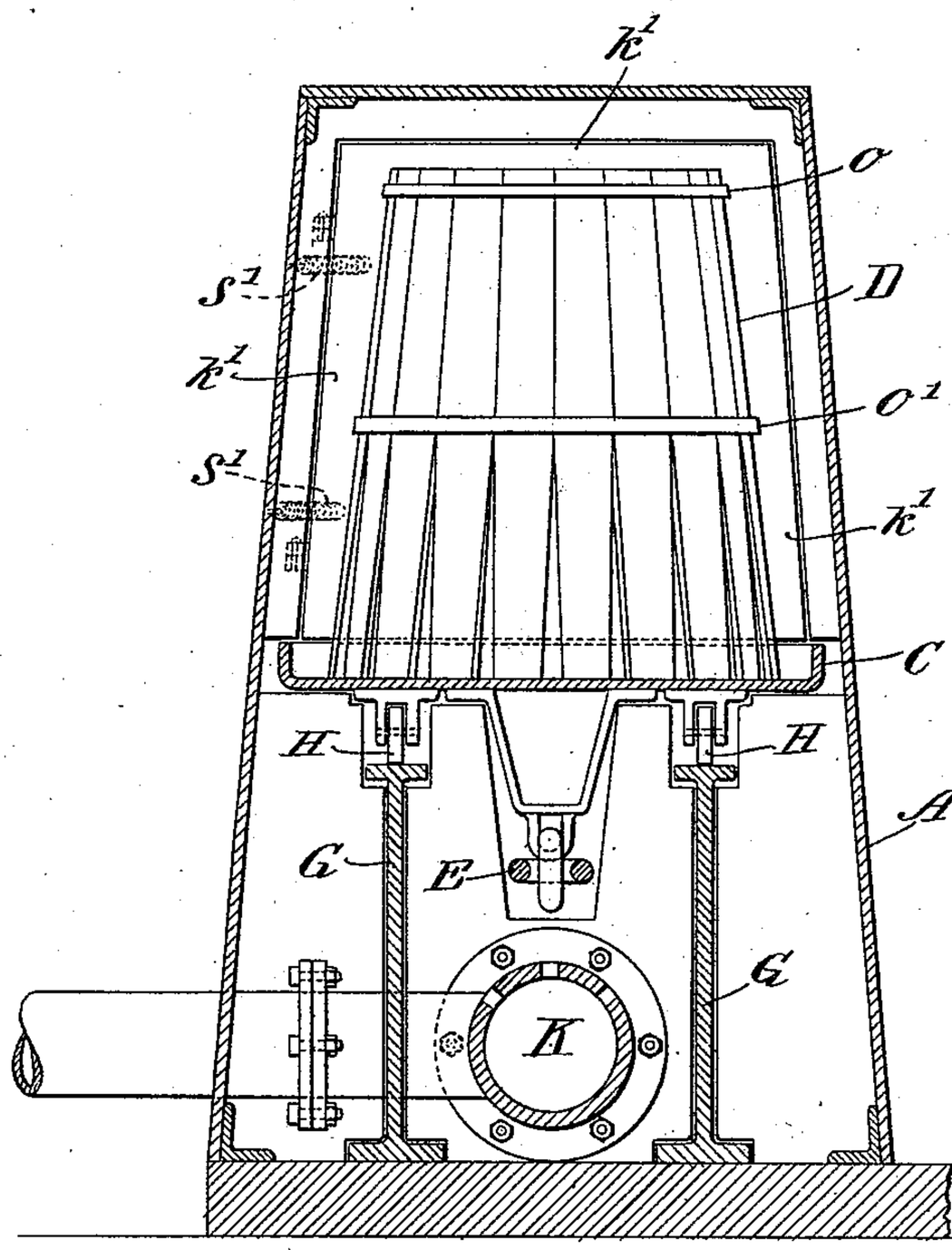
Fig: 3



Witnesses:
Thomas M. Smith.
Louis Winterberger.

Inventor.
Job W. Angus,
By J. Walter Douglass
Attorneys.

(No Model.) 3 Sheets—Sheet 3.

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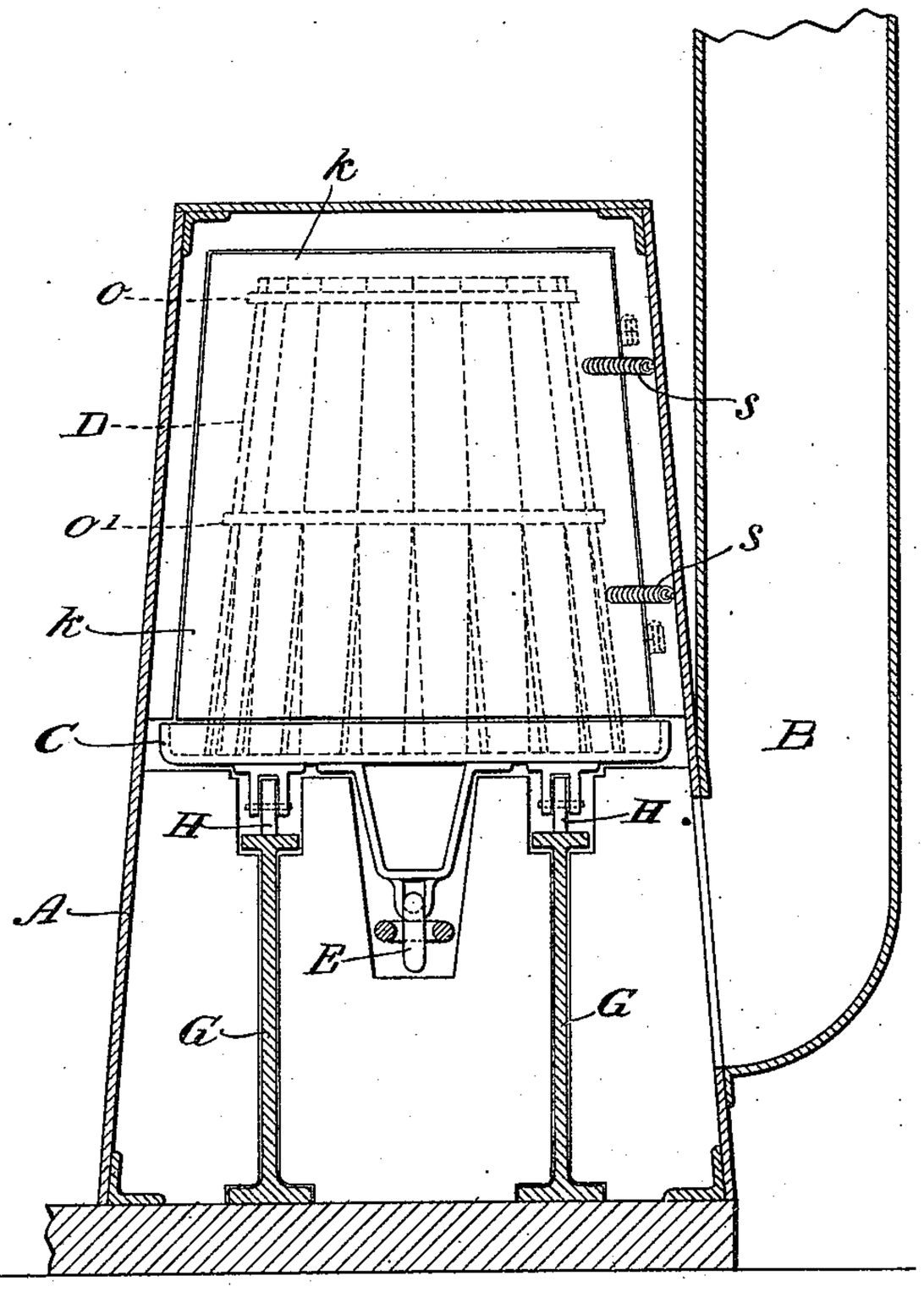
Fig: 4



Witnesses:
Thomas M. Smith.
Louis Winterberger.

Inventor.
Job W. Angus,
By J. Walter Douglass.
Attorney.

UNITED STATES PATENT OFFICE.

JOB W. ANGUS, OF ELIZABETH, NEW JERSEY, ASSIGNOR TO MARVIN BRIGGS, OF BROOKLYN, NEW YORK.

APPARATUS FOR STEAMING STAVES FOR BARRELS.

SPECIFICATION forming part of Letters Patent No. 553,801, dated January 28, 1896.

Application filed May 4, 1895. Serial No. 548,081. (No model.)

To all whom it may concern:

Be it known that I, JOB W. ANGUS, a citizen of the United States, residing at Elizabeth, in the county of Union and State of New Jersey, have invented certain new and useful Improvements in Apparatus for Steaming Shooks or Staves for Barrels, of which the following is a specification.

My invention relates in the manufacture of barrels to that part technically known as "steaming," and is especially applicable to tight barrels—that is, those intended for holding oils, alcohol, whisky, &c.—but it nevertheless may be advantageously employed for steaming all kinds of shooks for barrels where such steaming is desirable in the production of the barrel.

In the manufacture of barrels the shooks or staves are first sawed in required lengths for the kind of barrel. They are also cut to a circle to form the cross-section of the barrel, and when a number are placed together they form a cylinder having a diameter corresponding to that of the bilge or largest section of the barrel. In order that they may assume the barrel shape or condition the staves are passed through what is known as a "jointing-machine," by which the ends are tapered off, and at the same time the edges cut perpendicular to the circumference at all points of the edges. The staves are then set up so as to form a frustum of a cone, the smaller end of which is the required diameter of the barrel, but at the larger end the staves are widely separated, and have to be drawn together by proper appliances. The shooks or staves having previously been kiln-dried, any attempt to draw the ends together while in this condition results in breaking a large proportion of them, but to avoid which the staves are exposed to the action of steam to soften them and impart to them sufficient flexibility so as to be bent into required condition without breaking.

Heretofore it has been the custom to carry out the steaming by placing the partly-formed barrel upon a stationary platform surmounted by a hood, which is raised and lowered to cover the barrels. This hood is usually made large enough to cover two barrels at one time. After the hood has been lowered, steam is turned on and the barrel is exposed to its influence or action. This operation is slow and involves the use of live steam and waste of the steam remaining uncondensed in the hood when raised to remove the barrels, besides which the workman is the sole judge of how long the barrel shall be left under the action of the steam, and in practice the exposure varies according to his ability to guess as to the time and other considerations. Hence the operation is irregular and the percentage of breaks in the subsequent operation is quite large. It is desirable to utilize exhaust-steam in this operation, both because of the saving thereby effected, as well as the fact that exhaust-steam contains more moisture and acts more energetically in softening the staves; but this has proven impracticable under old practiced methods of treating barrel staves or shooks, because conditions were not present therein whereby exhaust-steam could be utilized.

The principal object of my present invention is to utilize exhaust-steam in the treatment of barrel-staves and to lengthen the time of their exposure, as well as to secure greater uniformity and also a saving in labor and the cost of conducting the operation.

Another feature of my invention is that breakage of staves is appreciably lessened as compared with the hitherto generally practiced methods of treating staves or shooks in the manufacture of barrels.

My invention stated in general terms consists of an apparatus for steaming shooks or staves for making barrels, constructed and arranged in substantially the manner hereinafter described and claimed.

The nature and general features of my invention will be more fully understood from the following description taken in connection with the accompanying drawings, forming part thereof, and in which—

Figure 1 is a plan of an apparatus embodying features of my invention. Fig. 2 is a side elevational view of the same. Fig. 3 is a vertical section on the line *x x* of Figs. 1 and 2, and Fig. 4 is a similar view on the line *y y* of Fig. 1.

Referring to the drawings, A represents a hood covering a portion of the apparatus and opening into the stack B.

C are carriers for the partly-formed barrel D. These carriers are of any suitable shape and perforated, so as to allow of the free access of steam into the interior of the barrel mounted thereon. The carriers C are suitably connected with an endless conveyer E, which is actuated by the sprocket-wheel F. The carriers are preferably mounted on rails G of suitable construction, and to avoid undue friction it is desirable to attach rollers H to the under side of the carriers C, as illustrated in Fig. 3, and which are adapted to travel along over said rails.

K is a steam pipe or conduit located below the endless conveyer E, and perforated at intervals to allow of the escape of the steam into the space embraced by the hood A, provided at each end with doors *k* and *k'*, whereof of one of them, *k*, opens outward by contact of a partially-formed barrel and closed by the springs *s* attached thereto, as shown in Fig. 4, and whereof the door *k'* opens inward, as shown in Figs. 2 and 3, by contact of the set-up barrel-staves therewith in the travel of the same along on the carriers C by means of the conveyer and returned to closed position after the set-up staves pass beyond the range thereof by means of the springs *s'*. It will be observed by reference to Figs. 3 and 4 that the respective doors do not snugly fit the end openings of the hood A, and this is made necessary in order that in the travel of the carriers C, by means of the endless conveyer, each carrier may be unretarded in its travel between the floor of the hood and the bottom edge of the doors *k* and *k'*, yet at the same time the space between the floor of the hood and bottom edge of the doors is not sufficient to permit any appreciable escape of the steam from the hood A, because of the size and location of the offtake B in connection with the hood, which affords sufficient suction for the steam through the hood to carry the same after spending its action on the set-up staves or shooks through the stack or offtake B above the appliance into the open air.

The sprocket-wheel F is connected with suitable driving mechanism, which in the drawings consists of a worm-gear L, meshing with a gear-wheel M, and operated by means of a shaft N from any source of power. (Not shown.)

In practice the staves or shooks are assembled and held in position by truss-hoops O and O', when the partially-formed barrels are placed on the series of carriers C and are moved slowly through the hood A, subject to the action of the steam to render the same pliable and so as to permit of their being drawn into proper shape or condition to become barrels and of the application of hoops in any suitable or well-understood manner.

In practice it has been found that a motion which will subject the shooks to the action of steam for five to seven minutes will give required flexibility thereto, and that when brought to such condition breakage in the drawing of the shooks into position is very appreciably lessened. Exhaust-steam being used gives far better results than live steam and with a great saving in cost of making the barrel. It may be here remarked that it is not absolutely necessary that the steam pipe or conduit K should extend the entire length of the hood A, because practice has demonstrated that it is more economical to admit steam only for a short distance from the entrance of the hood, and to allow it to expand and escape from the stack B on somewhat the same principle as in a steam-engine by a cut-off.

By the construction and arrangement of an apparatus as hereinbefore described, a great saving in labor and in the cost of doing the work is insured. In a word, one man can handle and steam at least four barrels in the present apparatus where he could steam only one barrel at the same time by the old generally-practiced methods of steaming staves or shooks in the making of barrels.

Having thus described the nature and objects of my invention, what I claim as new, and desire to secure by Letters Patent, is—

An apparatus for steaming shooks for barrels, consisting of a stationary hood, the ends of which are normally closed to prevent escape of steam therefrom, a perforated steam-supply conduit located at or near one end of said hood, an offtake leading from the other end of said hood, an endless conveyer adapted to travel in a horizontal direction partially through the entire length of the hood and partially without the hood and a series of circular perforated carriers connected with said conveyer and adapted to receive the partly-formed barrels, the arrangement being such that said partly-formed barrels may be mounted on or taken off the carriers of the conveyer outside the hood and may be conveyed through the hood in the presence of the steam, the ends of the hood being momentarily opened and closed by said barrels only to permit the passage of a partly-formed barrel, substantially as described.

In testimony whereof I have hereunto set my signature in the presence of two subscribing witnesses.

JOB W. ANGUS.

Witnesses:
E. H. SHELLEY,
B. F. WARREN.