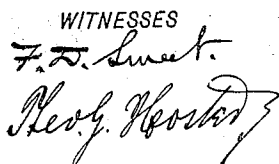


APPLICATION FILED JUNE 26, 1908.

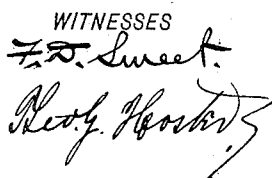
2 SHEETS—SHEET 1.



ANDREW. B. GRAHAM CO., PHOTO-LITHOGRAPHERS, WASHINGTON, D. C.

934,769.

2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

ERNEST C. THORSCHMIDT, OF NEW YORK, N. Y.

STAVE-CUTTING MACHINE.

934,769.

Specification of Letters Patent. Patented Sept. 21, 1909.

Application filed June 26, 1908. Serial No. 440,471.

To all whom it may concern:

Be it known that I, ERNEST C. THORSCHMIDT, a citizen of the United States, and a resident of the city of New York, borough of Brooklyn, in the county of Kings and State of New York, have invented a new and Improved Stave-Cutting Machine, of which the following is a full, clear, and exact description.

The object of the invention is to provide a new and improved stave-cutting machine, arranged to quickly and accurately give the desired shape to the stave, both as to the longitudinal contour of the side edges as well as to the bevel thereof and without requiring handling of the material.

The invention consists of novel features and parts and combinations of the same, which will be more fully described herein-after and then pointed out in the claims.

A practical embodiment of the invention is represented in the accompanying drawings forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the views.

Figure 1 is a sectional side elevation of the improvement on the line 1—1 of Fig. 2; Fig. 2 is a front end elevation of the same, parts being in section; Fig. 3 is a plan view of the endless carrier, the rack containing the stave blanks, the tension gage and the presser roller; Fig. 4 is an enlarged sectional plan view of the presser roller; and Fig. 5 is a face view of one of the cam wheels.

The several blanks A of rectangular shape are stacked in a suitable rack B supported on the base C on which the machine is mounted. The lowermost stave blank A of the stack of staves in the rack B is adapted to be engaged by one of a series of spaced lugs D' held on a carrier D, in the form of an endless sprocket chain passing through the bottom of the rack B directly under the lowermost stave blank A, the said endless carrier D passing around sprocket wheels E, E' having their shafts E², E³ journaled in suitable bearings arranged on standards F, F' attached to the base C. The lowermost stave blank A of the stack of blanks carried along by the endless carrier D is engaged at its sides by a gage G, and then the top of this stave blank A is engaged by a presser or resistance roller H located somewhat in advance of the gage G, and then the stave blank A is cut into a stave by circular saws I, I' located somewhat in advance of the

presser roller H on opposite sides of the carrier D. The side edges of the stave are engaged by gage rollers J, J' arranged in advance of the circular saws I, I'.

The gage G (see Fig. 3) consists essentially of a fixed member G' and a yielding member G² mounted on and pressed toward the fixed member G' by springs G³, so that the stave blank on passing between the members G', G² is pressed against the member G' having its inner face in lengthwise alinement with one side of the presser roller H, so that the successive stave blanks A pass in the same position under the presser roller H and to the saws I, I'. The members G' and the support G⁴ for the springs G³ are attached to a cross bar F² of standards F³ held on the base C, and provided with guideways F⁴ in which are mounted slide bearings K for the shaft H' of the presser roller H. The bearings K are adjusted in an inverse direction by set screws K', K², and the bearings K are mounted to yield in a vertical direction, and for this purpose springs K³ are interposed between the tops of the bearings K and the top members of the guideways F⁴. By the arrangement described the presser roller H can be moved nearer to or farther from the saws I, I', and the presser roller H is free to yield in an upward direction, to suit different thicknesses of stave blanks A. The presser roller H is preferably formed with a metallic center H², to which are secured on opposite sides the rim sections H³, H⁴, made of wood and fastened to the center H² by rivets or bolts H⁵, as indicated in Fig. 4. By the arrangement described the saws I and I', when accidentally cutting into the wooden rim parts H³, H⁴ of the presser roller H, are not liable to be injured, as would be the case if the said presser roller was made entirely of metal.

In order to prevent sagging of the endless carrier D at the presser roller H, a supporting roller H⁶ is provided, over which passes the endless carrier D, the supporting roller H⁶ being journaled in the standards F³ and located directly below the presser roller H.

In order to rotate the presser roller H, the following arrangement is made: On the shaft H' of the presser roller H is secured the sprocket wheel L over which passes a sprocket chain L', also passing over a sprocket wheel L² secured on a shaft L³ journaled in the standards F³. A gear wheel L⁴ is secured

on the shaft L^3 and is in mesh with a gear wheel L^5 secured on the main driving shaft N extending transversely and journaled in suitable bearings arranged on the standards F^3 . The driving shaft N is provided with a pulley N' connected by a belt N^2 (see Fig. 2) with other machinery for imparting a continuous rotary motion to the driving shaft N. Now when the latter is rotated, the gear wheels L^3 , L^4 rotate the shaft L^5 , which by the sprocket wheels L^2 , L and the sprocket chain L' causes the rotation of the presser roller H in the direction of the arrow a' .

The arbors I^2 , I^3 of the circular saws I, I' are journaled in suitable bearings arranged in slides O, O' adapted to move from and toward each other, to cause the saws I and I' to give the desired shape to the side edges of the stave blank when forming a stave, that is, to cut the side edges of the stave with a view to make the middle of the stave widest, gradually narrowing to the ends. In order to give the desired bevel to the side edges of the stave, the saws I and I' are inclined toward each other, as plainly indicated in Fig. 2, it being, however, understood that the axes of the arbors I^2 , I^3 are arranged in the same transverse plane. The arbors I^2 , I^3 of the saws I, I' are provided with pulleys I^4 , I^5 connected by belts I^6 , I^7 with other machinery for imparting a rotary motion to the saws I and I' independently of the motion given to the main driving shaft N.

In order to move the slides O, O' and consequently the saws I, I' from and toward each other, the following arrangement is made: The slides O and O' are provided with sets of friction rollers O^2 , O^3 , O^4 , O^5 , of which the friction rollers O^2 , O^3 of the slide O, are engaged by double cams P, P' secured on the main driving shaft N, and the friction rollers O^4 , O^5 of the slide O' are engaged by double cam wheels P^2 , P^3 , also secured on the main driving shaft N. Now the sets of cams P, P' , P^2 , P^3 are so arranged that they simultaneously impart a transverse bodily movement to the slides O, O' , and consequently the saws I, I' move in unison with the length of the stave carried past the saws I, I' by the endless carrier D, that is, the saws I, I' are nearest to each other at the time the front end of the stave blank reaches the saws I, I' , and then the saws gradually move apart while the stave is carried forward, and its side edges are trimmed by the saws I, I' until the middle of the stave is reached, at which point the saws I, I' are caused to travel toward each other until the end of the stave is reached and at which time the saws I and I' have again reached their nearest positions relative one to the other.

The gage rollers J and J' are journaled on levers J^2 , J^3 fulcrumed at J^4 , J^5 on the standards F^3 , and the lower ends of the said levers J^2 , J^3 are provided with friction rollers J^6 , J^7

engaging the double cams P' , P^2 , so that the levers J^2 , J^3 are rocked by the action of the cams P' , P^2 , to cause the gage rollers J, J' to follow the contour of the side edges of the stave.

In order to cause the stave blank to travel forward at a speed corresponding to the bodily movement given to the saws I, I' , the following arrangement is made: The gear wheel L^5 secured on the main driving shaft N is in mesh with an intermediate gear wheel Q journaled on the standard F and in mesh with a gear wheel Q' fastened on the shaft E^2 of the sprocket wheel E at the front end of the machine, so that when the main shaft N is running a rotary motion is given by the gearing described to the sprocket wheel E, to cause the endless carrier D to travel in the direction of the arrow b' .

The operation is as follows: When the shaft N is rotated and the endless carrier D moves in the direction of the arrow b' , then one of the lugs D' engages the rear end of the lowermost stave blank A held in the rack B, and pushes this lowermost stave blank out from underneath the pile, thus carrying the stave blank forward and forcing the same between the gage G and under the presser roller H, and finally in engagement with the saws I, I' rotating at a high speed, to trim the side edges of the stave blank to a stave of the usual form, as above described, at the same time giving the side edges the necessary bevel, as indicated in Fig. 2. The forward narrow end of the stave passes between the gage rollers J, J' following the contour of the stave edges, according to the action of the cams P' , P^2 on the levers J^2 , J^3 carrying the rollers J, J' . Now by the arrangement described the stave blank is guided to the saws I, I' by the gage G, and the stave is guided after leaving the saws I by the rollers J, J' , so as to insure accurate cutting or trimming of the stave blank into a stave of the desired shape. By having the presser roller H, the desired resistance is given to the stave blank, to prevent the same from flying up while the saws I, I' cut or trim the side edges of the blank.

The cams P, P' , P^2 , P^3 are made double, so that two staves are fed forward past the saws I, I' by the endless carrier D, during one revolution of the shaft N on which the said cam wheels P, P' , P^2 , P^3 are mounted.

Having thus described my invention, I claim as new and desire to secure by Letters Patent:

1. A stave-cutting machine, comprising a pair of circular saws inclined toward each other, a carrier for feeding the stave blank between the said saws, slides carrying the said saws, and movable toward and from each other to cause the saws to give the desired shape to the stave blank, movable gages for engaging the sides of the stave as it

passes from the saws, and a driving means for actuating the said carrier, and moving the said slides and the said gages in unison.

2. A stave-cutting machine, comprising an
5 endless carrier for the stave blank, a pair of circular saws on opposite sides of the said carrier and inclined toward each other, slides in which the arbors of the saws are journaled, the said slides being movable toward and
10 from each other to cause the saws to give the desired shape to the stave blank, a driving shaft connected with the said endless carrier, movable gage rollers adapted to follow the contour of the side edges of the stave,
15 and means for moving the said slides and the said gage rollers from the said driving shaft.

3. A stave-cutting machine, comprising a carrier for the stave blank, a pair of circular
20 saws on opposite sides of the said carrier and inclined toward each other, slides in which the arbors of the said saws are journaled, cam wheels for actuating the said slides, gages for engaging the sides of the stave and actuated from the said cam wheels,
25 and means for turning the cam wheels.

4. A stave-cutting machine, comprising a carrier for the stave blank, a pair of circular
30 saws on opposite sides of the carrier and inclined toward each other, slides in which the arbors of the said saws are journaled, sets of rollers carried by the said slides, a driving shaft, sets of cam wheels carried by the shaft and engaging the rollers to impart
35 a transverse bodily movement to the slides, gages for engaging the sides of the stave as it passes from the saws, the said gages being actuated from the said cam wheels, and means for moving the said carrier from
40 the said driving shaft.

5. A stave-cutting machine, comprising an endless carrier for the stave blank, a pair of
45 circular saws on opposite sides of the said carrier and having their axes arranged in a transverse plane, the axes being inclined toward each other, slides in which the arbors of the said saws are journaled, cam wheels for actuating the said slides, a driving
50 shaft on which the said cam wheels are secured, a gearing connecting the said driving shaft with the said endless carrier, and gages for engaging the sides of the stave as the latter passes from the saws, the said
55 gages being actuated from the said cam wheels.

6. A stave-cutting machine, comprising a base, standards carried by the base, a cross
60 bar connecting the standards, a gage having a fixed member carried by the cross bar, and a spring pressed movable member, the said standards being provided with guideways, a presser roller, bearings for the shaft of the presser roller mounted to slide in said
65 guideways, a pair of circular saws inclined toward each other, means for moving the

said saws from and toward each other, and a carrier for feeding the stave blank between the gage members, beneath the presser roller, and between the said saws.

7. A stave-cutting machine, comprising an
70 endless carrier provided with lugs for carrying a stave blank along, a presser roller above the said carrier engaging the top of the stave blank as the latter is carried along by the said carrier, a support for the under
75 side of the said carrier opposite the said presser roller, a pair of circular saws on opposite sides of the said carrier to which the stave blank passes from said presser roller, the said saws being movable toward and
80 from each other, gage rollers for engaging the sides of the stave as the latter passes from the said saws, levers carrying the said gage rollers, a driving shaft, and means carried by the driving shaft for actuating said
85 levers to impart movement to the gage rollers corresponding to that of the saws.

8. A stave-cutting machine, comprising an endless carrier having lugs for carrying a
90 stave blank along, a gage having members between which the blank passes, a presser roller under which the blank passes, a support for the said carrier opposite the presser roller, a pair of circular saws on opposite
95 sides of the said carrier, slides in which the arbors of the saws are journaled, cam wheels for actuating the said slides, rollers engaging the sides of the stave as it passes from the said saws, levers carrying the said rollers and actuated from two of said cam
100 wheels, a driving shaft carrying the cam wheels, and means for moving the endless carrier from said driving shaft.

9. A stave-cutting machine, comprising an
105 endless carrier for the stave blank, a pair of circular saws on opposite sides of the said carrier and having their axes arranged in a transverse plane, the axes being inclined toward each other, slides in which the arbors of the said saws are journaled, cam wheels
110 for actuating the said slides, a driving shaft on which the said cam wheels are secured, a gearing connecting the said driving shaft with the said endless carrier, gage rollers engaging the sides of the stave as the latter
115 passes from the saws, and levers carrying the said gage rollers and in contact with and actuated from the said cam wheels.

10. A stave-cutting machine, provided with an endless carrier having lugs for carrying
120 a stave blank along, a presser roller above the said carrier, engaging the top of the stave blank as the latter is carried along by the said carrier, the said presser roller having wooden side facings, a support for
125 the under side of the said carrier opposite the said presser roller, a pair of circular saws on opposite sides of the said carrier slides in which the arbors of the saws are journaled, cam wheels for actuating the said
130

slides, a driving shaft carrying the said cam wheels, and guiding devices for engaging the sides of the stave and actuated from the said cam wheels.

- 5 11. A stave-cutting machine, comprising a rack in which the stave blanks are stacked, an endless carrier having lugs for engaging and carrying a stave blank along, a pair of circular saws on opposite sides of the said
10 carrier, and inclined toward each other, slides in which the arbors of the said saws are journaled, gage rollers for engaging the sides of the staves, a driving shaft, means for actuating the said carrier from the said driv-
15 ing shaft, and means carried by the driving shaft for actuating the said slides and the said gage rollers.

- 20 12. A stave-cutting machine, comprising a carrier for the stave blanks, a pair of circular saws on opposite sides of the carrier,

slides in which the arbors of the said saws are journaled, sets of rollers carried at the ends of said slides, a driving shaft, sets of double cam wheels carried by the shaft and engaging the rollers to impart a transverse 25 bodily movement to the slides, gages for engaging the sides of the stave as it passes from the saws, levers carrying said gages at their upper ends, the lower ends of said levers being provided with rollers each en- 30 gaged by one of said cam wheels to actuate the levers, and a gearing connecting the said driving shaft with the said carrier.

In testimony whereof I have signed my name to this specification in the presence of 35 two subscribing witnesses.

ERNEST C. THORSCHMIDT.

Witnesses:

THEO. G. HOSTER,

EVERHARD B. MARSHALL.