

(No Model.)

2 Sheets—Sheet 1.

E. & B. HOLMES.  
Stave Jointing Machine.

No. 241,137.

Patented May 10, 1881.

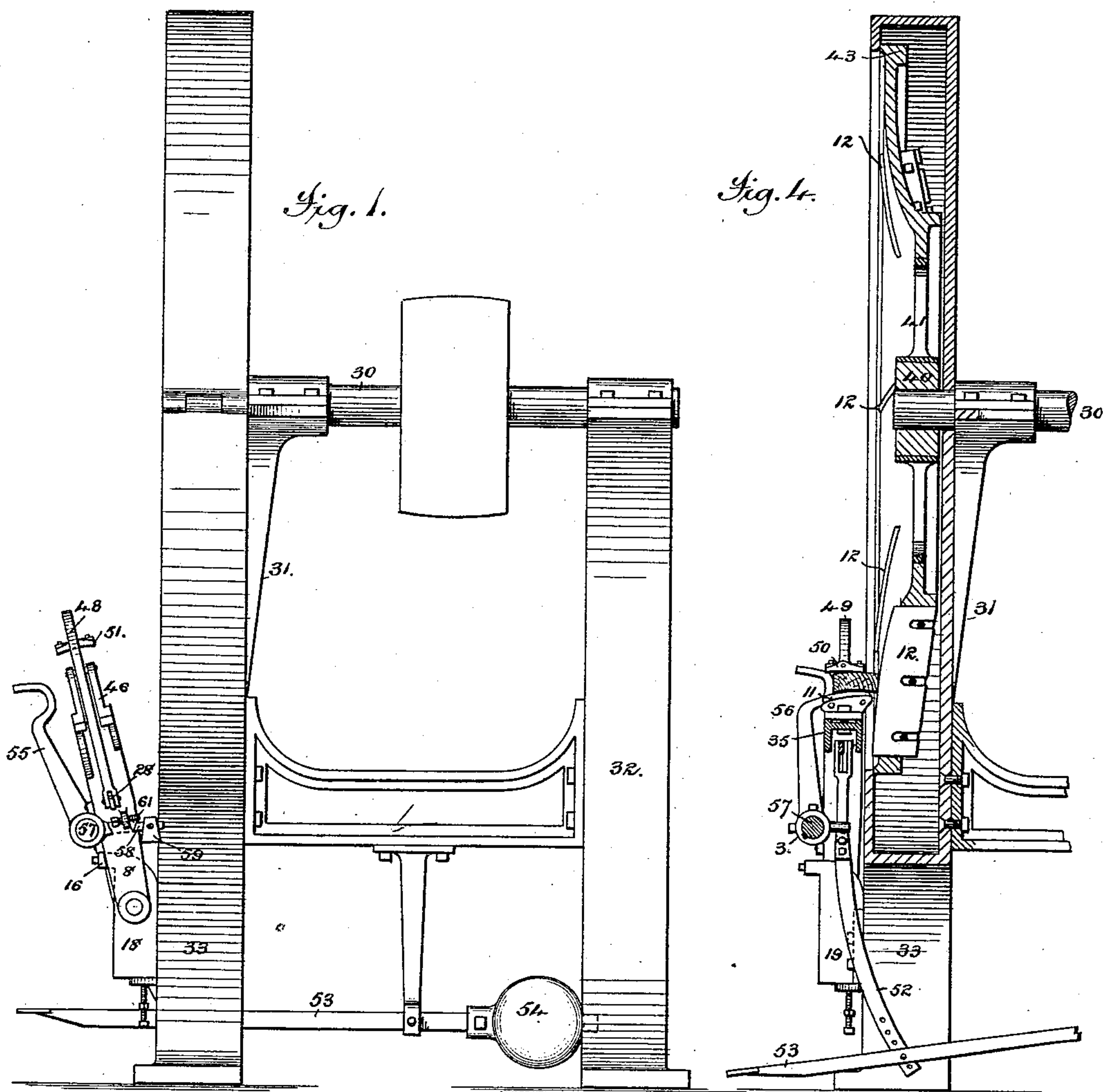


Fig. 5.



Fig. 6.

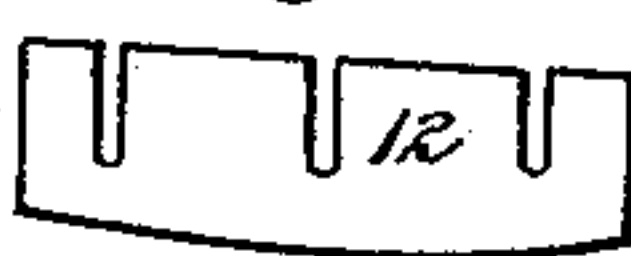


Fig. 7.

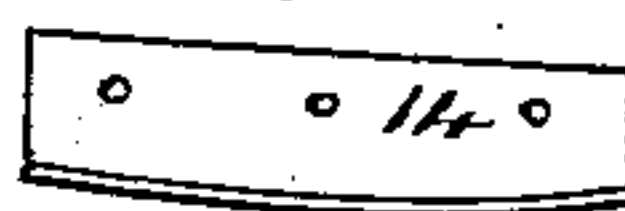
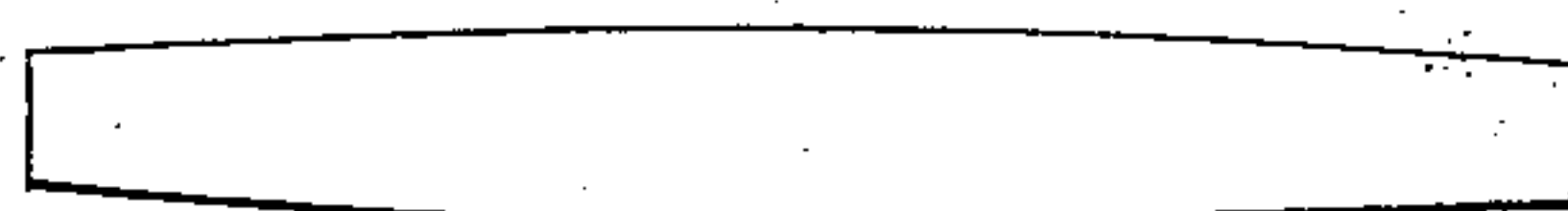


Fig. 8.



Attest:

W. M. Graham  
Anthony C. Jackson

Inventors,

E. and B. Holmes,

by *Amerson & Philips*

Attys.

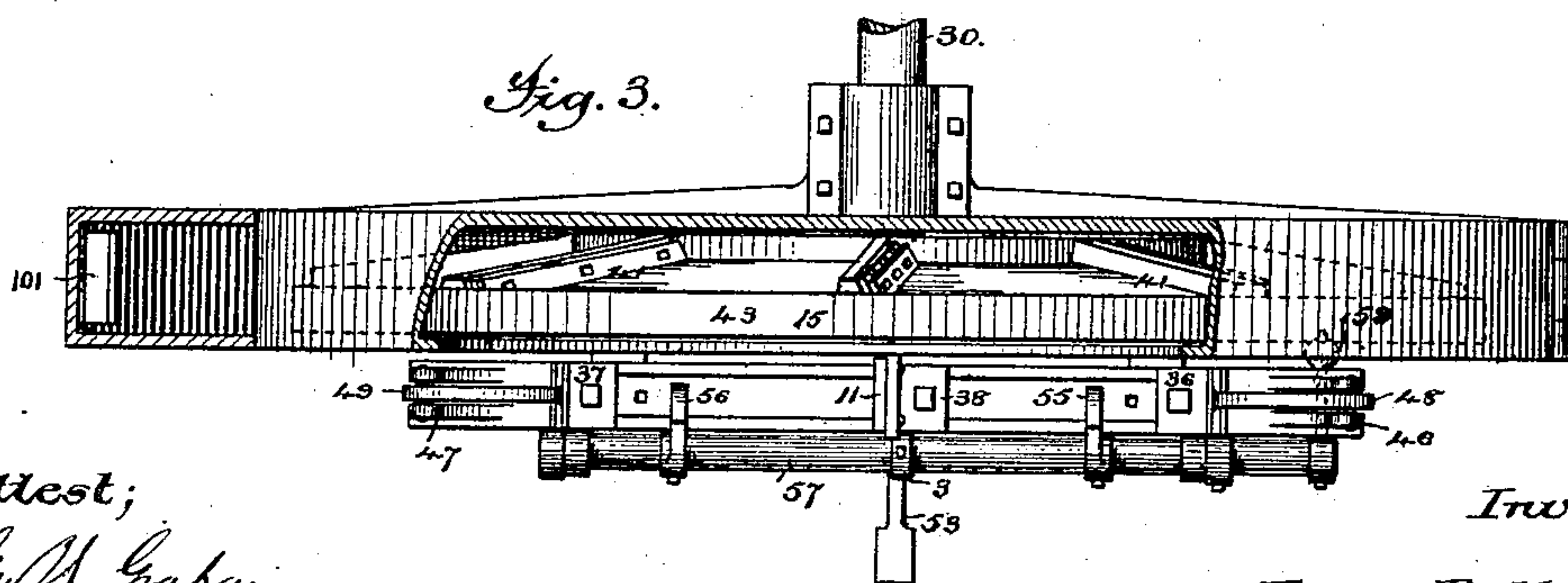
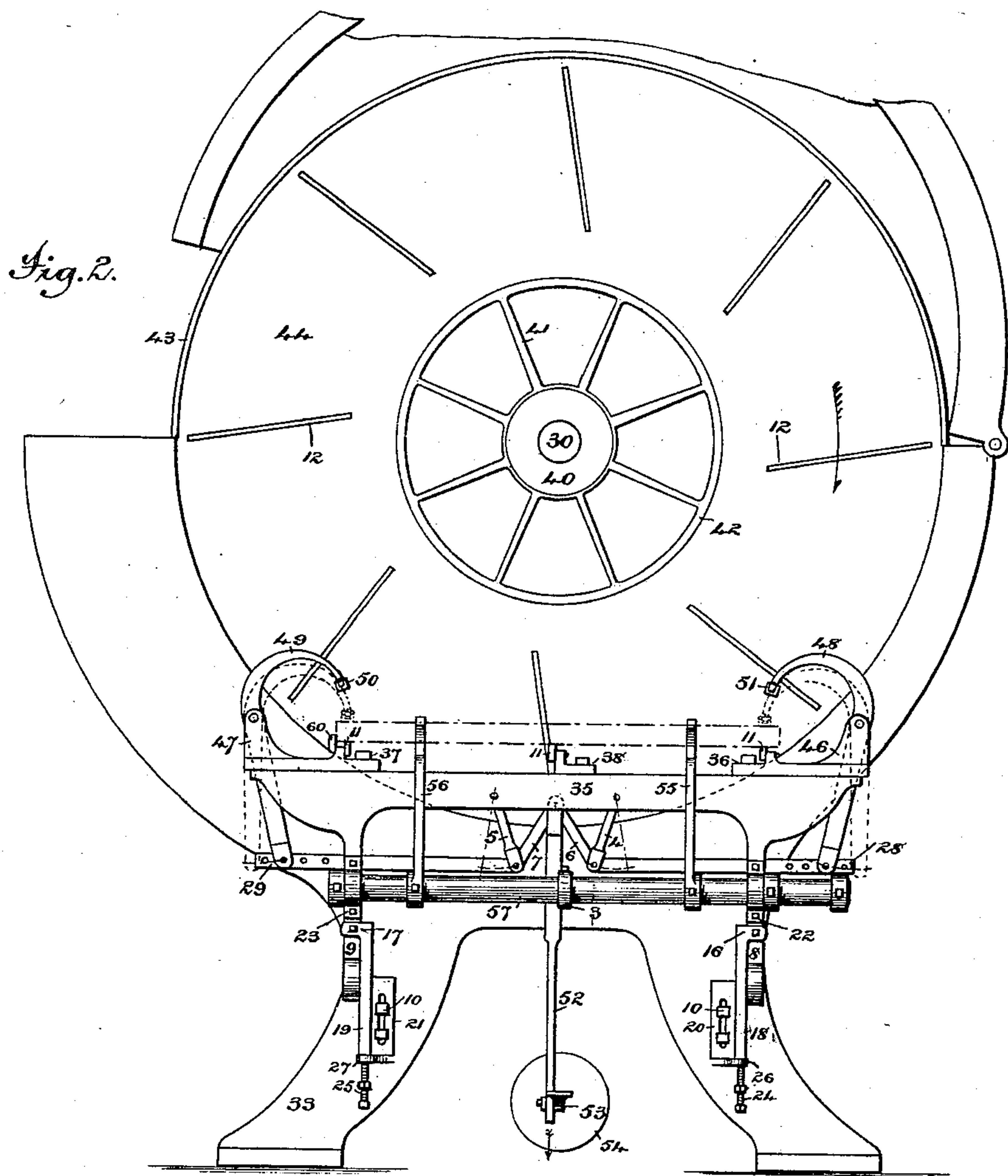
(No Model.)

2 Sheets—Sheet 2.

E. & B. HOLMES.  
Stave Jointing Machine.

No. 241,137.

Patented May 10, 1881.



Attest;  
Geo. W. Graham  
Anthony J. Jester

Inventors,  
E. and B. Holmes,  
by  
Hanson & Phillips  
Attys.



# UNITED STATES PATENT OFFICE.

EDWARD HOLMES AND BRITAIN HOLMES, OF BUFFALO, NEW YORK.

## STAVE-JOINTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 241,137, dated May 10, 1881.

Application filed May 8, 1880. (No model.)

*To all whom it may concern:*

Be it known that we, EDWARD HOLMES and BRITAIN HOLMES, citizens of the United States, residing in the city of Buffalo, county of Erie, and State of New York, have invented certain new and useful Improvements in Machines for Jointing Staves, of which the following is a specification.

A machine embodying our improvements is shown in Figure 1 by a side elevation, in Fig. 2 by a front elevation, in Fig. 3 by a plan view, partly in section, and in Fig. 4 by a vertical central sectional elevation. Fig. 5 is a detail view, showing, by a horizontal section, the mode of attaching the cutters. Fig. 6 is a plan view of one of the cutters detached; and Fig. 7, a similar view of the break-iron by which the cutters are secured in place. Fig. 8 is a plan view of a jointed stave.

The separate staves that are assembled in circular form to constitute a barrel-body require to be dressed so that the adjacent or bearing edges in contact shall fit or conform with each other, and thus form a proper joint, which, in "tight work," must be a closely-fitting joint. Such staves must also be bent to impart to them a longitudinal curvature, which produces the bilge-form. The dressing of their edges must therefore be an angular cut that slightly bevels their edges, so that they will fit together in a circle, and it must also produce a longitudinal cut that curves from one end to the other of the staves, so as to narrow their end portions, while their centers are left wide or projecting, which staves are thus suited to form a bilged barrel-body.

The cutting-wheels for stave-jointers have heretofore been constructed with a face constituted by a straight line from the periphery to a point a considerable distance therefrom, and thence curved down to the inner circle or line of its cutter-carrying portion, and the cutters carried by this wheel have cutting-edges conforming to this shape.

These improvements relate to a jointing-machine for producing these curved and beveled edge cuts; and the invention consists in a cutting head or wheel, of which the cutter-carrying portion is curved from its outer to its inner edge, and which carries adjustable cutters of like curved form, by which structure

the stave-edges will be so jointed that a barrel produced from them will be of the required curved form at bilge, quarter, and chine to constitute a barrel of perfect shape, having tight joints that will not leak, and the cubic area of which will correctly gage by the scientific instruments for such purpose; in an improved stave holding and presenting mechanism co-operating with said cutting-head; in an improved means for operating the stave-clamps, and other details of construction, all of which will more fully hereinafter appear.

To enable one to readily comprehend these improvements, we will now explain the structure and operation of a machine containing them.

This machine embodies a cutter-head or cutter-carrying wheel in which a series of cutters, 12, are fixed in angular positions, which head or wheel is rotated by means of a driving-shaft, 30, that is journaled in a proper frame, as the standards 31 32, which are supported upon legs, as 33, or other frame-work.

The cutter head or wheel is constructed of a central hub, 40, which is connected by spokes 41 to a circular inner rim, 42. An outer rim, 43, is connected to this inner rim, 40, by continuing the spokes 41, or by providing other brace-ribs. The space between the rims 42 and 43 is covered by a circular plate, 44, and this portion of the wheel is set forward, so as to provide the outer portion of the wheel, through which the cutters protrude, with a face that is concave in its general shape. This outer portion of the cutter head or wheel is also convex in form, as is clearly shown in Fig. 4, thus producing a cutter-wheel the general shape of whose face is concave, while the outer or cutter-supporting portion is convex.

The cutters 12 consist of separate chisel-edged plates or bits that are also convex in their outline. Each cutter is so supported in slots in the plate 44 by means of break-irons 14 and bolts that secure them upon the inclined faces of holding-lugs 15, with which the wheel is provided between the rims 42 43, that the convex edges of the series are disposed in concave form. These cutters 12 may thus be adjusted to protrude a slight or proper distance beyond the face of the disk or plate 44; and as such plate is convex and inclines back-



wardly from its outer to its inner edges, it follows that the cutters will stand longitudinally in a corresponding position.

By giving the wheel in which the cutters are set a general concave form said cutters are caused to produce a curved cut along the edge of the stave, which cut the convex form given to the edge of each cutter modifies so as to produce the required straighter cut or curve at the quarter of the stave than the concave disposition of such cutters would alone make. (See Fig. 8.) The convex curvature given to the edges of these cutters is greatest at their inner ends, and at their outer ends it is comparatively straight, which form enables the degree of curvatur of cut accomplished by them to be readily raised by adjusting the stave to be jointed, so that different longitudinal portions of the cutters perform the cutting, as will presently be further explained.

In front of the cutter-wheel, and near its lower edge or side, is a horizontal bed or table, 35, that is arranged to swing back and forth by means of depending arms 8 9, which are pivoted to brackets 18 19. This table is capable of vertical adjustment by the following means: The bodies of its supporting-brackets 18 19 rest upon screw-bolts 24 25, that are tapped in screw-threaded lugs 26 27 projecting from the legs 33, the movement of which bolts will raise or lower the table, as may be required. These bolts 24 25 are provided with jam-nuts, which, screwed against the under faces of the lugs 26 27, prevent the jarring action of the machine from causing the said bolts to turn, and thus disturb the adjustment. The brackets are further provided with side plates, 20 21, that are slotted to receive the shanks of holding-bolts 10, that are tapped into threaded holes in the legs 33, and thus act to more securely hold the table in its adjusted positions. The body-plates of these brackets extend upward to form rests 16 17, which are engaged by stops 22 23, with which the rear sides of the depending arms 8 9 are provided.

To the bed 35 are secured the stave-rests 36 37 38, upon which the stave to be jointed is supported. The end rests, 36 and 37, are adjustable to and from the center rest, 38, and each is provided with a seat, 11, that has a curved upper surface conforming to the curved inner surface of the stave. These seats 11 are connected to the rests by means of bolts or other common means, whereby they may be adjusted vertically to proper positions, so that the whole under surface of the stave will bear upon them, and the stave thus be rigidly supported and compelled, by the pressure exerted upon it by the clamps, to adjust itself to their curved upper faces, whereby the crooks and wind of the stave will be removed when it is jointed. The end rest, 37, is also provided with a head-block, 60, against which the end of the stave is adjusted as it is introduced into the machine. The end rests, 36 37, also carry rising ears 46 47, in which the arms 48 49 of the clamps 51 50 are pivoted, which clamp-arms 48 49 are provided

with connecting-rods 28 29, pivoted to swinging arms 4 5, and attached to the toggle-levers 6 7, that are connected to and operated by a connecting-rod, 52, attached to a foot-lever, 53, that is counterbalanced by a weight, 54.

The forward movement of the bed or table 35 is limited by an adjusting-screw, 61, that turns in a lug projecting from the arm 8 and projects so as to engage the leg 33.

The stave-eveners 55 56 consist of arms that are fast upon a rocking shaft, 57, hung in bearings provided in the bed or table 35, and said arms have their upper ends suitably bent to bear against the rear edge of the stave. The shaft 57 is provided with a forwardly-projecting arm, 58, upon which is carried an adjustable weight, 59, the tendency of which is to hold the stave-eveners 55 56 in their forward position, and thus cause them to press forward and bear upon the rear edge of and hold a stave in proper position to have its front edge presented to the cutters of the jointer wheel or head. The shaft 57 supporting these arms is provided with a collar, 3, having an arm projecting from it in such a forward position as to be engaged by a pin on the rod 52 when such rod moves upwardly, and thus causes the shaft 57 to rock and the eveners to be thrown rearwardly or in an open position, to permit the stave lying in front of them upon the rests to be removed and another one to be introduced.

The normal position of the lever 53 is its raised position, in which it is held by the weight 54, the clamps 50 51 then being raised, the bed or table 35 resting against the stops 16 17 in its rearward position, while the eveners 55 56, from before which a stave has been removed, are held in their rearward position. (See Fig. 1.) The stave to be jointed is then laid upon the rests 36 37 38 in front of the eveners, with its end snugly seated against the head-block 60. Pressure is then applied to the foot-lever 53, the downward movement of which, through the toggle-levers and their connections, causes the clamps 50 51 to be brought down upon the ends of the stave to clamp the same, and at the same time, the pin on the collar 3 being released, the eveners are pressed forward by their weight 59 against the rear edge of the stave, to properly project its front edge beyond the rests for its presentation to the cutters 12. As the clamps are thus brought down they press sufficiently to cause the seats 11 to properly adjust under the stave, which is thus supported in a true position in all directions with respect to the jointing-cutters. The stave thus secured upon its bed or table 35 is carried forward by the same movement of the foot-lever that operates the clamps and eveners, and hence presents such stave in a proper position to be engaged by the cutters 12 of the rapidly-revolving jointer-wheel. Now as the stave is supported in a horizontal plane, and each cutter travels in a circular arc through such plane, it follows that the cutters engaging the stave-edge must perform a shearing cut thereon, and as these cutters are arranged in inclined posi-



tions in the cutter-head it also follows that the cut they make will be inclined vertically, or provide the stave with an inwardly-inclined undercut edge, and that horizontally such cut will be circular and composed of such arcs as are determined by the portion of the cutter-edges that are in cutting range as the cutter-wheel revolves. Thus the stave is given a curved forward edge that is properly tapered from one end to the other, the center or bilge point being considerably curved, while the quarters and ends have very slight curves. Each stave-edge is thus formed so that when a number of such staves are assembled as a barrel-body such barrel-body will have the desired form of bilge, quarters, and ends.

The degree of angularity of the stave-edge may be varied by a proper arrangement of the stave-rests and the adjustable pieces upon the clamps, whereby the stave is given more or less angularity with respect to the supporting bed or table.

To obtain more or less extent of the curvature of the stave-edge, it is only necessary to raise or lower the bed or table by means of its adjustable brackets 18 19, whereby the stave is brought more or less toward the center of the cutter-wheel and thus exposed to the cutters, so that a lesser or greater curved portion of the edges of the cutters shall act. When the stave-edge has been properly dressed the workman, releasing the forward pressure upon the bed or table 35, allows the same to vibrate rearward, and at the same time permits the lever 53 to rise, whereupon the clamps 50 51

are raised, the eveners 55 56 drop rearward, and the stave is released, and the described operation may be repeated.

The casing of the cutter-wheel is made hollow, and its lower portion at one side converted into a chute, whereby the shavings cut from the staves are collected and guided out of the opening 101, from whence they may be conducted by a pipe to any desirable place.

Having thus described our improvements, what we claim is—

1. The combination, with the stave-supporting bed, of a wheel for jointing staves, having its face formed upon a curve from its outer edge to its inner edge, and provided with cutters which have their cutting-edges conformed to the said wheel-face, substantially as and for the purpose described.

2. The combination, with the stave-supporting bed and its end clamps, of the toggle-levers for operating the clamps and rods connecting said levers and clamps, substantially as described.

3. The combination, with the stave supporting bed, its rest blocks or seats and clamps, of the eveners and mechanism connecting them with the clamps, so that the movement of the eveners is governed by the movement of the clamps, substantially as described.

EDWARD HOLMES.  
BRITAIN HOLMES.

Witnesses:

JAMES SANGSTER,  
M. D. FIELD.