

(No Model.)

2 Sheets—Sheet 1.

A. T. LINDERMAN.
DOVETAIL JOINT CLOSING MACHINE.

No. 411,923.

Patented Oct. 1, 1889.

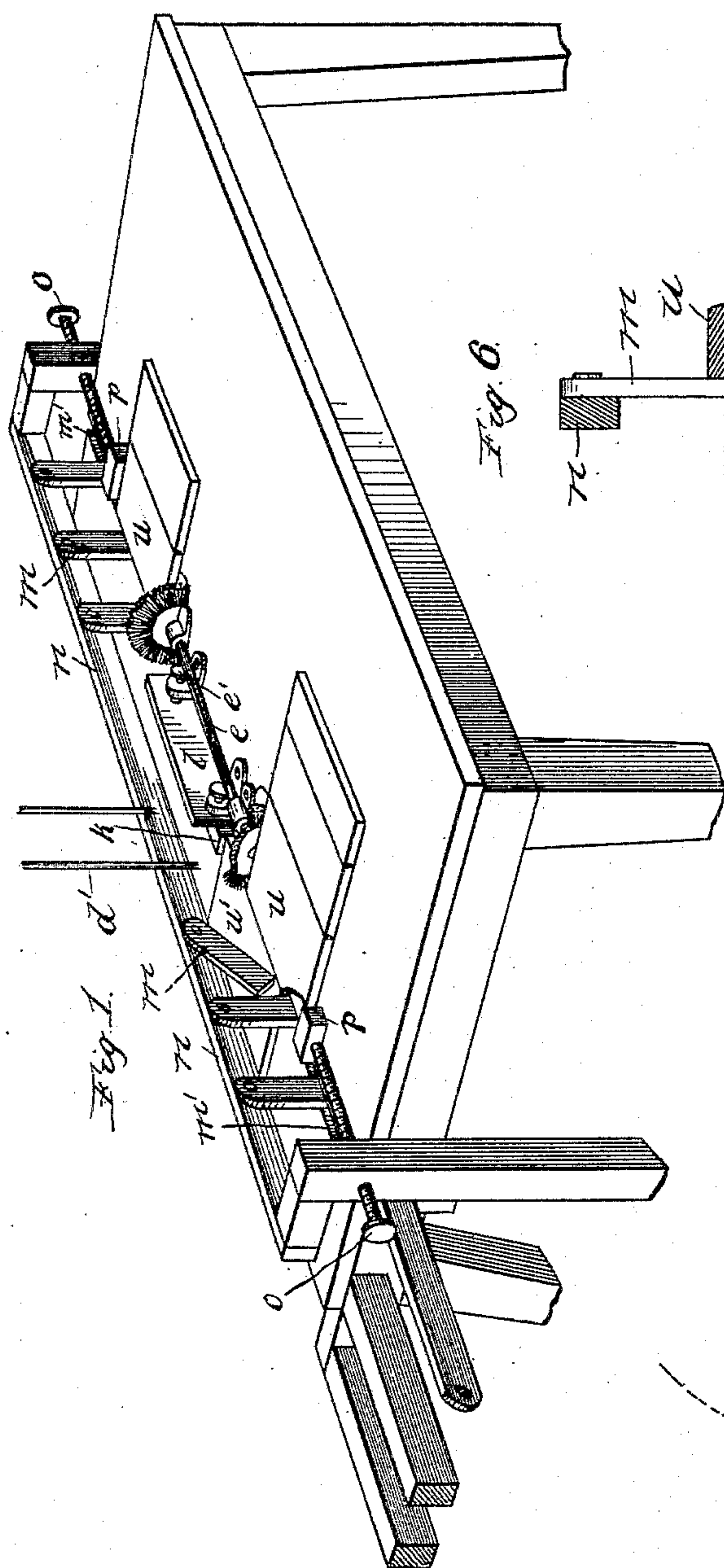


Fig. 1.

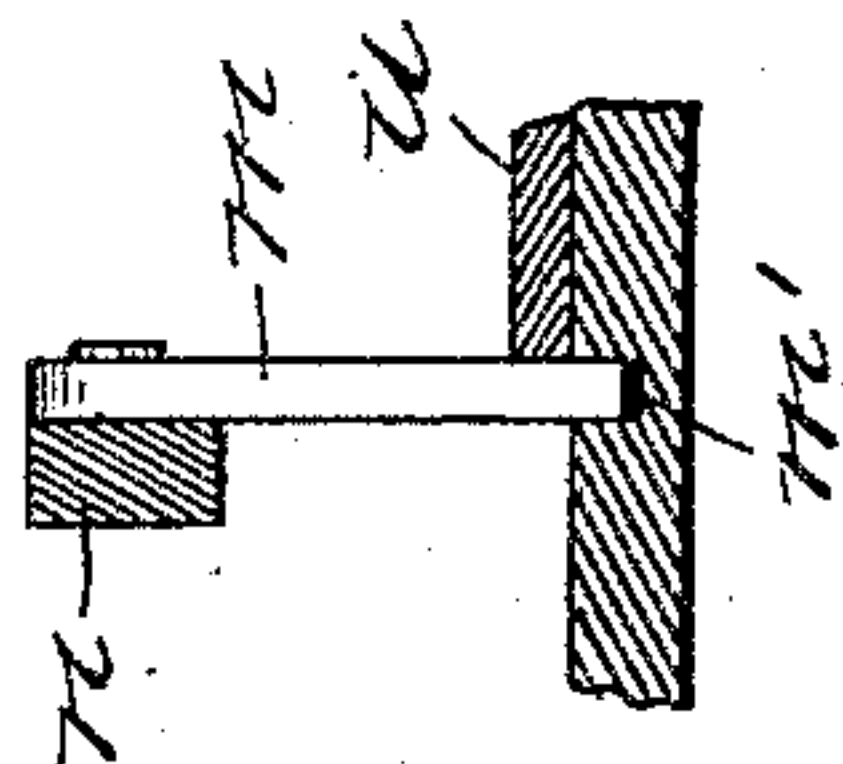


Fig. 6.

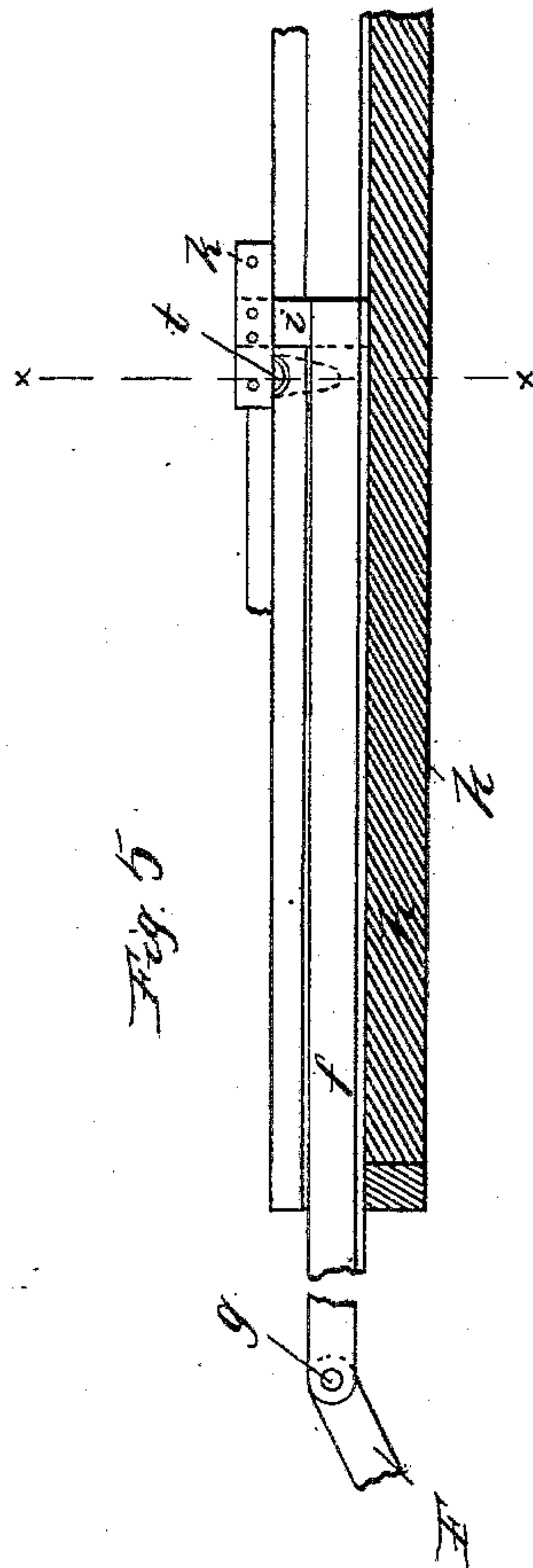


Fig. 5.

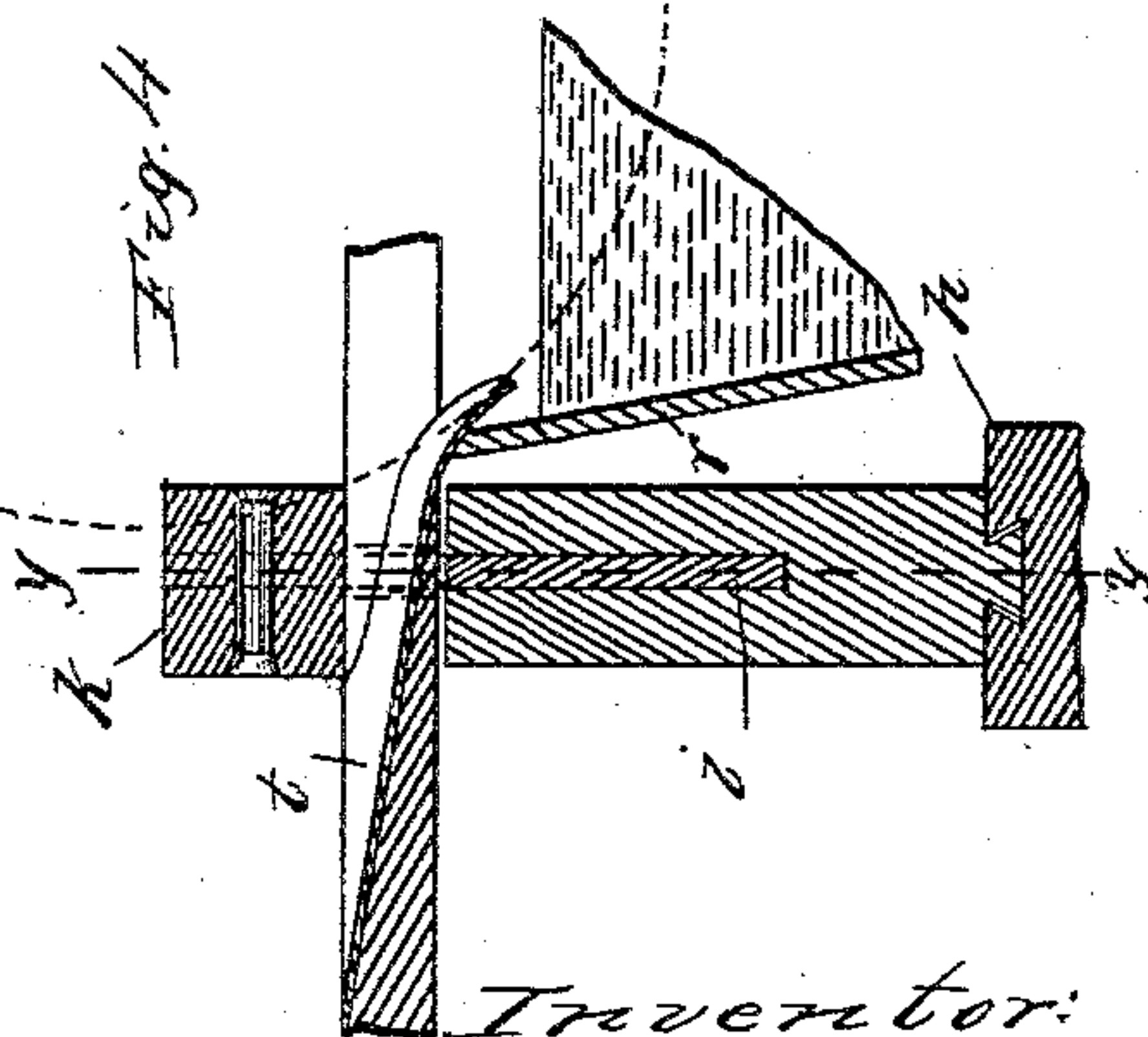


Fig. 4.

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UNITED STATES PATENT OFFICE.

ALBERT T. LINDERMAN, OF WHITEHALL, MICHIGAN.

DOVETAIL-JOINT-CLOSING MACHINE.

SPECIFICATION forming part of Letters Patent No. 411,923, dated October 1, 1889.

Application filed March 6, 1886. Renewed February 9, 1889. Serial No. 299,355. (No model.)

To all whom it may concern:

Be it known that I, ALBERT T. LINDERMAN, a citizen of the United States, residing at Whitehall, in the county of Muskegon and State of Michigan, have invented a new and useful Dovetail-Joint-Closing Machine, of which the following is a specification.

My invention relates to a machine for uniting lumber having interfitting tongues and grooves formed upon the abutting edges.

The object of the invention is to provide a machine in which this operation may be performed by a sliding or lengthwise movement of one piece upon the other, in which movement the tongue of the one piece may be made to enter and slide along in the groove of the other piece.

Another object is to provide means for gluing the joint as the operation of uniting the pieces proceeds; also, to provide for working two or more crews or sets of hands at the same time by duplicating a part only of the machine.

I attain these objects by the machine hereinafter described, and which embodies the following features of invention, to wit: First, the combination of a pusher for driving the incoming stock and a stop for holding the other portion of the stock against the push of the incoming stock, with a table or support and gages or positioning devices for the stock; second, in a machine for uniting tongued and grooved lumber, the combination, with a pusher for driving the incoming stock, of a stop for the other stock and one or more gages for positioning the latter, said gages being adapted to move out of the way of the incoming stock; third, in a machine for uniting tongued and grooved lumber, the combination of a pusher for driving and a fence or guide for positioning the incoming stock with holding and positioning devices for the stock with which the incoming stock is to be united; fourth, in a machine for uniting tongued and grooved lumber, the combination, with devices for holding one part of the stock and devices for driving the other part of the stock into the first-named part by a lengthwise-sliding movement, of a brush-wheel so located as to apply glue to the edge of the moving stock as it

slides into the receiving stock; fifth, the combination, in a machine of this character, with a reciprocating pusher adapted to drive stock in both directions, of holding and positioning devices at each side of said pusher for holding the receiving stock against the push of the incoming stock.

The accompanying drawings, which form a part of this specification, and in which similar letters of reference indicate like parts, show at Figure 1 a perspective, partly broken away, of the table where the lumber is joined and glued, showing some sheets of boards as just having been joined and another board in position and ready for the closing operation. Fig. 2 is a plan view of the main portion of the machine. Fig. 3 is a vertical section of the part shown at Fig. 2. Fig. 4 is a sectional end view, drawn at the plane $x x$ of Fig. 5, of the follower-head or pusher and the sliding arm which drives it, the waste-glue trough emptying into glue-dish, dotted lines showing the outlines of the glue-wheel. Fig. 5 is a sectional side view, drawn at the plane $y y$ of Fig. 4, of the follower-head, the post and sliding arm that drives it, the timber which supports the sliding arm, the waste-glue pot, and the table. Fig. 6 is a partial cross-vertical section on the line 6 6 of Fig. 2.

Suitable legs and cross-girders support the table-top of my machine. I prefer this top to be of iron plate, so as to maintain a uniform plane, as a wood top I find is liable to warp from the effects of the wet glue, which is apt to be dropped upon it. Power is carried by a belt (not shown) to the pulley b , which is keyed to the shaft b' . To said shaft is also keyed the driving friction pulley-wheel B . By means of sliding boxes in which the shaft b' turns and a suitable starting-lever (not shown) connected thereto the friction-wheel is thrown into contact with the pitman-wheel C and the machine started. The pitman-wheel is fast upon its shaft, and said shaft also carries a rope-wheel d , driving the rope belt d' . This rope belt is passed around an overhead idler-pulley (not shown) and thence to the pulley on the shaft e of the glue-wheels E , thereby actuating the latter.

F is a pitman carrying motion from the pitman-wheel to the follower f , being connected

to the latter by the pin *g*. To the post *i*, which is attached to the follower and projects above the table-top, are attached follower driving-heads *k k*, with overhanging ends. 5 These overhanging ends drive or push the incoming stock *u'*, one head driving the stock on the upstroke and the other on the downstroke into the stock *u*, to which the incoming pieces are to be severally joined. This 10 double action obtains, however, only when both "sides" of the machine are to be worked at the same time. The follower-blocks *p p* act as stops to hold the stock *u* against the pressure of the incoming stock. These stops 15 are preferably adjustable to the extent required to accommodate the different lengths of stuff operated upon, and they may be made so by providing them with screws *o o*. Gages *m m* are employed as stops, against which the 20 edge of the stuff so held by the stops *p p* may be pushed to bring it in line with the edge of the incoming stock. These gages are located in the path of the incoming stock, and hence I make them movable, so they may be thrown 25 or moved out of the way, and a very simple way of accomplishing this result is to support them from the bar *n* by pivots, which will permit them to swing freely in the direction in which the stock moves, so that the stock 30 will itself lift them out of the way one after another as it approaches them. These gages are also preferably long enough to reach below the table-top and into the recess or slot *m'*, whereby they are supported against the push 35 of the stock *u*.

The fence *l* serves as a guide to the incoming stock both in positioning the incoming stock and also to direct it in its movement toward stock *u*, with which it is to be united. 40 It is preferably adjustable, as by means of screws *l'*.

The glue-applying brush-wheels *E E* are located, as shown, so that they act upon the edge of the incoming stock as it is moved 45 along in closing the joint. The brushes rotate in glue-pots *r*, warmed by steam from the pipe *s*, the steam being admitted to the space in vats *r'* surrounding the pots. Troughs *t t*, Figs. 4 and 5, conduct any superfluous glue 50 that may be thrown off the glue-wheels back into the glue-pots. These troughs are recessed into the table-top sufficiently to allow the incoming stock to pass over them without interference, and the overhanging of the driver-heads *k k* allows them to cross the line of the 55 travel of the supporting-post *i* without being struck by it, as the stock is pushed far enough beyond the post to leave a clearance of the glue-trough. It is for this reason that the driving ends of heads *k* overhang the post *i*, and the amount of the projection or "overhang" should correspond to the width of the glue-spout. A dovetail tenon on the bottom 60 edge of the follower *f* fits movably in a groove upon the top of the supporting-timber *h*, and furnishes a way in which the follower may slide. The slot *m'*, in which the post *i* moves,

is, when extended, the same groove into which the ends of the gages *m* drop for their steadiment. 70

I have used the term "side of the machine" to mean the set of gages *m*, the glue-wheel, and the follower for holding the stock against the push of the incoming stock at one side of the driver or pusher for the incoming stock, 75 the corresponding parts at the other side of the driver constituting the other side. One or both sides may be operated, and the machine may be built with either one or both sets of these duplicate mechanisms. 80

The operation of the machine is as follows: The stock having been previously prepared with a straight dovetail tenon upon one edge and a straight dovetail groove upon the other 85 edge, the operator takes a piece and places it with the tenon-edge against the gages *m* and the end against the follower *p*. This stock is shown in the drawings at the letter *u*. Another operator stands at the other side of the table, and as the pusher-head passes 90 places a piece of the stock (designated in the drawings by the letter *u'*) with its grooved edge against the fence *l*. This fence brings the last-mentioned piece of stock, which may also be designated as the "incoming stock," in 95 such line that as the pusher drives it toward the first-mentioned piece the tenon of the latter will enter the groove of the incoming piece, and the stroke of the pusher being completed the two will be joined. The gages *m*, 100 which have been successively raised by the incoming piece, will then lie upon it, and as it is drawn back by the operator they will drop into place ready for the next operation. The operation is repeated until a sheet of stock has 105 been formed of the desired width, when it is laid aside and another begun. Where both sides of the machine are operated at the same time, the incoming pieces are placed against the fence behind the pusher in its travel each 110 way, and as it makes the return-stroke are driven home alternately to one side upon the up-stroke and to the other side on the downstroke. The glue-wheels, turning in contact with the jointed edge of the incoming receiving 115 stock, serve to coat the same with glue over its entire length, and as the close-fitting joint will allow only a small part of the glue to adhere the surplus will run off at the first junction of the parts, which is at the end of 120 the stock *u* next the glue-wheel, and be caught by the glue-pan, if sufficiently large, thereby using only a small amount of glue.

The incoming stock is illustrated at Fig. 1 as partially joined to the receiving stock. 125 At Fig. 2, however, the incoming stock is shown as merely positioned ready to be driven into union with the receiving stock.

I claim—

1. A machine for closing together lumber 130 which is provided with interfitting dovetail joints upon its edges, having the following elements: a table for the receiving and incoming lumber, a pusher for driving the in-

coming into the receiving stock, a guide-fence
alongside the pusher's travel for regulating the
position of the incoming piece, an adjustable
follower-block to support the end of the re-
ceiving stock against the push of the incom-
ing piece, and gages to regulate the position
of the receiving stock when it is pressed
against them, which gages are so arranged as
to recede from before the incoming stock as
it is driven home, substantially as set forth.

2. In a dovetail-joint-closing machine, the
combination, with a reciprocating pusher for
driving the stock and an adjustable guide-
fence alongside the pusher's travel to regulate
the position of the incoming stock, of two sets
of devices at opposite sides of the table, each
of which sets of devices consists of an ad-
justable follower-block to support the end of
the receiving stock against the push of the
incoming stock and gages to regulate the
position of the receiving stock, so arranged
as to recede from before the incoming stock
as it is driven home, substantially as set forth.

3. The combination, with the table for the
receiving and incoming lumber, a guide-fence,
a stop for the receiving lumber to resist the
push of the incoming piece, and receding gages
to regulate the position of the receiving lum-
ber, of a gluing device for applying liquid
glue to the edge of the incoming piece as it is
driven into the receiving piece, substantially
as set forth.

4. In a machine for closing dovetail tenon-
joints, the combination, with a table for the
receiving and incoming lumber, a stop for the
receiving lumber, receding gages to regulate
the position of the receiving piece, and a gluing
device for spreading liquid glue from a glue-
pan underneath upon the edge of the incom-
ing piece while in transit, of a waste-glue
spout opposite the gluing device recessed in
the table-top and a pusher for driving the
incoming stock, having overhanging ends
whereby the stock is driven home without in-
terference to the waste-glue spout, substan-
tially as shown and described.

5. In a machine for closing dovetail tenon-
joints, the combination, with a table for the
lumber, a guide-fence, and a reciprocating
pusher having overhanging driving ends, of
two sets of devices at opposite sides of the
table, each set consisting of a gluing device,
a stop-block for the receiving lumber, pend-
ent sidewise-yielding gages, and a trough re-
cessed in the table for waste glue, as and for
the purposes set forth.

6. In a machine for closing dovetail tenon-
joints, the combination, with a table for the
receiving and incoming lumber, a guide for
the incoming lumber, and a gluing device, of
the bar *n* above the table and gage-pins *m*,
pivotally attached to the bar to gage the po-
sition of the receiving lumber and recede suc-
cessively before the incoming lumber, sub-
stantially as set forth.

7. The combination, with a table for the re-
ceiving and incoming lumber, a guide-fence,
a gluing device, a pusher for the incoming
piece of lumber, and a stop for the receiving
lumber to resist the push of the incoming
piece, of gages pivotally arranged above the
table to regulate the position of the receiving
lumber and to yield sidewise before the in-
coming piece, substantially as specified.

8. The machine for closing dovetail joints,
consisting, essentially, of a pusher recipro-
cating along a table for supporting the ma-
terial to be joined and adapted to drive the
incoming stock and a stop for holding the
other portion of the stock against the push of
the incoming stock, in combination with said
table and separate devices for positioning
both parts of the stock preparatory to uniting
them, substantially as set forth.

9. In a machine for uniting tongued and
grooved lumber, the combination, with a table
for supporting the material to be joined and
a power-driven pusher reciprocating along
such table and acting to drive the incoming
stock, of one or more gages for positioning
the receiving stock, such gages being located
in the path of and adapted to be moved out
of the way by the incoming stock, and a hold-
ing device for the receiving stock, substan-
tially as set forth.

10. In a machine for uniting tongued and
grooved lumber, the combination of a table
for supporting the material to be joined, a re-
ciprocating pusher for driving the incoming
stock moving along said table, and a fence
against which the incoming stock is position-
ed, with a stop for holding the receiving stock
against the push of the incoming stock and
a gage or gages against which the receiving
stock is positioned, substantially as set forth.

11. In a machine for uniting tongued and
grooved lumber, the combination, with a table
for supporting the material, a reciprocating
pusher moving along said table and adapted
to drive the incoming stock into the receiving
stock by a lengthwise-sliding movement, and
a stop for holding the receiving stock, of a
brush-wheel located essentially as shown and
adapted to apply glue to the edge of the mov-
ing stock as it enters the receiving stock,
substantially as set forth.

12. The combination, in a machine of this
character, with a reciprocating pusher adapt-
ed to drive incoming stock in both directions
and a table for supporting the material, said
pusher moving along over said table, of a stop
at each side of said pusher for holding the
receiving stock against the push of the in-
coming stock, substantially as set forth.

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Witnesses:

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