

No. 688,169.

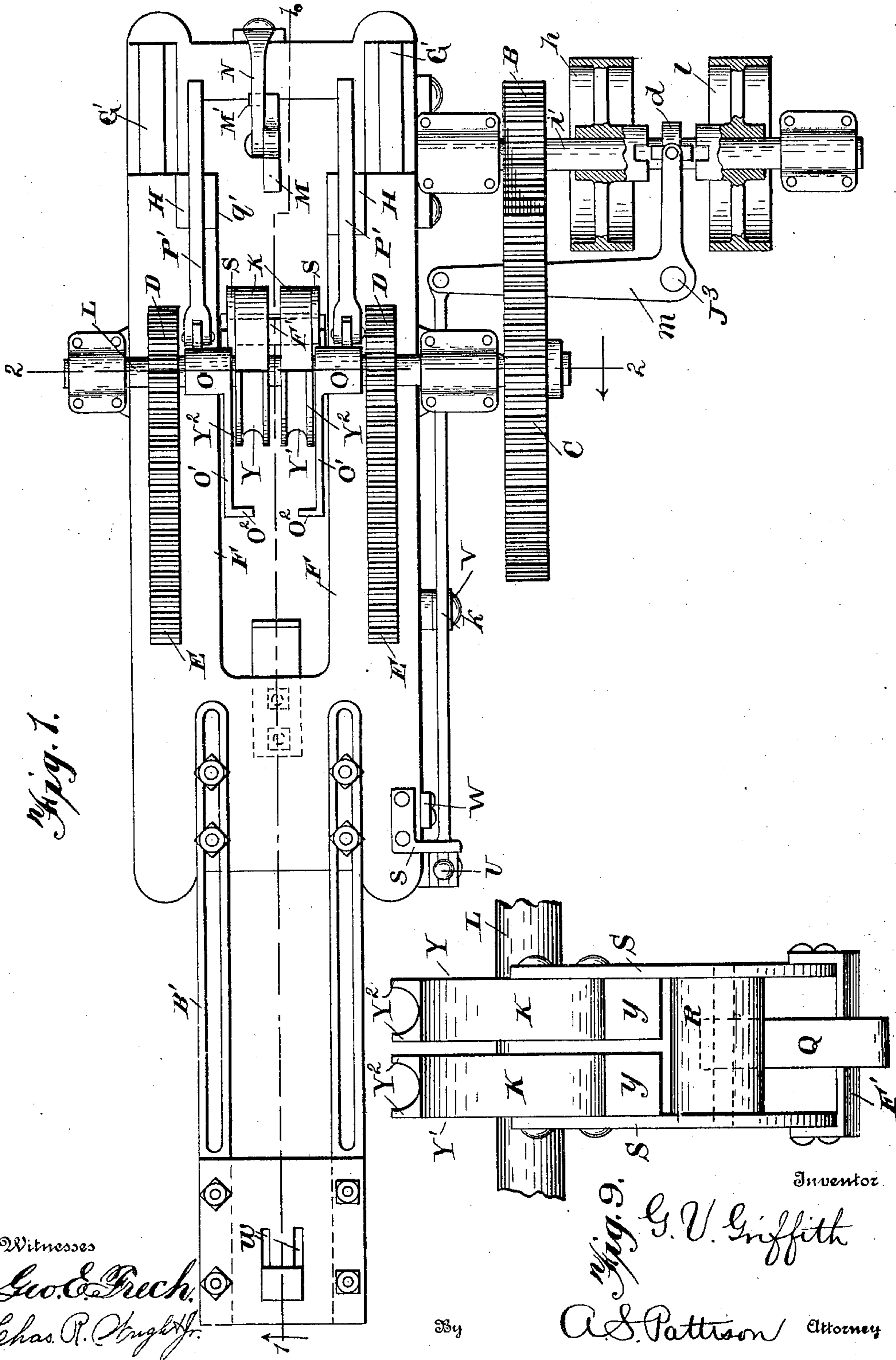
Patented Dec. 3, 1901.

G. V. GRIFFITH.
WOOD BENDING MACHINE.

(Application filed May 10, 1901.)

(No Model.)

5 Sheets—Sheet 1.



Witnesses
Geo. E. Grech.
Chas. R. Hughes.

Fig. 9. G. V. Griffith
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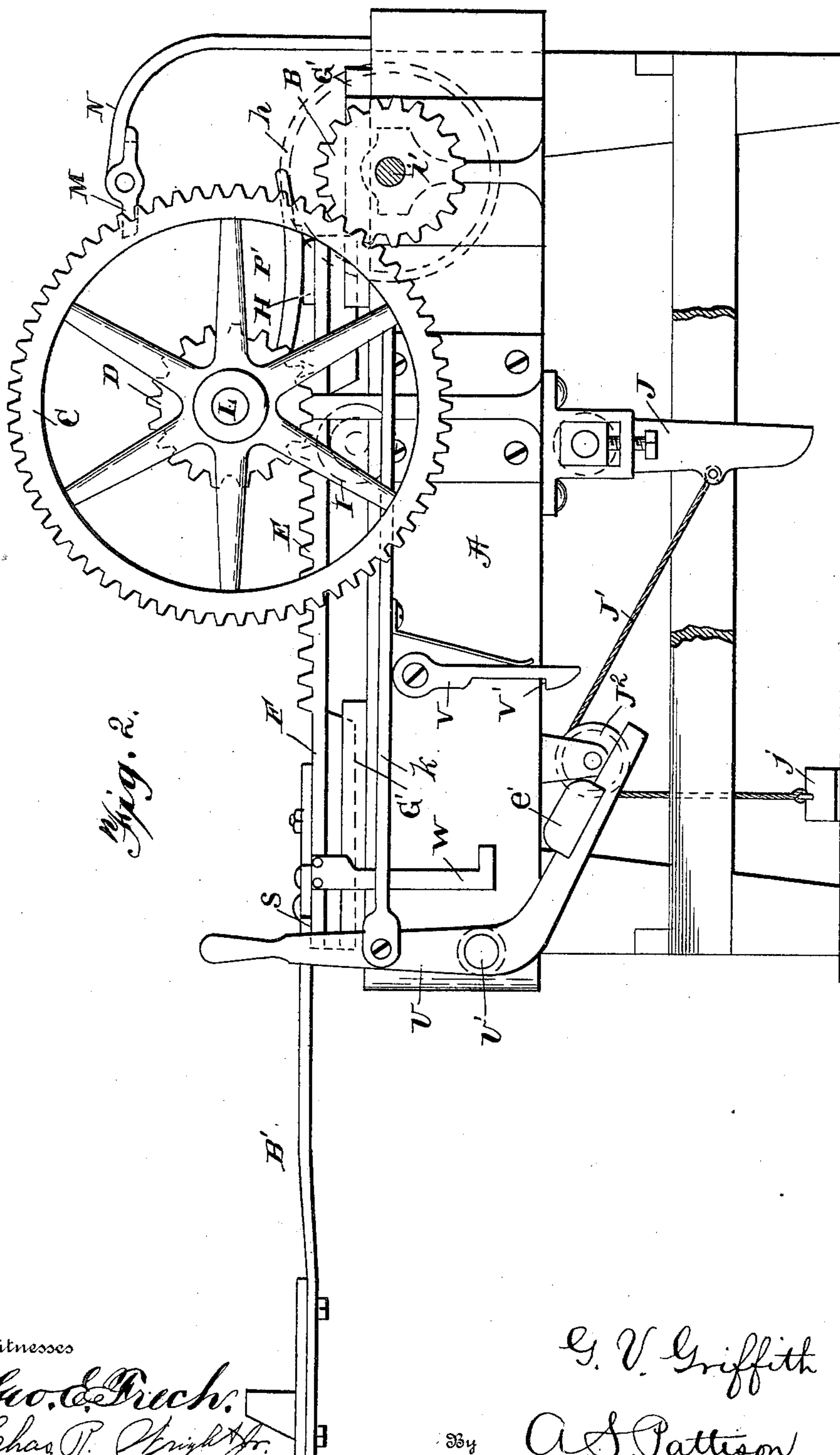
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5 Sheets—Sheet 2.



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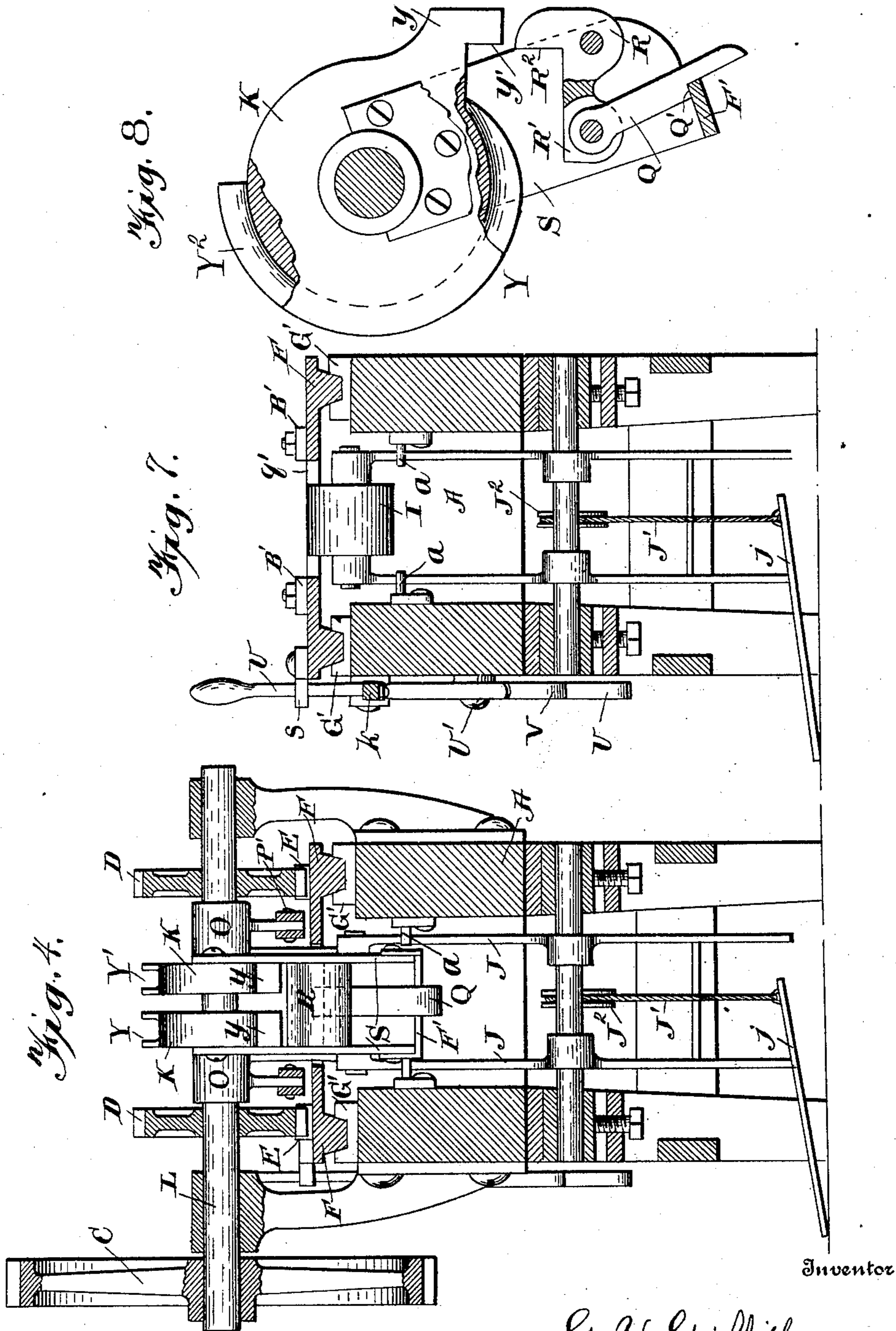
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(No Model.)

5 Sheets—Sheet 4.



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5 Sheets—Sheet 5.

Fig. 5.

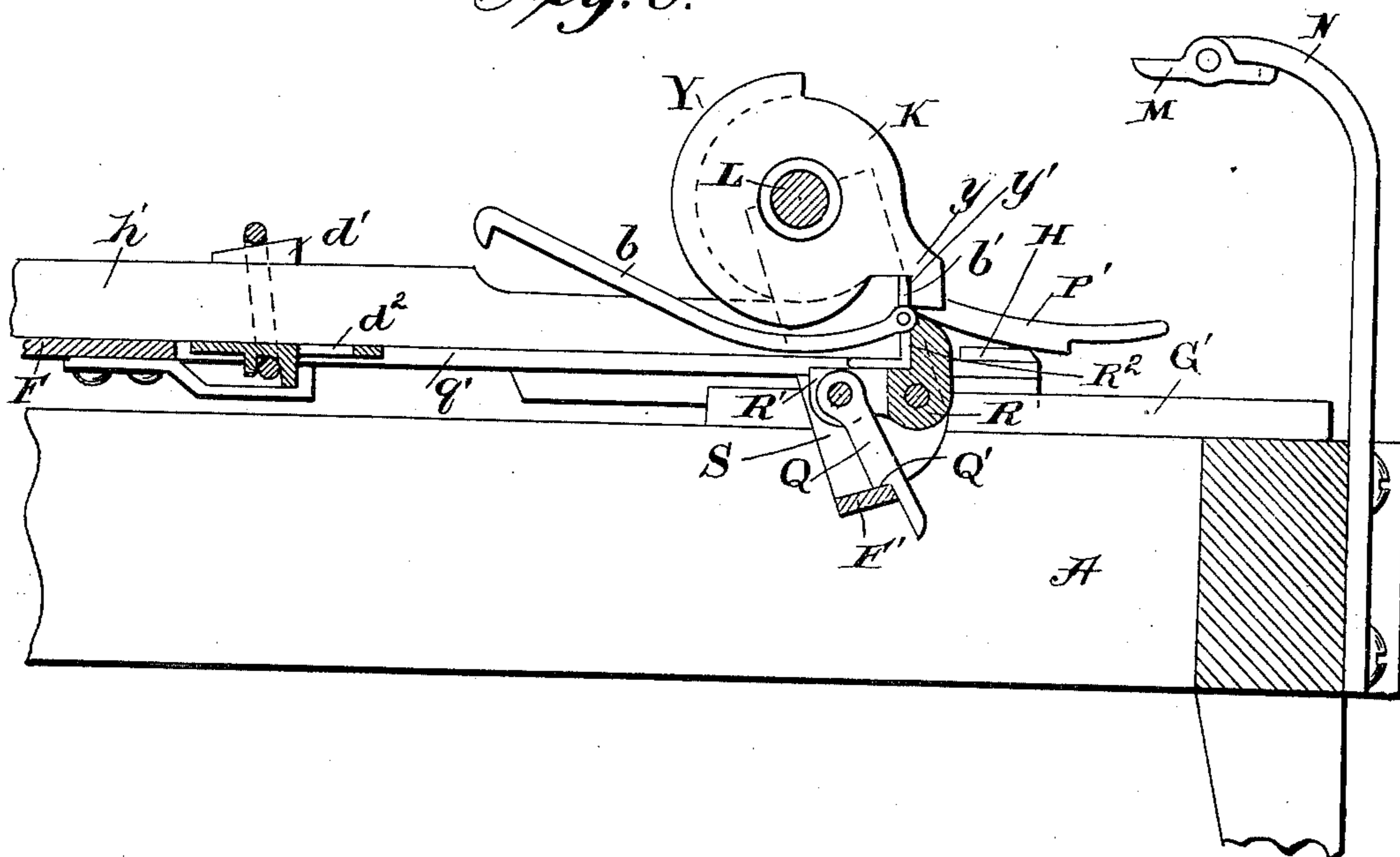
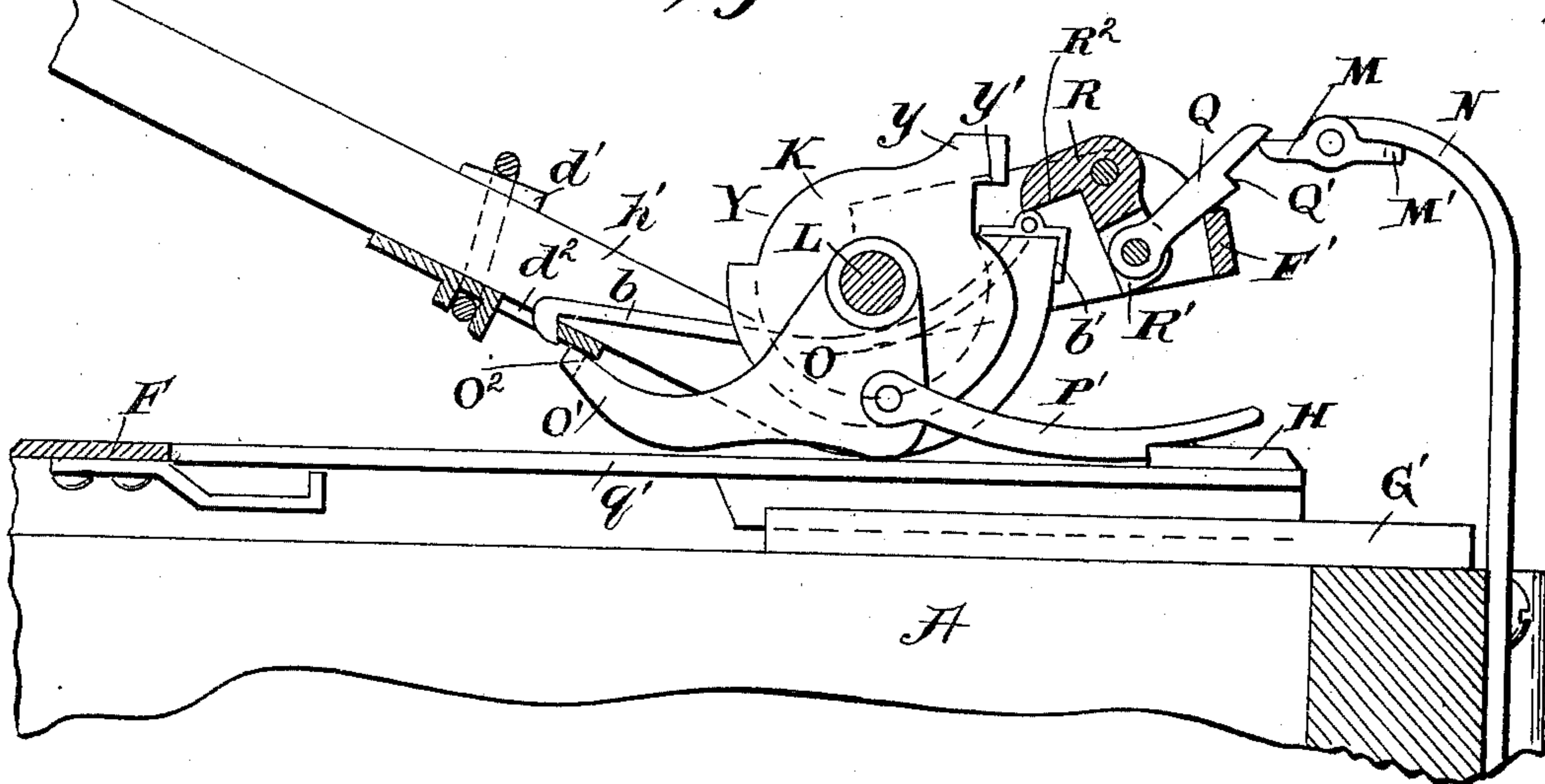


Fig. 6.



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UNITED STATES PATENT OFFICE.

GEORGE V. GRIFFITH, OF HUNTINGTON, INDIANA, ASSIGNOR OF ONE-THIRD
TO EDWARD L. GRIFFITH, OF HUNTINGTON, INDIANA.

WOOD-BENDING MACHINE.

SPECIFICATION forming part of Letters Patent No. 688,169, dated December 3, 1901.

Application filed May 10, 1901. Serial No. 59,634. (No model.)

To all whom it may concern:

Be it known that I, GEORGE V. GRIFFITH, a citizen of the United States, residing at Huntington, in the county of Huntington and State of Indiana, have invented new and useful Improvements in Wood-Bending Machines, of which the following is a specification.

My invention relates to improvements in wood-bending machines, and pertains more particularly to machines for bending plow-handles.

The object of my invention is to provide a machine in which the handle is automatically grasped and locked in the machine, bent, the clamp applied for holding it after it is released, and withdrawn from the machine at a single operation thereof.

Another object of my invention is to provide a machine of the character described in which after each operation every part is automatically brought into its normal position and stopped ready for another operation.

A still further object of my invention is to provide a machine which will more effectively bend the plow-handle without injuring it and reducing the strength thereof.

In the accompanying drawings, Figure 1 represents a top plan view of my machine. Fig. 2 is a side elevation. Fig. 3 is a longitudinal sectional view on the line 1 1, Fig. 1, showing the plow-handle in the act of being inserted. Fig. 4 is a transverse sectional view on the line 2 2, Fig. 1, looking in direction of arrow. Fig. 5 shows a sectional view of the head and table with the handle clamped and locked therein. Fig. 6 shows a sectional view of the head with the handle therein after being bent and in the act of being released and discharged therefrom.

Referring now to the drawings, A represents a table or support of any desired construction and having thereabove at one end a rotatable main shaft L, which carries at one end a large gear-wheel C, which is adapted to mesh with a second smaller gear-wheel B. The said gear is mounted upon a counter-shaft l' , which is also rotatably mounted upon said support or table. Loosely mounted upon said shaft are two pulleys h and l , driven in opposite directions and spaced apart for the purpose hereinafter more fully described.

The upper part of the table A is provided with horizontally-arranged plates G' , forming guideways in which the horizontally-movable table F is adapted to slide. The upper face of said table is provided on either side with rack-bars E, which are adapted to mesh with the gears D, carried by the shaft L, whereby the table is reciprocated backward and forward as the gears D are first rotated in one direction and then in the other, hereinafter more fully described. The table F is provided with a longitudinally centrally located opening q' , through which the heads Y, the arms O, and the rollers I are adapted to pass and cooperate with each other. The shaft L has rigidly secured thereto above the opening q' the heads or forms Y Y'. I show but two heads or forms, although any desired number may be used without affecting the operation of my machine. The said heads or forms Y Y', upon which the handle of the plow is bent, are composed of a circular plate K, centrally located upon the shaft, and at one side provided with flanges Y^2 , between which the plow-handle rests. The lower edge of the disk is provided with a downwardly-extending arm y , having a straight vertical portion y' , against which the end of the plow-handle h' is adapted to abut and limit the forward movement thereof. The sides of the said disks are provided with plates S S, bolted thereto and extending downwardly when in their normal position. Pivotaly mounted between said plates is an L-shaped clamping-dog R, having a vertical wall R^2 , corresponding with the vertical portion y' of the head. The outer end of the horizontal portion R' has pivotaly secured thereto a downwardly-projecting arm Q, which is provided with a notch Q' intermediate its ends. Said notch is adapted to catch on the cross-bar F' , connecting the lower ends of the plates S S, and firmly hold the dog R in engagement with the handle. Loosely mounted upon the shaft L are arms O, one for each head or form and having forwardly downwardly curved portions O' , provided with the portion O^2 , extending at right angles thereto and adapted to engage the under side of the plow-handle. The other end of said arm O' has pivotaly secured thereto a rearwardly-extending latch

P', which engages a block H, carried by the rear end of the table F, and forces it forward as the table is moved forward, and the moving forward of said latch raises the outer end of the arm O, and therefore raises the plow-handle and throws it from the machine.

The rear end of the frame A is provided with an upwardly-extending arm N, having its end bent horizontally, and the extreme end of said horizontal portion having an intermediately-pivoted arm M, and the inner end of said arm having a horizontal portion M', extending at right angles thereto and adapted to engage the under side of the arm N. The arm Q engages the said arm M on its upward movement and is swung up and allows it to pass; but on the downward movement of the head Y the arm Q engages said arm; but it is prevented from swinging by the projection M', and therefore the dog R is released and the handle released.

Below the opening of the table carried by the frame A are intermediately-pivoted bars J J, which have at their upper ends rollers I, which are adapted to be forced up through the opening q' against the under side of the plow-handle and roll thereon to prevent it from splitting while being bent. The lower ends of said bars J J have secured thereto rope or cable J', which passes over pulley J² and is connected to the treadle j , whereby the rollers are forced upward. A stop a is carried by the frame A to engage the bars J and to prevent them from being carried rearward while the handle is being bent, as the tendency would be such.

The forward end of the table A is provided with an L-shaped stopping and starting lever U, which is pivoted at the point U' and the lower end carrying a weight e' , and the extreme outer end is adapted to rest in a notch V' in the lower end of the pivoted or swinging arm V, which is supported from the frame, whereby the lever is held in a position to start the machine. The upper end of the lever U has pivotally connected thereto a rearwardly-extending stopping, starting, and reversing bar k , which has its outer end connected to a horizontal L-shaped lever m , which is pivoted upon the top of the standard J³ and has its rearwardly-extending arm m' connected to a clutch d , which rotates with the shaft i between the pulleys l and h . The pulleys being loosely mounted on said shaft, but traveling in an opposite direction, the clutch may be thrown in or out of engagement with either pulley, whereby the shaft is revolved in either direction, and which in turn rotates the shaft L in either direction through the medium of the gears C and B.

The forward end of the table F is provided with a horizontal projection s , which is adapted to engage the upper end of the operating-handle U and to force it forward, whereby after a handle or handles have been bent the clutch d is thrown out of gear with the pulley

and held in between the two pulleys and the pulleys continue to run; but the machine is stopped ready for another handle or handles to be inserted therein. The said table is provided with a downwardly-projecting arm W, which travels therewith, and after the table has traveled the desired distance to properly bend the material it engages the latch V and allows the weight carried by the lever to force the upper end rearward, and by means of the bar k the clutch is thrown out of gear with one pulley and into gear with the other and starts the table and the heads and forms in the opposite direction.

For the purpose of holding the handles in the bent position after being removed from the machine I use an angle-iron composed of an L-shaped plate b' , adapted to fit over the end of the handle to be bent before it is placed in the machine and having pivotally connected to its lower end a forwardly-projecting curved arm b , provided with a notch or notches at the opposite end. Each handle is provided with a sleeve d at a specified place and held thereon by wedges d' and provided with an opening d^2 , through which the arm b passes as the handle is being bent, and as it is removed or released from the machine one of the notches engages the outer wall of the opening d^2 and prevents the handle from straightening.

The table A is provided at its end with an outwardly-projecting bracket B', which is adapted to be adjusted in or out, according to the length of the handles to be bent. The outer end of said bracket is provided with openings w , which are adapted to receive the wedge-shaped members X, which engage the outer ends of the handles and prevent them from slipping forward; but after the handles are bent and are being thrown automatically from the machine a slight upward pressure thereof will throw the wedges out of the openings and allow the end adjacent thereto to move upward and allow the handle to be thrown over the rear end of the table.

The operation of my machine is as follows: The angle-iron and the sleeve are first placed upon the handle. The operator stands at the forward end of the table A, adjacent the bracket B', and the end of the handle having the angle-iron is forced under the head Y and brought in engagement with the dog R and is then forced forward, the dog raising the latch S, which catches on the bar F' and firmly locks the handle therein. The wedge X is then inserted in the opening w and the handle firmly held flat upon the movable table F. The treadle f is forced down, which brings the roller I up through the opening in the table against the under side of the handle below the head Y. The lever U is then pulled forward, which pulls the bar k forward and throws the clutch d in engagement with the pulley h , which starts the head or form revolving and at the same time starts the table F on its rearward movement. As the le-

ver U is pulled forward the lower end catches on the latch V and holds it in that position. When the handle has been bent the desired amount, the stop W, carried by the table, has traveled rearward and engaged the latch V and allows the weight *e* to force the lever rearward and throw the clutch out of engagement with the pulley *h* and in engagement with the pulley *l*, which is traveling in the opposite direction. This starts the table in the opposite direction and reverses the motion of the head Y. As the head travels backward the latch Q engages the arm M and releases the dog R, when the handle is released. The projection H, carried by the movable table, engages the arm P and forces the arm O upward, whereby the handle is raised and thrown from the machine over the rear end of the table. The table has then traveled nearly back to its starting-point, when the arm *s* carried thereby engages the lever U and carries it forward, which throws the clutch *d* out of engagement with the pulley *l* and holds it in the space between the two pulleys, whereby the machine is stopped ready for another operation.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

30 1. A bending-machine comprising a support, a rotary form or head, means carried thereby for automatically grasping the material to be bent, means carried thereby for automatically releasing the material and throwing it from the machine, substantially as described.

2. A bending-machine comprising a support, a reciprocating table carried thereby, a shaft rotatably mounted upon said support, heads rigidly secured to said shaft, means carried by the head for holding the material, an arm loosely mounted upon said shaft, and means carried by the table for raising said arms, whereby the material is thrown from the machine, substantially as described.

3. A bending-machine comprising a support, a shaft rotatably supported thereby, a head carried by said shaft, a reciprocating table carried by said support beneath the head and operated by said shaft, means carried by said table for reversing said shaft and means carried by said table for stopping said shaft, substantially as described.

4. In a wood-bending machine, the combination with a support, of a rotatable shaft mounted thereon, a head carried by said shaft, a horizontally-movable feed-table carried by said support beneath the said head, immediately-pivoted bars carried by the support and extending transverse the line of the feed-table, rollers carried by the upper ends of said bars beneath the table, stops carried by the support beneath the head, and means for bringing the rollers in contact with the material on the feed-table, whereby the rollers are carried rearwardly by friction, substantially as described.

5. A wood-bending machine comprising a shaft, a head carried thereby, adapted to receive the plow-handle, means carried by said head for automatically grasping the plow-handle, means carried thereby for automatically locking it in said head, and means for automatically releasing said locking mechanism, substantially as described.

6. A wood-bending machine comprising a support, a shaft mounted thereon, a head carried by said shaft and having downwardly-projecting plates, a clamping member immediately pivoted between said plates and a locking and operating arm carried by one end of said clamping member, substantially as described.

7. A wood-bending machine comprising a support, a head rotatably mounted thereon, downwardly-projecting plates carried by said head, an L-shaped clamping member pivoted between said plates, a plate connecting the lower ends of said side plates and a locking-arm carried by the clamping member and having notches adapted to catch on said cross-plate, substantially as described.

8. A wood-bending machine comprising a support, a rotary head carried thereby, a projection carried by the outer face of said head forming a stop, downwardly-projecting plates carried by said head, an L-shaped clamping member pivoted between said plates and having one end adapted to abut the projection carried by the head, a plate connecting the lower ends of said side plates, and a downwardly-projecting locking-arm carried by the clamping member and having a notch adapted to catch on the plates connecting the lower ends of the side plates, substantially as described.

9. A wood-bending machine comprising a support, a shaft carrying means for driving it in either direction, a head carried by said shaft, a horizontal movable table beneath the head, a lever connected to the mechanism for reversing the shaft, a clutch for holding the lever in the starting position, an arm carried by the movable table for releasing the lever from said clutch, a weight carried by the lever for reversing the direction of the shaft and a lug carried by the movable table for forcing the lever back into its normal position, substantially as described.

10. A wood-bending machine comprising a support, a shaft carried thereby, a head carried by said shaft, a horizontal movable table carried by the support, arms loosely mounted upon said shaft, and a projection carried by said table for raising the arms, whereby the material is thrown from the machine, substantially as described.

11. A wood-bending machine comprising a support, a shaft carried thereby, a head carried by said shaft, concentrically-arranged forwardly-extending arms mounted upon said shaft and extending under the material in the machine, a rearwardly-extending arm secured to the first arm and resting upon the movable

table, and a lug carried by the movable table and adapted to engage the rearwardly-extending arm, whereby the forwardly-extending arm is raised, substantially as described.

5 12. A wood-bending machine comprising a support, a head rotatably mounted thereon, and carrying means for gripping the material and an upwardly-extending arm carried by the table, for engaging the head and releasing
10 the material, substantially as described.

13. A wood-bending machine comprising a support, a rotary head carried thereby, means carried by said head for holding the material,
15 an outwardly-extending releasing-arm carried by said holding means, an intermediately-pivoted member in the path of the releasing-arm allowing it to pass on its upward movement but operating it in its downward movement, substantially as described.

20 14. A wood-bending machine comprising a support, a head having means for clamping the material and an outwardly-extending releasing-lever, an upwardly-extending curved arm carried by the table, an intermediately-
25 pivoted member carried by said arm and having at right angles thereto a projection adapted to engage the under side of the arm, whereby the releasing-arm is allowed to pass on its upward movement but operating on its down-
30 ward movement, substantially as described.

15. A wood-bending machine comprising a support, a head or form carried thereby, means for rotating said head in first one direction, then the other, a reciprocating table in gear
35 with said head, an operating-lever for starting the head in one direction, means for locking said lever in said position, and means carried by the table for allowing the lever to drop and reverse the head, substantially as
40 described.

16. A wood-bending machine comprising a support, a head or form carried thereby, means for rotating said head in first one direction, then the other, a reciprocating table in gear
45 with said head, an operating-lever for starting the head in one direction, means for holding said lever in said position, means carried by the table for allowing the lever to drop and reverse the head and means carried by the
50 table forcing the lever into its normal position and stopping the machine, substantially as described.

17. A wood-bending machine comprising a support, a head rotatably mounted thereon,
55 means carried by said head for grasping the material, and an outwardly-extending releasing-arm adapted to be operated during the backward movement thereof, substantially as described.

60 18. A wood-bending machine comprising a support, a head rotatably mounted thereon, means carried by said head for grasping the material, an outwardly-extending arm for releasing the grasping mechanism and a pivoted
65 arm in the path of said arm adapted to swing in one direction, substantially as described.

19. A wood-bending machine comprising a support, a head mounted thereon, means for driving said head in both directions, a recip- 70
rocating table below said head and having an elongated opening therein, bars pivoted to the support below said openings intermediate their length, rollers carried by the upper ends of said bars and adapted to be forced
75 through said opening adjacent the head, a lever for starting the said head and mechanism carried by the table for reversing the head and stopping the head, substantially as described. 80

20. A wood-bending machine comprising a support, a head adapted to be rotated in either direction, a reciprocating table beneath said head, and means carried by said table for reversing the rotation of said head, sub- 85
stantially as described.

21. A wood-bending machine comprising a support, a head rotatably mounted thereon, means carried thereby and operated by the material for automatically grasping the ma- 90
terial, means for automatically locking said material in said head, and means for automatically releasing said lock, substantially as described.

22. In a wood-bending machine, the combi- 95
nation with a support, of a rotatable head carried thereby, means carried by said head for automatically grasping the material means for automatically reversing the direction of said head, means for automatically releas- 100
ing the material from said head, and means for automatically stopping said head, substantially as described.

23. In a wood-bending machine, the combi- 105
nation with a support, of a rotatable head carried thereby, means carried by said head for automatically grasping the material, means for automatically reversing the direction of said head, means for automatically releasing the material from said head, means for auto- 110
matically throwing the material from said head, and means for automatically stopping said head, substantially as described.

24. In a wood-bending machine, the combi- 115
nation with a support, of a rotatable shaft carried thereby, a head carried by said shaft, a table below said head, rack-bars carried by said table, pinions carried by the shaft and meshing with said rack-bars, and means carried by the table for reversing and stopping 120
said head, substantially as described.

25. In a wood-bending machine, the combi-
nation with a support, of a rotatable head carried thereby, having an outwardly-extending arm provided with a downwardly-projecting 125
portion forming a stop, downwardly-extending plates on either side of said arm, and means between said plate for automatically grasping the material, substantially as described. 130

26. In a wood-bending machine, the combi-
nation with a support, of a rotatable head carried thereby, having an outwardly-extending arm provided with a downwardly-projecting

portion forming a stop, downwardly-projecting plates on both sides of said arm, an L-shaped clamping member pivoted between said plates and having one end adapted to abut the stop carried by the head and extending in a line therewith, and means carried by the opposite end for locking the same in position, substantially as described.

27. In a wood-bending machine, the combination with a support, of a rotatable head carried thereby, downwardly-projecting plates carried by said head, an L-shaped clamping member pivoted between said plates, and means carried by said clamping member for locking it in a clamped position, substantially as described.

28. In a wood-bending machine, the combination with a support, of a rotatable head carried thereby, a reciprocating table beneath said head and operated thereby, means for driving said head in either direction, an L-shaped operating-lever having a weight carried by its lower end, a forwardly-spring-pressed catch adapted to support the lower end of said lever, when the machine is started, a downwardly-projecting arm carried by the table and adapted to engage said latch and allow the lower end of the lever to drop and reverse the head and thereby the table, and a projection carried by the table and adapted to engage the upper end of the operating-lever and bring it in a vertical position, whereby the machine is stopped, substantially as described.

29. In a wood-bending machine, the combination with a support, of a rotatable head carried thereby, downwardly-projecting plates carried by said head, an L-shaped clamping member pivoted between said plates, a bar connecting the lower ends of said plates, and a locking-arm pivotally connected to one end of said L-shaped lever and adapted to catch on said cross-bar, substantially as described.

30. In a wood-bending machine, the combi-

nation with a support, of a rotatable head carried thereby, a shaft driving said head, pulleys on said shaft and rotating in opposite directions, a clutch between said pulleys, a lever for forcing said clutch in engagement with one pulley, means operated by said head for bringing the clutch in engagement with the opposite pulley and means operated by the head for throwing said clutch out of engagement with the said pulley and holding it between the two, substantially as described.

31. In a wood-bending machine the combination with a support, of a rotatable head carried thereby, means carried by the head for grasping the material and bending it, a bracket carried by the support, the forward end of the bracket having an opening therein, and a wedge adapted to enter said opening and engage the end of the material being bent, whereby the material is prevented from being forced forward but allowed to be raised by forcing the wedge out of said opening, substantially as described.

32. In a wood-bending machine the combination with a support, of a rotatable head carried thereby, an L-shaped clamping member carried thereby, a catch pivoted to said clamping member and means carried by the head for locking said catch, substantially as described.

33. In a wood-bending machine the combination with a support, of a rotatable head carried thereby, means for automatically reversing the direction of the head, and means for automatically stopping the head, substantially as described.

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

GEORGE V. GRIFFITH.

Witnesses:

H. E. ROSEBROUGH,
B. F. NICHOLS.