

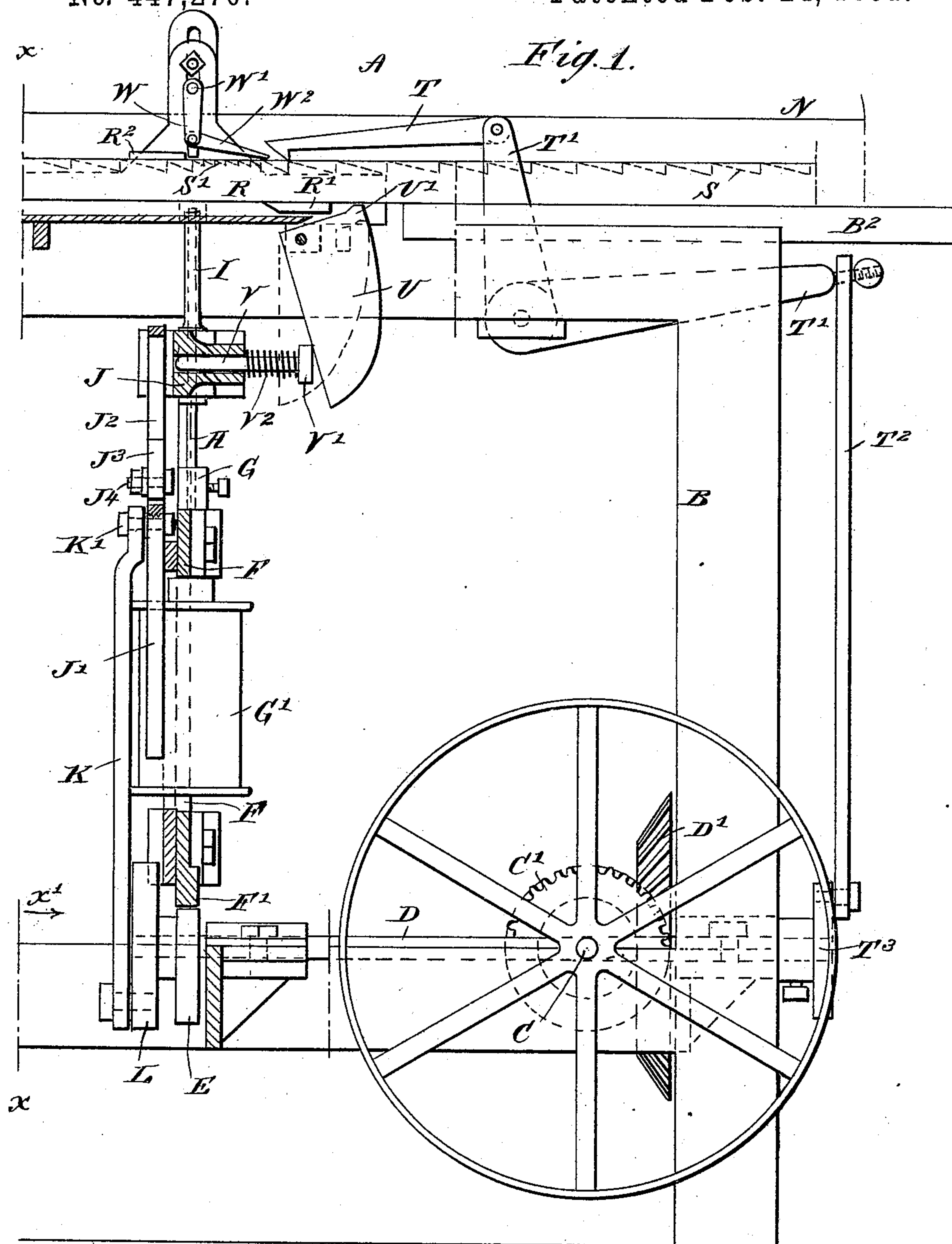
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3 Sheets—Sheet 1.

W. C. & J. A. AYCOCK.
BLIND STILE BORING AND MORTISING MACHINE.

No. 447,270.

Patented Feb. 24, 1891.



WITNESSES:

Donn Twitchell
C. Sedgwick

INVENTOR:

W. C. Aycock
BY *J. A. Aycock*
Munn & Co.
ATTORNEYS

(No Model.)

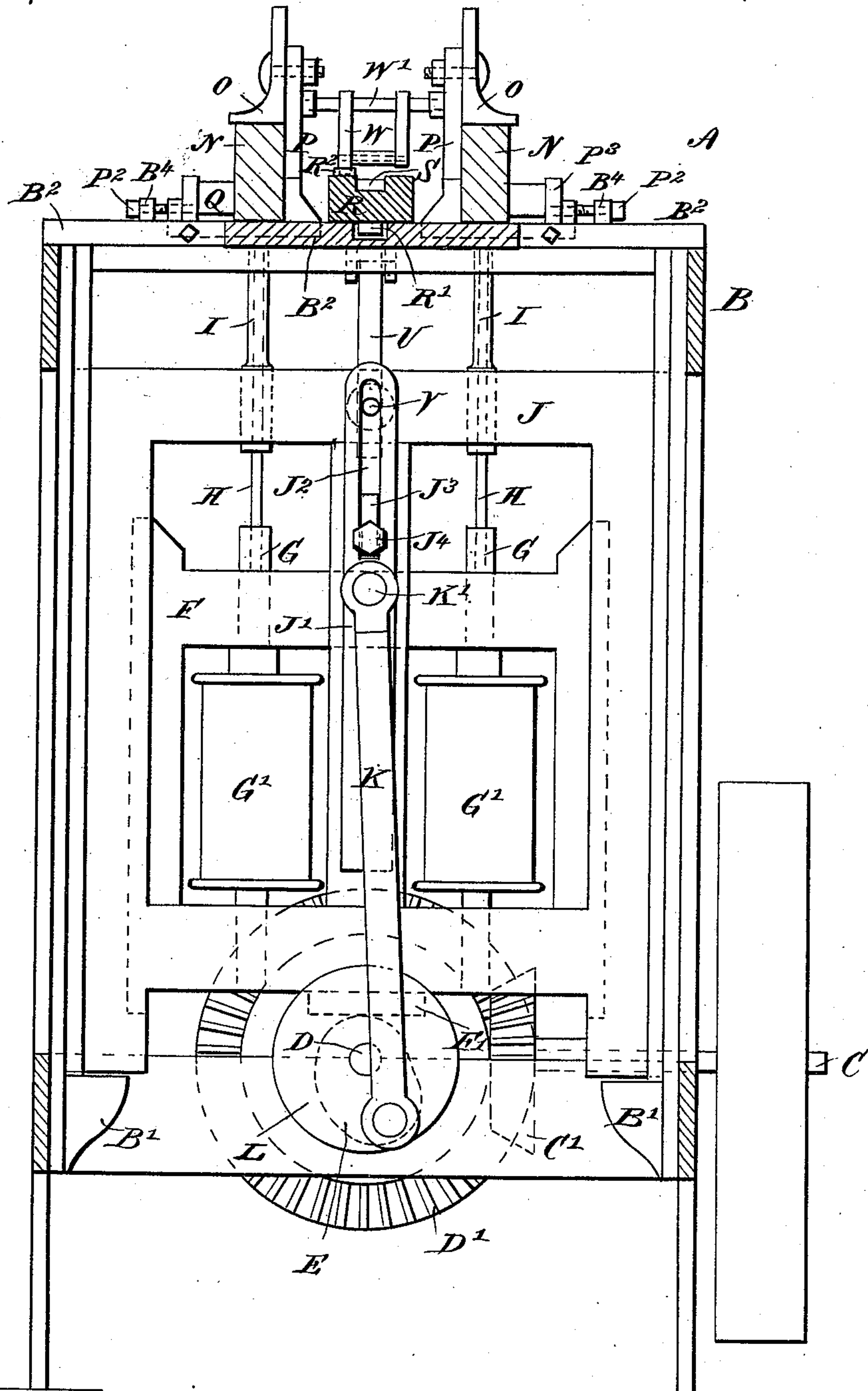
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Fig. 2.



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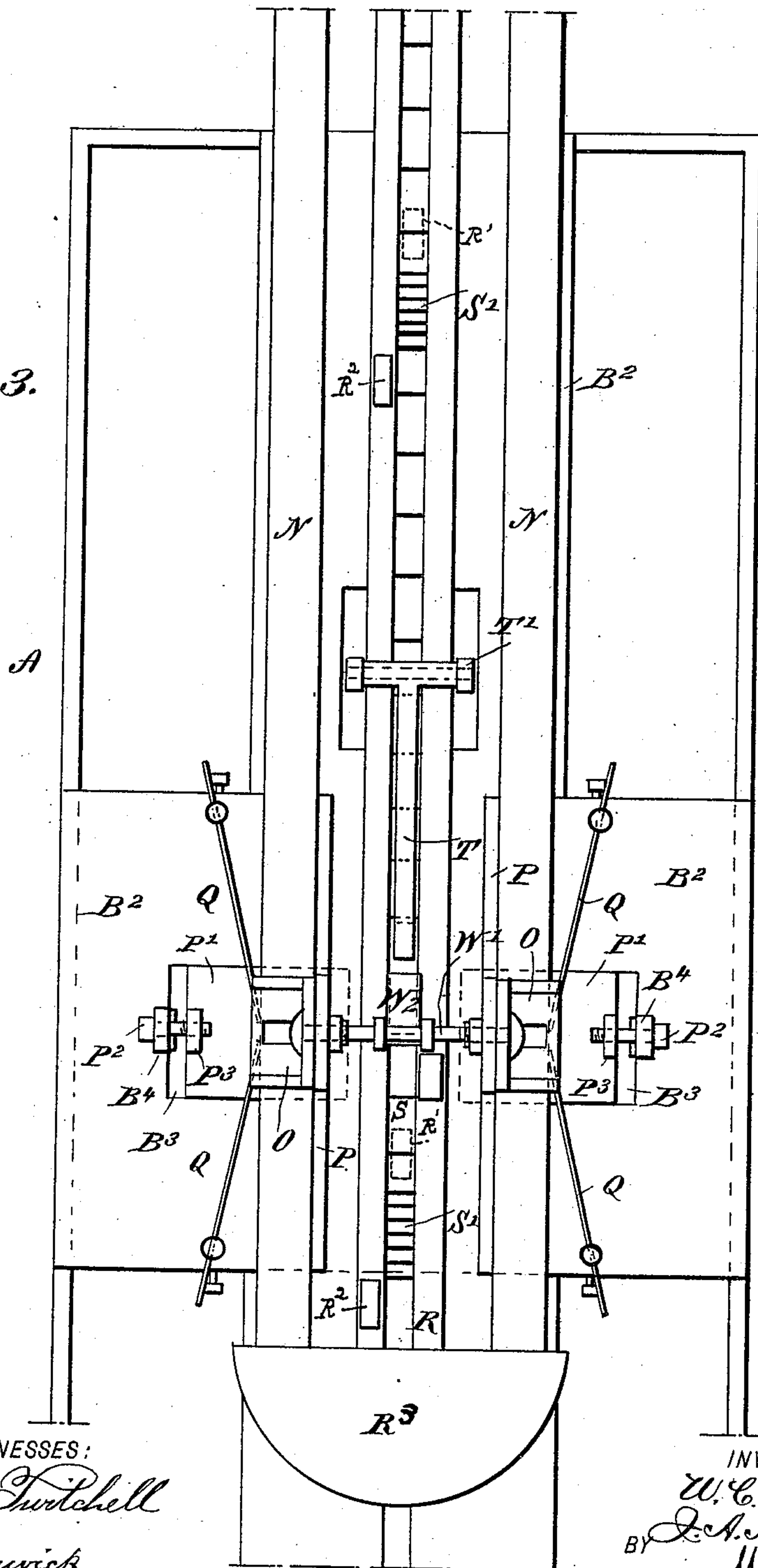
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Fig. 3.



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UNITED STATES PATENT OFFICE.

WILLIAM C. AYCOCK AND JOHN A. AYCOCK, OF GRIFFIN, GEORGIA, ASSIGN-
ORS OF ONE-THIRD TO JAMES A. BROOKS, OF SAME PLACE.

BLIND-STILE BORING AND MORTISING MACHINE.

SPECIFICATION forming part of Letters Patent No. 447,270, dated February 24, 1891.

Application filed April 29, 1890. Serial No. 349,882. (No model.)

To all whom it may concern:

Be it known that we, WILLIAM C. AYCOCK and JOHN A. AYCOCK, both of Griffin, in the county of Spalding and State of Georgia, have
5 invented a new and Improved Blind-Stile Boring and Mortising Machine, of which the following is a full, clear, and exact description.

The invention relates to blind-stile-boring machines such as shown and described in
10 United States Letters Patent No. 423,110, granted to us March 11, 1890.

The object of the present invention is to provide a new and improved blind-stile-boring machine combined with a mortising-machine in such a manner as to rapidly and automatically bore the apertures and make the mortises at the same time.

The invention consists of certain parts and details and combinations of the same, as will
20 be described hereinafter, and then pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate
25 corresponding parts in all the figures.

Figure 1 is a side elevation of the improvement with parts in section. Fig. 2 is a transverse section of the same on the line $x x$ of
30 x' , and Fig. 3 is a plan view of the same.

The combined blind-stile boring and mortising machine A is provided with a suitably-constructed frame B, in which is mounted in
35 suitable bearings the transversely-extending main driving-shaft C, carrying a pulley connected with suitable machinery for imparting a rotary motion to the said shaft C. On the inner end of the shaft C is secured a bevel gear-wheel C', meshing into a bevel gear-wheel D', fastened on the longitudinally-extending shaft D, also mounted to turn in suitable bearings on the main frame B.

Near the inner end of the shaft D is secured a cam-wheel E, the periphery of which acts
45 on the under side of the projection F', formed on a frame F, in which are mounted to turn one or more shafts G, carrying the bits H, extending upward and passing through hollow gages or mortising-tools I, secured on the
50 frame J, arranged transversely and fitted to slide in suitable bearings in the main frame

B. When not moving, the lower ends of the said frame rest on the lugs B', projecting from the main frame. In this frame J is fitted to slide the frame F, carrying the shafts G, which
55 latter are provided with pulleys G', over which pass belts connected with suitable machinery for imparting a rotary motion to the said shafts G in order to turn the bits H. The frame F receives its sliding motion from the
60 cam E, previously mentioned, and the frame J is intermittently actuated from the main shaft D by being provided on one side with a bar J', fitted to slide in the said frame J and pivotally connected at K' with a pitman K,
65 pivoted on a crank-disk L, held on the inner end of the main driving-shaft D next the cam-wheel E.

The bits H and the mortising-tools I are adapted to engage the under sides of the
70 stiles N, held on top of the bed-plate B² of the main frame B. Each of the stiles N is held in place on the bed-plate by the brackets O, fitted onto the top of the stile in such a manner that the latter is free to slide longitudinally, the sides of the stile resting on
75 brackets P, each held transversely adjustable on the bed-plate B². For this purpose each bracket P is provided with a base P', fitted to slide transversely in a recess B³, formed in
80 the top of the bed-plate B². In a lug B⁴ on the bed-plate is fitted to turn a screw P², screwing into a lug P³, formed near the outer end of the base P'. By turning the screw P² the bracket P is quickly laterally adjusted,
85 so as to bring the stile N in proper position relatively to the bits H and tools I. The brackets P support adjustably the brackets O, adapted to engage the top of the stile. Against the outside of each stile N press the
90 springs Q, so as to hold the stiles against the brackets P, at the same time permitting the stiles to slide longitudinally.

The stiles abut at their ends against the foot R³, secured on a stile-carrier R, fitted to
95 slide on top of the bed-plate B² and provided with sets of teeth S and S', adapted to be engaged by a pawl T, pivotally connected with a bell-crank lever T', fulcrumed on the main
100 frame B and pivotally connected by the pitman T² with a crank-arm T³, fastened on the outer end of the longitudinally-extending

shaft D. The crank-arm T^3 is arranged relatively to the cam-wheel E in such a manner that when the said cam-wheel moves the frame F with the bits H upward to bore the stile N then the pawl T is on its return-stroke, so that the stile-carrier R remains stationary. When the frame F slides downward and its bits H are out of contact with the stiles, the pawl T, by engaging one of the teeth S, moves the stile-carrier R, so as to shift the stiles to present a new place over the bits for the next aperture to be bored.

On the under side of the bed-plate B^2 is fulcrumed a gravity-pawl U, having a projection U' , adapted to be engaged by a lug R' , secured on the under side of the stile-carrier R. The lower end of the gravity-pawl U rests against the head V' of a bolt V, extending longitudinally and fitted to slide in suitable bearings in the frame J. A spring V^2 serves to hold the bolt in an outermost position, so as to hold the gravity-pawl U in the position shown in Fig. 1—that is, moving the lug U' into the path of the lug R' of the stile-carrier R, so that when the said stile-carrier is moved outward and the lug R' strikes against the lug or projection U' the lower end of the pawl presses against the head V' and forces the bolt V through the frame J and into a slot J^2 , formed vertically in the arm J' , previously mentioned. A block J^3 is held in the slot J^2 of the said arm J' by means of a suitable bolt J^4 . Now when the bolt V has been pressed outward into the slot J^2 of the arm J' and the latter is moved upward, then the block J^2 presses against the said sliding bolt and lifts the frame J upward, so as to force the mortising-tools I into the stiles N. At the same time that the frame J slides upward the frame F is moved in the same direction, as the cam-wheel E and the crank-arm L stand in line with each other, as is plainly shown in Fig. 2.

When the gravity-pawl U is in the position shown in Fig. 1, the sliding bolt V is withdrawn from the slot J^2 and the arm J' is moved up and down by the pitman K and the crank-arm L without lifting the frame J, it being understood that the said frame J only moves upward when the gravity-pawl U is pressed by the lug R' of the stile-carrier R. On top of the latter is arranged a lug R^2 , adapted to engage a frame W, pivoted on a shaft W' , held on the brackets P, as is plainly shown in the drawings. On the frame W is hung a wedge W^2 , the free pointed end of which extends over one of the teeth S, so as to prevent the pawl T from engaging more than one tooth S' at a time when the mortising is taking place, it being understood that the sets of teeth S are farther apart, according to the distances between the apertures to be bored, while the sets of teeth S' are short and are acted on by the pawl T at the time the mortising takes place.

The operation is as follows: If the machine

is in the position shown in Fig. 1 and the main driving-shaft C is rotated, the cam-wheel moves the frame F upward, so as to cause the drills H to bore apertures into the under sides of the stiles N. As the sliding bolt V is withdrawn from the slot J^2 in the arm J' , the pitman K, the said arm J' , and the crank-arm L run empty and the frame remains stationary in its lowermost position. At every turn of the main shaft D the frame F makes a full up-and-down stroke, and at its downstroke the pawl T moves the slide R forward the distance of one of the teeth S, so that at the next upward movement of the frame T new sets of apertures are bored by the bits H in the under side of the stile. When the lug R^2 on top of the stile-carrier R comes in contact with the swinging frame W, the wedge-shaped arm W^2 is pushed forward toward the pawl T, so that the latter on its return-stroke passes up the said arm W^2 and engages at its forward stroke the first of the set of teeth S' , which is now in that position. At the same time the lug R' has acted on the projection U' of the gravity-pawl U, so that the latter swings and pushes the sliding bolt V into the slot J^2 of the arm J' . At the next upward movement of the frame F the frame J is carried along by the block J^3 engaging the bolt V in the said sliding frame J, as previously described, and the upper cutting-edge of the mortising-tools I cut around the aperture bored by the bits H. When the frames J and F are on their downward stroke and the bits H and mortising-tools I have receded from the stiles N, then the pawl T pushes the stile-carrier R forward the distance equal to the space between two teeth of the sets of teeth S' , so that on the next upward sliding movement of the frames J and F the bits H and the mortising-tools I again cut the stiles, about one-half of the mortising-tools I extending into the previously-made apertures, so as to clean the same. This operation is repeated until the sets of teeth S' have all been acted on by the pawl T, the lug R^2 has passed the frame W, and the lug R' has passed the projection U' . The frame W then swings back to its former position, so that the pawl T again engages one of the teeth of the sets of teeth S, and the spring V^2 forces the sliding bolt V outward out of engagement with the slot J^2 of the arm J' , so that the latter again runs empty. The gravity-pawl U then again stands in the position shown in Fig. 1, to be acted on by the next following lug R' in the manner previously described. It will thus be seen that the apertures for the trunnions of the slats are bored into the stiles at regular intervals, and the mortises for the cross-pieces are also cut into the stiles wherever desired, it being understood that as many sets of teeth S and S' are arranged on the stile-carrier R as correspond with the sets of apertures and mortises to be formed in the stiles.

Having thus fully described our invention, we claim as new and desire to secure by Letters Patent—

1. The combination, with a reciprocating non-rotary hollow mortising-tool, of a rotary boring-bit passing therethrough and disconnected therefrom, and means for reciprocating the boring-bit independently of said mortising-tool, substantially as described.

2. The combination, with a hollow intermittently-reciprocating non-rotary mortising-tool, of a separate disconnected and independent regularly-reciprocating rotary boring-bit passing through said mortising-tool, substantially as described.

3. The combination, with a stile-carrier having a variable feed or movement at stated intervals, of an intermittently-reciprocating hollow mortising-tool operating in connection therewith, and a separate and independent regularly-reciprocating boring-bit passing through the said hollow tool, substantially as described.

4. In a blind-stile boring and mortising machine, the combination, with a stile-carrier fitted to slide horizontally, of a vertically-reciprocating tool-frame carrying the bits, and a mortising tool-frame carrying hollow mortising-tools through which pass the said bits and movably independent of the bit-carrying frame, substantially as shown and described.

5. In a blind-stile boring and mortising machine, the combination, with a stile-carrier fitted to slide horizontally, of a vertically-reciprocating tool-frame carrying the bits, a separate and independent mortising-tool frame carrying hollow mortising-tools through which pass the said bits, and means, substantially as described, for imparting motion to the said frames and the carrier, as set forth.

6. The combination, with the longitudinally-extending stile-carrier provided with sets of teeth of different lengths, a lug on its under side just in advance of each set of smaller teeth, and a reciprocating pawl operating alternately on said sets of teeth, of a regularly-reciprocating boring-bit-carrying frame under said stile-carrier, a mortising-tool frame in which the bit-carrying frame reciprocates, the hollow mortising-tools through which said bits pass, a reciprocating bar for operating the mortising-tool frame, a device for connecting the said frame and bar, and a pawl or lever in the path of the said lugs to operate said connecting device and permit the mortising-tool frame to be reciprocated when the pawl is acting on said shorter teeth, substantially as described.

7. In a blind-stile boring and mortising machine, a stile-carrier having sets of teeth of

varying lengths, in combination with a pawl adapted to engage the said sets of teeth to move the carrier forward, and a device, substantially as described, to cover part of the small teeth, so that the said pawl moves the said carrier the distance between two small teeth, substantially as shown and described.

8. In a blind-stile boring and mortising machine, a stile-carrier having sets of teeth of varying lengths on its upper side, a lug on said upper side in rear of each set of shorter teeth, and a lug on its under side in advance of each of said sets of shorter teeth, the swinging frame over the stile in the path of the upper lugs and carrying a wedge, the pawl for engaging the stile-teeth and engaged at intervals by said wedge for the purpose described, a pawl or lever below the stile-carrier in the path of the lower lugs, a vertical tool-carrying frame provided with a bolt operated by said pawl or lever, and an operating mechanism connected with the said frame when the bolt is operated by said pawl or lever, substantially as described.

9. In a blind-stile boring and mortising machine, the combination, with a stile-carrier provided in its under side with a lug, of a gravity-pawl adapted to be actuated by the said lug, a spring-pressed bolt engaging the said gravity-pawl, a frame carrying the mortising-tools and in which the said bolt is fitted to slide, an arm having a reciprocating motion and adapted to be engaged by the said bolt to reciprocate the said frame, and a block held adjustably on the said arm and adapted to engage the said bolt, substantially as shown and described.

10. In a blind-stile boring and mortising machine, the combination, with a stile-carrier provided in its under side with a lug, of a gravity-pawl adapted to be actuated by the said lug, a spring-pressed bolt engaging the said gravity-pawl, a frame carrying the mortising-tools and in which the said bolt is fitted to slide, an arm having a reciprocating motion and adapted to be engaged by the said bolt to reciprocate the said frame, a regularly-reciprocating boring-bit frame within the mortising-tool frame, the bits thereof passing through the mortising-tools, and means, substantially as described, for moving the said stile-carrier when the said frames slide downward and the mortising and boring tools are disengaged from the stile, substantially as shown and described.

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JOHN A. AYCOCK.

Witnesses:

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J. P. NICHOLS.