No. 705,658. Patented July 29, 1902.

W. J. EDWARDS & W. M. WAUTERS.

MACHINE FOR DRILLING EDGES OF BOARDS.

(Application filed Mar. 14, 1902.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.

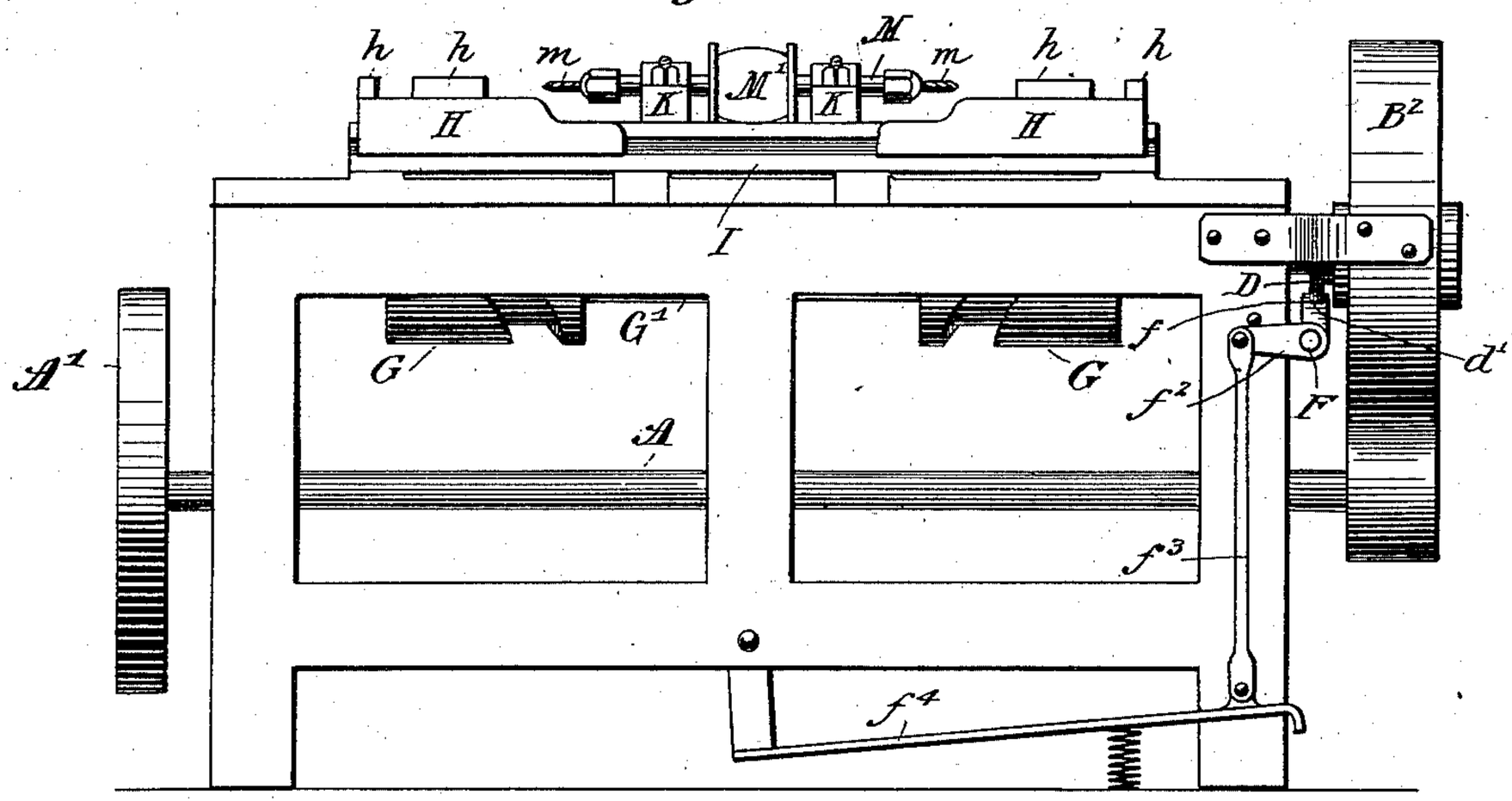

Fig. 2.

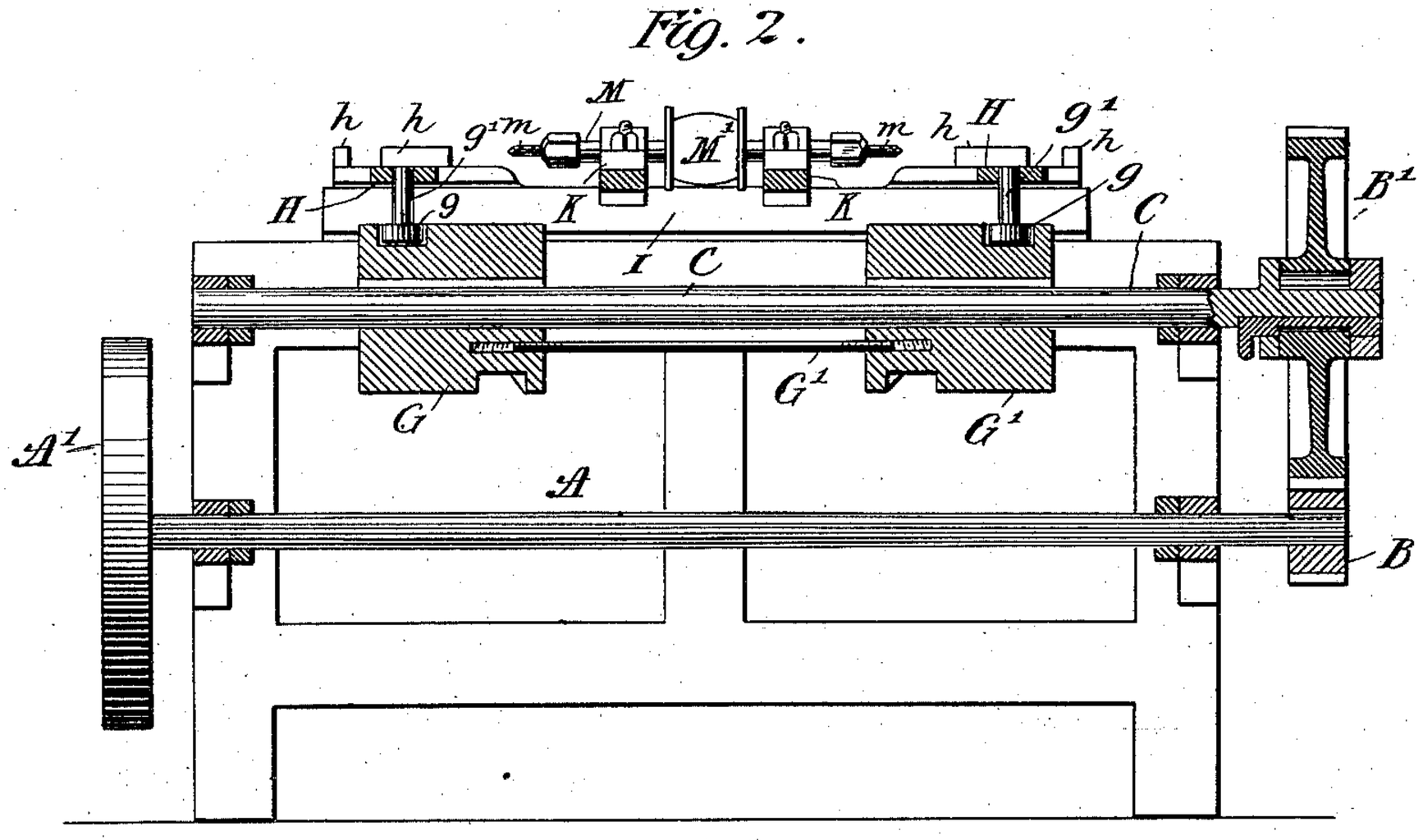

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Fig. 3.

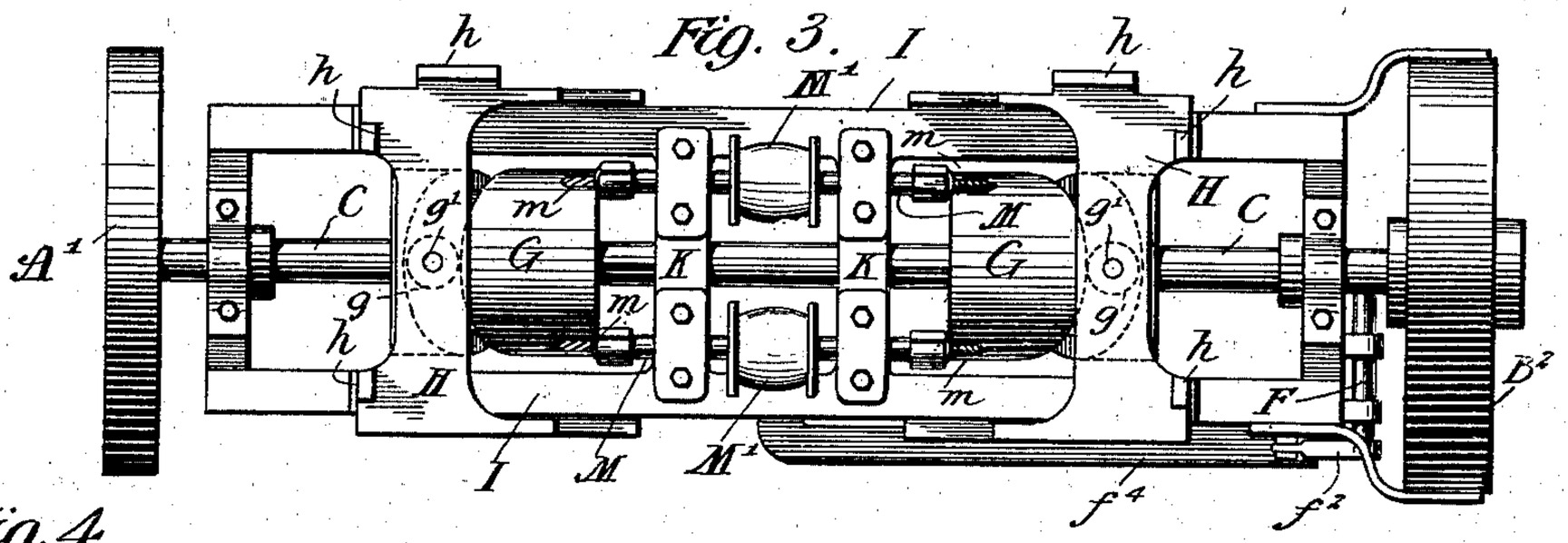


Fig. 4.

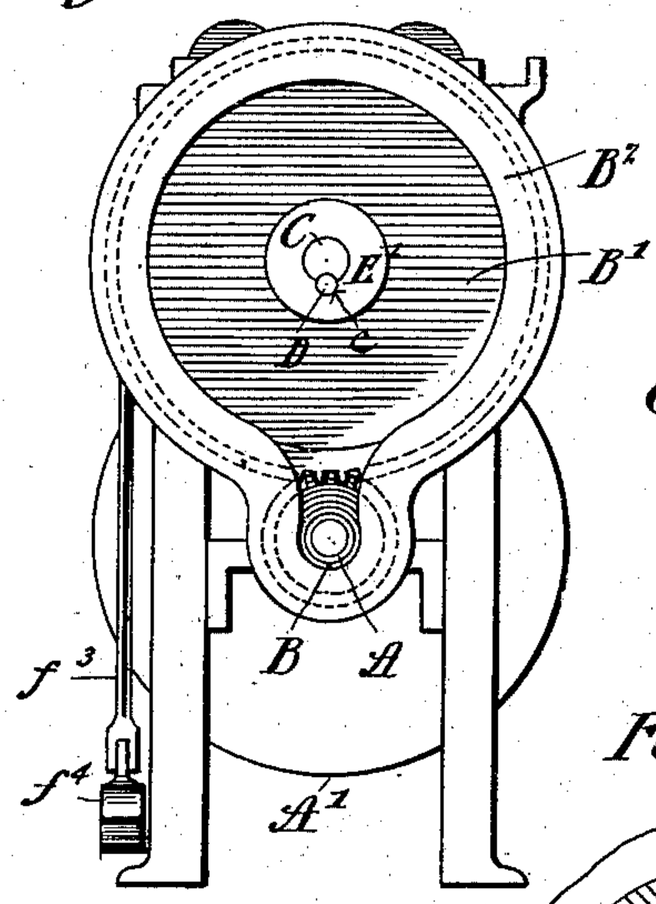


Fig. 6.

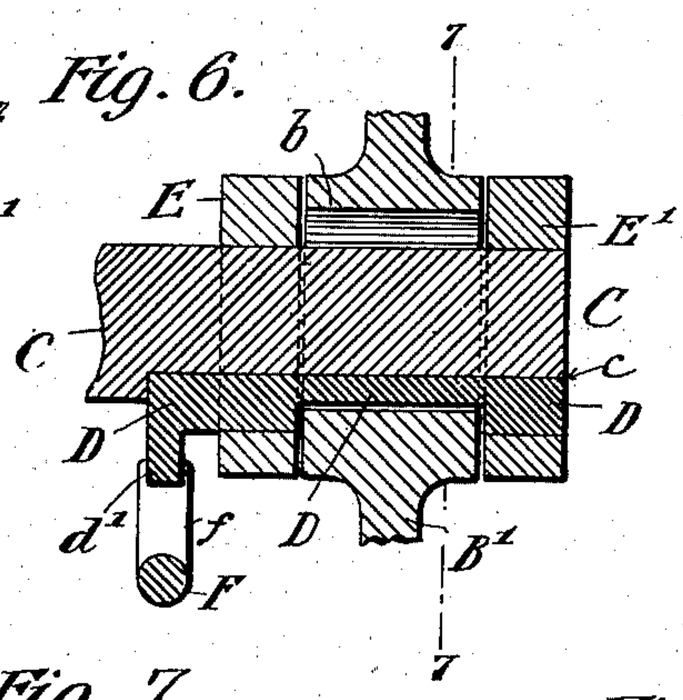


Fig. 5.

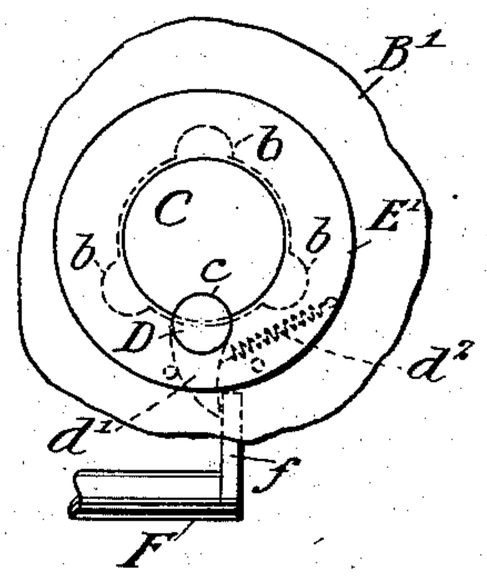


Fig. 7.

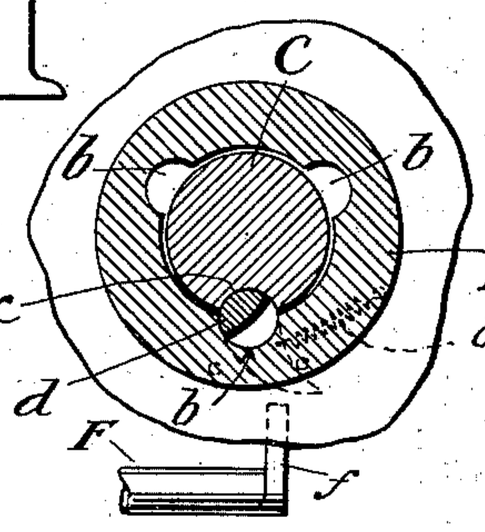


Fig. 9.

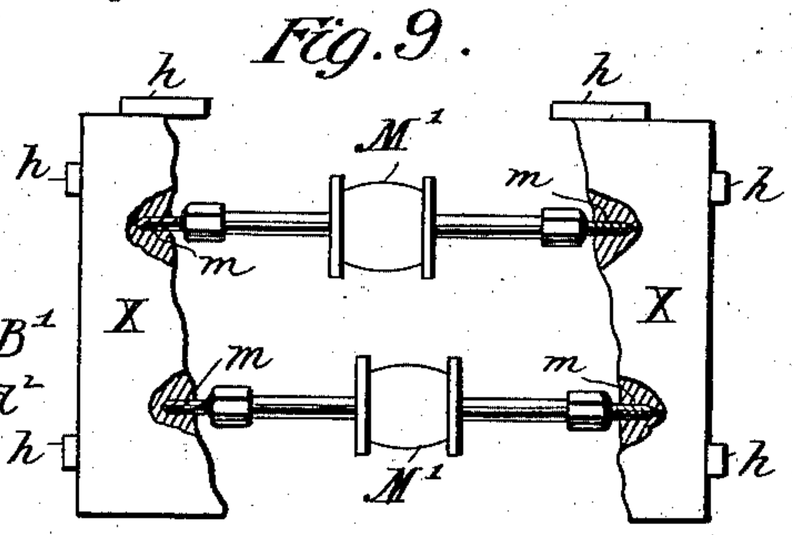


Fig. 8.

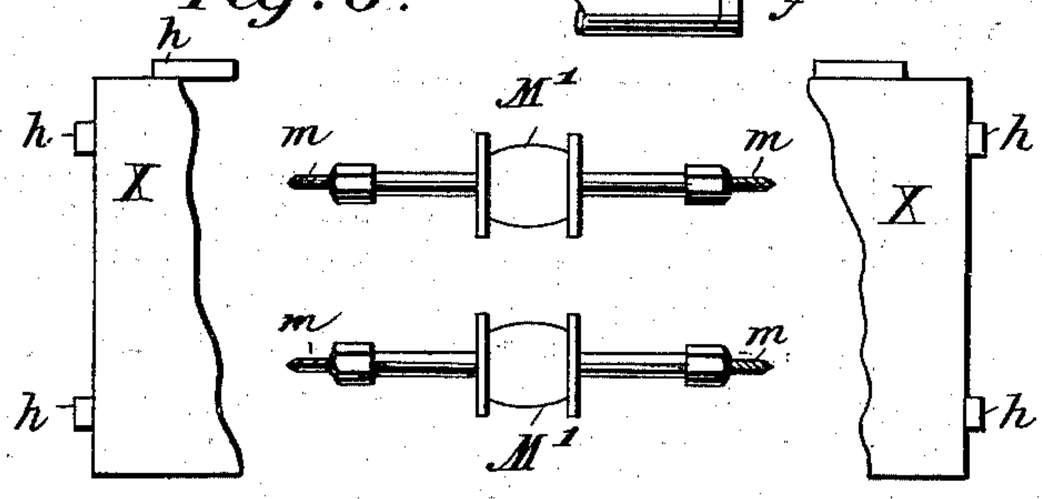
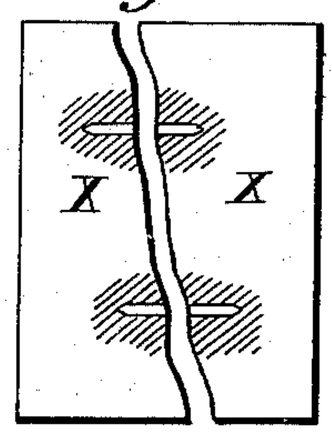


Fig. 10.



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UNITED STATES PATENT OFFICE.

WILLIAM J. EDWARDS AND WILLIAM M. WAUTERS, OF BAYONNE, NEW JERSEY.

MACHINE FOR DRILLING EDGES OF BOARDS.

SPECIFICATION forming part of Letters Patent No. 705,658, dated July 29, 1902.

Application filed March 14, 1902. Serial No. 98,171. (No model.)

To all whom it may concern:

Be it known that we, WILLIAM J. EDWARDS and WILLIAM M. WAUTERS, citizens of the United States, residing at Bayonne, county of Hudson, State of New Jersey, have jointly invented a certain new and Improved Machine for Drilling Edges of Boards, of which the following is a specification.

In the manufacture of wooden boxes or barrel-heads and other articles it is desirable to unite by doweling two pieces forming together a box end or side or a portion of a barrel-head. These two pieces may be rectangular and of such shape that when united they may form the box end or side, for instance, of the desired dimensions, or the line of division between them may be an irregular one of varying angular relation to the side edges. This occurs when a piece of proper dimensions for the object intended is split or broken in transportation or in the mill. In order to prepare their meeting edges for doweling, we have devised a machine for simultaneously drilling the edge of each board irrespective of the character or angularity of the edges which are to be abutted.

The particular embodiment of our invention herein described is one which experience has demonstrated to be a practical and efficient one; but obviously changes may be made therein by those skilled in the art without departing from the principles of the invention.

In the accompanying drawings, which show a machine embodying our invention designed for drilling pieces which when united are of rectangular shape and designed for the ends or sides of boxes, Figure 1 is a front elevation; Fig. 2, a vertical longitudinal section; Fig. 3, a plan view; Fig. 4, an elevation of the right-hand end of the machine; Figs. 5, 6, and 7, detail views, on an enlarged scale, showing a clutch device by which motion is imparted to the main shaft from a continuously-operated driving-shaft. Figs. 8 and 9 are detached views indicating the operation of the drills, and Fig. 10 is a view showing two pieces of board with the abutting edges drilled and detached to be united by dowels.

Turning in bearings in the frame and arranged longitudinally thereof is a driving-shaft A, equipped with a pulley A′ to be driven continuously by a belt. On the right-hand end of the shaft is keyed a pinion B, meshing with a gear-wheel B″, and both these gears may be inclosed by a housing or casing B^2. The wheel B′ is mounted on a main shaft C, which ordinarily runs freely thereon except when engaged therewith by an appropriate clutch. The form of clutch illustrated is as follows: The shaft C within the hub of the wheel B′ is formed with a segmentary longitudinal recess *c*, in which lies a rocking feather or key *d*, whose inner face corresponds with that of the groove and whose outer face when in normal position is coincident with the periphery of the shaft. The ends of this key are cylindrical, as seen at D D, and rock in bearings in an annular flange E on the shaft C on the inner side of the wheel-hub and in a collar E′, applied to the shaft on the outer side of the wheel-hub. From one end D of the key-piece is a radially-projecting arm *d*′, connected by a coiled spring d^2 to the part E, Figs. 5, 6, and 7, and normally abutting against and held in a position to permit free rotation of the wheel by a radial arm or trip *f* on the end of a rock-shaft F, mounted in brackets on the frame. The other end of this rock-shaft has a radial arm f^2, connected by a link f^3 with a treadle f^4, normally held up by a spring. When the treadle is depressed, the trip *f* passes out of engagement with the radial arm *d*′, which is then drawn by its spring to lock the key-piece, so that one of its angular edges will engage a recess *b* in the inner face of the hub of the wheel, (three such recesses being shown,) and the foot of the operator having been removed from the treadle the shaft C will now be driven through one revolution, when the radial arm *d*′ of the clutch again abuts against latch *f* and releases the shaft.

Splined to slide on the main shaft are two cylindrical cams G G, adjustably spaced and coupled to move together by a right-and-left screw-rod G′, and in the camway of each runs a roller *g* on the lower end of a downwardly-extending rod *g*′, attached to a carriage H, sliding in ways on the bed-plate or upper part I of the frame. These carriages are formed with upturned edges or gage-

pieces *h* to insure proper seating thereon of the boards to be drilled. In yokes or bridge-pieces K K, extending between the sides of the bed-plate or upper part I of the frame, are mounted drill-spindles M, each equipped with a pulley M′ between its bearings in the bridge-pieces, and the width of the pieces and the length of the spindles are such that the latter are free to move endwise in their bearings. The ends of each spindle are equipped with right and left drills or bits *m*. The carriages H H lie outside of the ends of the drills, and their faces are in a plane sufficiently below that in which the axes of the drills lie as to provide for the drills entering the boards midway between the upper and lower faces thereon.

The cams G are so constructed that in one revolution of the shaft the carriages are advanced toward the drills and then retracted to normal position.

The pulleys M′ being driven by proper belts, the operation of the machine is as follows: The operator places a board upon each carriage with the edges to be abutted turned toward each other. He then depresses the treadle, and the shaft C is set in rotation, the carriages, with the boards, are advanced, and the carriages retracted. Owing to the capacity of the drills to move freely endwise in their bearings they adapt themselves to any angularity or irregularity of the line dividing the meeting edges of the boards.

The boards X and the operation of drilling them are indicated in Figs. 8 and 9.

Fig. 10 shows two boards X X that have been drilled and are ready to be united by dowels.

The cams or carriage-drivers G being coupled by the rod G′ will slide together on their driving-shaft. This is an important feature, as the widths of the respective pieces to be drilled vary. By means of the rod G′ the cams may be spaced closer together or farther apart to adapt the machine to drill pairs of boards, the entire width of which may vary when placed edge to edge.

We claim as our invention—

1. The combination of a main frame, parallel drill-spindles mounted in bearings thereon and adapted to move freely endwise in their bearings and each equipped with right and left hand drills at their opposite ends, carriages mounted opposite the ends of the spindles and means for simultaneously advancing the carriages toward the drills and then retracting them.

2. The combination of a main frame, a drill-spindle mounted in bearings thereon and adapted to move freely endwise in its bearings and equipped with right and left hand drills at its opposite ends, carriages mounted opposite the ends of the spindle and means for simultaneously advancing the carriages toward the drills and then retracting them.

3. The combination of a main frame, a continuously-rotated driving-shaft mounted in bearings thereon, a pinion on the shaft, a normally stationary main shaft, a gear loosely mounted thereon and engaging the pinion, clutch devices between the normally stationary shaft and the gear thereon whereby at the will of the operator the normally stationary shaft may be driven through one revolution, cams sliding on the normally stationary shaft and connected to move together, carriages mounted to slide toward and from each other during each revolution of the normally stationary shaft, means for so actuating them from the cams, and parallel drill-spindles, mounted in bearings between the carriages, adapted to move freely endwise and each equipped with a driving-pulley located between its bearings and with right and left hand drills at its opposite ends.

4. The combination of a main frame, a drill-spindle mounted in bearings thereon, adapted to move freely endwise in its bearings and equipped with right and left hand drills at its opposite ends, carriages mounted opposite the ends of the spindle, cams coupled to slide together on their driving-shaft parallel with the drill-spindle and connections between the cams and carriages for simultaneously advancing the latter toward the drills and then retracting them.

5. The combination of a main frame, a drill-spindle mounted in bearings thereon, adapted to move freely endwise in its bearings and equipped with right and left hand drills at its opposite ends, carriages mounted opposite the ends of the spindle and mechanism, for simultaneously advancing the carriages toward the drills and then retracting them, comprising drivers mounted to move together in a direction parallel with the line of motion of the carriages for the purpose set forth.

In testimony whereof we have hereunto subscribed our names.

WILLIAM J. EDWARDS.
WILLIAM M. WAUTERS.

Witnesses:
H. C. COLVILLE,
E. W. HARDING.