

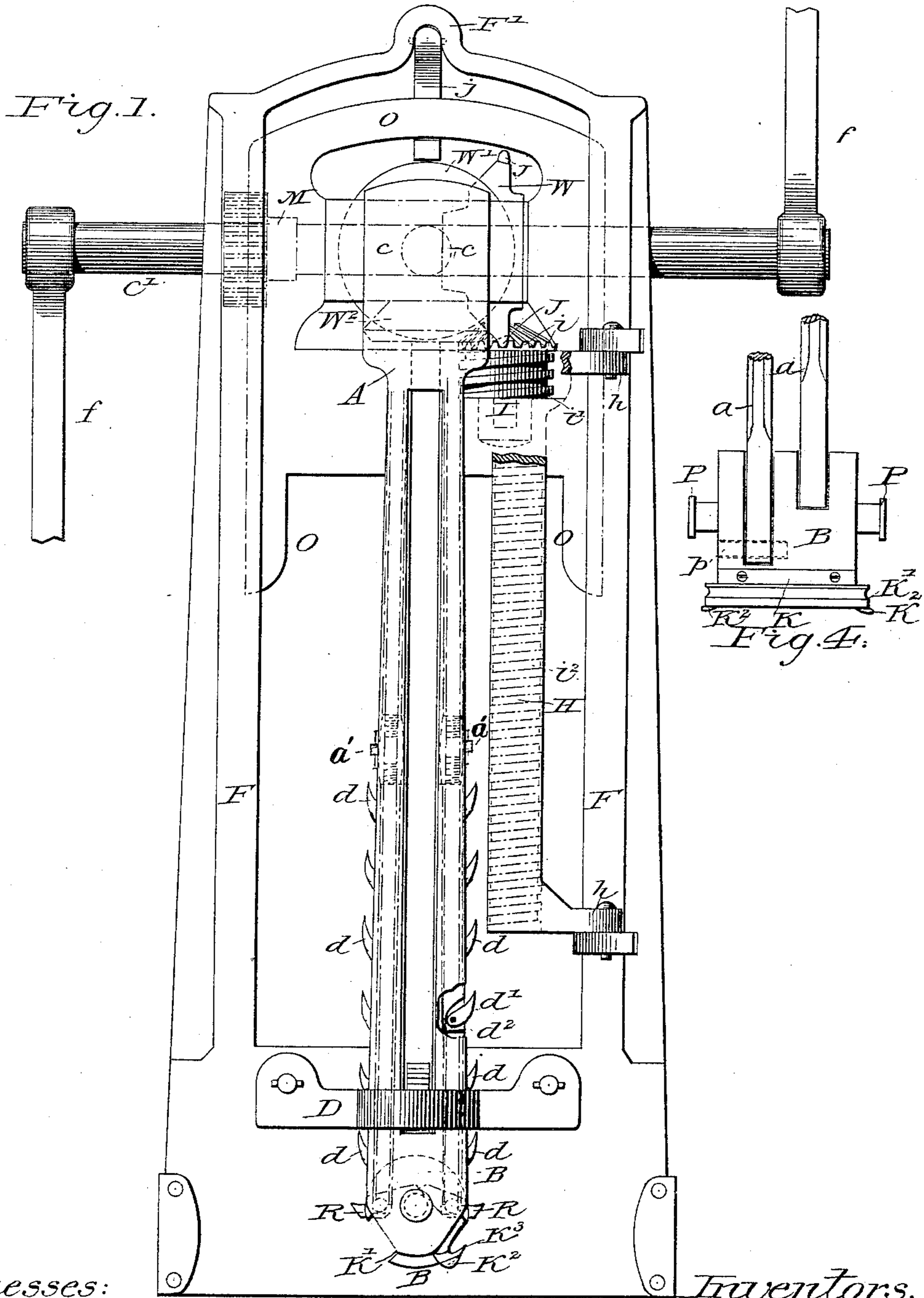
(No Model.)

2 Sheets—Sheet 1.

A. E. & J. C. LAKE.
SQUARE HOLE BORING MACHINE.

No. 339,195.

Patented Apr. 6, 1886.



Witnesses:
Lucas Platter,
P. T. Downing

Inventors.
A. E. Lake & J. C. Lake
By H. B. Swartz Atty

(No Model.)

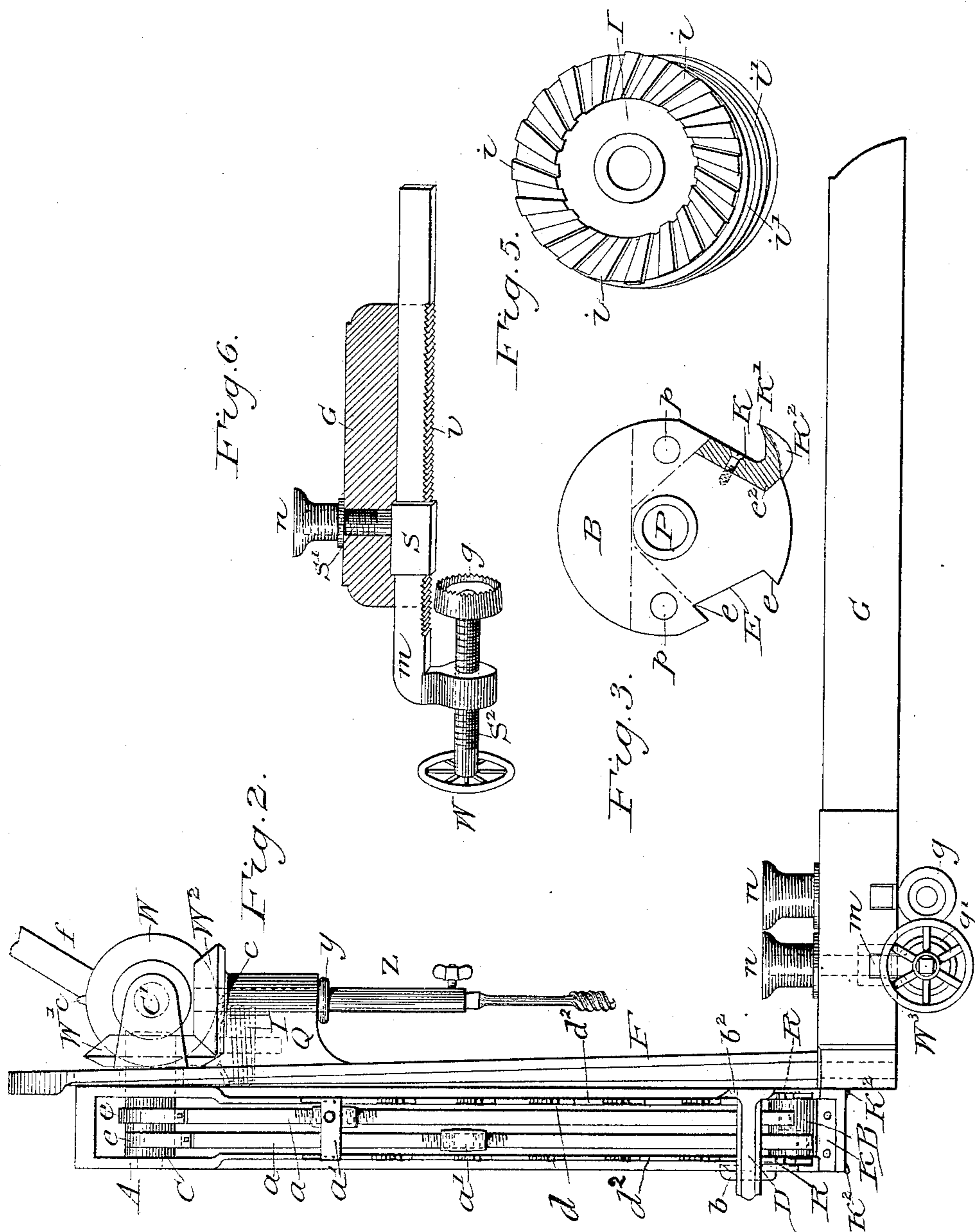
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SQUARE HOLE BORING MACHINE.

No. 339,195.

Patented Apr. 6, 1886.



Witnesses:
Lucas Hattery
D. T. Downing

Inventors.
A. E. Lake & J. C. Lake
By H. B. Swartz Atty

UNITED STATES PATENT OFFICE.

ABRAHAM E. LAKE, OF WOOSTER, AND JOHN C. LAKE, OF BIG PRAIRIE,
ASSIGNORS TO THE SQUARE HOLE AUGER COMPANY, OF WOOSTER,
OHIO.

SQUARE-HOLE-BORING MACHINE.

SPECIFICATION forming part of Letters Patent No. 339,195, dated April 6, 1886.

Application filed July 29, 1885. Serial No. 173,199. (No model.)

To all whom it may concern:

Be it known that we, ABRAHAM E. LAKE and JOHN C. LAKE, citizens of the United States, residing at Wooster and Big Prairie, respectively, in the county of Wayne and State of Ohio, have invented a new and useful Square Hole-Boring-Machine, of which the following is a specification.

Our invention relates to square-hole-boring machines which employ an oscillating cutter-head to bore the square hole; and it consists, first, in the use of reciprocating rods to operate a cutter-head journaled into the lower end of a stock, said cutter-head provided with a cutting device adapted to cut across the grain at right angles with the edges of the blades; second, of a journaled cutter-head provided with two independent cutting-blades set into opposite sides of the cutter-head to cut upwardly, each blade having end cutters to cut across the grain in the direction of its operation; third, of an improved device for taking the cuttings from the cutters and carrying the same out of the auger-hole; and, fourth, of an improved feeding device, whereby a regular intermittent downward feed is obtained, adapted to the cut of the blades, as hereinafter set forth. We attain these objects by the devices illustrated in the accompanying drawings, in which—

Figure 1 is a front view of our improved boring-machine. Fig. 2 is a side view of the same. Fig. 3 is an end view of our improved cutter-head. Fig. 4 is a side view of the same. Fig. 5 is a top view of our improved feeding device. Fig. 6 is a view of our double screw-clamp for securing the machine upon the timber, but which we do not claim specifically in this application.

Similar letters of reference indicate like parts.

F G are the frame and seat, respectively, of the machine.

O is a sliding frame, to which the machinery of the auger is attached. It is fitted to slide vertically in suitable grooves in the frame F.

A is a vertically-sliding stock attached at its upper end to the sliding frame O. Into

the lower end of the stock is hung the cutter-head B upon journals P.

D is the guide for the stock, through which it slides when the machine is operated.

The cutter-head B is provided with independent cutting-blades *k*, and is made to oscillate upon its journals P by means of two rods, *a*, which are pivoted thereto on opposite sides of its axis, and connected at their upper ends with suitable driving-gear, consisting, preferably, of a double eccentric or crank shaft, *c*, as shown.

We are aware that the use of rods to operate an oscillating cutter-head is not new, and we do not claim such, broadly.

Our improvement consists in the novel arrangement and use of two rods, *a*, in combination with an oscillating cutter-head journaled at its axis, instead of using one rod with a journaled cutter-head, or two rods with a cutter-head having no journal-bearings, as heretofore.

The use of two opposite reciprocating rods upon a journaled cutter-head involves a new combination in square-hole-boring machines, and overcomes the defects heretofore existing, by enabling all lost motion to be taken up by the screw-couplings *a'*, or their equivalents, thereby giving greater strength to the operating-gear, and producing a more even oscillating movement of the cutter-head than heretofore.

We do not limit ourselves to any particular form of supporting-structure or operating-gear, but prefer the devices shown in the drawings; and our invention may be used either singly or in combination with gearing adapted to a round-hole auger, thereby making it a combined machine, as shown—shaft Z and gear-wheel W².

We are also aware that oscillating cutter-heads having independent blades have been before used. Such cutters, however, were not provided with end cutters to cut across the grain, and were defective. So, also, such cutters were arranged to cut downwardly, and thereby defeated successful operation by accumulation of cuttings in the hole. We are

also aware that heretofore a single double-edged blade provided with end cutters has been used. Such are defective, because they cannot be secured firmly enough upon the cutter-head, and they afford no means of compensating for wear of the blades.

Our improvement lies in the use of two independent cutting-blades, K, provided with suitable end cutters, K², to cut across the grain, and set so as to cut upwardly with the swing of the cutter-head. To secure the blades to the cutter-head, we set these blades into suitable recesses, E, on opposite sides of the cutter-head, the upper side of the recess being cut, preferably, with an acute angle, e', and the lower side with an obtuse angle, e'', thereby obtaining great strength, and at the same time admitting outward adjustment of the blades by packing behind the plate K' of the blade to compensate for wear. The shape or bend of the blades is immaterial, and they may be set to cut in a slanting direction, if preferred, instead of in line with the axis of the head.

Our device for removing the cuttings from the blades and auger-hole consists of vertical bars d², fitted to slide up and down along the opposite faces of the stock A, above the blades K, at each swing of the cutter-head. To these bars are attached a series of independent barbs or catches, d, which fall outwardly by their own weight. The proper movement of these shaving-lifters is accomplished by connecting the united upper ends of the bars d² with the opposite reciprocating rod a', respectively. By this means the catches R, which are stationary upon the lower ends of the bars d², immediately above the respective cutters K, move downwardly, while the corresponding cutter swings upwardly, and thereby deposits the shaving upon the catches as they sink below the blades, and as the cutter swings back the catches R elevate the shaving to a position where it is caught by the barbs d, successively, as the bars d² move up and down, thereby carrying the shavings out of the auger-hole. The barbs, being hinged upon the bars, are so made to pass by the shavings in their downward movement, and by falling outwardly, as aforesaid, catch under the shavings in their upward movement and lift them up. The arrangement of such shaving-lifters on each side of the stock above each blade K is in all respects similar. We do not limit ourselves to any particular method of attaching the barbs d, nor of operating the bars d².

To secure regularly intermittent downward feed, we use a feed-wheel, I, pivoting the same upon the frame O below the cog-wheel W. It is provided with beveled cogs i upon its upper surface, which stand obliquely to the diameter thereof. Upon its rim is a worm-thread, i', which coacts with a worm-thread, i², under the adjustable rack H, which is hinged upon the frame F at h. The gear-wheel W has a tooth, J, at each end of its diameter, which is fitted to pass through the

beveled and oblique gear j' on the line of the arrow J' as the machine is operated, whereby a slight rotary movement is given to the wheel I at each half-turn of the wheel W, and this, communicating with the rack H, gives the frame O a slight downward movement at the same time. By changing the slant of the oblique cogs i' the rate of movement may be varied, and by properly adjusting the wheel W upon the crank-shaft c the stroke of the feed may be made just before the blade K begins a new cut, which is very necessary.

The gearing and operation of the machine is similar to boring-machines heretofore used, and the mechanism of the same is immaterial, provided suitable motion be given the reciprocating rods a, as aforesaid, and gearing be applied to the feed-wheel I, as shown, by means of lugs or teeth J, to give the same an intermittent movement.

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

1. The combination, with a mortising cutter-head having journal-bearings provided with a cutting device having parallel side cutting-edges and parallel end cutters, of the operating device consisting of opposite reciprocating bars a, connected with the cutter-head to oscillate the same upon said journal-bearings, substantially as and for the purpose specified.

2. The combination, with a mortising cutter-head having journal-bearings, of the cutting device consisting of two independent blades set into opposite sides of the cutter-head to cut upwardly only, said blades provided with end cutters to cut across the grain, substantially as set forth.

3. In combination with stock A and oscillating cutter-head B, the shaving-catches R, connected with bars d², having an up-and-down movement along the stock above the cutters corresponding with the swing of the cutter-head, substantially as and for the purpose specified.

4. In combination with stock A and oscillating cutter-head B, the sliding bars d², provided with a series of catches, d, having an up-and-down movement along the stock above the cutters, substantially as and for the purpose specified.

5. In combination with sliding frame O, gear-wheel W, having teeth or lugs J, hinged rack H, having worm-gear j², of the feed-wheel I, provided with beveled and oblique gear j on its upper surface, and worm-thread j' upon its rim, said gear and thread fitted to coact with the lugs J and worm-gear j², respectively, substantially as and for the purpose specified.

6. The combination, in a square-hole-boring machine, with the slide-stock A, of a feed-wheel, I, pivoted in the frame O, and having a worm-thread upon its periphery, and beveled cogs upon its upper surfaces standing

obliquely to the diameter thereof, a rack, H,
hinged to the stationary frame F, and mesh-
ing with said worm-wheel, a wheel, W, mount-
ed upon the main shaft, having upon its rim
5 at intervals teeth or lugs to mesh with the
beveled cogs upon the pivoted feed-wheel,
whereby an intermittent movement is com-
municated to said sliding frame, substantially
as set forth.

In testimony whereof we hereunto set our 10
hands in presence of two witnesses.

ABRAHAM E. LAKE.
JOHN C. LAKE.

Witnesses:

H. B. SWARTZ,
LUCAS FLATTERY.