

F. FISCHER.
BORING MACHINE.
APPLICATION FILED MAY 31, 1910.

966,816.

Patented Aug. 9, 1910.

4 SHEETS—SHEET 1.

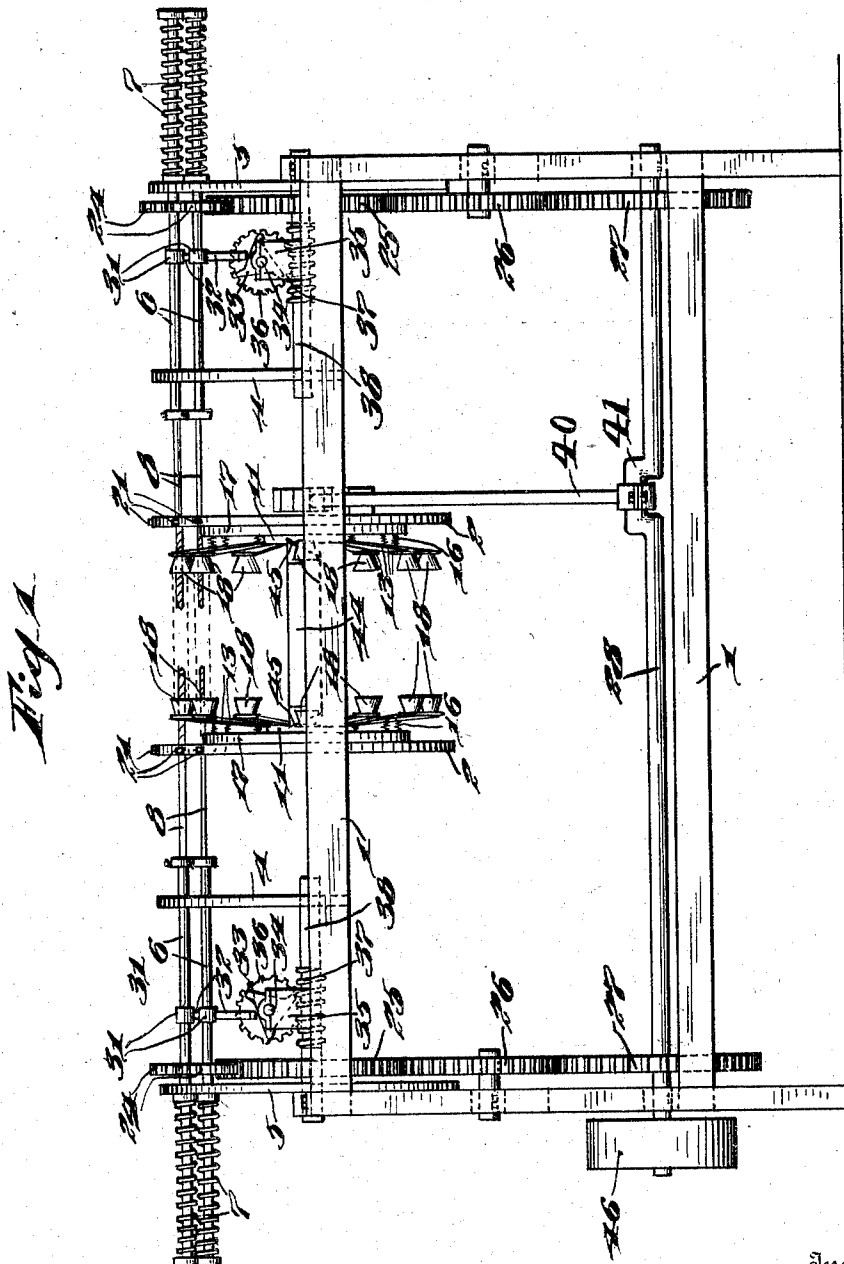


Fig. 1

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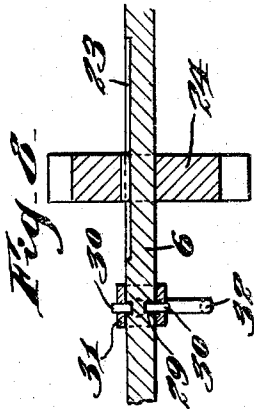
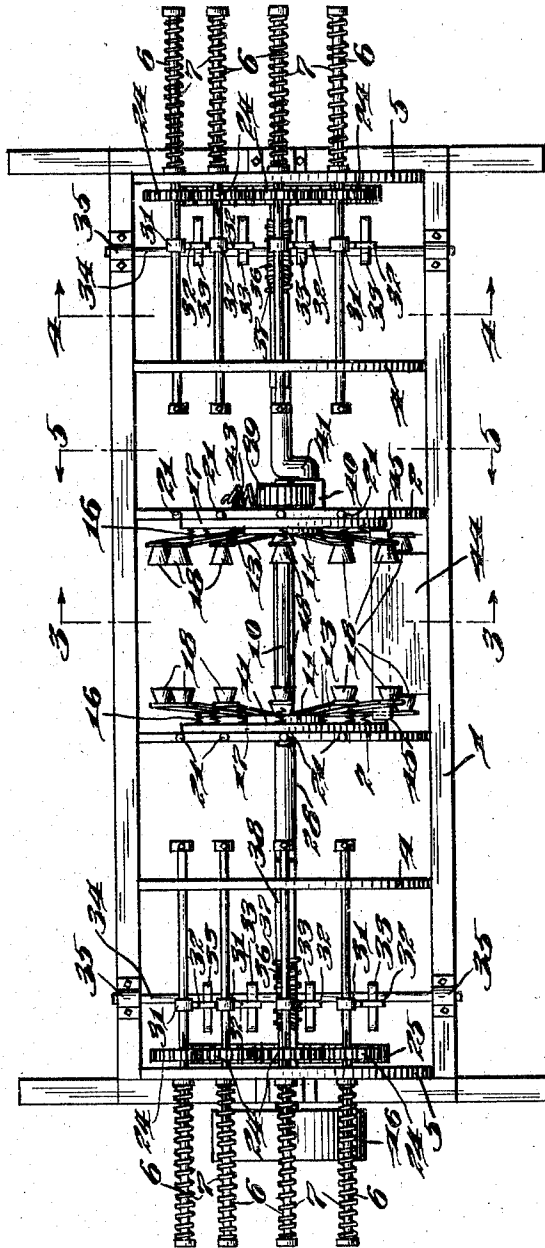


Fig. 7.



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4 SHEETS—SHEET 3.

Fig. 3.

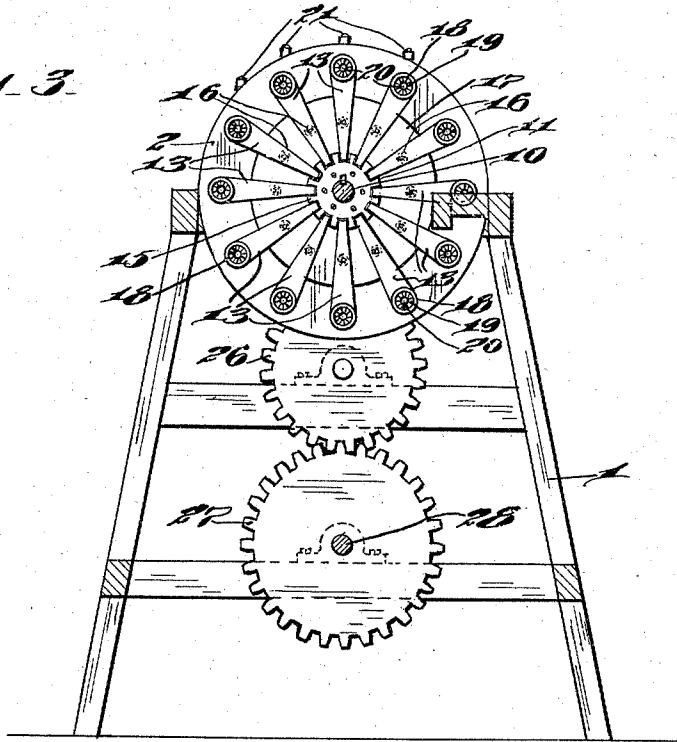
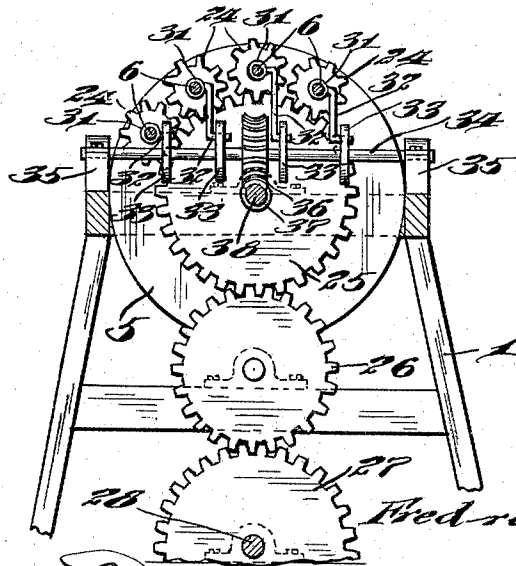


Fig. 4.



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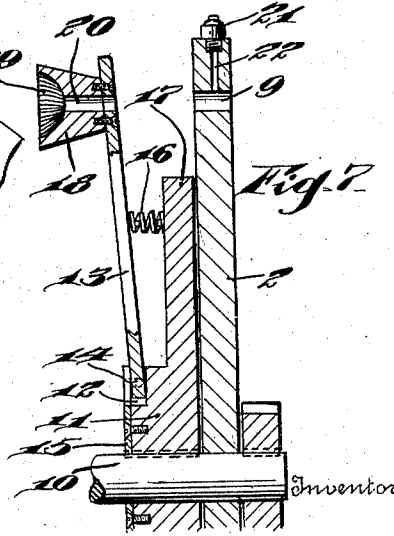
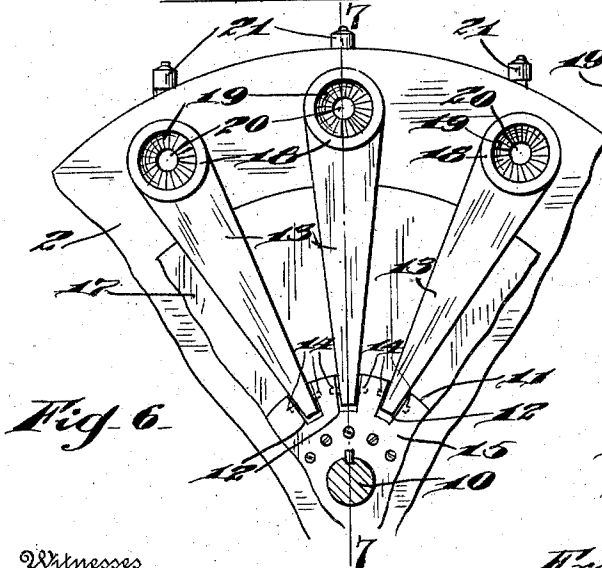
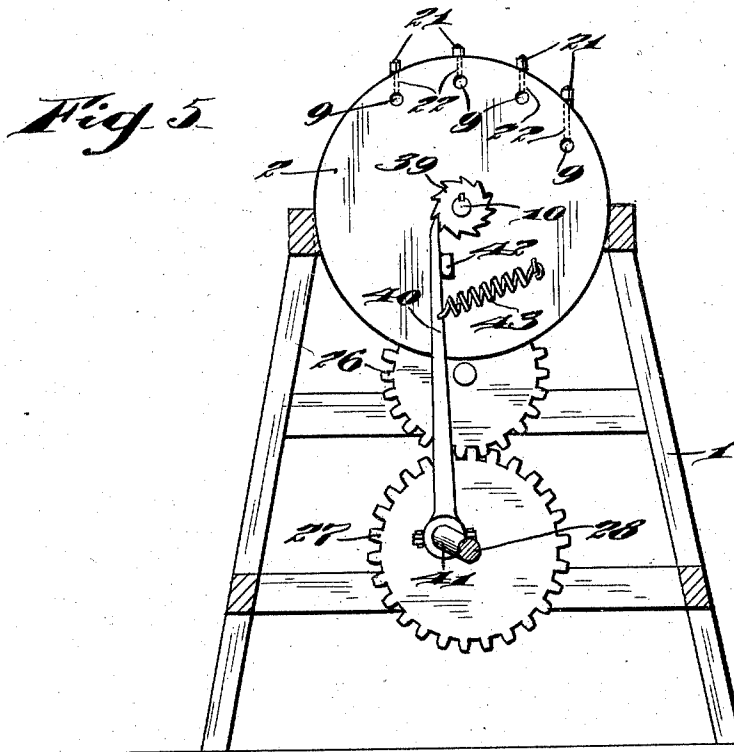
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4 SHEETS—SHEET 4.



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UNITED STATES PATENT OFFICE.

FREDRICK FISCHER, OF PHILADELPHIA, PENNSYLVANIA.

BORING-MACHINE.

966,816.

Specification of Letters Patent.

Patented Aug. 9, 1910.

Application filed May 31, 1910. Serial No. 564,063.

To all whom it may concern:

Be it known that I, FREDRICK FISCHER, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Boring-Machines, of which the following is a specification.

My invention relates to improvements in boring machines, the object of the invention being to provide an improved boring machine designed particularly for boring holes in handles and the like, in which a plurality of longitudinally movable bits are provided to bore in the opposite ends of the block or blank, and which in turn operate upon the same block or blank, so that it may be bored either partially or entirely through as may be desired.

A further object is to provide an improved carrier consisting of two opposed members, each member comprising a plurality of radially disposed hinged arms having cups at their ends to engage and hold the blocks, and springs back of said arms, normally pressing the arms of one member toward the arms of the other.

A further object is to provide improved means whereby the arms are compelled to separate to drop a finished block, and be held out of their normal position momentarily, and then spring into normal position to engage a block.

A further object is to provide improved means for imparting a step by step feed to the carrier, and an intermittent reciprocating movement to the drills, and the bits carried thereby.

With these and other objects in view, the invention consists in certain novel features of construction, and combinations and arrangements of parts, as will be more fully hereinafter described and pointed out in the claims.

In the accompanying drawings: Figure 1, is a view in side elevation, illustrating my improvements. Fig. 2, is a top plan view. Fig. 3, is a view in section on the line 3, 3, of Fig. 2. Fig. 4, is a view in section on the line 4, 4, of Fig. 2. Fig. 5, is a view in section on the line 5, 5, of Fig. 2. Fig. 6, is an enlarged fragmentary view illustrating a portion of one of the carrier members. Fig. 7, is a view in section on the line 7, 7, of Fig. 6, and Fig. 8, is an enlarged view

in longitudinal section through one of the drills.

1, represents a supporting frame in which parallel disks 2 are secured and spaced apart, and upright plates 4, and 5, are also secured at opposite sides of the disks 2, to support the drills 6. There are four of these drills at each end of the frame, and springs 7 on the drills normally press them inward, and their bits 8, through openings 9 in disks 2, as will more fully hereinafter appear.

A short shaft 10 is mounted to turn in disks 2, and on this shaft adjacent the disks, hubs 11 are keyed. These hubs 11 are provided with an annular series of notches 12, in which radial arms 13 are pivotally mounted. These arms 13 are preferably provided with trunnions 14, which engage in recesses in the hub 11, and are held in place by a removable plate 15, secured to the hub. This gives to the arms a hinged connection with the hub, and the arms of one member are normally pressed toward the arms of the other, by coiled springs 16 which are disposed between the arms 13, and a disk-like enlargement 17, integral with hub 11.

At the free ends of the arms 13, block holding cups 18 are secured. These cups 18 have roughened recesses 19 to engage the ends of the blocks, and prevent them from turning, and each cup is made with an opening 20, registering with the opening 9, so that the bits 8 may pass through said openings 9, and 20, and bore into the ends of the block held in the cup.

Disks 2, are provided at each of the openings 9, with an oil cup 21, to feed oil to said openings through ducts 22, to oil the bits. Each of the drills 6 is provided with a longitudinal groove 23, in which a pinion 24 is keyed, and all of these pinions 24 are driven by a single large gear 25, which latter receives motion from an idler 26, driven by a gear 27, on drive shaft 28, extending longitudinally through the lower portion of frame 1. The drills 6, are also provided with annular grooves 29, in which lugs or pins 30 on collars 31 project, and arms 32 on said collars depend therefrom, and lie in the path of movement of three-sided cams 33. The cams 33 are mounted on a shaft 34, supported in brackets 35 on frame 1. On this shaft 34, a worm wheel 36 is secured, and is driven by a worm 37, on shaft 38, upon which gear 25 is fixed, so that the

motion imparted to the gear 25, may be transmitted to the shaft 34, to turn the cams, and impart an intermittent reciprocating movement of the drill.

5 While the description above, relative to the drills applies alike to the set of drills at both ends of the machine, it is to be understood, of course, that the cams will be oppositely disposed so that the drills will be
10 simultaneously moved outward and inward, toward and away from the blocks in the cups 18.

The short shaft 10 has a ratchet wheel 39, secured thereon, which is engaged by a
15 long pawl 40, mounted on a crank 41, forming a part of the shaft 28. This pawl 40 is held against a stop 42, on a disk 2, by means of a coiled spring 43. As the pawl has a greater movement than is necessary
20 to impart to the ratchet a movement equal to the length of one tooth, this block 42, will hold the pawl in its relative position when it is drawn away from the ratchet wheel, but it is to be understood that the
25 pawl at each operation, only moves the shaft 10 a distance of one tooth of ratchet wheel 39, which is just far enough to advance one set of arms from one drill to the next.

44, represents a block which is secured to
30 one side of the frame, and has cam-like ends 45, which lie in the path of movement of arms 13. When the carriers turn at each step by step feed, one pair of arms engages the cams 45, and these arms are spread
35 apart, so that they will drop the finished handle. At the same time, the operator holds a block on top of the block 44, so that when the arms pass over the cams, they will
40 spring toward each other, and grasp the new block or blank. It will therefore be noted, that the finished handles will automatically drop, and it is simply necessary for the operator to place blocks or blanks
45 in position on the block 44, to be grasped by the arms 13. The bits 8, are preferably made of different sizes, so that the first bit to engage the block, will cut the smallest
50 sized opening, and each succeeding bit of increased diameter, so as to give to each bit an equal amount of work to do. Just as the carriers are about to be moved by the
55 pawl 40, cams 33 will momentarily draw back the drills moving the bits out of the cups 18, so that the carriers may turn a distance equal to the distance between the bits, and the bits will be returned to working
position by means of their springs 7.

The machine may be driven, of course, in
60 various ways, and I have illustrated on drive shaft 28, a pulley 46 which receives power from any suitable source, and all of the mechanism above described is operated by the drive shaft 28, each of the sets of
65 drills at the ends of the machine being alike, and operated alike, the reference characters

employed are alike for both, as the parts are identical.

Various slight changes might be made in the general form and arrangement of parts described without departing from my invention, and hence I do not limit myself
70 to the precise details set forth, but consider myself at liberty to make such changes and alterations as fairly fall within the spirit and scope of the appended claims. 75

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

1. In a machine of the character described, the combination with a frame, of a rotary
80 carrier supported on the frame, and comprising two members, each member consisting of a central hub portion, an annular series of radial arms hinged to the hub portion, and block engaging cups at the ends
85 of the arms, and drills adapted to be projected through said cups and into the blocks carried thereby, substantially as described.

2. In a machine of the character described, the combination with a frame, of a rotary
90 carrier supported on the frame, and comprising two members, each member consisting of a central hub portion, an annular series of radial arms hinged to the hub portion, and block engaging cups at the ends
95 of the arms, disk enlargements on said hubs back of the arms, springs between said arms and disk enlargements, and drills adapted to be projected through the cups, substantially as described. 100

3. In a machine of the character described, the combination with a frame, of a rotary
105 carrier comprising two members each member consisting of an annular series of hinged arms, and block engaging cups on the ends of said arms having openings therethrough,
110 a series of drills at each side of the carrier and constructed to project through the cups, means for imparting a step by step rotary feed to the carrier, and means for intermittently reciprocating the drills to move them
out of the cups when the carrier turns, substantially as described. 115

4. In a machine of the character described, the combination with a frame, of a rotary
120 carrier comprising two members, each member consisting of an annular series of hinged arms, and block engaging cups on the ends of said arms, having openings therethrough,
125 a series of drills at each side of the carrier and constructed to project through the cups, a ratchet wheel locked to turn with the carrier, a crank shaft, a pawl operated by the crank shaft to engage the ratchet wheel and
move the ratchet wheel a distance of one
tooth at each operation, and means for intermittently reciprocating the drills, substantially as described. 130

5. In a machine of the character described, the combination with a frame, of a rotary

carrier comprising two members, each member consisting of an annular series of hinged arms, and block engaging cups on the ends of said arms, having openings therethrough, a series of drills at each side of the carrier and constructed to project through the cups, means for imparting a step by step rotary feed to the carrier, depending lugs on the drills, and cams engaging the lugs to impart an intermittent reciprocating movement to the drills, substantially as described.

6. In a machine of the character described, the combination with a frame, of a rotary carrier comprising two members, each member consisting of an annular series of hinged arms, and block engaging cups on the ends of said arms, having openings therethrough, a series of drills at each side of the carrier, and constructed to project through the cups, a ratchet wheel locked to turn with the carrier, a crank shaft, a pawl operated by the crank shaft to engage the ratchet wheel and move it a distance of one tooth at each operation, depending lugs on the drills, springs pressing the drills in one direction, and cams engaging the lugs to impart an intermittent reciprocating movement to the drills, substantially as described.

7. In a machine of the character described, the combination with a frame, disks secured in the frame and spaced apart, and a shaft mounted to turn in said disks, of a carrier secured on said shaft between the disks, and comprising two members, each member having an annular series of hinged arms, block engaging cups at the ends of said arms, springs pressing the arms of one member toward the arms of the other member, a series of drills projected through openings in the disks and through openings in the cups, means for imparting a step by step rotary motion to the carrier, and means for intermittently reciprocating the drills, substantially as described.

8. In a machine of the character described, the combination with a frame, of a rotary carrier supported on the frame, and comprising two members, each member consisting of a central hub portion, an annular series of radial arms hinged to the hub portion, and block engaging cups at the ends of the arms, a block located between the members of said carrier and having beveled or cam ends in the path of said arms to spread the arms apart, and drills adapted to be projected through said cups and into the blocks carried thereby, substantially as described.

9. In a machine of the character described, the combination with a frame, of a rotary carrier supported on the frame, and comprising two members, each member consisting of a central hub portion, an annular series of radial arms hinged to the hub portion, and block engaging cups at the ends of

the arms, disk enlargements on said hubs back of the arms, springs between said arms and disk enlargements, a block located between the members of said carrier and having beveled or cam ends in the path of said arms to spread the arms apart, and drills adapted to be projected through the cups, substantially as described.

10. In a machine of the character described, the combination with a frame, of a rotary carrier comprising two members each member consisting of an annular series of hinged arms, and block engaging cups on the ends of said arms having openings therethrough, a series of drills at each side of the carrier and constructed to project through the cups, a block located between the members of said carrier and having beveled or cam ends in the path of said arms to spread the arms apart, means for imparting a step by step rotary feed to the carrier, and means for intermittently reciprocating the drills to move them out of the cups when the carrier turns, substantially as described.

11. In a machine of the character described, the combination with a frame, of a rotary carrier comprising two members, each member consisting of an annular series of hinged arms, and block engaging cups on the ends of said arms, having openings therethrough, a series of drills at each side of the carrier and constructed to project through the cups, a ratchet wheel locked to turn with the carrier, a crank shaft, a pawl operated by the crank shaft to engage the ratchet wheel and move the ratchet wheel a distance of one tooth at each operation, means for intermittently reciprocating the drills, and a block located between the members of said carrier and having beveled or cam ends in the path of said arms to spread the arms apart, substantially as described.

12. In a machine of the character described, the combination with a frame, of a rotary carrier comprising two members, each member consisting of an annular series of hinged arms, and block engaging cups on the ends of said arms, having openings therethrough, a series of drills at each side of the carrier and constructed to project through the cups, means for imparting a step by step rotary feed to the carrier, depending lugs on the drills, cams engaging the lugs to impart an intermittent reciprocating movement to the drills, a block located between the members of said carrier and having beveled or cam ends in the path of said arms to spread the arms apart, substantially as described.

13. In a machine of the character described, the combination with a frame, of a rotary carrier comprising two members, each member consisting of an annular series of hinged arms, and block engaging cups on the ends of said arms, having openings,

therethrough, a series of drills at each side of the carrier, and constructed to project through the cups, a ratchet wheel locked to turn with the carrier, a crank shaft, a pawl
 5 operated by the crank shaft to engage the ratchet wheel and move it a distance of one tooth at each operation, depending lugs on the drills, springs pressing the drills in one direction, cams engaging the lugs to impart
 10 an intermittent reciprocating movement to the drills, a block located between the members of said carrier, and having beveled or cam ends in the path of said arms to spread the arms apart, substantially as described.
 15 14. In a machine of the character described, the combination with a frame, disks secured in the frame and spaced apart, and a shaft mounted to turn in said disks, of a carrier secured on said shaft between the
 20 disks, and comprising two members, each

member having an annular series of hinged arms, block engaging cups at the ends of said arms, springs pressing the arms of one member toward the arms of the other member, a series of drills projected through
 25 openings in the disks and through openings in the cups, means for imparting a step by step rotary motion to the carrier, means for intermittently reciprocating the drills, a
 30 block located between the members of said carrier and having beveled or cam ends in the path of said arms to spread the arms apart, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of
 35 two subscribing witnesses.

FREDRICK FISCHER.

Witnesses:

R. H. KRENKEL,
 CHAS. E. POTTS.