No. 825,791. PATENTED JULY 10, 1906.

I. YOUNG.

BORING MACHINE.

APPLICATION FILED OCT. 1, 1904.

3 SHEETS—SHEET 1.

Fig. 1.

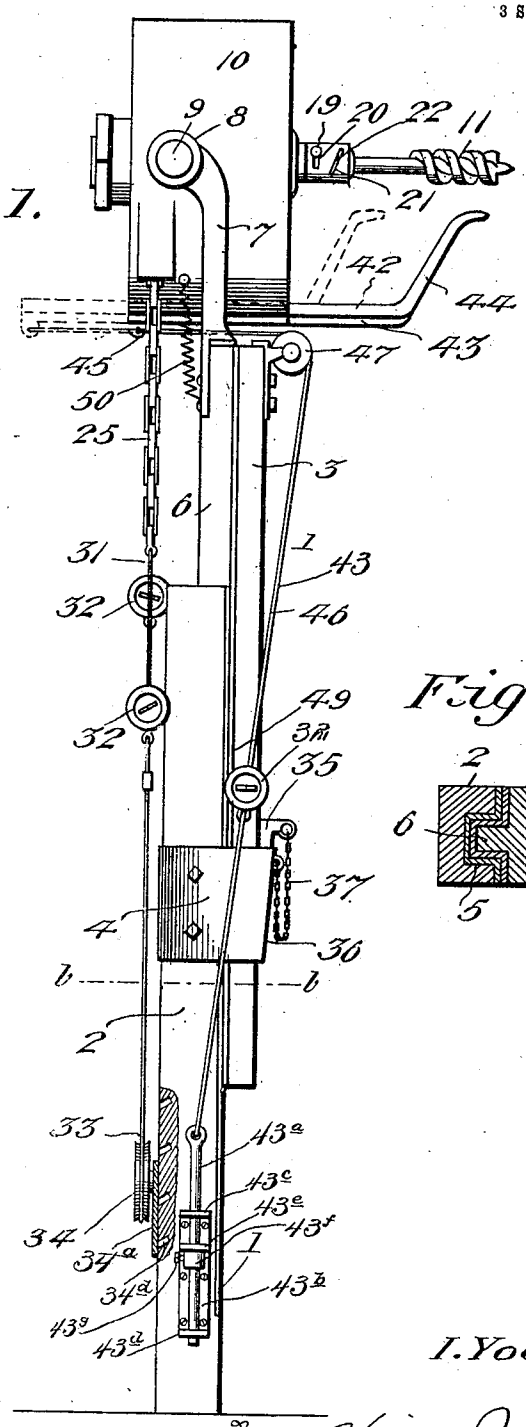



Fig. 5.




Witnesses

Inventor

I. Young.

By Victor J. Evans

Attorney

THE NORRIS PETERS CO., WASHINGTON, D. C.

No. 825,791. PATENTED JULY 10, 1906.

I. YOUNG.

BORING MACHINE.

APPLICATION FILED OCT. 1, 1904.

3 SHEETS—SHEET 2.

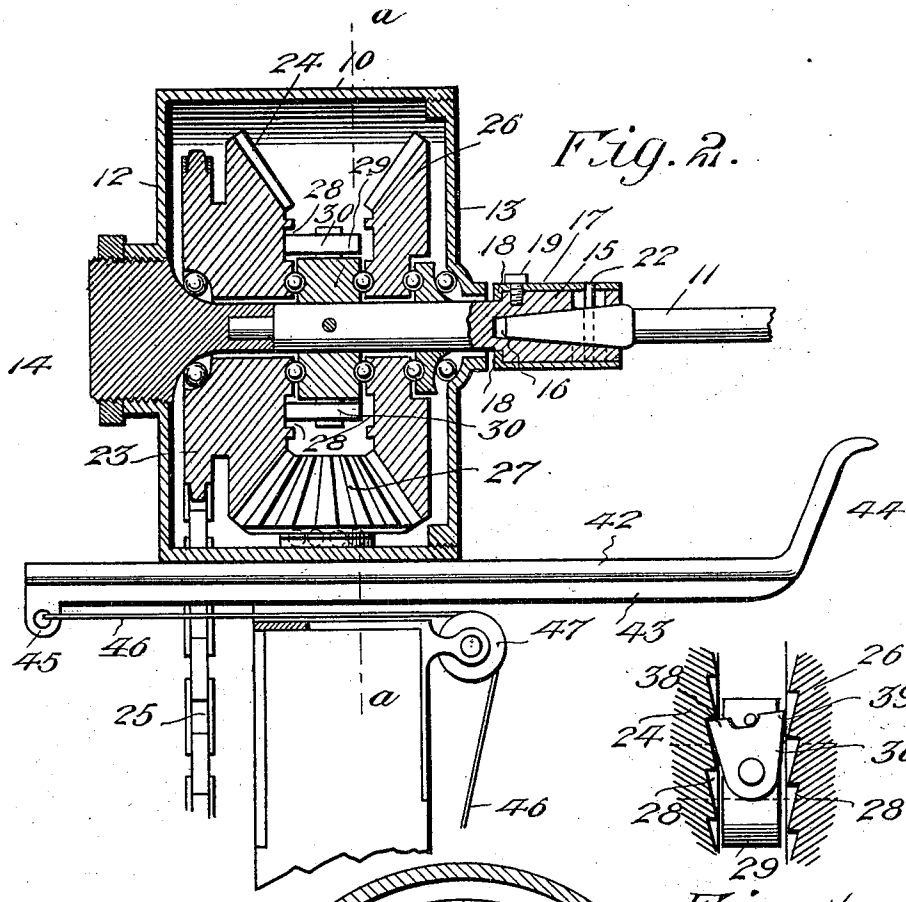
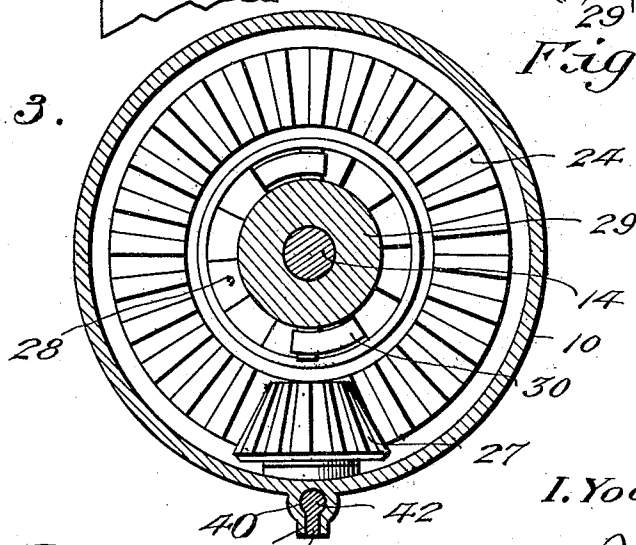



Fig. 2.




Fig. 4.

Fig. 3.




Witnesses

T. W. Ray.

A. P. Hollingsworth

Inventor

I. Young.

By Victor J. Evans

Attorney

THE NORRIS PETERS CO., WASHINGTON, D. C.

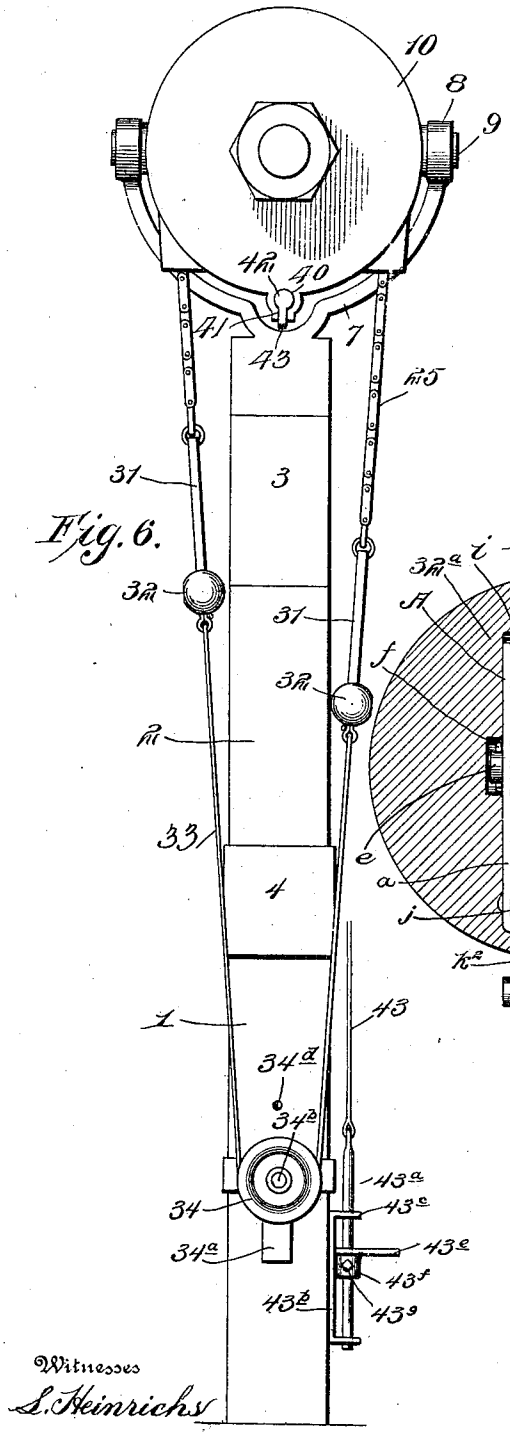
No. 825,791. PATENTED JULY 10, 1906.

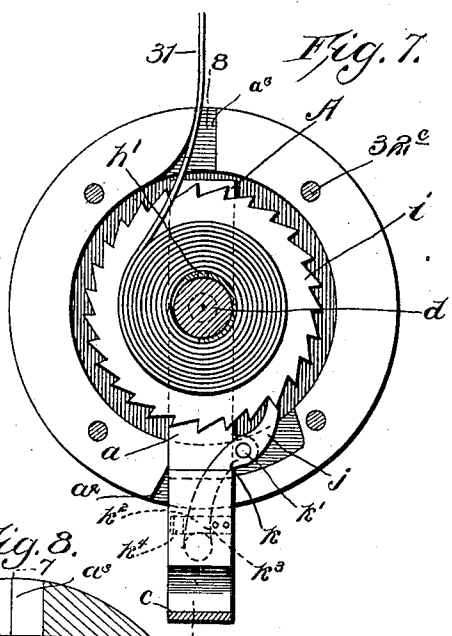
I. YOUNG.

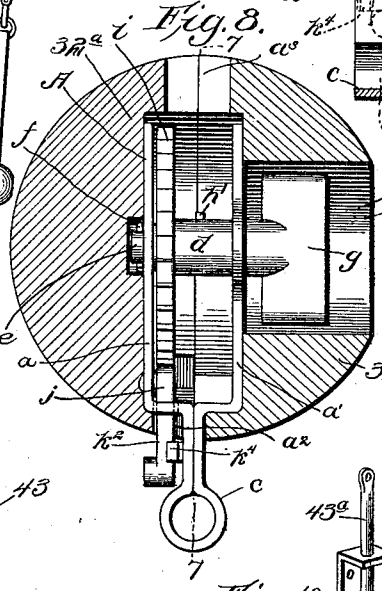
BORING MACHINE.

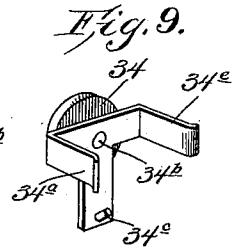
APPLICATION FILED OCT. 1, 1904.

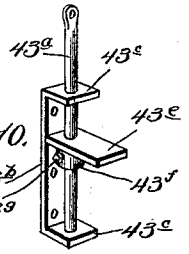
3 SHEETS—SHEET 3.




Witnesses

L. Heinrichs

Geo. Ackmann Jr.

Inventor

I. Young

By Victor J. Evans

Attorney

THE NORRIS PETERS CO., WASHINGTON, D. C.

# UNITED STATES PATENT OFFICE.

IGNATZ YOUNG, OF SAN FRANCISCO, CALIFORNIA.

## BORING-MACHINE.

No. 825,791. Specification of Letters Patent. Patented July 10, 1906.

Application filed October 1, 1904. Serial No. 226,815.

*To all whom it may concern:*

Be it known that I, IGNATZ YOUNG, a citizen of the United States, residing at San Francisco, in the county of San Francisco and State of California, have invented new and useful Improvements in Boring-Machines, of which the following is a specification.

This invention relates to boring-machines designed for operating tools for boring wood, especially in places inaccessible or inconvenient to the ordinary hand devices in common use.

The principal objects of the invention are, first, to provide a suitable mechanism for rotating an auger or other boring-tools operated by a belt, strap, chain, or other suitable means to which a reciprocatory movement is imparted by the hands of the operator. The auger and its rotating mechanism are mounted on a suitable support having longitudinal adjustment by means of which the boring-tool can be moved into an operative position while the bottom of the support rests against an abutment; secondly, means for withdrawing the boring-tool without rotating it, so that all cuttings made by the tool may be removed from the hole when the tool is withdrawn, and, thirdly, to provide means for lengthening or shortening the reciprocating device as the support for the rotating mechanism is extended or reduced in length.

Further objects of the invention will be hereinafter described and the novel features pointed out in the drawings.

In the accompanying drawings, Figure 1 represents a side elevation of the improved boring-machine. Fig. 2 is a vertical section, on an enlarged scale, through the boring-tool and its driving mechanism on the line of the shaft of said tool. Fig. 3 is a section taken on line *a a* of Fig. 2. Fig. 4 is a detail sectional view showing one of the pawls for transmitting motion to the driving-gears. Fig. 5 is a sectional plan view on line *b b* of Fig. 1. Fig. 6 is a front elevation of the boring-machine. Fig. 7 is a section through one of the ball-handles and take-up devices, taken on line 7 7 of Fig. 8. Fig. 8 is a section taken in the opposite direction on line 8 8, Fig. 7. Fig. 9 is a detail view of the direction-pulley and its supporting-bracket, and Fig. 10 is a similar view of the means for projecting the retractor-bar

Similar reference characters indicate corresponding parts.

The numeral 1 indicates a standard in two parts 2 and 3, slidably connected by means of a sleeve 4. The lower part 2 may rest on the floor or against some other suitable abutment and is provided on one side with a groove 5, in which a tongue 6, formed on the proximate face of the part 3, is fitted and adapted to guide the said part when it is raised and lowered. The standard 1 may be made of metal or wood. When the latter material is used, the groove 5 and the tongue 6 are preferably covered with thin sheet metal, as shown in Fig. 5, to prevent undue wear and friction when the parts are moved to extend or decrease the length of the standard. Bolted or otherwise secured in a fixed position to the top of the part 3 is a semicircular bracket 7, the ends of which project upwardly and are provided with bearings 8 to receive the journals 9 of a frame or casing 10, in which the mechanism for rotating the boring-tool is carried. The casing 10 is cylindrical in form and is preferably made of cast metal, the sides and one end, as 12, being integral, the other end, 13, having its periphery threaded and screwed into the casing, as represented in Fig. 2. The construction above described is the preferred one; but changes may be made therein without departing from the spirit of the invention.

Passing axially through the center of the casing 10 is a shaft 14, rotating on bearings forming a part of said casing and having at one end an enlargement 15, in which a socket 16 is formed for the butt-end of the bearing-tool 11. Surrounding the enlargement 15 is a sleeve 17, the inner end of which is flanged at 18, which flange bears against a shoulder at the inner end of the enlargement 15 and prevents the sleeve 17 from being withdrawn from said enlargement. The sleeve 17 has a circumferential movement on the enlargement 15, this movement being limited by means of a screw 19, passing through a short circumferential slot 20 in the sleeve. The sleeve is also provided with a second slot 21, inclined to the axis of rotation. A pin 22 is passed through the slot 21 and the enlargement 15 into a hole bored in the butt of the tool 11. By loosening the screw 19 and rotating the sleeve 17 to the right the walls of the slot 21 will act on the pin 22 and draw the head of the tool 11 firmly into the socket 16, after which the screw is tightened to hold the sleeve against movement. If desired, the pin 22 may pass wholly through the enlarge-

ment 15 of the tool-head and into a slot on the opposite side of the sleeve 17 similar to the slot 22, but inclined in the opposite direction.

A sprocket-wheel 23 is integrally formed with or attached to a beveled gear 24 and is mounted to turn freely around the shaft 14. A chain 25, passing over the sprocket-wheel 23, will when operated in a manner hereinafter described reciprocate said sprocket-wheel and the beveled gear 24, connected therewith. Facing the beveled gear 24 is a similar gear 26, also rotatable about the shaft 14 and adapted to be reciprocated through a beveled pinion 27 by the beveled gear 24. The inner face of each beveled gear 24 and 26 is provided with radially-disposed ratchet-teeth 28, those on one gear facing in opposite direction to the teeth on the other. Fixed to the shaft 14 between the beveled gears 24 and 26 is a collar 29, on diametrically opposite sides of which are independently-pivoted double tooth-pawls 30, adapted to alternately engage the teeth 28 in the beveled gears 24 and 26.

Each end of the chain 25, before mentioned, is attached to a metal tape 31, its lower end being connected to a take-up device inclosed within a ball-handle 32, by means of which latter the chain is operated. A cable, rope, or chain 33, attached to the bottom of each ball-handle 32, passes around a wheel 34 near the bottom of the standard 1. The wheel 34 is carried by a bracket $34^a$, the body portion of which is T-shaped and the upper or cross portion thereof provided with a pin $34^b$, on which the wheel 34 is mounted to revolve. The vertical arm or portion of the bracket is provided with a pin $34^c$, projecting inwardly therefrom at an upward angle and adapted to engage any one of a series of sockets $34^d$, formed in the front of the portion 2 of the standard or frame. This permits the bracket $34^a$ and the wheel 34 to be adjusted on the frame, as desired, the inclination of the pin preventing the bracket from pulling loose under the tension of the connection 33. The horizontal or cross arm is provided with spring arms or clasps $34^e$, adapted to engage opposite sides of the post and steady the connection of the pin $34^b$. These arms also serve to hold the bracket against disengagement when the pin is removed from one of the seats $34^d$ and is being adjusted into engagement with another one of said seats. Each ball-handle and take-up device 32 comprises a casing formed of two sections $32^a$ $32^b$, adapted to be secured together by bolts, screws, or other fastenings $32^c$. The meeting faces of these sections are recessed to form a chamber in which is a frame A in the form of a yoke, the arms $a$ and $a'$ of which are seated in the respective recesses in the casing-sections and are joined at one end by an eye $c$, which forms a connection to receive one end of the rope or cable 33. The shank of this eye is formed by bending the adjacent ends of the arms $a$ $a'$ into parallel relation and extends to the exterior through a slot or passage $a^2$, formed by coinciding notches or cut-away spaces in the sections $32^a$ $32^b$.

Journaled in the arms $a$ $a'$ is a shaft $d$, provided at one end with a head $e$, pierced for the pasage of a cotter-pin or like fastening $f$, which retains the shaft in position. The other end of the shaft is provided with a winding-key $g$, arranged in a bore or passage $h$ in section $32^b$ of the casing and adapted to be turned in one direction or the other to wind or unwind the adjacent end of the tape 31, which is wound about the shaft, and is provided at its extremity with an opening to receive a pin $h'$ on the shaft, whereby it is retained in position and held from disengagement. The tape 31 enters the casing through the admission slot or recess $a^3$, opposite the point of outward projection of the eye $c$, as clearly shown in Fig. 7. Fixed to the shaft $d$ is a ratchet-wheel $i$, which is engaged by the teeth $j$ of a pawl $k$, pivoted at $k'$ to the arm $a$ of the yoke A and having a weighted arm $k^2$ projecting to the exterior through the slot or passage $a^2$. This pawl normally engages the teeth of the ratchet-wheel and prevents unwinding of the portion of the tape wound upon the shaft $d$, the teeth $j$ being normally held into engagement with the teeth of the ratchet-wheel by the gravitative action of the arm $k^2$. When it is desired to allow the tape to unwind from the shaft $d$, the arm $k^2$ is swung in a direction to move the tooth $j$ of the pawl out of engagement with the teeth of the ratchet-wheel, whereupon the shaft $d$ will be left free to turn and the tape 31 to unwind. A spring catch or detent $k^3$ is suitably secured at one end to the yoke A and has an angularly-bent free end $k^4$. This detent lies alongside the arm $k^2$ and does not interfere with the normal movement thereof; but when the arm $k^2$ is retracted to the limit of its movement the end $k^4$ of the detent will be forced by the spring action of said detent into the path of said arm, thus preventing said arm from returning to its normal position, and thereby holding the tooth $j$ out of engaging relation, thus permitting the key $g$ to be turned to unwind the tape 31. Upon pressing the detent $k^3$ inward the arm $k^2$ will be released and the pawl will swing by gravity to its normal position and again engage the ratchet-wheel and lock the shaft $d$ from movement. The take-up devices in the ball-handles keep the chain 25 and cable 33 taut and prevent the chain from swinging and becoming disengaged from the sprocket-wheel 23. The two take-up devices also permit the tapes 31 to be let out or taken up to compensate for variations in the length of the adjustable standard 1. It will be ob-

served that the means provided for reciprocating the sprocket-wheel consists of a flexible, member or connection formed by an operating portion or chain 25, a guiding-section 33, passing around the direction-pulley 34, and interconnecting extensible sections 31, adjustable through the medium of the take-up devices.

Assuming that a hole is to be bored through an elevated beam, the boring-machine is set up in position by resting part 2 against the floor or a suitable base and raising or lowering the part 3 until the boring-tool 11 is in line with the part of the beam in which the hole is to be formed. The parts 2 and 3 after adjustment are firmly clamped together by means of a wedge 35, driven between the part 3 and the inclined side 36 of the sleeve 4. This form of connection has been found quite sufficient and enables the parts of the standard to be quickly adjusted and rigidly fixed in place after adjustment. A chain 37 is connected to the wedge 35 and the sleeve 4 to prevent the former from becoming detached and lost or mislaid.

After the boring-machine has been placed in position the operator grasps the ball-handles 32 and alternately draws them downward. The movement of the chain thus operated will oscillate or rock the sprocket-wheel 23 and the beveled gear 24. The beveled gear 26 also oscillates at the same time, but in the opposite direction, the beveled gear 27 conveying motion from the beveled gear 24 to the gear 26.

Assuming that the pawls 30 are in engagement with the ratchet-teeth 28 on the beveled gear 24, if the operator pulls on the right-hand portion of the chain 25 the beveled gear 24 will be turned to the right, carrying the collar 29 and the shaft 14, with the boring-tool, in the same direction. The position of the double pawls 30 during this movement will be such as shown in Fig. 4, one finger, 38, of each pawl being in engagement with teeth 28 on the beveled gear, as above stated, while the other fingers, 29, will be drawn out of engagement with similar teeth 28 on the beveled gear 26, thus permitting the said gear to rotate in the opposite direction. If the opposite end of the chain 25 be now drawn down, the beveled gear 24 will turn to the left and the gear 26 to the right. The beveled faces of the ratchet-teeth 28 on the gear 24 will operate on the fingers 38 of the pawls 30, rocking them on their pivots to force the fingers 38 of said pawls into engagement with the ratchet-teeth 28 on the pawl 26, which will turn to the right and impart to the shaft 14 and tool 11 a movement in the same direction. From this it will be apparent that by imparting an oscillating movement to the gear 24 a substantially continuous rotary motion to the right will be imparted to the shaft 14 and the boring-tool 11. After the tool has completed its work it is withdrawn from the hole made by it without reversing the motion by means of the device now to be described.

Through the bottom of the casing 10 and in an axial direction is formed a guideway 40 and a slot 41, in which is fitted a bar 42, having a feather 43 on its under side to travel in the slot 41 and prevent the rod from turning. One end of the bar 42 has an upwardly-turned finger 44, the opposite end of said bar having an eye 45, to which is attached a cord or cable 46, which passes below the casing 10 and around the pulley 47 and is attached at its lower end to an eye on the upper end of a sliding rod or bar $43^a$. Rod $43^a$ is slidably mounted upon a bracket $43^b$, secured upon the side of the part 2 of the standard or frame and provided at its upper and lower ends with ears or eyes $43^c$, serving as guides in which the rod is slidably mounted. On the rod is a pedal or foot-piece $43^e$, having a collar $43^f$, surrounding the rod $43^a$ and provided with a set-screw $43^g$ to secure it in adjusted position. This construction enables the foot-piece $43^e$ to be adjusted to suit the reach of the operator, and by depressing said foot-piece the rod $43^a$ will be forced downwardly and draw upon the connection 46 to project the bar 42. Should the bar 42 be in the position indicated by dotted lines in Fig. 1 after the hole has been completed the operator by pressing on the foot-lever $43^e$ slides the bar 42 in its guideway until its upturned end strikes the object being bored, against which it presses and causes the boring-tool to be withdrawn from the hole and at the same time to carry away and clear the hole of chips produced by the boring operation. The finger 44 may remain in its extended position, as it will be pushed back when the tool is again operated. The take-up device 49 on the cord or tape 46 is similar to the take-up in the ball-handles 32.

The casing 10 is capable of rocking on its journals 9 for the purpose of maintaining the boring-tool at all times in a true position. A spring 50 is attached at one end to the casing and at its other end to the part 3 of the standard to assist in maintaining the casing 10 in normal position.

Having thus described my invention, what I claim as new is —

1. In an overhead boring device, the combination of a supporting-standard, a rotary tool-holder carried thereby, an oscillating element, interconnecting means for imparting continuous rotary motion to the tool-holder from the oscillating element, a guide member on the standard, a flexible driving element passing around said oscillating element and guide member, said driving element being formed of sections, and take-up and let-out devices connecting the ends of the sections, each of said devices comprising a handle composed of sections having their meeting faces

recessed to form a chamber, one of said sections having a bore therein arranged at right angles to said chamber, a yoke-shaped frame mounted in said handle and having its arms joined at one end and bent to form a shank extending to the exterior of the handle and an eye at the outer end thereof connected to one of the sections of the flexible driving element, a winding-shaft journaled in the arms of said frame and provided with a key arranged in and accessible through the said bore, a tape connected at one end to said shaft and at the other end to the other section of the flexible driving element, a ratchet-wheel carried by said shaft, a pawl normally held in engagement with the ratchet-wheel and having a portion projecting beyond the handle whereby it may be retracted to permit the shaft to revolve, and a catch supported by the aforesaid shank to engage and hold the pawl retracted.

2. In an overhead boring device, the combination of a supporting-standard, a rotary tool-holder carried thereby, an oscillating element, interconnecting means for imparting continuous rotary motion to the tool-holder from the oscillating element, a guide member on the standard, a flexible driving element passing around said oscillating element and guide member, said driving element being formed of sections, and take-up and let-out devices connecting the ends of the sections, each of said devices comprising a handle composed of sections having their meeting faces recessed to form a chamber, one of said sections having a bore therein arranged at right angles to said chamber, a yoke-shaped frame mounted in said handle and having its arms joined at one end and bent to form a shank extending to the exterior of the handle and an eye at the outer end thereof connected to one of the sections of the flexible driving element, a winding-shaft journaled in the arms of said frame and provided with a key arranged in and accessible through the said bore, a tape connected at one end to said shaft and at the other end to the other section of the flexible driving element, a ratchet-wheel carried by said shaft, a pivoted pawl having a gravity-acting weighted arm projecting exteriorly alongside said shank and adapted to normally hold the pawl in engagement with the ratchet-wheel, and a spring-detent fixed at one end to the shank and having at its free end an angularly-bent portion, said free end adapted to be bent back to allow the weighted arm to swing past the same and to be engaged by the angularly-bent portion when said detent is released to hold the pawl retracted, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

IGNATZ YOUNG.

Witnesses:

CHARLES A. RUGGLES,

ALBERT H. ELLIOT.