Sept. 4, 1923.

1,466,897

P. GAMPHER

EARTH AUGER

Filed Feb. 5, 1921

2 Sheets-Sheet 1

Fig. 1.

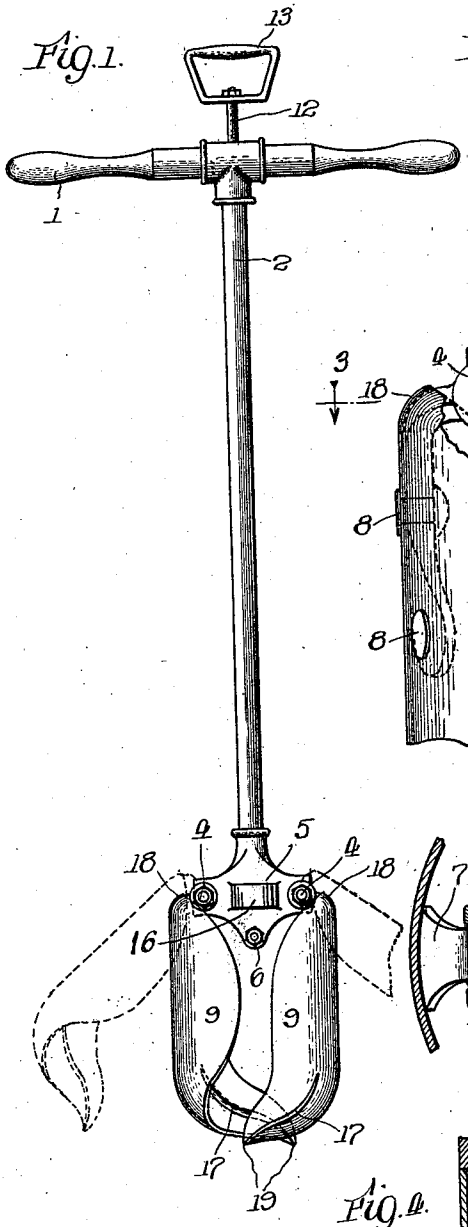


Fig. 2.

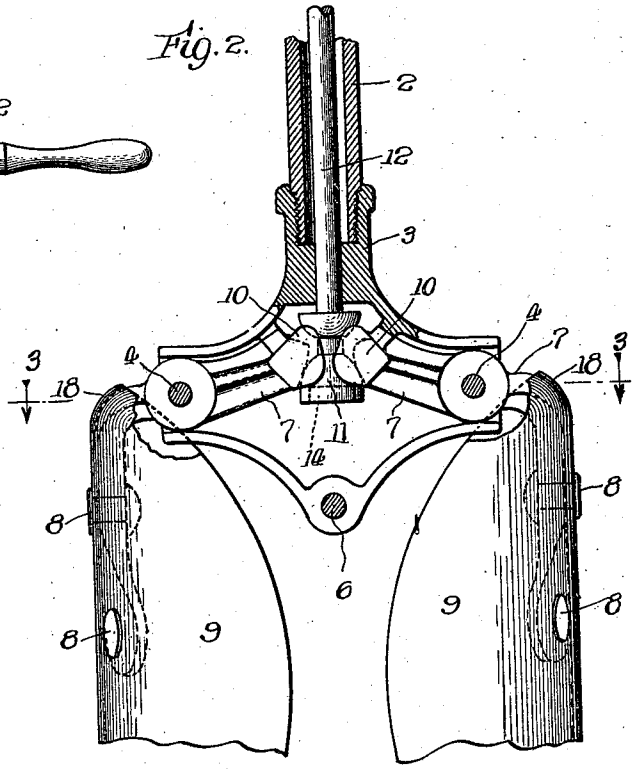


Fig. 3.

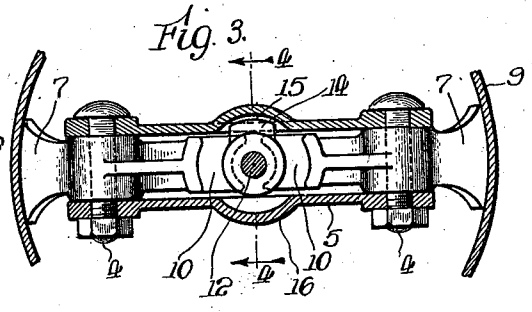
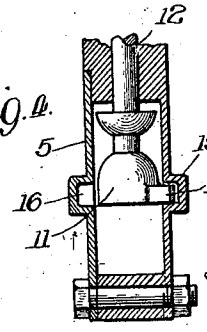


Fig. 4.



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EARTH AUGER

Filed Feb. 5, 1921 2 Sheets-Sheet 2

Fig. 5.

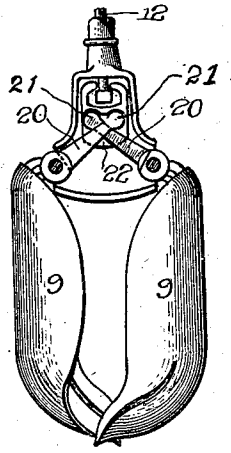


Fig. 6.

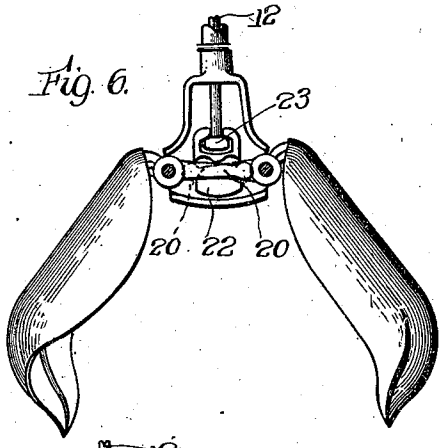
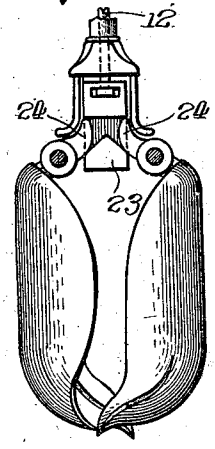


Fig. 7.



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Patented Sept. 4, 1923. 1,466,897

UNITED STATES PATENT OFFICE.

PAUL GAMPHER, OF CHICAGO, ILLINOIS.

EARTH AUGER.

Application filed February 5, 1921. Serial No. 442,723.

To all whom it may concern:

Be it known that I, PAUL GAMPHER, a citizen of the United States, a resident of Chicago, county of Cook, and State of Illinois, have invented a new and useful Improvement in Earth Augers, of which the following is a specification.

My invention relates to earth augers that are used in boring post holes, water wells, and for other purposes. The drawings indicate an auger adapted particularly for post holes, but the principles involved in my augers for other purposes are the same.

The object of my invention is to produce a highly efficient auger with little weight and great serviceability, rigidity and strength, together with some peculiar shapes to the parts, which add to the efficiency of the auger.

The invention is set forth in the claims.

Reference will be had to the accompanying drawings in which Figure 1 is an assembled view of the auger.

Figure 2 is an enlarged detail view, partly in section, of parts of the auger.

Figure 3 is a plan section on line 3—3 of Figure 2.

Figure 4 is a sectional detail on line 4—4 of Figure 3.

Figure 5 is a modified form of some of the parts of the mechanism.

Figure 6 shows the same form as in Figure 5, but with the parts in a different position.

Figure 7 is another modified form, with the auger bits closed together and partly in section.

In the drawing 1 indicates an ordinary handle which is used to handle a post hole auger and 2 indicates the handle stem, or spindle of the auger, here shown as being made out of a piece of pipe. On the lower end of this pipe there is mounted a fixture or casting 3 which carries some bearings for hinge pins 4. This main casting 3 is provided with a cover plate over a part of the section, as indicated by 5 in Figure 3. A clamping bolt indicated by 6 holds on the cover plate 5 at the lower point. Mounted on the hinge pins 4 are bellcrank levers 7 which are secured by rivets 8 to the auger bits 9. The bellcranked levers 7 have bearing ends 10 which are engaged by the curved faces of a block 11, secured to a rod 12 which extends up through the spindle 2 and handle 1 and on the end of which there is provided a hand handle 13.

This rod 12 may be rotated as desired through the influence of the handle 13 and thus revolve the block 11 in any position of contact with the ends 10 of the bell cranked levers 7.

On the side of the block 11 (see Figures 3 and 4), there is a projection 14 adapted to fit into a recess 15 in the side of the casting 3 or a recess 16 in the cover plate 5. This projection 14, engaging the recesses 15 or 16, in either case, as desired by the operator, locks the bits 9 in position of closure for excavation and when the bits have been filled with earth and lifted out from the hole the operator, by twisting the handle 13, disengages the projection 14 from the recesses 15 or 16, which releases the rod 12 for vertical movement.

Then by pushing down on the handle 13 the bellcrank levers 7 are operated to spread the bits 9 apart, as indicated by the dotted lines in Figure 1, which permits the discharge of the earth accumulated within the bits after which the bits are brought home to the full lines, by the drawing up of the rod 12 by the handle 13 and again, by a twisting of the handle 13, the bits are locked in place by means of the projection 14 as previously described.

The bits 9 are made out of rather thin steel for convenience in handling and for stiffening purposes on the nose of the bits I provide the ribs 17 which add but little weight and greatly stiffen the working ends of the bits 9.

These bits or curved blades 9 are curved over at 18 at the top, to give additional stiffness at the top, and also to facilitate the withdrawal of the auger from the hole during the excavating work.

The peculiar shape of the nose 19 of the bits, gives this auger great efficiency and is a most excellent tool for the purpose designed.

The modified form as shown in Figure 5 differs from the form shown in Figures 1 to 4 inclusive in relation to the connection of the bellcrank arms with the controlling block connected to the rod 12, which opens and closes the bits as before described. In Figures 5 and 6 the bellcrank arms 20 have contact ends 21 which engage a block 22 in a slighly different manner from that shown for the ends 10 of the arms and the block 11 of the rod 2, as previously described. The purpose of this modification provides for a little stronger leverage to be exerted by the handle 13 in opening and closing the bits, as the ends 20 cross each other as is indicated in Figure 5. With this construction shown in Figures 5 and 6 the block 22 does not revolve as does the block 11 in Figure 2, but the rod 12 revolves within the block 22 and in Figures 5 and 6 this rod 12 is provided with a head 23 which has a locking projection upon it to perform a similar function to the locking projection indicated by 14 in the earlier figures.

Figure 7 shows another modified form which resides purely in the block 23 on the rod 12 and is more or less similar to the construction shown in Figures 5 and 6, the difference being only that the ends 24 of the bell cranked levers do not cross each other but are shaped slightly different from the ends 10 as shown in Figure 2, the results being substantially the same.

The casting 3, or lower base block of the stem, which I have referred to as a block in claims, is so shaped as to embrace the ends 10 or inner arms of the bell cranked levers 7 and the cover plate 5 makes the other side of this enclosure so that the earth is shut out from clogging the movement of the rod 2 with this block 11 and the ends 10 of the bell cranked levers 7.

What I claim is:—

1. In an earth auger, the cutting bits having the curved shaped cutting ends stiffened by ribs extending down and along the narrower and weaker portion of the bits.

2. In a device of the class described, the cutting bits having the cutting ends stiffened by ribs extending along the narrower and weaker portions, and having the upper ends of these bits curved over for stiffening purposes and for convenience in removal from the hole excavated by the auger.

3. In a device of the class described, cutting bits made of segments of a cylinder turned in at their ends forming cutting edges and said cylinders secured to bell cranked levers hinged into a head block and provided with ends shaped to be engaged and moved by a block secured to an operating rod adapted to be reciprocated and revolved in the control of the bellcrank arms and for locking the rod and arms in excavating position, said block on said rod having a beveled edged groove for engaging the ends of said bell cranks in any position and a projection adapted to lock the block against vertical movement.

4. In a device of the class described, an operating handle for revolving the auger, mounted on the handle stem and said stem being hollow; a secondary handle mounted on a rod extending down through the operating handle and through the hollow stem and provided on the lower end with a block having a beveled edged groove adapted to engage in any position the ends of bellcrank levers on which the auger bits are mounted; a fixed block on the handle stem provided with hinged pins for supporting the bell cranked levers and an aperture in the side of this fixed block adapted to form part of a locking device for holding the auger bits in excavating operative position and a projection on the said block on the said secondary handle rod adapted to engage the said aperture in the said fixed block by a rotative movement of the said secondary handle and its rod.

5. In a device of the class described, an auger bit composed of two shells provided with excavating points adapted to excavate material and hold it within the embrace of the shells, the said shells mounted on bellcrank levers hinged in the fixed block on the stem of the auger and the said levers having curved shape ends adapted to embrace and be moved by a grooved block adapted to fit and engage the ends of the said levers in a manner that a reciprocating movement of the grooved block operates levers to spread apart or close the said shells and a rotating movement of the block operates to lock the block and bell cranked levers in fixed position, by means of a projection on the said block and a recess in the said fixed block adapted to hold the parts in fixed position against vertical movement when the locking is desired; in combination with a regular handle and stem of the auger and an operating device for the said block which engages the ends of the said bellcrank ends.

6. In a device of the class described, a main stem or handle for the auger provided with a fixed supporting block on the end thereof, and the latter provided with hinged bearings for bellcranked levers on which are mounted the cutting bits of the auger and the said fixed block embracing the ends of the said levers and provided with a cover plate adapted to make a complete enclosure of the operating ends of the bellcranked levers for the purpose of shutting out the accumulation of earth and other material that might clog the movement of the operating parts and the said block and

its cover plate having locking recesses therein, adapted to aid in the locking mechanism for the opening and closing of the bits of the said auger; in combination with a rod extending down through the handle and adapted to be rotated and reciprocated and provided with a grooved block adapted by its groove to engage the ends of said bell cranked levers and move the same and with a projection on said grooved block adapted to be rotated in and out of engagement with the said locking recess of said cover plate.

Signed at Chicago, in the county of Cook and State of Illinois, this 20th day of January, 1921.

PAUL GAMPHER.

Witnesses:
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B. J. BERNHARD.