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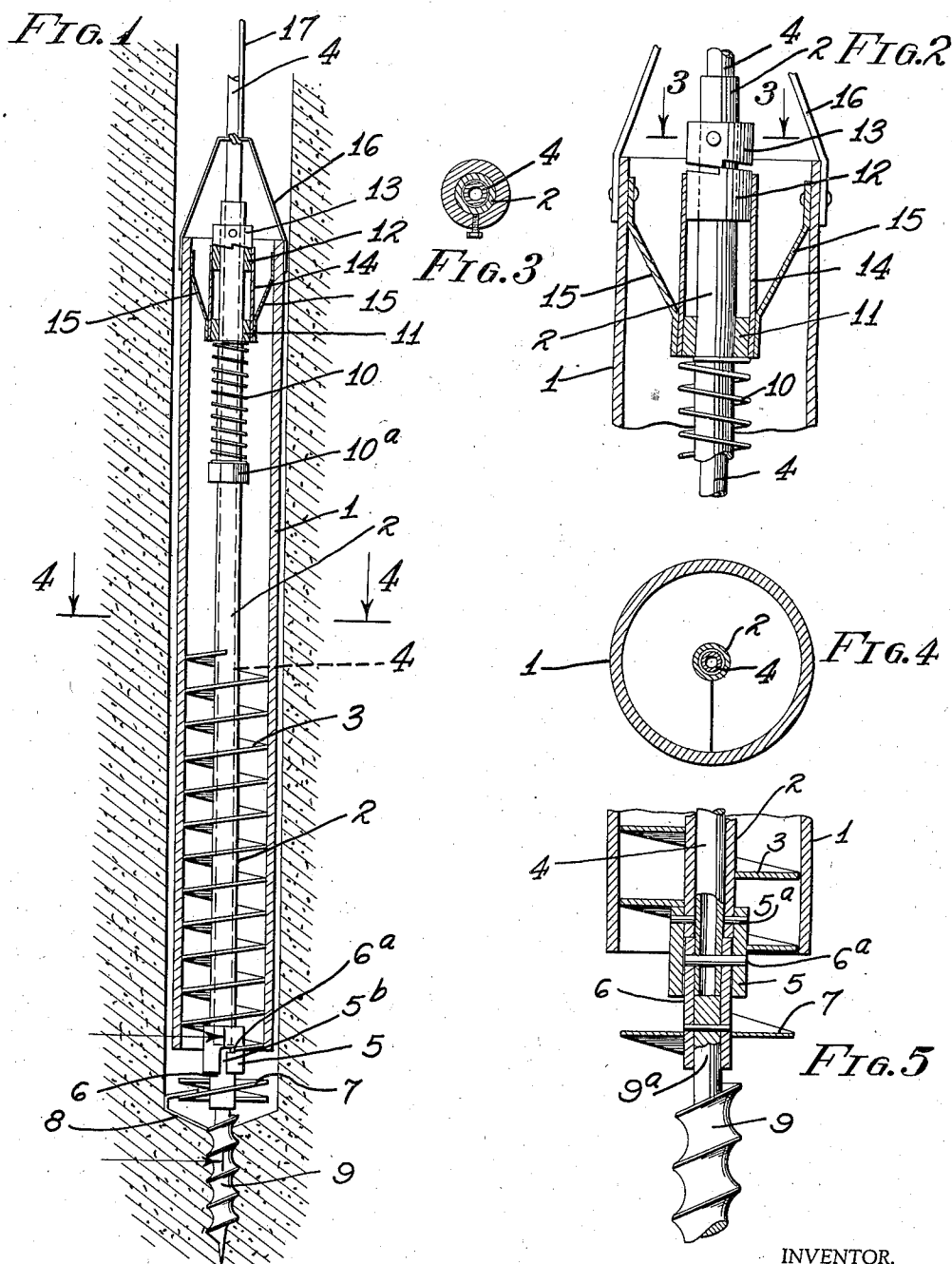
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2,116,359

WELL BORING APPARATUS

Filed July 27, 1936

2 Sheets-Sheet 1



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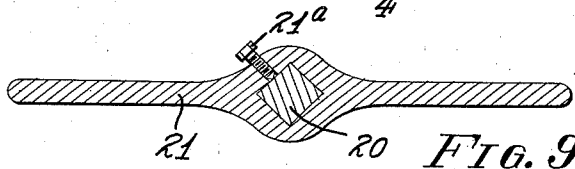
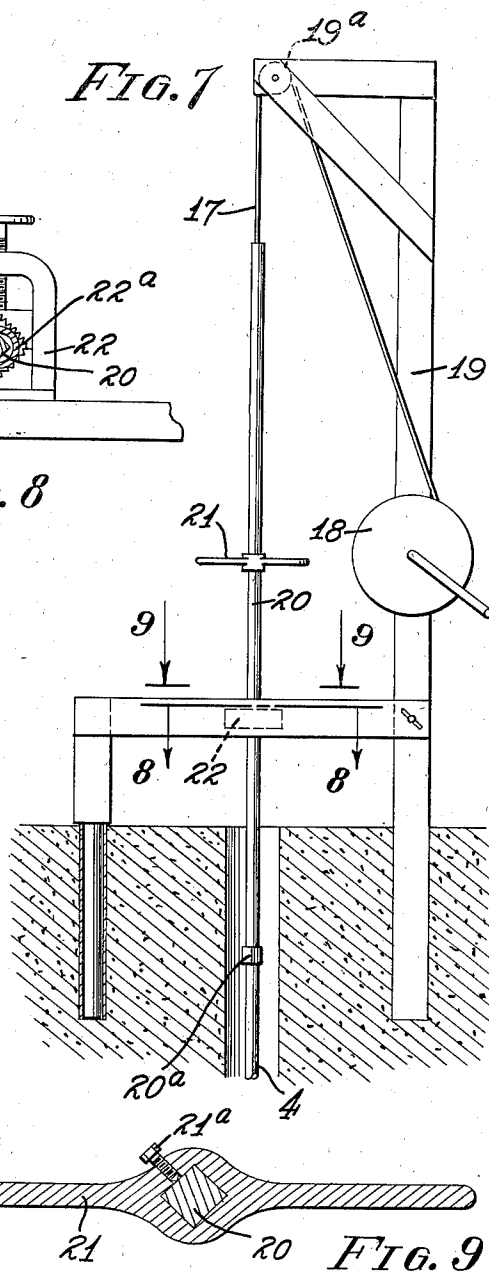
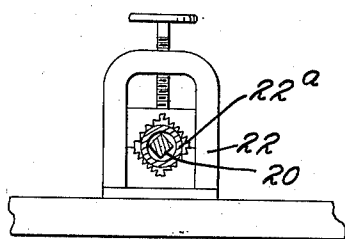
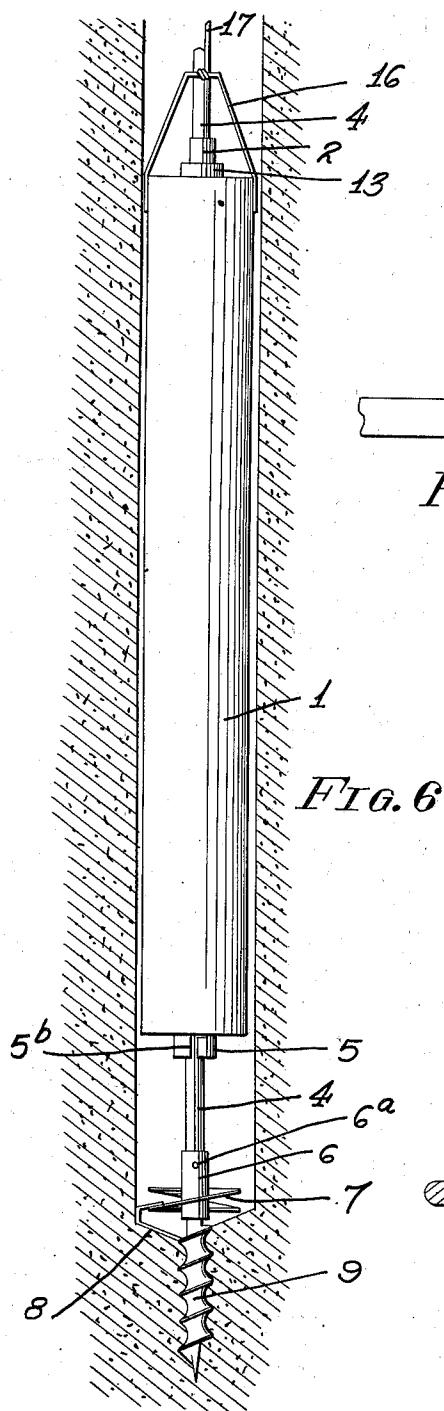
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WELL BORING APPARATUS

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WELL BORING APPARATUS

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10 Claims. (Cl. 255—67)

My invention relates to a well boring apparatus and the objects of my invention are:

First, to provide an apparatus for quickly boring wells, more particularly adapted for water wells;

Second, to provide an apparatus of this class with a bucket which may be quickly raised to the surface for emptying the dirt produced in boring the well;

Third, to provide an apparatus of this class in which the boring members are released and left in the well when raising the dirt bucket;

Fourth, to provide an apparatus of this class with means for raising and lowering the dirt container relatively to the boring mechanism with each revolution of the shaft;

Fifth, to provide a means for readily connecting and disconnecting the boring portion from the dirt container;

Sixth, to provide a simple means for supporting and turning the boring means; and

Seventh, to provide a well boring apparatus of this class which is very simple and economical of construction, easy to operate, efficient in its action, and which will not readily deteriorate or get out of order.

With these and other objects in view as will appear hereinafter, my invention consists of certain novel features of construction, combination and arrangement of parts and portions as will be hereinafter described in detail and particularly set forth in the appended claims, reference being had to the accompanying drawings and to the characters of reference thereon which form a part of this application in which:

Figure 1 is a longitudinal sectional view of the portion that enters the well, showing some of the parts in elevation to facilitate the illustration and showing the apparatus positioned in the well in boring position; Fig. 2 is an enlarged fragmentary sectional view of the upper portion thereof showing some of the parts in elevation to facilitate the illustration; Fig. 3 is a transverse sectional view from the line 3—3 of Fig. 2; Fig. 4 is a sectional view on an enlarged scale from the line 4—4 of Fig. 1; Fig. 5 is an enlarged fragmentary sectional view of the lower portion of the apparatus as shown in Fig. 1 showing some of the parts in elevation to facilitate the illustration; Fig. 6 is an elevational view of the apparatus that enters the well shown in position in the well with the boring portion released and the dirt container in its upward movement; Fig. 7 is a side elevational view of the operating apparatus above the ground and showing a frag-

mentary portion of the upper portion of the well; Fig. 8 is a sectional view on an enlarged scale from the line 8—8 of Fig. 7 and Fig. 9 is a sectional view from the line 9—9 of Fig. 7.

Similar characters of reference refer to similar parts and portions throughout the several views of the drawings:

The hollow cylindrical casing 1, hollow shaft 2, dirt raising spiral 3, main shaft 4, coupling members 5 and 6, spiral 7, cutter member 8, auger member 9, spring 10, collar 11, dirt container shifting members 12 and 13, sleeve 14, connecting member 15, bail 16, cable 17, windlass 18, derrick 19, square shaft 20, wrench member 21, and vise 22 constitute the principal parts and portions of my well boring apparatus.

The hollow cylindrical casing 1 is a large tubular member of approximately the size of the well to be bored, and it is provided on its normally upper end with a bail 16 to which is secured a cable 17 for raising and lowering this casing member 1. This casing member is supported by means of a connecting member 15, which is secured to the inner side of the casing member 1 near its upper end and extends downwardly and inwardly, and at its lower end is secured the lower end of a sleeve member 14. This sleeve member 14 is supported at one end by means of a collar 11, and at its upper end by means of dirt container shifting member 12. The collars 11 and 12 are both slidably mounted on a hollow shaft 2. This hollow shaft 2 is also provided with a collar 10a positioned below the collar 11 and interposed between these two collars 10a and 11 is a compression spring 10 which tends to hold the collar 11 upwardly relatively to the collar 10a, the collar 10a being secured to this shaft 2. In the lower end of the casing is a dirt raising spiral 3, which is adapted to revolve inside the lower end of the casing for raising the dirt loosened by the boring apparatus upwardly in the casing 1.

Secured to the lower end of the hollow shaft 2 is a coupling member 5 which is in the form of a sleeve which is secured over the end of the shaft and held in relation thereto by means of a pin 5a and extends past the end of the shaft 2. It is provided in this extended end with an L-shaped groove 5b, which is open at the lower end and adapted to receive a pin 6a secured in the upper end of the coupling member 6. This coupling member 6 is adapted to be received between the collar 5 and the main shaft 4 to which the coupling member 6 is also secured by the pin 6a. Secured in the lower end of the coupling

member 6 is the shank 9a of the auger member 9 which extends downwardly in a central position some distance as shown best in Figs. 1 and 6 of the drawings and provides the means for drawing the cutter member downwardly and guiding the cutter member 8, which is secured at one end to the upper portion of the auger 9 and extends outwardly slightly past the outer side of the casing member 1 as shown best in Figs. 1 and 6 of the drawings. This cutter member 8 is adapted to bore or cut the dirt and provides a hole slightly larger than the casing 1, and the dirt is picked up by means of a small spiral member 7 secured around the coupling member 6 and adapted to pick up the dirt and carry it upwardly where it is taken up by the spiral 3 and carried up into the casing 1 as the boring proceeds, it being here noted that when it is desired to lift the casing 1, the boring member is shifted until the pin 6a is in alignment with the vertical portion of the groove 5b whereupon the casing 1 may be raised by means of the bail 16 and cable 17, leaving the auger, spiral 7, and shaft 4 in position and may be again attached by lowering the same into position and then turning so that the pin 6a is positioned in the horizontal portion of the groove 5b as shown in Fig. 1 of the drawings, the Fig. 6 showing the casing 1 partially raised and the coupling 5 released from the coupling 6.

At the upper end of the shaft 4 is provided a square shaft member 20 coupled thereto by means of a coupling 20a. This shaft 20 passes through a pipe vise 22 which is a conventional type and positioned on a horizontal plane so that the axis of the opening is on a vertical plane, and between the pipe vise and the shaft 20 is a sleeve member 22a which permits the revolving of the shaft 20 relatively to the pipe vise, but the pipe vise supports rigidly the sleeve member 22a. Secured to the shaft 20 slightly above the sleeve 22a is a wrench member 21 by means of a set screw 21a. This wrench provides means for turning the shaft 20 which in turn revolves the main shaft to provide the boring operation, and the lower side of this wrench 21 may rest on the upper edge of the sleeve 22a for holding the shaft 4 and boring apparatus as desired. The wrench 21, however may be raised above and turned for the boring operation and the weight of the pipe 4 and boring apparatus may rest on the ground for feeding the boring apparatus into the ground.

At the upper surface is preferably provided a conventional derrick 19 which is provided with a windlass 18 and a sheave 19a, thus providing means for raising the cable 17 and thereby the casing 1, which carries the dirt upwardly.

Though I have shown and described a particular construction, combination, and arrangement of parts and portions, I do not wish to be limited to this particular construction, combination, and arrangement, but desire to include in the scope of my invention the construction, combination, and arrangement substantially as set forth in the appended claims.

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

1. In a well boring apparatus, a tubular casing, a tubular shaft revolubly mounted therein, a spiral secured in relation to the lower end of said shaft in said casing, a coupling member secured on the lower end of said tubular shaft, a main shaft extending through said tubular shaft upwardly past the upper end of said tubular casing,

another coupling member secured to said main shaft arranged to engage and couple with the first mentioned coupling member, a boring apparatus secured to said last mentioned coupling and said main shaft.

2. In a well boring apparatus, a tubular dirt container casing, a tubular shaft revolubly mounted therein, a spiral secured in relation to the lower end of said shaft in said casing, a coupling member secured on the lower end of said tubular shaft, a main shaft extending through said tubular shaft upwardly past the upper end of said tubular casing, another coupling member secured to said main shaft arranged to engage and couple with the first mentioned coupling member, a boring apparatus secured to said last mentioned coupling and said main shaft, a dirt container shifting member secured to said tubular shaft, and another dirt container shifting member shiftably mounted on said tubular shaft and spring means tending to hold said dirt container shifting members into engagement with each other.

3. In a well boring apparatus, a tubular dirt container casing, a tubular shaft revolubly mounted therein, a spiral secured in relation to the lower end of said shaft in said casing, a coupling member secured on the lower end of said tubular shaft, a main shaft extending through said tubular shaft upwardly past the upper end of said tubular casing, another coupling member secured to said main shaft arranged to engage and couple with the first mentioned coupling member, a boring apparatus secured to said last mentioned coupling and said main shaft, a dirt container shifting member shiftably mounted on said tubular shaft and spring means tending to hold said dirt container shifting members into engagement with each other, and means for raising said tubular casing independently of said main shaft.

4. In a well boring apparatus, a tubular dirt container casing, a tubular shaft revolubly mounted therein, a spiral secured in relation to the lower end of said shaft in said casing, a coupling member secured on the lower end of said tubular shaft, a main shaft extending through said tubular shaft upwardly past the upper end of said tubular casing, another coupling member secured to said main shaft arranged to engage and couple with the first mentioned coupling member, a boring apparatus secured to said last mentioned coupling and said main shaft, a dirt container shifting member shiftably mounted on said tubular shaft, spring means tending to hold said dirt container shifting members into engagement with each other, means for raising said tubular casing independently of said main shaft in connection with said main shaft for turning said main shaft.

5. In a well boring apparatus, a tubular dirt container casing, a tubular shaft revolubly mounted therein, a spiral secured in relation to the lower end of said shaft in said casing, a coupling member secured on the lower end of said tubular shaft, a main shaft extending through said tubular shaft upwardly past the upper end of said tubular casing, another coupling member secured to said main shaft arranged to engage and couple with the first mentioned coupling member, a boring apparatus secured to said last mentioned coupling and said main shaft, a dirt container shifting member shiftably mounted on said tubular shaft, spring means tending to hold said dirt container shifting members into engagement with each other, means for raising said tubular casing

ing independently of said main shaft in connection with said main shaft for turning said main shaft, and means in connection with said main shaft for holding said main shaft upwardly when desired.

6. In a well boring apparatus, a tubular casing, a tubular shaft revolubly mounted therein, a spiral secured in relation to the lower end of said shaft in said casing, a coupling member secured on the lower end of said tubular shaft, a main shaft extending through said tubular shaft upwardly past the upper end of said tubular casing, another coupling member secured to said main shaft arranged to engage and couple with the first mentioned coupling member, a boring apparatus secured to said last mentioned coupling and said main shaft, and means in connection with said casing and said tubular shaft for shifting said casing relatively to said tubular shaft with each revolution of said shaft.

7. In a well boring apparatus, a tubular casing, a tubular shaft revolubly mounted therein, a spiral secured in relation to the lower end of said shaft in said casing, a coupling member secured on the lower end of said tubular shaft, a main shaft extending through said tubular shaft upwardly past the upper end of said tubular casing, another coupling member secured to said main shaft arranged to engage and couple with the first mentioned coupling member, a boring apparatus secured to said last mentioned coupling and said main shaft, means in connection with said casing and said tubular shaft for shifting said casing relatively to said tubular shaft with each revolution of said shaft consisting of a pair of cam shifting members in operative relation with each other, and spring means tending to hold said cam members in engagement with each other.

8. In a well boring apparatus, a tubular casing, a tubular shaft revolubly mounted therein, a spiral secured in relation to the lower end of said shaft in said casing, a coupling member secured on the lower end of said tubular shaft, a main shaft extending through said tubular shaft upwardly past the upper end of said tubular casing, another coupling member secured to said main shaft arranged to engage and couple with the first mentioned coupling member, a boring apparatus secured to said last mentioned coupling and said main shaft, means in connection with said casing and said tubular shaft for shifting said casing relatively to said tubular shaft with each revolution of said shaft consisting of a pair of cam shifting members in operative relation with each other, and spring means tending to hold said cam members in engagement with each other.

wardly past the upper end of said tubular casing, another coupling member secured to said main shaft arranged to engage and couple with the first mentioned coupling member, a boring apparatus secured to said last mentioned coupling and said main shaft, means in connection with said casing and said tubular shaft for shifting said casing relatively to said tubular shaft with each revolution of said shaft consisting of a pair of cam shifting members in operative relation with each other, spring means tending to hold said cam members in engagement with each other, and means for raising said tubular casing independently of the main shaft and boring apparatus.

9. In a well boring apparatus, a tubular dirt retaining casing, a tubular shaft revoluble therein, a main shaft revoluble within said tubular shaft, an auger secured to said main shaft, a cutter member secured to said auger and extending outwardly past the periphery of said tubular casing, spiral means in connection with said auger and cutter member tending to raise the dirt loosened by said auger and cutter member into said casing, means for retaining said dirt in said casing, and means for releasing said auger, cutter member and dirt raising means from said casing.

10. In a well boring apparatus, a tubular dirt retaining casing, a tubular shaft revoluble therein, a main shaft revoluble within said tubular shaft, an auger secured to said main shaft, a cutter member secured to said auger and extending outwardly past the periphery of said tubular casing, spiral means in connection with said auger and cutter member tending to raise the dirt loosened by said auger and cutter member into said casing, means for retaining said dirt in said casing, means for releasing said auger, cutter member and dirt raising means from said casing, means for raising and lowering said casing relatively to said auger and cutting means with each revolution of said auger and cutting means.

FOREST GLEN McCANN.