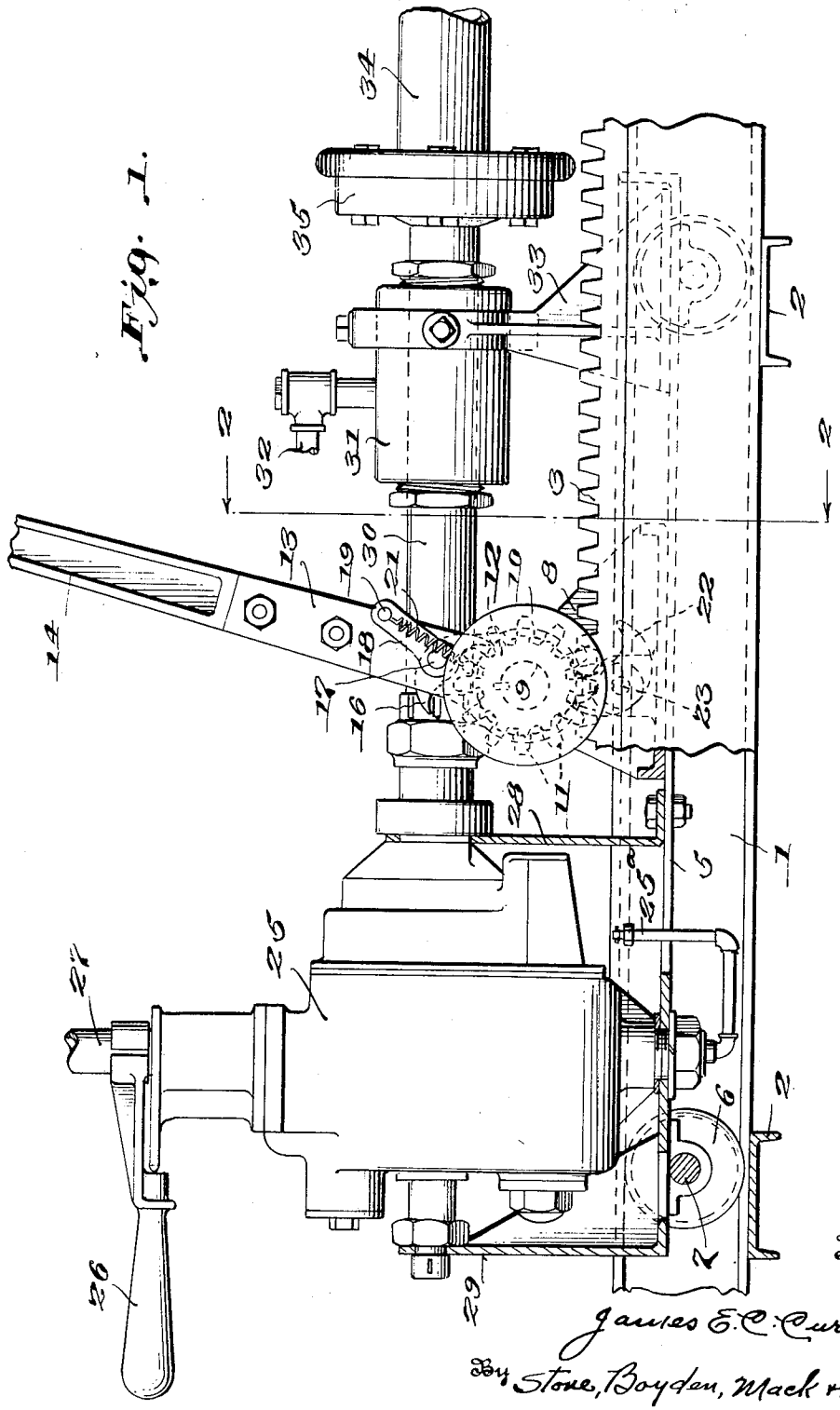
Sept. 26, 1933. J. E. C. CURRENS 1,928,048

FEED MECHANISM FOR EARTH BORING APPARATUS

Filed Feb. 10, 1931 2 Sheets-Sheet 1

Fig. 1.



Inventor

James E. C. Currens,

By Stone, Boyden, Mack & Hahn,

Attorneys.

Sept. 26, 1933. J. E. C. CURRENS 1,928,048

FEED MECHANISM FOR EARTH BORING APPARATUS

Filed Feb. 10, 1931 2 Sheets-Sheet 2

Fig. 2.

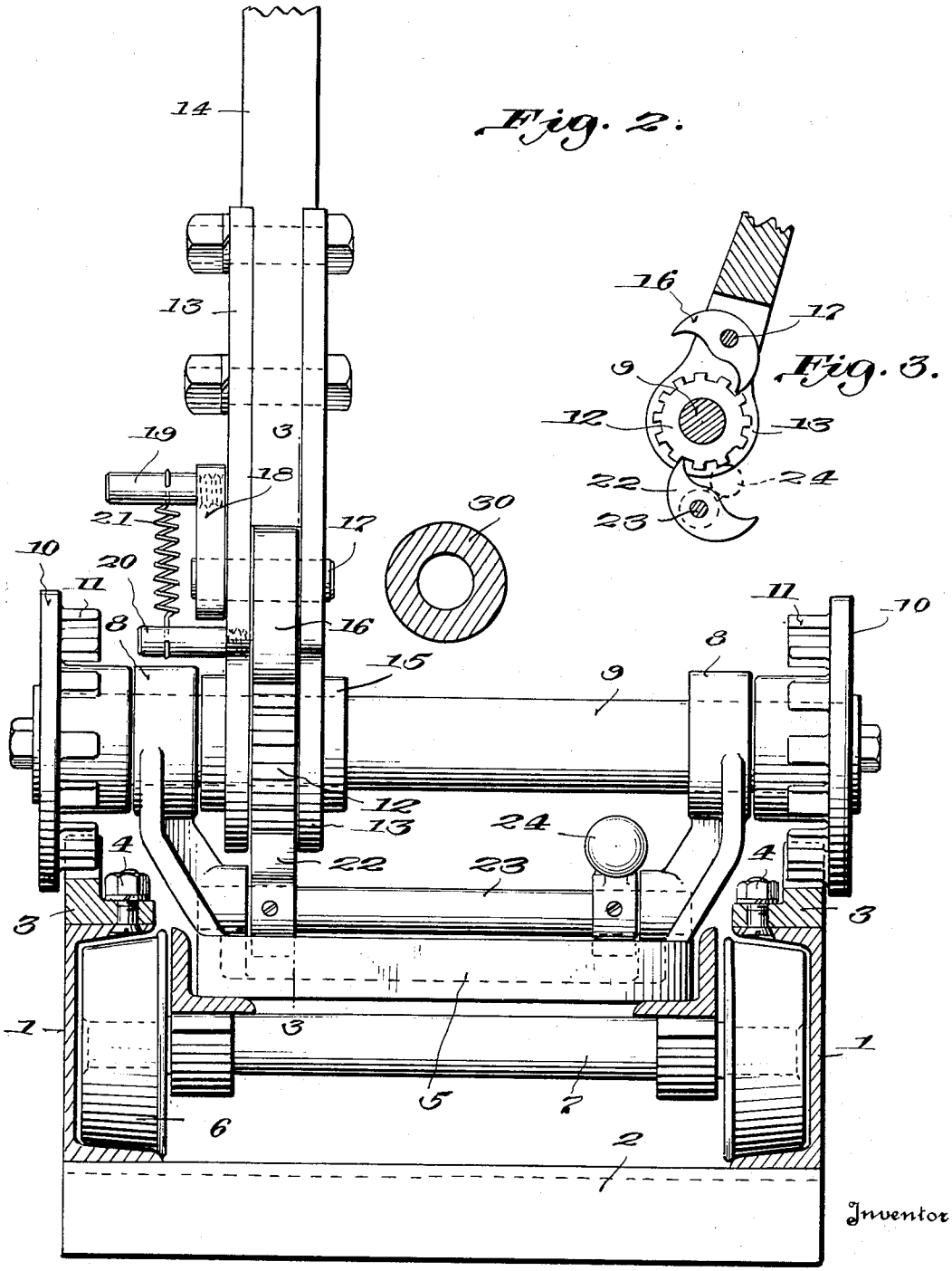


Fig. 3.

Inventor

James E. C. Currens,

By Stone, Boyden, Mack & Halm,

Attorneys.

Patented Sept. 26, 1933

1,928,048

UNITED STATES PATENT OFFICE

1,928,048

FEED MECHANISM FOR EARTH BORING APPARATUS

James E. C. Currens, San Anselmo, Calif.

Application February 10, 1931. Serial No. 514,847

1 Claim. (Cl. 255—45)

This invention relates to earth boring apparatus and more particularly to feed mechanism for such apparatus.

Specifically, the present invention constitutes an improvement upon the feed mechanism disclosed in application Serial No. 469,906, filed July 22, 1930, by Alfred E. Englebright, Frederick J. Foret and myself.

In apparatus of the type in question, it is necessary to provide means for propelling the feed carriage positively either forwardly or rearwardly, so as to insert or withdraw the boring bar carrying the earth auger. In the above mentioned prior application, a trackway was provided, to which trackway was secured a rack having symmetrical teeth, and a reversible pawl was mounted upon the carriage and arranged to engage either side of the teeth so as to propel the carriage in either direction as desired.

In the present invention, the carriage is propelled by means of a rack and pinion, the pinion being driven by means of a ratchet wheel having symmetrical teeth, with which ratchet wheel a reversible pawl is adapted to engage.

One specific object of the invention is to provide an improved double ended reversible driving pawl arranged so that either end may be brought into yielding engagement with the ratchet wheel.

Another specific object is to provide an improved double ended reversible holding pawl for preventing rotation of the ratchet wheel in a direction the reverse of that in which it is being driven.

In order that the invention may be readily understood, reference is had to the accompanying drawings, forming part of this specification, and in which:

Figure 1 is a fragmentary side elevation of the feed carriage equipped with my improved propelling mechanism, a portion of the track and rack being illustrated, and parts being shown in section;

Figure 2 is a transverse section on an enlarged scale, taken substantially on the line 2—2 of Figure 1 looking in the direction of the arrow; and

Figure 3 is a fragmentary section on a smaller scale, taken on the line 3—3 of Figure 2, parts being shown in dotted lines.

Referring to the drawings in detail, the trackway consists of a pair of rails 1, preferably of channel section, as in said prior application, united by cross bars 2.

A toothed rack 3 is secured to the top of each rail 1 by means of bolts 4, and extends longitudinally thereof.

The carriage comprises a suitable frame 5 supported on four wheels 6 which fit inside of the channel rails, as shown in Figure 2, and are secured to axles 7, journalled in bearings secured to the frame.

Extending from the frame to a point above the track are a pair of spaced bearing brackets 8 in which is journalled a driving shaft 9, having secured to each end thereof a pinion adapted to engage the racks 3. These pinions are preferably constructed as shown and comprise a disc shaped body 10 having teeth 11 projecting axially therefrom. The discs engage the outside of the racks 3 and thus prevent displacement of the pinions laterally.

Also secured to the shaft 9 at a point between the bearing brackets 8 is a ratchet wheel 12 having square faced or symmetrical teeth, as clearly shown in Figure 3. A pair of side plates 13 secured to the lower end of an operating lever 14 are disposed one on each side of the ratchet wheel 12. These plates have aligned openings through which the shaft 9 freely passes, so that the lever 14 is thus pivotally mounted upon the shaft 9, and it is maintained in position thereon by collars 15.

Mounted on a shaft 17 and located between the side plates 13 is a driving pawl 16. This is reversible and is constructed with a pair of similar ends, as shown in Figure 3. A crank arm 18 is rigid with the shaft 17 which is journalled in the side plates 13, and the arm 18 carries a pin 19 between which and another pin 20 set into one of the side plates, extends a tension spring 21. By reference to Figure 1, it will be seen that the relation of the pins 19 and 20 to the pivot shaft 17 is such that the arm 18 may be swung from one side to the other and that the spring 21 will snap past the center and thus serve to resiliently hold the arm 18, and the pawl 16, in either one of two operative positions. Thus, as shown in Figures 1 and 3, the right hand end of the pawl 16 is in position to engage the teeth of the ratchet wheel and drive it in a right hand or clockwise direction when the lever 14 is oscillated. If, on the other hand, the arm 18 is swung over to the left, as viewed in Figure 1, then the left hand end of the pawl 16 will engage the ratchet wheel 12 and such wheel will be rotated in a left hand or counter clockwise direction when the lever is oscillated. It will be observed that in rotating the ratchet wheel in one direction or the other, the pawl 16 en-

gages different sides of the symmetrical teeth carried by said wheel.

Under certain circumstances, especially when withdrawing the boring bar from the hole while the motor is running, it becomes necessary to positively prevent creeping or shifting of the carriage in one direction while propelling it in the other. To prevent such rotation and to positively lock the ratchet wheel against retrograde movement, I provide an improved holding pawl 22. This, like the pawl 16, is formed with two similar ends, and is secured to a shaft 23, journalled in the brackets 8 at a point below the shaft 9. Also secured to this shaft is a weighted lever 24, which is positioned above the shaft and is so located that it may be swung over the center, from one side to the other, and will serve to yieldingly hold the pawl 22 in either one of its two operative positions. Thus, in Figure 3, where the driving pawl is set to produce clockwise movement of the ratchet wheel, the holding pawl is set to prevent reverse movement thereof. When, however, the driving pawl is swung to its opposite position, to produce counter clockwise rotation of the ratchet wheel, it is necessary to swing the weighted lever 24 over to the other side of the shaft 23 and thus shift the holding pawl to its other position.

Referring again to Figure 1, the numeral 25 designates the motor which drives the boring bar and which, as in said prior application, is preferably of the compressed air type. Air is supplied to the motor through a pipe 27 and is controlled by means of a handle 26.

The motor is supported on the carriage by brackets 28 and 29, and lubricant may be supplied through an oil pipe 25a.

The numeral 30 designates the power shaft connected with the motor, and this is hollow and, as in said prior application, passes through a hydraulic head 31, to which water is supplied by means of a pipe 32, the hydraulic head being supported on the carriage by a bracket 33.

34 designates the hollow boring bar, and 35 a chuck or grip device, which is secured to the power shaft and which serves to drive the boring bar, all of these parts being preferably of the type fully shown and described in the said prior application, and forming no part of the present invention.

What I claim is:

Earth boring apparatus of the horizontal type including a trackway comprising a pair of spaced rails, a rack secured to each rail, a carriage movable along said trackway, a boring bar connected with said carriage, a pair of pinions adapted to engage said racks, a ratchet wheel, a shaft to which both said pinions and said ratchet wheel are rigidly secured, an operating lever pivotally mounted on said shaft, a reversible pawl carried by said lever and adapted to engage said ratchet wheel to rotate the same in either direction, as desired, and means for holding said ratchet wheel against rotation in the opposite direction, said means including a second shaft extending across the carriage, a double ended locking pawl secured to said second shaft, and a weight attached to said second shaft and serving to selectively maintain either end of said locking pawl in engagement with said ratchet wheel.

JAMES E. C. CURRENS.