May 22, 1956 F. F. CANNON 2,746,720

POSTHOLE DIGGER

Filed Dec. 23, 1952 2 Sheets-Sheet 1

FIG. 1

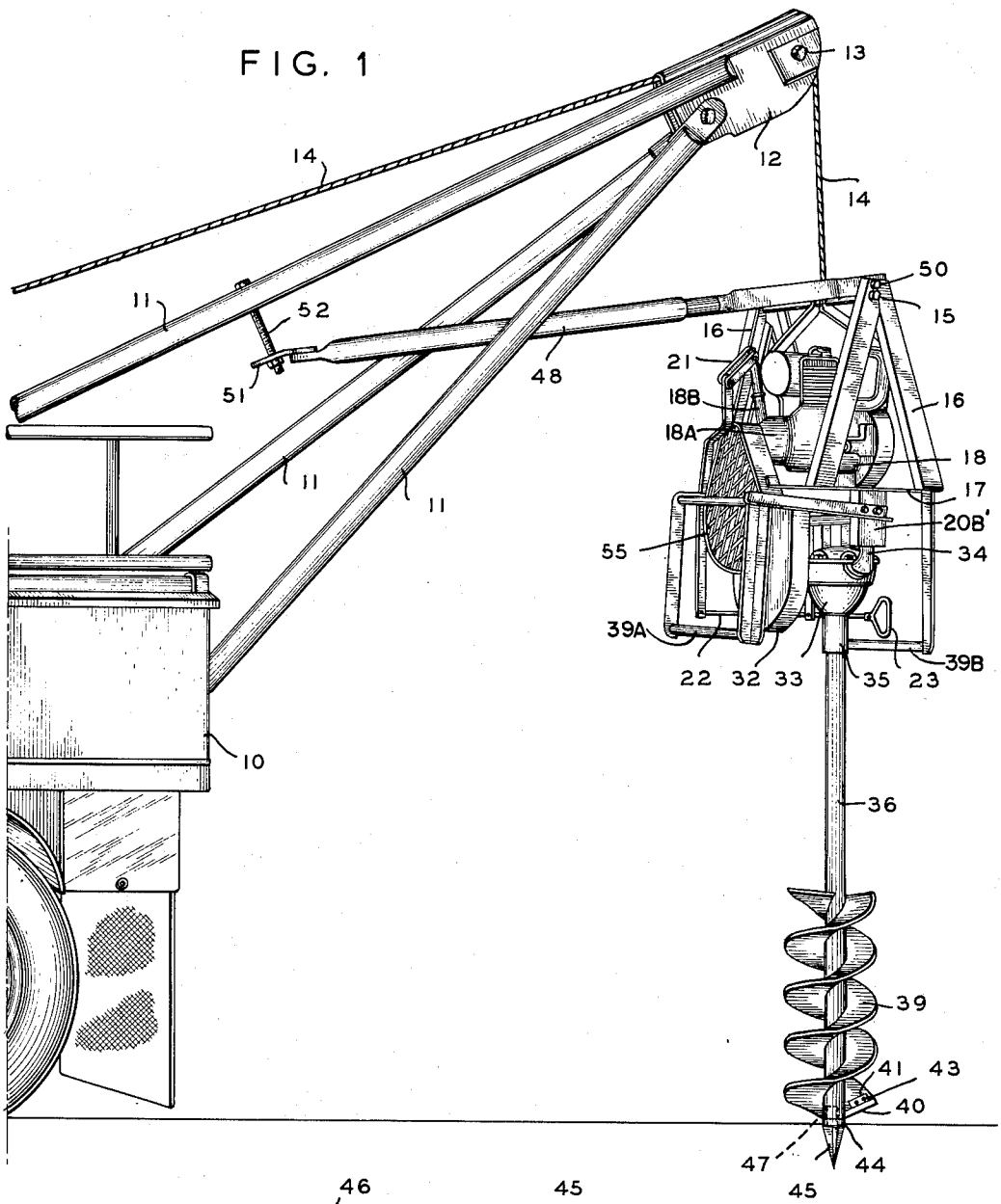
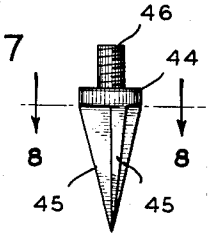


FIG. 7



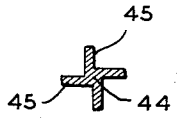


FIG. 8

INVENTOR
FRED F. CANNON
BY A. Yates Dowell
ATTORNEY

May 22, 1956 F. F. CANNON 2,746,720

POSTHOLE DIGGER

Filed Dec. 23, 1952 2 Sheets-Sheet 2

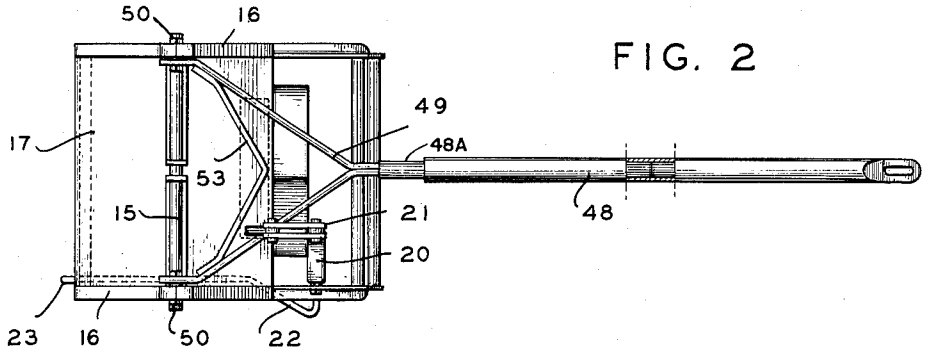


FIG. 2

FIG. 3

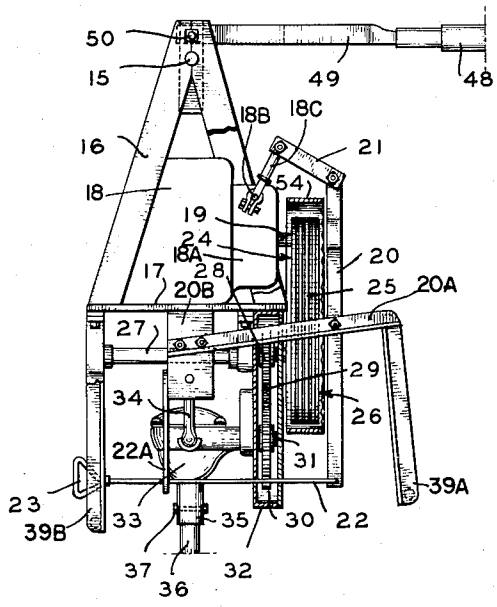


FIG. 4

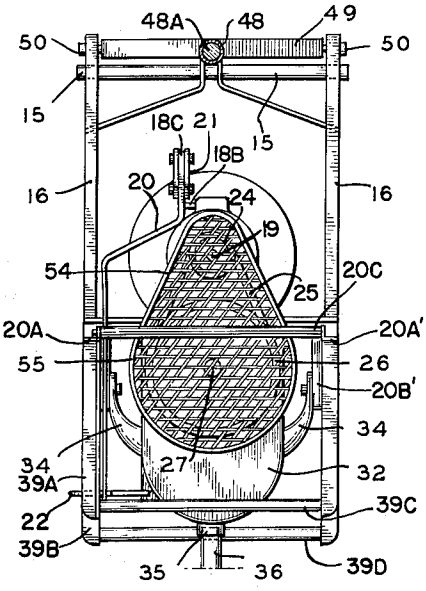
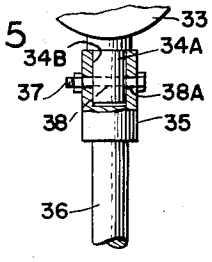


FIG. 5



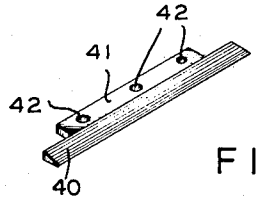


FIG. 6

INVENTOR
FRED F. CANNON

BY Agatos Dowell
ATTORNEY

United States Patent Office 2,746,720 Patented May 22, 1956

2,746,720

POSTHOLE DIGGER

Fred F. Cannon, Frazeyburg, Ohio

Application December 23, 1952, Serial No. 327,577

1 Claim. (Cl. 255—19)

This invention relates to the reaction of structures including the preparation of the foundations thereof. More particularly the invention is directed to tools and implements used, such as those by means of which laborious operations are simplified and the time required in performance is materially reduced.

Specifically the invention relates to a post hole digger of a portable character by means of which post holes may be easily dug including through relatively hard formations in the earth, such as shale or rock.

Power operated drilling equipment has been more or less unsatisfactory or difficult to operate and has been relatively expensive and difficult to obtain for small operations about the home, farm and elsewhere. Accordingly, the digging of postholes without appropriate equipment has been both time consuming and laborious, and has made it desirable to have easily available equipment of this character at moderate expense.

An object of the invention is to overcome the problems enumerated and to provide relatively simple, inexpensive portable equipment by means of which postholes can be quickly and inexpensively dug.

Another object of the invention is to provide power driven posthole drilling equipment which may be easily moved on location.

A further object of the invention is to provide portable drilling equipment in which the drill is subject to and is driven through a suitable transmission from an internal combustion engine or other source of power mounted above the drill in a manner to apply weight to the drill during operation of the same.

Further objects and advantages of the invention will become apparent from the following description and in conjunction with the accompanying drawings in which:

Fig. 1 is a perspective illustrating one application of the invention.

Fig. 2, a top plan view of the drill rig per se;

Fig. 3, a side-elevational view of the device as shown in Fig. 2;

Fig. 4, a rear elevational view of the device of Fig. 3;

Fig. 5, a fragmentary sectional detail of the coupling between the drill and the driving mechanism;

Fig. 6, a perspective of the detachable cutting blade for the drill;

Fig. 7, a detail of the detachable drill point, and

Fig. 8, a section on line 8—8 of Fig. 7.

Briefly stated the invention is adapted to be mounted on a vehicle such as a truck or the like by means of appropriate supporting mechanism in the form of a crane, derrick or the like having a cable which supports the complete rig, a telescopic brace being employed for resisting the torque.

This rig comprises a double V-frame supporting a platform or motor base plate on which a gasoline engine or other source of power is mounted. The power shaft of this gasoline engine or the like has a pulley engaged by a belt which drives a larger pulley fixed on a stub

shaft which also has fixed thereon a sprocket of relatively small size. This sprocket is engaged by a chain by means of which a larger sprocket mounted upon a transmission shaft drives the latter.

The transmission shaft extends into a housing and drives, through conventional gearing or transmission, a drill shaft collar or sleeve which in turn is secured by means of a shearing pin to the end of the stem of a drill having a detachable drill point at its lower end, also one or more replaceable cutting blades.

In this construction the more or less self-contained drilling apparatus is mounted for easy operation and direct application of weight to the drill during such time. Further, the device can be easily transported from place to place.

With continued reference to the drawings the present invention is adapted to be applied to a truck **10** or other vehicle and to support an object by means of a crane or derrick from such vehicle. The support may be three supporting arms **11** forming a boom attached to a bracket **12** having a shaft **13** supporting a pulley about which a cable **14** extends from the truck.

The cable **14** is connected to a bar **15**, supporting spaced V-frames **16**, one at each end, which V-frames are connected to a platform or motor base plate **17** on which a gas engine **18** or other source of power is adapted to be mounted. The gasoline engine has a crank case including a clutch housing **18A**, which carries a conventional clutch mechanism operated by oscillatable shaft **18B**, which operates a conventional forked lever, which cooperates with a clutch throw-out bearing (not shown), and is actuated by a conventional hand lever **18C**, which is provided with an aperture at its upper end by means of which one end of a link **21** is pivotally connected to the lever **18C**. Extending outwardly from the clutch housing **18A** is a power shaft **19**, on which a pulley **24** is fixed by any suitable means. The other end of the link **21** is pivotally connected to an offset lever **20**, which is pivotally connected to an angle member **20A**, which is secured to a downwardly extending plate **20B**, which is secured to the base plate **17**, the angle member **20A** being secured to the plate **20B** by suitable means such as bolts and the like and such angle member **20A** being connected by a bar **20C** extending to a similar angle member **20A'**, secured to a similar downwardly extending plate **20B'**. The lower end of the lever **20** receives a bent over end of a control rod **22** for pivotal connection, such rod **22** being guided by means of a strap **22A**, projecting downwardly from the plate **20B**. The rod **22** is provided wtih a handle **23** for operating such rod and thereby the pivotal lever **20**, link **21** and the clutch operating hand lever **18C**, whereby power is connected from the engine **18** to the power shaft **19** at any desired time and by means of the clutch within clutch housing **18A**, whereby the pulley **24** is driven or disconnected from the drive in accordance with the requirements. A suitable clutch is shown in Patent No. 1,181,321, for example pulley **24** is mounted on the power shaft of the gasoline engine or the like and serves to drive the belt **25** which in turn transmits power to a larger pulley **26** fixed on a stub or transfer shaft **27** which stub shaft also has fixed thereon a sprocket **28** of a somewhat smaller diameter. Power is transmitted from the sprocket **28** by means of a chain **29** to a larger sprocket **30** mounted on a transmission shaft **31**. A housing **32** encloses the chain sprocket drive. Power from the transmission shaft is imparted to the transmission **33**, the latter being supported by brackets or arms **34**.

From the transmission **33** a take-off shaft **34A** is rotatably mounted in bearings in the transmission housing **33**, which housing is similar to an automobile differ-

ential, such take-off shaft carrying a bevel ring gear (not shown) which is engaged by a bevel pinion gear (now shown) which is fixed to the shaft **31** and driven by the chain **29**. The take-off shaft **34A** extends downwardly into a collar **35**, Fig. 5, having a socket **34B** for receiving the stub shaft **34A** while a shear pin **37** extends through a transverse aperture **38** in the stub shaft **34A** and through aligned apertures **38A** in the socket **35**, the socket **35** being fixed to the auger or drill stem **36**.

Downwardly depending frame members **39A** and **39B** are mounted on the frame and arranged so that the bottom ends of the depending frame members are normally well below the lower end of the stub shaft **34A** whereby such frame members serve to support the frame on a horizontal surface when the drill or auger is removed thereby permitting storage and servicing of the power unit. Cross members **39C** and **39B**, respectively, connect the lower ends of frame members **39A** and **39B**. The downwardly depending frame members **39A** and **39B** also serve as handles to facilitate the positioning of the drilling unit so that such drilling unit may be additionally guided by hand as well as being guided by the boom including the supporting cable **14** and the telescopic arm **48**, said telescopic arm being formed of a tube connected by a slotted attaching plate **51**. A rod **48A** telescopes within the tube and is connected to the apices of the frame members **16**.

On the lower end of the drill stem **36** is an auger or bit having one or more replaceable cutting blades **40**, each provided with ears **41** and apertures **42** through which rivets **43** secure them in place. The drill is provided also with a detachable drilling point **44** having cutting edges **45** and a threaded shank **46** by means of which it is received in an internally threaded socket **47** in the drill.

The drill shaft **36** is disposed at right angles to the power shaft and the driving of the drill is controlled by the clutch and associated control mechanism including the linkage and the connecting rod control with the operating handle **23**. This handle is disposed at an elevation where it may be operated by a person standing on the ground adjacent to the drill. Thus the suspended unit supported from the cable extending from the truck may be readily moved with the truck.

During the operation of the device, in order to limit the torque or tendency to rotate, the telescopic arm **48** is attached to an intermediate portion of the boom by means of a bolt **52** fixed to one of the supporting arms **11** and projecting through an elongated slot in a plate **51** fixed to one end of the telescopic arm **48**. The opposite end of the telescoping arm **48** is provided with bifurcated arms **49** having brace means **53**; said arms

are attached by fasteners **50** to the upper ends of the frame members **16**, the connection being pivotal to permit raising and lowering of the frame members **16** while the telescoping arm **48** takes the reaction of the auger which tends to rotate the frame.

A housing **54** for the drive pulleys and another housing **32** for the end chain may be provided.

With the structure described, the weight of the rig including that of the gasoline engine and the drilling structure is directly upon the axis of the drill on account of being mounted directly above the same. This particular arrangement is especially efficient and permits the driving of the drill through relatively hard formations of shale, rock and the like.

It will be apparent to those skilled in the art that the invention is not limited to the specific embodiment disclosed but that reasonable variations are within the scope thereof, and therefore the invention is only limited as defined in the following claim.

What is claimed is:

A post hole digger comprising a boom arranged at an inclination to the ground, a pulley adjacent the end of the boom, cable means extending around the pulley, a frame having upstanding V-shaped side members connected at their upper ends to the cable, a platform supported adjacent the lower ends of said frame, opposite downwardly depending frame members extending from said frame, power means on said platform including a vertically extending driven shaft located between said downwardly depending frame members and terminating above the bottom of said downwardly depending frame members, means for connecting said shaft to an auger, an elongated telescopic member having bifurcated arms connected to the apices of the V-shaped side members at one end thereof, a swivel connection joining the other end of the telescopic member to an intermediate portion of said boom, said telescopic member serving to prevent rotational movement of said frame, said depending frame members constituting manual guiding means for accurate control of the auger in forming post holes in the ground, and also serving as a support on the ground or other surface when the auger is disconnected from the shaft.

References Cited in the file of this patent

UNITED STATES PATENTS

1,499,938	Leedom	July 1, 1924
1,507,776	Humiston	Sept. 9, 1924
2,016,667	Crowell	Oct. 8, 1935
2,165,754	Hornack	July 11, 1939
2,320,612	Kandle	June 1, 1943
2,598,565	Lagant	May 27, 1952