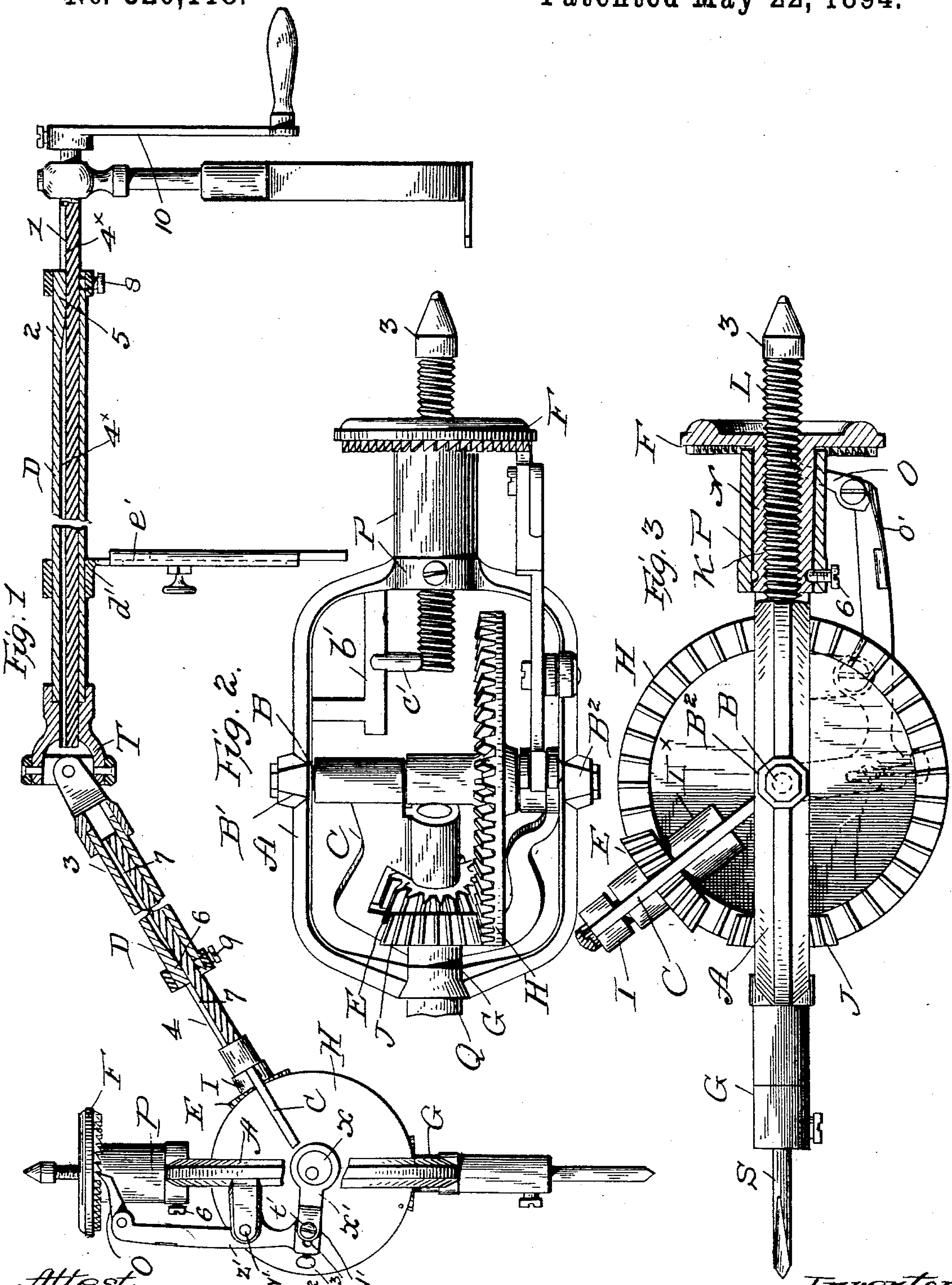
(No Model.)

W. J. McGEHE.

PORTABLE DRILLING MACHINE.

No. 520,118. Patented May 22, 1894.



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WILLIAM J. McGEHE, OF BUSHNELL, ILLINOIS.

PORTABLE DRILLING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 520,118, dated May 22, 1894.

Application filed January 29, 1894. Serial No. 498,322. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM J. McGEHE, of Bushnell, in the county of McDonough and State of Illinois, have invented a new and Improved Portable Drilling-Machine for Drilling in Metals and Hard Substances, of which the following is a full, clear, and exact description.

The object of my invention is to provide a new and improved drilling machine which is simple in construction, and durable, very effective in operation and adapted for drilling in smoke chambers, fire boxes, and boilers of stationary, portable, traction or locomotive engines, in places difficult of access with the ratchet drills generally used.

The invention consists of certain parts and details, and combinations of the same, as will be hereinafter fully described and pointed out in the description, drawings, and claims.

In the accompanying drawings, forming a part of the specification, in which the same reference-letters and numerals indicate the same parts, Figure 1, represents a side view of the machine, partly in section and partly broken away, showing the driving shaft, and self feed, and the universal joint. Fig. 2, is a detail plan view of the gearing mechanism, the feed screw, and the drill-spindle, and Fig. 3, is a detail view of Fig. 2 partly in section.

My machine is constructed with a main frame A having a pivot or swivel shaft B and a pivot or swivel yoke C with a shaft journaled in said yoke having connections to a driving shaft D; a drill spindle G, and a feed wheel F with gearing mechanism for driving, and mechanism for feeding the drill. The main frame A is of substantially the shape shown in Fig. 2, and is provided with two stationary bearing boxes B′ and B² located in opposite sides of the frame and centrally thereof and in which is rigidly mounted the shaft B. A pivot or swivel yoke C has its ends pivotally connected to the ends of the pivot or swivel shaft B near the journal boxes inside of the main frame and is provided with bearing boxes I and I× for the purpose of supporting driving shaft D and as shown more clearly in Fig. 2. The driving shaft D is formed in four sections 1, 2, 3 and 4 with two of the sections connected by a universal joint of any desired form and through which power is transmitted to drive the drill. Section 4 of the driving shaft D is journaled in bearing boxes I and I× attached to the swivel yoke C and has a bevel drive pinion E rigidly attached to it between the bearing boxes I and I× which engages with a bevel gear wheel H journaled on shaft B.

In one end of the main frame A at right angles to the shaft B is formed a bearing box Q in which is journaled the drill spindle G which passes through said bearing box and at the end inside of main frame A, is provided with a rigidly connected bevel pinion J meshing with the intermediate bevel gear wheel H and the end of drill spindle G, outside of bearing box Q is provided with any suitable mechanism to receive drill S.

The three bevel gears above described, working in connection with the above described driving shaft and drive bevel pinion which may be swung in pivot or swivel yoke C above described, permit the drill to be placed in any desired position to suit the operator as shown in Fig. 1.

In the main frame A, at right angles to the pivot or swivel shaft B and opposite the bearing box Q is a bearing box P in which is journaled a sleeve N. Sleeve N at the other end has a wheel F rigidly attached provided with notches adapted to be engaged by pawl O of the feeding device for feeding the drill. The sleeve N is held in the bearing P at its inner end by a set screw 6 engaging a groove in said sleeve. Sleeve N is further provided on the inside with a female screw K to receive male feed screw L for the purpose of feeding the drill. Feed screw L has a tapered center 3 for supporting back end of drill.

Main frame A is provided with a guide bar *b′* on the inside of said frame and opposite male feed screw L, as shown in Fig. 2 and the inner end of male feed screw L is provided with a pin *c′* rigidly attached, said pin *c′* extending from male feed screw L to the bar *b′* to prevent male feed screw L from turning.

The back hub of intermediate bevel gear wheel H has an eccentric *x* rigidly attached, and an arm *x′* journaled on eccentric *x*. Arm *x′* at its outer end is provided with a fork *y′* to receive lever *z′* which is held by a screw *t′* passing through the slot *z*³ of the lever. The lever *z′* is further provided with a set screw

z^2 to regulate feed by allowing more or less lost motion at this joint. Lever z' is pivoted in a bearing w' securely attached to main frame A. Lever z' at its opposite end is provided with a pawl O hinged to bell crank z' and working in the notches in wheel F for feeding the drill.

My machine may be operated with or without the self feeding device.

The driving shaft D as before stated is formed in four sections, and between sections 2 and 3 is provided with a universal joint T by means of which it can be worked at any angle to suit the operator of the drill.

Section 1 of driving shaft D is a solid shaft, and is provided with a groove $4^{\times}$, while section 2 of driving shaft D is hollow and is provided with a spline 5, working in groove $4^{\times}$ of section 1 to prevent section 2 from rotating on section 1. The said section 2 is further provided with a collar and set screw 8, for the purpose of adjusting sections 1 and 2, if desired. Said section 2 of driving shaft D is rigidly attached to universal joint or knuckle T. Section 3 of driving shaft D is also a hollow shaft, and is provided with a spline 6, said pipe or hollow shaft being securely attached to the universal joint or knuckle T. Section 3 of driving shaft D is also provided with a collar and set screw 9 adapted to clamp section 4 of driving shaft D which is a solid shaft and is provided with groove 7 for receiving the spline of section 3.

The universal joint or knuckle T, in driving shaft D is preferably an open universal joint or knuckle, for the purpose of permitting solid shaft of section 1, of driving shaft D, to pass through section 2 and universal joint or knuckle T, and enter section 3 and thereby make a stiff shaft instead of an adjustable shaft when a solid shaft is desired; or section 4 of driving shaft D may pass through section 3 and universal joint or knuckle T and enter section 2 and thereby make a stiff shaft of driving shaft D.

Driving shaft D is further provided with bearing box d' which is provided with an extensible tail e' rigidly attached so that said bearing box tail e' may be clamped to any object or device to hold driving shaft D in position for operating drill when universal joint or knuckle T is used to adjust drilling machine angularly from outer end of driving shaft D.

Driving shaft D is further provided at the outer end with a crank 10, for operating driving shaft and drilling mechanism or by other suitable means. The shaft may be used with or without set screws 8 or 9 being set, and when set screws are not set it permits driving shaft of the drill to be extended or contracted as the use of the drill is required by the operator.

The pawl O is pressed upon by a spring O' adapted to retain the pawl either in or out of engagement with the wheel F.

I claim—

1. In combination with a portable drilling machine, a driving shaft therefor comprising two hollow shaft sections connected together by an open universal joint, and inner sections of greater length located within the hollow sections and adjustable through the same whereby they may be adjusted to extend through the open joint and into the adjoining hollow section to provide a rigid shaft, substantially as described.

2. In a portable drilling machine a frame having a drill shaft carrying a bevel gear, a transverse shaft carrying an intermediate gear engaging therewith a yoke having its arms pivoted on the transverse shaft, a driving shaft supported by said yoke and engaging the intermediate gear, a hollow sleeve having a screw threaded interior and a toothed exterior portion a rigid feeding screw passing through said sleeve, a bell lever pivoted in the frame having a pawl engaging said toothed portion, an eccentric on the transverse shaft and connections therefrom to the bell lever for operating the same to rotate the sleeve and feed the frame and drill shaft forward, substantially as described.

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

WILLIAM J. McGEHE.

Witnesses:
T. H. WHEELER,
J. M. SANDERS.