Sept. 12, 1933. B. E. PARK ET AL 1,926,788

ATTACHMENT FOR PORTABLE DRILLING MACHINES

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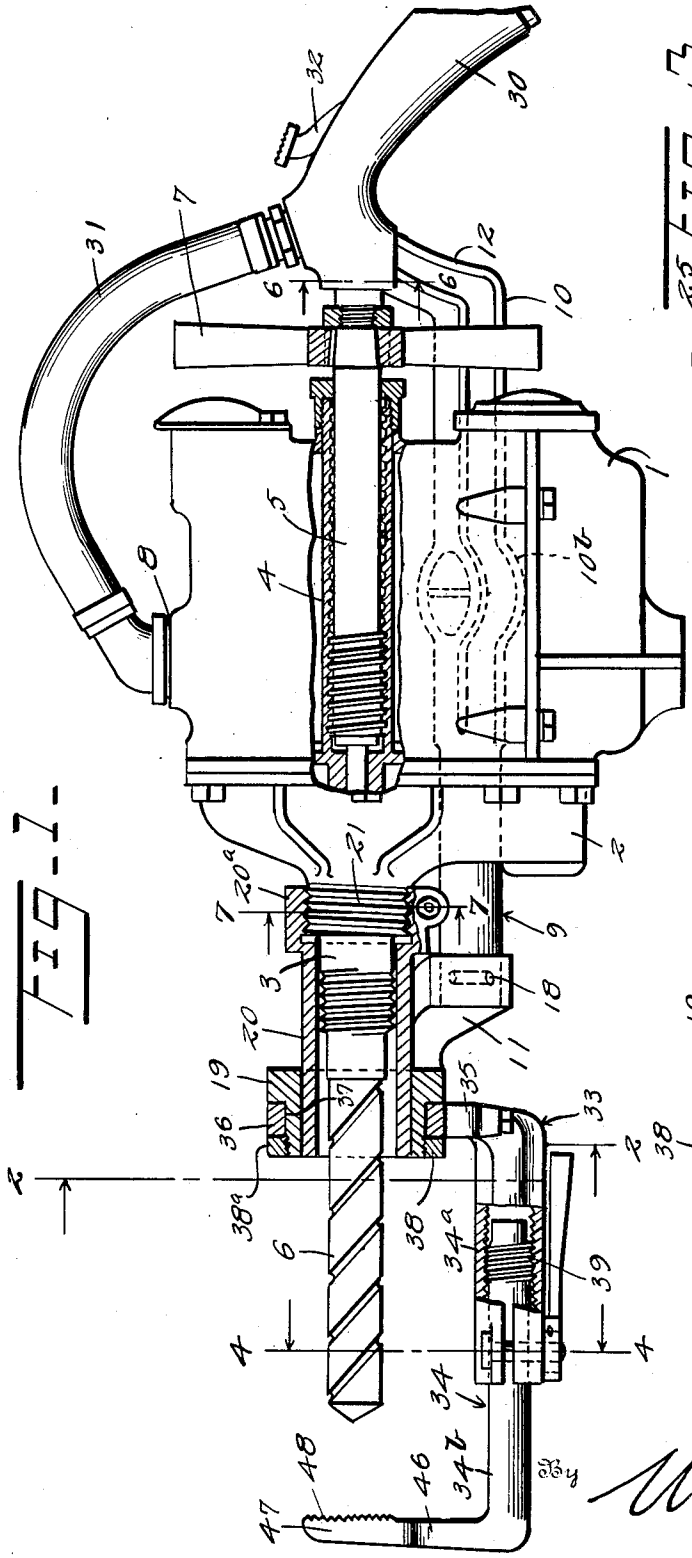


Fig. 1.

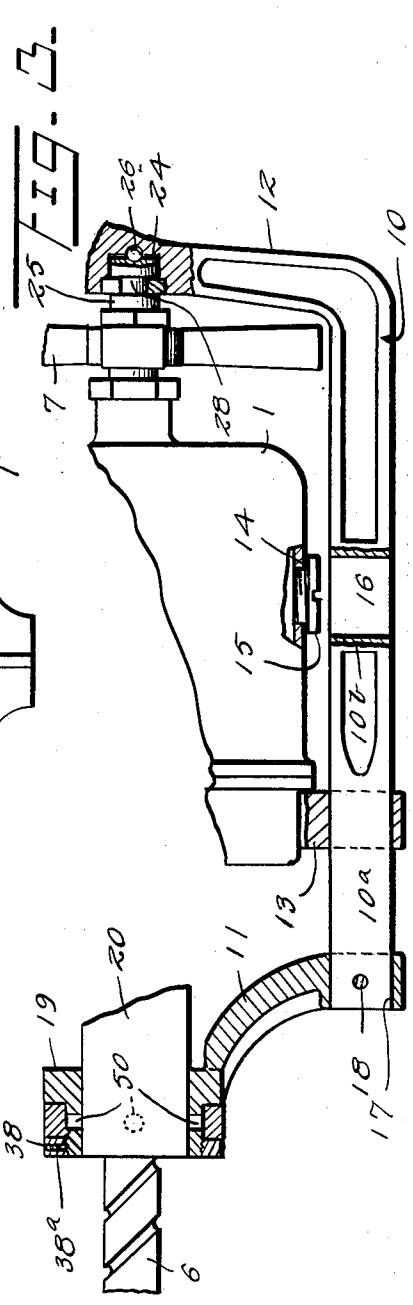


Fig. 2.

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Fig. 2.

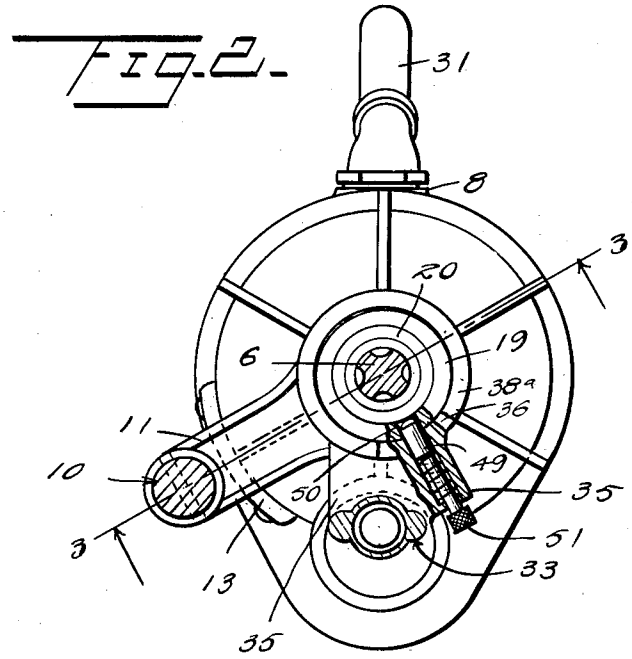


Fig. 6.

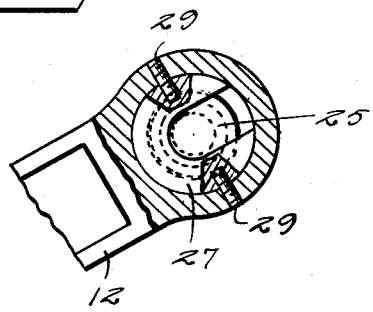


Fig. 4.

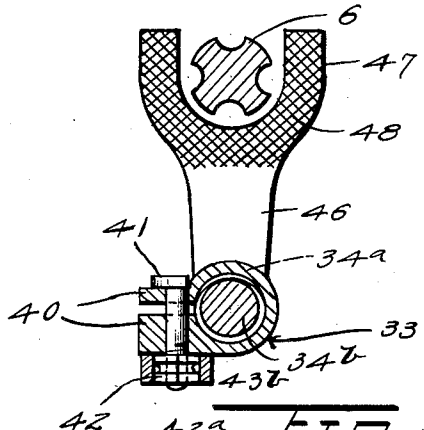


Fig. 7.

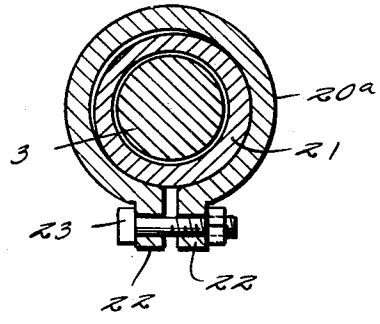
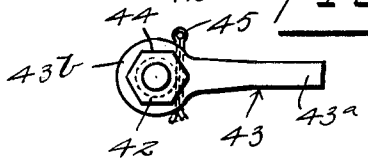


Fig. 5.



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UNITED STATES PATENT OFFICE

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ATTACHMENT FOR PORTABLE DRILLING MACHINES

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Application April 4, 1931. Serial No. 527,830

4 Claims. (Cl. 77—7)

This invention relates to an attachment for portable drilling machines of that type embodying a motor and a casing therefor, a drill carrying spindle extending forwardly from the casing and rotated by the motor, a feed screw sleeve mounted in the casing, a feed screw threadedly engaged with the sleeve and extending rearwardly from the casing for engagement with the fixture known as "old man", and a hand wheel fixed to the rear end of the feed screw and providing means by which the screw may be turned to effect the feeding of the drill to or its withdrawal from the work.

The invention has for one of its objects to provide a novel attachment for a drilling machine of the character stated which shall be adapted to permit the machine to be efficiently used without the aid of the fixture known as "old man", and which shall be adapted to permit one man to perform with ease and in a comparatively short time the work requiring the services of two men when such fixture is used.

The invention has for a further object to provide an attachment of the character stated which shall be adapted to be readily applied to a drilling machine of the character stated, which shall be simple and durable, and which may be manufactured and sold at a low cost.

To attain the foregoing and other objects, the nature of which will appear as the description proceeds, the invention comprehends the provision of an attachment of the character stated which shall include a bracket through the medium of which a drilling machine of the character stated may be manually supported while in use, upon which the drilling machine shall be slidably mounted so as to permit the drill to be fed to or withdrawn from the work, and with which the feed screw of the drilling machine shall be swivelly connected so that the operation of such screw will impart sliding movement to the drilling machine with respect to the bracket.

The invention further comprehends the provision of an attachment of the character stated which shall include a work engaging bracket which shall be adapted to materially assist the operator in holding the drill to the work.

The invention further comprehends the provision of an attachment of the character stated wherein the work engaging bracket shall be adjustable so as to adapt the drilling machine to perform openings in work of different thicknesses, and wherein the work engaging bracket shall be carried by the drilling machine supporting bracket and adjustable angularly with respect to the axis of the drill so as to enable the openings to be drilled in the required points of the work.

The invention is hereinafter fully described and claimed, and illustrated in the accompanying drawings, wherein:—

Figure 1 is a view partly in side elevation and partly in vertical section of a motor driven drill equipped with an attachment constructed in accordance with our invention.

Figure 2 is a sectional view taken on the planes indicated by the line 2—2 of Figure 1.

Figure 3 is a sectional view taken on the plane indicated by the line 3—3 of Figure 2.

Figure 4 is a sectional view taken on the plane indicated by the line 4—4 of Figure 1.

Figure 5 is a bottom plan view of the wrench for adjusting the nut on the bolt of the split section of the work support.

Figure 6 is a sectional view taken on the plane indicated by the line 6—6 of Figure 1, and

Figure 7 is a sectional view taken on the plane indicated by the line 7—7 of Figure 1.

Referring in detail to the drawings, 1 designates the motor casing, 2 the gear casing, 3 the drill spindle, 4 the feed screw sleeve and 5 the feed screw of a portable drilling machine of the pneumatic type. 6 designates the drill which is secured to the spindle 3, 7 designates the hand wheel which is keyed to the rear end of the feed screw 5 and through the medium of which the feed screw is turned to effect the feeding of the drill 6 to the work, and 8 designates the opening through which air is admitted to the casing 1 to effect the operation of the motor.

The attachment through the medium of which the drilling machine may be manually supported and which cooperates with the feed screw 5 to the end that the turning of the latter may effect the advancing of the drill 6 to the work, comprises a bracket 9 which includes a bar 10 located at one side of the casing 1 and extending longitudinally thereof, and front and rear arms 11 and 12, respectively, extending upwardly and inwardly from the ends of the bar 10. The bar 10 has a cylindrical front portion 10*a*, and this portion thereof has a sliding fit in a lug 13 which may be formed integrally with the gear casing 2 or made separately from such casing and fastened thereto. The casing 1 is provided with a grease opening 14 which is closed by a removable plug 15. The bar 10 is closely related to the plug 15, and in order to permit access to the plug the bar is provided with a laterally enlarged portion 10*b* having an opening 16 large enough to permit the passage of the plug therethrough while the plug

is being applied to or removed from the casing 1.

The front arm 11 is made separately from the bar 10, and is provided in its lower end with an opening 17 receiving the front end of the bar, the arm being secured to the bar by a pin 18. The front arm 11 is provided at its upper end with a collar 19 which slidably receives a sleeve 20 which is secured to the gear casing 2 in surrounding relation to the spindle 3 and drill 6. The rear end portion of the sleeve 20 is radially enlarged, as at 20*a*, and such sleeve portion is internally screw threaded for engagement with an externally screw threaded boss 21 which extends forwardly from the gear casing 2 in surrounding relation to the spindle 3. The sleeve portion 20*a* is split, and is provided at opposite sides of the slot thereof with lugs 22. A bolt 23 passing through the lugs 22, provides means by which the sleeve portion 20*a* may be contracted about the boss 21 so as to hold the sleeve 20 against any accidental rotary motion with respect to the gear casing 2.

The rear arm 12 is formed integrally with the rear end of the bar 10, and is provided at its upper end with a socket 24 for the reception of an extension 25 screw threadedly engaged with the rear end of the feed screw 5. The extension 25 is rotatably mounted in the socket 24, and a bearing ball 26 positioned between the bottom wall of the socket and the rear end of the nut, insures the free rotation of the extension. The extension 25 is secured to the arm 12 by a split washer 27, which engages in an annular groove 28 in the extension, and which is positioned in the socket 24 and secured therein by grub screws 29.

A handle 30 extends downwardly and rearwardly from the upper end of the arm 12. The handle 30 is hollow to permit the passage therethrough of the compressed air used to operate the motor. A tube 31 extending from the upper end of the handle 30 to the opening 8 in the motor casing 1 conveys the air from the handle to the motor casing. A tube, not shown, extending from a source of compressed air supply, will in practice be connected to the lower end of the handle 30, and the handle will be provided with a throttle valve, not shown, through the medium of which the supply of air to the tube 31 may be regulated and controlled. Such valve will be under the control of a thumb lever 32 carried by and extending upwardly from the handle 30.

The bracket 9 provides means through the medium of which the drilling machine may be manually supported with the drill 6 in engagement with the work; the drilling machine is slidably mounted upon the bracket to permit the drill to be fed to or withdrawn from the work, and the swivel connection 25 between the feed screw 5 and the bracket causes the turning of the feed screw in one direction to move the entire machine on the bracket in the direction of the work and causes the turning of the feed screw in the opposite direction to move the entire drilling machine on the bracket away from the work. To permit the feeding of the drill 6 to the work with the minimum of effort on part of the operator, a work engaging bracket 33 is connected to the drilling machine carrying bracket 9. The work engaging bracket 33 comprises a bar 34 which is of sectional formation and the sections 34*a* and 34*b* of which are adjustably connected or telescopically associated to permit the effective length of the bar to be varied so as to adapt the drilling machine for work of different thicknesses.

The bar section 34*a* is of tubular formation, and is provided at its rear end with a right angularly related arm 35. This arm is provided with a ring 36 which is rotatably mounted upon the collar 19 of the drilling machine supporting bracket 9. The collar 19 is provided with an annular groove 37 for the reception of the ring 36, and this groove is formed by providing the forward portion of the collar with an annular rabbet and mounting a ring nut 38 on the forward portion of the annular wall of the rabbet, the nut being secured in place by a grub screw 38*a*. The bar section 34*b* is of solid formation and fits in the bar section 34*a*, and these sections are screw threadedly engaged, as shown at 39, to permit the length of the bar 34 to be varied by turning the bar section 34*b* with respect to the bar sections 34*a*. The bar section 34*a* is split longitudinally, and is provided at opposite sides of the slot thereof with lugs 40 through which a bolt 41 passes. The bolt 41 is provided with a nut 42 adjustable to contract the bar 34*a* about the bar section 34*b* to secure the bar sections against accidental movement from their adjusted relation. The nut 42 is also adjustable to permit the bar section 34*a* to expand and thus release the bar section 34*b* for adjustment with respect to the bar section 34*a*. The nut 42 is adjustable through the medium of a wrench 43 which comprises a shank 43*a* and a head 43*b*. The head 43*b* is provided with an angular opening 44 for the reception of the nut 42. The wrench 43 is secured to the nut 42 by a cotter pin 45 which passes through the head 43 and through an annular groove 42*a* in the side of the nut. When the bar section 34*a* is in fully contracted condition about the bar section 34*b*, the shank 43*a* of the wrench extends longitudinally of the bar section 34*a* so as to prevent it from contacting with the work.

When any wear occurs in any one or more of the parts 34*a*, 34*b*, 40, 41 and 42 which would cause the shank 43*a* to occupy an angular position with respect to the bar section 34*a*, when this bar section is in fully contracted condition about the bar section 34*b*, the wrench 34 is adjusted on the nut so as to cause its shank 43*a* to occupy a parallel position with respect to the bar section 34*a* when such section is in such condition. The wrench 43 may be readily adjusted on the nut 42 after the removal of the cotter pin 45.

The bar section 34*a* is provided at its front end with a right angularly related arm 46 which is parallel to the arm 35 and which is provided with a work engaging foot 47. The foot 47 is of U-form in elevation, and the rear side thereof is serrated, as at 48.

The work engaging bracket 33, due to its rotatable connection with the collar 19 of the drilling machine supporting bracket 9, may be rotated or adjusted angularly with respect to the axis of the drill 6 so as to arrange its bar 34 above, below or laterally of the work, to the end that the foot 47 may be engaged with the work in such manner as to permit the drill 6 to bore openings in the work at the required points. The slot of the foot 47 is directly in alinement with the drill 6 so as to permit the passage of the drill therethrough after an opening has been bored. The work engaging bracket 33 is held in its adjusted position, through the medium of a spring pressed pin 49 carried by the ring 36 and engaging in one of a series of annular openings 50 in the collar 19. The pin 49 is provided at its outer end with a milled head 51 through the

medium of which it may be readily withdrawn from engagement with the collar 19 when it is desired to free the work engaging bracket 33 for adjustment.

In practice, the operator grasps the handle 30 with the right hand and uses his left hand to place the end of the drill 6 against the face of the work and the foot 47 against the back of the work. He then uses his left hand to operate the hand wheel 7 and turns this wheel in a direction to cause the feed screw 5 to advance the drilling machine in the direction of the work. He then depresses the throttle valve lever 32 to supply the motor with compressed air. As the drill 6 and foot 47 engage opposite sides of the work, comparatively little effort is required on the part of the operator to support the drilling machine, and it may be readily supported by the right hand grasping the handle 30. The left hand is thus left free to operate the wheel 7 to effect the budging of the drill to the work. After the opening has been bored, the hand wheel 7 is rotated in the opposite direction to withdraw the drill 6 from the work. When the drilling machine is in use the bar 34 contacts with an edge of the work, and the drill 6 turns to the right. The tendency of the motor to turn to the left is stopped by the contact of the bar 34 with the work.

As the attachment obviates the necessity of the use of a fixture known as "old man" it permits one man to perform with ease the work requiring the services of two when such fixture is used and permits the work to be done in a comparatively short time due to the fact that it is not necessary for the operator to perform any work corresponding to the attaching and adjusting of the "old man".

It has been our experience in drilling boiler plate that there is so much spring to the boiler plate and to the "old man" that the feed screw is sometimes adjusted halfway out before the drill starts cutting, and that when the drill works through the boiler plate the spring in the plate and in the "old man" together feed the drill so fast that it usually "hogs in" and stalls the motor. These disadvantages owing to the use of the "old man" are overcome by our attachment. The arm 11 of the drilling machine supporting bracket 9 and the work engaging bracket 33 may be readily removed by withdrawing the pin 18, and with these parts removed the drilling machine may be used for a purpose of boring wood and the like.

While we have described the principle of the invention, together with the structure which we now consider the preferred embodiment thereof, it is to be understood that the structure shown is merely illustrative and that such changes may be made, when desired, as fall within the scope of the invention as claimed.

It is to be further understood that the attachment is not restricted to use in connection with the particular type of drilling machine shown in the drawings and that it is capable of being used in connection with electrically operative as well as pneumatically operative drilling machines.

What is claimed is:—

1. In combination, a drilling machine having a feed screw extending rearwardly therefrom and a drill extending forwardly therefrom, a bar extending longitudinally of the machine, a lug carried by the machine and slidably receiving the bar, a sleeve extending forwardly from the machine in surrounding relation to a portion of the drill, a front arm carried by the bar and provided with a collar slidably receiving the sleeve, a rear arm carried by the bar and arranged opposite the feed screw, means connecting the feed screw to the rear arm and fixedly secured to one of said parts and swivelly connected to the other, a bracket bar having a ring rotatably mounted on the collar to permit the bar to be angularly adjusted with respect to the axis of the drill, means releasably securing the bar in adjusted position, a third bar adjustable longitudinally with relation to said second bar and provided with a work engaging foot located forwardly of the drill, and means for securing said third bar in adjusted position.

2. An attachment for a portable drilling machine having a feed screw and a boss extending centrally from the rear and front ends of the casing thereof, said attachment comprising a bar greater in length than the casing and adapted to be arranged in parallel relation thereto, means for connecting the rear end of the bar to the feed screw, a handle extending from said means, means for slidably connecting the casing through its boss to the bar, a ring mounted on said second means for rotation about the longitudinal axes of the drilling machine, an arm extending from the ring at an angle to said axes, a bar adjustable as to length and extending forwardly from the arm, and a right angularly related second arm carried by the front end of the bar and extending therefrom in the direction of and beyond said axes.

3. A supporting attachment for pneumatic drills comprising a longitudinally extending bar having inwardly extending arms at its opposite ends, a drill body supporting element on the bar between its arms and engageable with and supporting the drill casing, the forward arm having a collar carried thereby and adapted to engage the forward end of a drill casing, the rear arm having a recess forming a bearing for the rear end of the feed screw of the drill, the bar having a hollow handle adapted to be connected to a source of compressed air and having a flexible tube extending from the handle and adapted to conduct air from the handle to the drill body, the handle having an air controlling valve.

4. A supporting attachment for pneumatic drills comprising a longitudinally extending bar having inwardly extending arms at its opposite ends, the bar between its arms having means for engaging and supporting the casing of a drill the forward arm having a collar carried thereby and adapted to receive the forward end of a drill casing, the rear arm having a recess to form a bearing for the rear end of the feed screw of the drill, the bar at its rear end having a hollow handle adapted to be connected to a source of compressed air, the handle having a controlling valve and having a flexible tube extending from the handle and adapted to connect with the drill casing, and a work engaging member operatively engaged with the forward arm for rotative adjustment thereon, the work engaging member being formed of two longitudinally adjustable sections and the outer section having a terminal portion extending at right angles to the axis of the drill.

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