July 14, 1959 J. C. CLAY 2,894,489

MOTOR MOUNTING

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FIG. 1

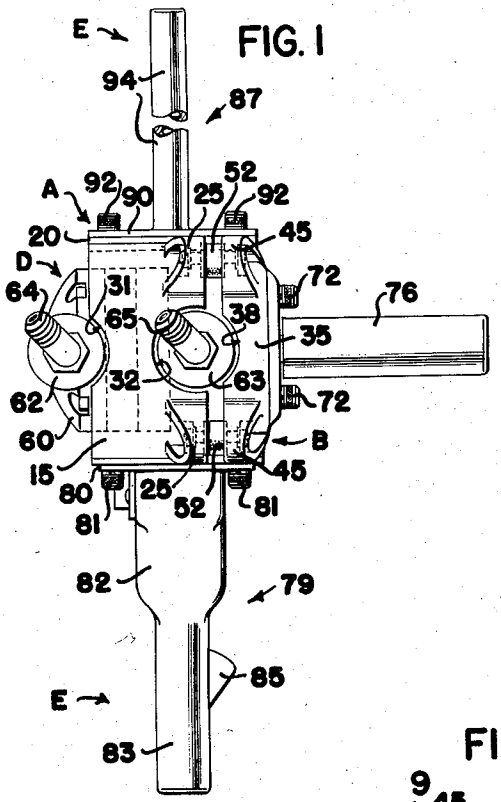


FIG. 2

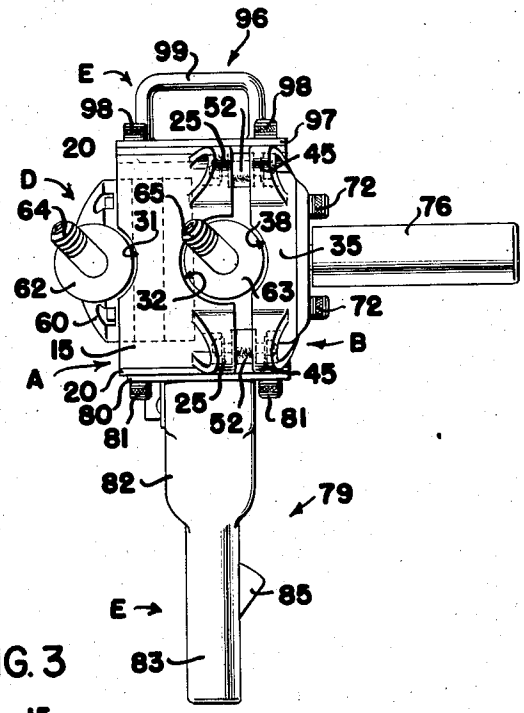


FIG. 3

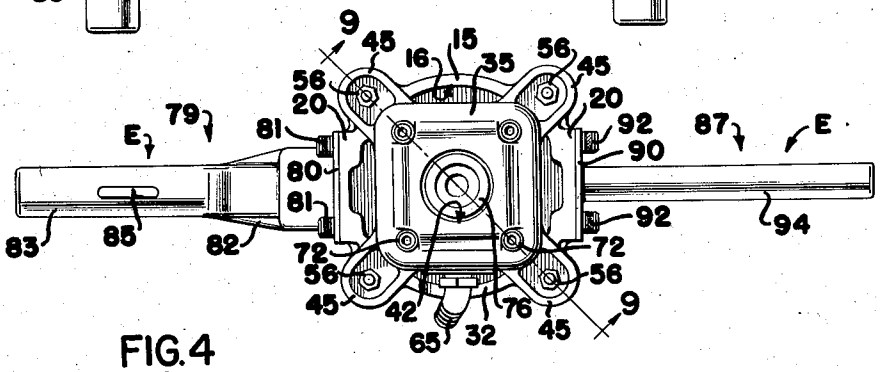
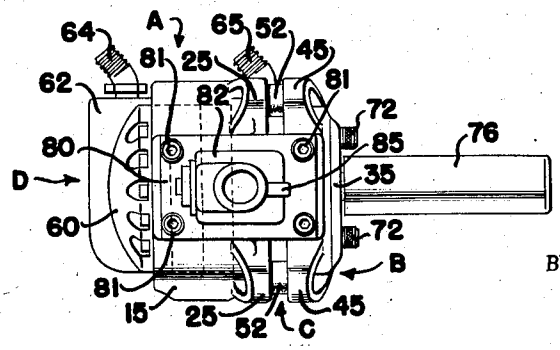


FIG. 4



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FIG. 5

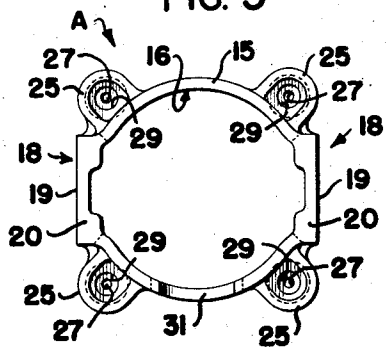


FIG. 7

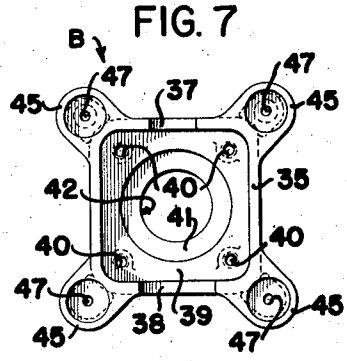


FIG. 6

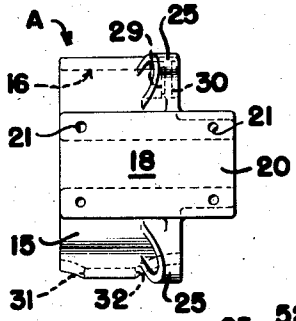


FIG. 8

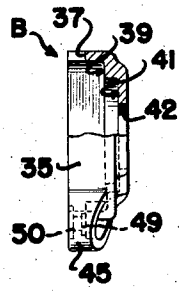
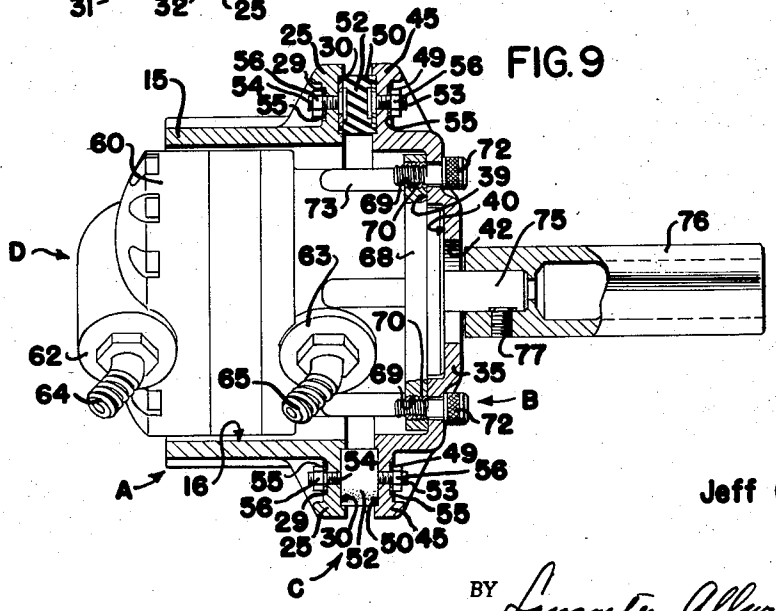


FIG. 9



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MOTOR MOUNTING

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Application December 3, 1957, Serial No. 700,488

7 Claims. (Cl. 121—36)

The invention relates generally to improvements in motor mountings and more particularly to a motor-handle mount of the type that may be utilized in hand tools.

The tool which I have shown in the drawings is a drill of the type used in mining operations, however, it is not intended that the use of my improved motor mounting be restricted solely to mining drills, but it may be utilized in any tool in which it is desired to isolate vibration.

The primary object of this invention is the provision of a mounting for motors and other machines whereby the vibrations produced by the operation of the machine will be isolated from the machine support or handle.

A further object is the provision of a motor mounting for hand supported tools, wherein the tool is of the type as to require support at two separate locations, about the tool frame, and wherein uneven pressures at the two locations, as when feeding a drill into the work, will ordinarily result in improper or faulty operation of the tool; that will permit "floating" of the operative portion of the tool within the frame, neutralizing the effect of the uneven pressures.

A further object is the provision of a drill handle motor mount for use upon mining drills, wherein the drill motor and chuck are resiliently mounted within the drill handle, preventing binding, distortion or bending of the drill bit when uneven pressures are exerted upon the drill handle, such as often occurs when the drill handle is supported by two workmen.

A further object is the provision of a motor mounting for hand supported tools having a frame associated therewith for the attachment of various handles.

Other objects and advantages of this invention will be apparent from the following detailed description of a preferred embodiment of the invention, taken in connection with the accompanying drawings, forming a part of this specification, and in which drawings:

Fig. 1 is a bottom plan view of a drill embodying my improved motor mounting, showing two types of handles attached thereto.

Fig. 2 is a bottom plan view of the drill of Fig. 1, but showing a different type of handle attached thereto, in place of one of the types shown in Fig. 1.

Fig. 3 is a front elevation of the drill of Fig. 1.

Fig. 4 is a side elevation of the drill of Fig. 1.

Fig. 5 is a front elevation of the handle supporting frame.

Fig. 6 is a side elevation of the handle supporting frame.

Fig. 7 is a front elevation of the drill motor supporting bracket.

Fig. 8 is a side elevation, partly in section, of the drill motor supporting bracket.

Fig. 9 is a sectional view taken substantially on the line 9—9 of Fig. 3.

In the drawings, wherein for the purpose of illustration is shown a preferred embodiment of the invention,

and wherein similar reference characters designate corresponding parts throughout the several views, the letter A generally designates a frame; B a bracket, C a vibration isolation mounting for securing the bracket B to the frame A; D a hydraulic motor secured to the bracket B and disposed in a spaced relationship within the frame A; and E handle means secured to the frame A.

The frame A comprises generally a cylindrical housing 15 defining a chamber 16. This housing is provided with handle mounting means 18 that are preferably flattened side portions 19 of the cylindrical housing 15, forming a base 20 to which the handle means E may be secured about the periphery of the frame A. Threaded openings 21 may be provided through the flattened side portions 19 for securement of the handle means E thereto. The flattened side portions 19 extend longitudinally outwardly beyond the housing 15, at one side thereof, overlapping the bracket B and forming an elongated base upon which the handle means E can be mounted.

Outwardly extending flange portions 25 are provided about the outer periphery of the cylindrical housing 15, forming an attaching flange for the mounting of the bracket B upon the frame A. Openings 27 are provided centrally of the flanges 25, for receiving the bolt of the vibration isolation mounting C as hereinafter described. These flanges 25 are each provided with a counter bore 29, at one side thereof, for receiving a lock washer and are provided with a counter bore 30 at the other side thereof within which the vibration isolation mounting C may be socketed, as hereinafter set forth.

Various portions of the cylindrical housing 15 may be cut away, as at 31 and 32 providing for the spaced insertion or accommodation of the ports of the hydraulic motor D through the frame A.

The bracket B may generally comprises rectangular housing 25 having cut-away portions 37 and 38 about the outermost side edge thereof, providing openings through which a drain plug and port, respectively, of the hydraulic motor D may extend in a spaced relationship therefrom.

The rectangular housing 35 is provided with an indented, flattened, central portion 39, offset in planar relation to the outermost portion, to which the hydraulic motor D is attached. Threaded openings 40 may be provided through the portion 39 to receive the mounting screws of the motor D, as hereinafter described. A second indented cylindrical portion 41 may be provided for receiving the forward mounting bearing of the hydraulic motor. An opening 42 is provided centrally of the bracket B for receiving the shaft of the hydraulic motor D therethrough.

Outwardly extending flanged portions 45 may be provided about the outer periphery of the rectangular housing 35, forming attaching flanges for the securement of the bracket B to the frame A. An opening 47 may be provided centrally of each of the flanges 45 for receiving the attaching bolt of the vibration isolation mounting C. The flanges 45 are each provided, at one side thereof, with a counter bore 49 for receiving a lock washer of the vibration isolation mounting B and may be provided with a counter bore 50 at the other side thereof within which the vibration isolation mounting C may be socketed.

The vibration isolation mounting C forms a resilient mounting means for attaching the bracket B to the frame A. The mounting C preferably comprises a rubber sandwich 52 having fastening projections 53 and 54 bonded thereto, forming a resilient cushion having outwardly extending fastening means at opposite sides thereof. The fastening projections 53 and 54 comprise bolts which extend through the openings 27 and 47 of the frame

A and bracket B. Lock washers 55, fitting into the counter bores 29 and 49 of the frame and bracket respectively, may be provided and hex nuts 56 may be secured upon the bolts 53 and 54, holding the frame A and bracket B securely to the mounting C.

The hydraulic motor D may be of any conventional type, designed so that it may be mounted upon the bracket B and spaced from and disposed mainly within the frame A, I have found that a Denison Hydroilic Pump/Motor, Model No. TNC 3F, C Series, flange mounted unit, manufactured by the Denison Engineering Division of the American Brake Shoe Company of Columbus, Ohio, is a hydraulic motor which may be satisfactorily used with this unit, and I have shown this motor in the drawings.

The hydraulic motor D generally comprises a housing 60, within which the motor mechanism is mounted. Ports 62 and 63, having hose connections 64 and 65 respectively, may be provided leading into the housing 60. As the hydraulic motor has bi-directional rotation, i.e. it may be operated in either direction of rotation, and the ports 62 and 63 will function alternately as both inlet and outlet ports, depending upon the direction of rotation desired.

A flange 68 is preferably provided about one end of the housing 60, extending outwardly beyond the outer periphery of the housing 60. This flange 68 may be provided with threaded openings 69 within which a heli-coil thread insert 70 may be inserted, so that when cap screws 72 are extended through the openings 40, provided in the bracket B, and are threaded within the heli-coil inserts 70, the cap screws 72 will be locked in position. The housing 60 may have indented portions 73 thereabout so that the ends of the cap screws 72 will not rub against the housing 60.

A drive shaft 75 extends outwardly from the hydraulic motor D, to which may be attached a drill chuck 76, as by a set screw 77.

The handle means E may be of any various types, dependent upon the manner in which the tool is to be held, two different types of which are shown in Figs. 1 and 2. I have shown a switch handle assembly 79 which is common to both Figs. 1 and 2.

The switch handle type 79 includes a base plate 80, which is of substantially the same rectangular shape as the flattened base 20 of the frame A, and which is secured to the base 20 by cap screws 81 which pass through the base plate 80 and fit within the screw threaded openings 21 of the base 20. Secured to and projecting outwardly from the base plate 80 is a rectangular projection 82 which tapers into a cylindrical grip 83. A switch assembly 85 is provided upon the grip portion 83 for controlling the operation of the hydraulic motor D.

Mounted upon the frame A opposite the switch handle assembly 79, in Fig. 1, I have provided an elongated cylindrical gripping handle unit 87. This handle unit 87 is provided with a base plate 90 which is secured to the base 20 of the frame A, opposite the switch handle assembly 79, by cap screws 92 which fit into the threaded openings 21 of the base 20. Secured to the base plate 90, and extending therefrom I have provided an elongated cylindrical grip 94 that may be of any desired length. As it is often desirable that two men operate a mining drill, it may be necessary to provide a cylindrical handle grip 94 of a length of several feet so that an operator may grasp the handle and still face the working surface on which the tool is to be used.

In Fig. 2 I have shown the same switching handle assembly 79, however, I have shown at the opposite side of the frame A, a modified form of gripping handle unit 96. This handle unit 96 is provided with a base plate 97 which is secured to the base 20 of the frame A, opposite the switch handle assembly 79, as by cap screws 98 projecting through the base plate 97, into the

screw threaded openings 21 provided in the base 20. The handle unit 96 preferably comprises a U-shaped gripping portion 99 which is secured to the base plate 97.

In the assembly of this tool, the drill motor D is secured to the bracket B by the capscrews 72 and the bracket B is secured to the frame A by means of the vibration isolation mountings C. It will be seen from Fig. 9 that when these units are thus secured that the hydraulic motor D "floats" within the frame A and that any shock that may be imparted to the drill motor, through the drive shaft 75, will be taken up by the vibration isolation mountings C and will not be transmitted to the frame A. As the handles E are connected directly to the frame A and do not contact either the hydraulic motor D or the bracket B, such shock as may be imparted to the drill motor D will thus not be felt by operators grasping the handles E, as the shock will be dissipated by the vibration isolation mountings C.

Various changes in the shape, size and arrangement of parts may be made to the form of invention herein shown and described without departing from the spirit of the invention and the scope of the following claims.

I claim:

1. In a hand supported drill the combination of a bracket having a central motor receiving portion, a motor socketed within said motor receiving portion of said bracket, attaching means for fixedly securing said motor to said bracket, a handle receiving frame interfitting about said motor and spaced therefrom, a handle fixedly secured to said frame, and resilient attaching means for securing said frame to said bracket.

2. A frame as specified in claim 1 comprising a cylindrical housing having flattened side portions, said flattened side portions extending outwardly of said frame and overlapping a portion of said bracket, forming a base for the attachment of handles to said frame.

3. A bracket as specified in claim 1 comprising a plate having the central portion thereof disposed in offset planar relation with respect to the outer portion thereof, said central portion being socketed about said motor and said outer portion being attached to said resilient mounting means.

4. A motor mounting as specified in claim 1 wherein said frame and said bracket are provided with like outwardly extending flange portions, said bracket being secured to said frame by said resilient mounting means by attachment of said flanges to said resilient mounting means.

5. In a hand supported drill the combination of a frame comprising a cylindrical housing having flattened handle receiving portions about the outer periphery thereof and attaching flanges extending outwardly from said housing; a bracket having an indented central portion and attaching flanges extending outwardly from said bracket, resilient mounting means securing said attaching flanges of said frame to said attaching flanges of said bracket, said resilient mounting means comprising a resilient cushion supporting outwardly extending fastening means at opposed sides thereof which are secured to said attaching flanges; and a motor secured to said indented central portion of said bracket and extending within but in spaced relation to said cylindrical housing, between said handle receiving portions, forming a balanced compact drill unit.

6. In a hand supported drill having a motor and a drive shaft, said motor having attaching sockets at one end thereof; a mounting for said motor comprising a bracket having a central motor receiving portion within which said motor is socketed, attaching means interfitting with said attaching sockets of said housing for fixedly securing said motor to said bracket, a handle receiving frame interfitting in a spaced relationship about said motor, handle means fixedly secured to said frame, and

resilient attaching means for securing said bracket to said frame.

7. In a universally resilient mounting for the motor of a hand supported drill, the combination of a motor, a bracket fixedly secured to said motor, said bracket having attaching flanges extending outwardly beyond the outer periphery of said motor, attaching means for fixedly securing said motor to said bracket, a frame interfitting about said motor in a spaced relationship, said frame having attaching flanges aligned with said first mentioned attaching flanges of said bracket, handle means secured to the outermost surface of said frame, and resilient attaching means securing said bracket to said frame

supporting said motor with respect to said handles in a universally resilient manner with respect to shear, compression and uneven pressures resulting from the operation of the drill.

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