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S. G. DUNNING

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METHOD OF MOUNTING UNITS

Filed Aug. 26, 1930

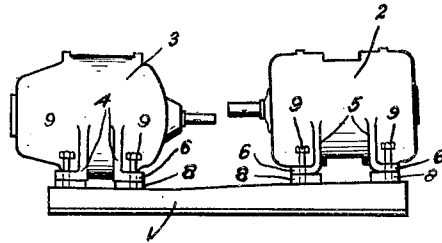


FIG. 1

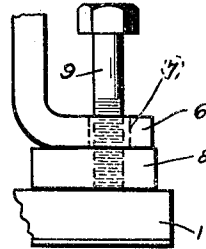


FIG. 4

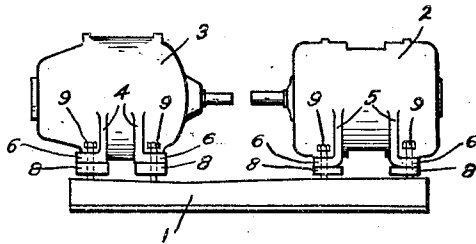


FIG. 2

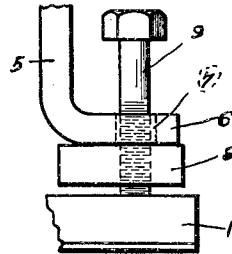


FIG. 5

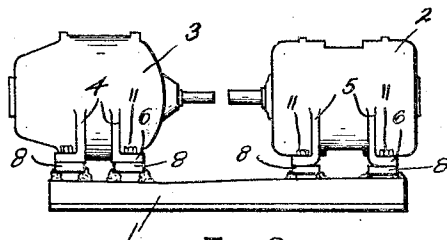


FIG. 3

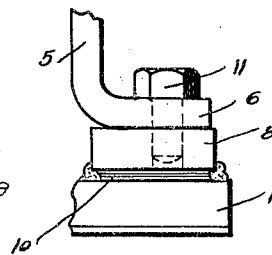


FIG. 6

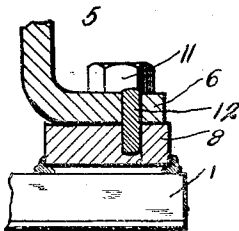


FIG. 7

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METHOD OF MOUNTING UNITS

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This invention, relating as indicated to a method of mounting units, has particular reference to an improved method for mounting units such as motors, generators, motor driven pumps, gear reduction units, motor generator sets, and any other machinery units, including two or more separate elements adapted to be mounted on a common or separate base so as to have their respective rotating shafts in axial alignment.

The method heretofore employed in mounting separate units so that the rotating shafts thereof are in axial alignment, has been to provide a base for such units, which base consists of a casting or welded structural steel element to form a platform usually provided with pads designed to register with the legs or other supporting means of the units to be mounted thereon. After the cast iron or welded structural steel base has been provided it has been the practice to finish off the pads on such base to different planes, the vertical distance between the surfaces of the pads for the different machines corresponding to the difference in the distance between the axis of rotation of the shafts of such machines and the lower surface of the legs or other means by which such machines are supported. After the pads have been properly planed and finished to the required level, as above outlined, it has been customary to place the separate units in their proper position on the base and to then mark on the pads the holes which were to be drilled and tapped to receive the bolts by means of which the machine was eventually secured to the platform or base. After the holes have been marked it is necessary to remove the machines and to drill and tap the holes and then replace the machines in order to receive the securing bolts.

This method of positioning, aligning and securing separate units on a common base or platform, or even on separate platforms, has been very undesirable due to the cost thereof which necessarily resulted from the time required to effect all of the above named operations.

It is among the objects of my invention to provide a method of mounting units of the

above described class, which method shall be more accurate than any heretofore employed and, further, be less costly due to the relatively short length of time in which units may be mounted when employing the method comprising my invention.

To the accomplishment of the foregoing and related ends, said invention, then, consists of the means hereinafter fully described and particularly pointed out in the claims, the annexed drawing and the following description setting forth in detail one approved method of carrying out the invention, such disclosed method, however, constituting but one of the various ways in which the principle of the invention may be used.

In said annexed drawing:—

Figs. 1 to 3 show the successive steps comprising my invention by which a motor generator set may be properly mounted on an uneven base; Figs. 4 to 6 are fragmentary enlarged elevational views, respectively, of portions of Figs. 1 to 3, both inclusive; and Fig. 7 is a fragmentary, part sectional, part elevational view, similar to Fig. 6, showing the employment of dowel pins for aligning the unit upon the base after the same has been temporarily removed.

Referring more specifically to the drawing, the method comprising my invention will be described in connection with the mounting of the separate units of a motor generator set so as to have the rotating shafts of such machines in proper operating axial alignment. 1 designates a common form of base or platform adapted to receive the machines, which platform may be either a cast iron structure or a platform built up by welding together a plurality of structural steel units, it being noted that the principles of my invention are applicable regardless of the particular type of platform employed to receive the machines. The machines 2 and 3 are here shown provided with legs 4 and 5 which may have laterally extending legs or pads 6 adapted to rest upon the means supporting such machine. The legs 6 are provided with apertures 7 which are of a size hereinafter more clearly specified.

When employing the principles compris-

ing my invention, blocks such as 8 are provided which have threaded holes therein adapted to threadably engage locating bolts, such as 9. It will be noted that the thickness of the blocks 8 may vary according to the particular requirements of each installation, such blocks being carried in stock of different thicknesses so as to facilitate the carrying out of the method comprising my invention. It should be noted, however, that blocks of a single standard thickness may be employed for all installations so long as the normal distance between the two planes on the base on which the machines are to be mounted do not vary an extraordinary amount.

After the blocks are inserted under each of the legs of the two machines, the bolts such as 9 are threaded into such blocks and, by screwing down each of such bolts, the two machines may be brought into position so that the axes of the rotating shafts thereof are in proper axial alignment, as illustrated in Figs. 2 and 5. When the bolts 9 have been so screwed down, each machine will be supported simply by the bolts in engagement with the base for the machines, the aperture 7 in the legs being of sufficient size so that the blocks 8 will be forced upwardly against the lower surface of the legs 6.

After the machines have been brought into proper alignment, as illustrated in Fig. 2, the spaces between the blocks 8 and the base 1 may be filled in by molten metal deposited by suitable welding apparatus, which metal will rigidly secure the blocks to the base and also maintain the same in proper elevation. If desired, shim means, such as 10, may be inserted under the blocks prior to welding so that when the molten metal is deposited the edges of such shims will be fused and united with the base 1 and the blocks 8 so that a rigid structure is insured.

After the molten metal deposited under the edges of the blocks 8 has had time to cool, the bolts 9 will be withdrawn and replaced by short bolts, such as 11, which will be of such a length as not to project through the blocks 8 and contact with the base 1 before the heads of such bolts are drawn down tightly on the legs 6 of the machines, thereby rigidly securing the machines to the foundation or platform.

When the particular type of installation is such that occasion demands that the machines be temporarily removed from the base or foundation, close fitting dowel pins, such as 12, may be inserted in close fitting holes provided therefor in the legs 6 and the blocks 8, which will determine the position occupied by the machine relative to the base when the same is reset.

It will be noted that by employing the above described method of locating units no expensive planing and aligning of the supporting pads on the base need be resorted to,

but by a simple screw adjustment of bolts, such as 9, the several machines may be brought into proper alignment and maintained in such aligned position while the supporting blocks 8 are secured to the base by the deposition of the molten metal and/or shims thereunder. By providing the blocks 8 with screw threaded apertures adapted to receive the securing bolts for the machine, the necessity of drilling and tapping carefully aligned holes in the base is entirely obviated, but such blocks may be drilled and tapped easily and quickly before the installation of the machines is undertaken. If there should be any expansion or contraction of the several units resulting from the heat incidental to depositing the molten metal under the blocks, correction for such minute inaccuracies in the level or position of the blocks 8 may be effected by inserting thin shims between the legs 6 and the upper surface of the blocks. This, however, is very seldom necessary and even if it should be necessary, requires only a very short time to accomplish and does not entail a great expense.

By providing the size of the apertures 7 in the legs 6 slightly greater than the outside diameter of the shank of the securing bolts 11, the machine may be further moved slightly relative to its base to further correct slight inaccuracies resulting upon cooling of a metal, so that the machines may be properly aligned with but a minimum amount of adjustment.

A further description of the principles comprising my invention is believed unnecessary for those familiar with the art, suffice it to say that numerous changes may be made in the specific form of the above described method without departing from the principles of my invention.

Other modes of applying the principle of my invention may be employed instead of the one explained, change being made as regards the method herein disclosed, provided the step or steps stated by any of the following claims or the equivalent of such stated step or steps be employed.

I therefore particularly point out and distinctly claim as my invention:—

1. The method of making a supporting bed for a machine comprising providing a suitable metallic base, placing a desired machine on said base with metallic blocks under its legs, providing bolts extending through said legs, in threaded engagement with said blocks and abutting said base, rotating said bolts to space said blocks from said base sufficiently to properly position said machine, and fill welding said blocks to said base.

2. The method of making a supporting bed for a machine comprising providing a suitable metallic base, placing a desired machine on said base with metallic blocks under its legs, providing bolts extending through said legs in threaded engagement with said blocks

and abutting said base, rotating said bolts to space said blocks from said base sufficiently to properly position said machine, shimming the space between said blocks and base, and
5 fill welding said blocks to said base.

3. The method of making a supporting bed for a plurality of machines which comprises providing a suitable metallic base, placing the selected machines on said base in juxta-
10 position with metallic blocks under the legs thereof, providing bolts extending through said legs in threaded engagement with said blocks and abutting said base, rotating said bolts to space said blocks from said base suf-
15 ficiently to bring said machines in proper relation, and fill welding said blocks to said base.

4. The method of making a supporting bed for a plurality of machines which comprises
20 providing a suitable metallic base, placing the selected machines on said base in juxtaposition with metallic blocks under the legs thereof, providing bolts extending through
25 said legs in threaded engagement with said blocks and abutting said base, rotating said bolts to space said blocks from said base sufficiently to bring said machines in proper relation, and fill welding said blocks to said
30 base while the same are maintained in such adjusted position.

Signed by me this 19th day August, 1930.

SAMUEL G. DUNNING.

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