

July 22, 1958

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2,843,969

MACHINE SUPPORTING STRUCTURE

Filed Dec. 31, 1956

5 Sheets-Sheet 1

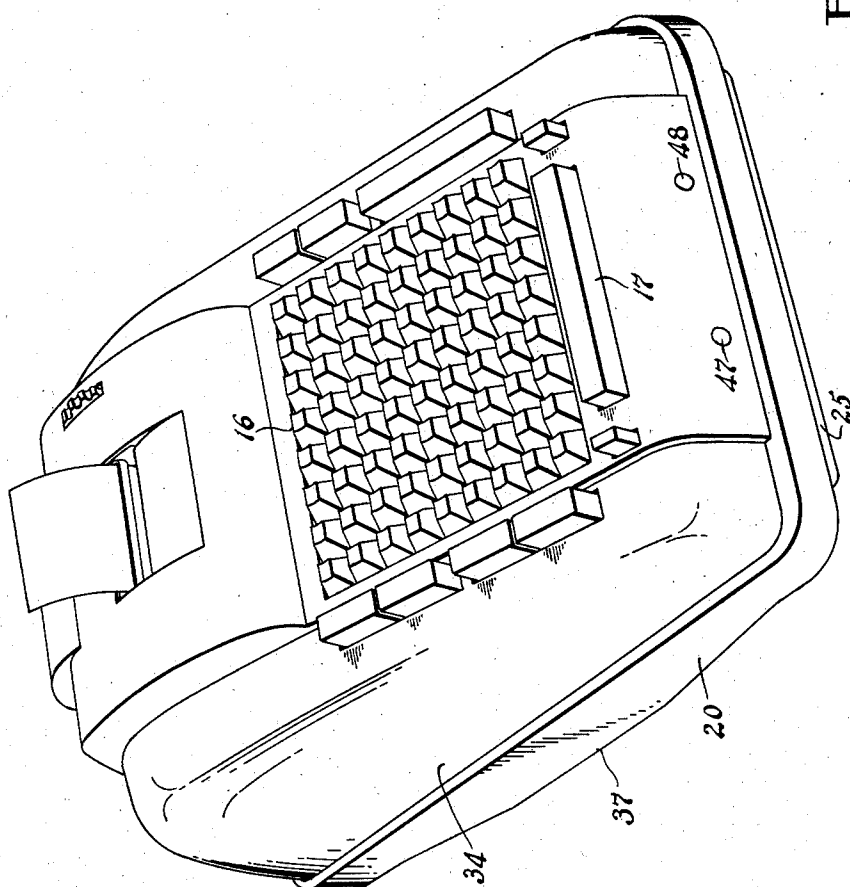


FIG. 1

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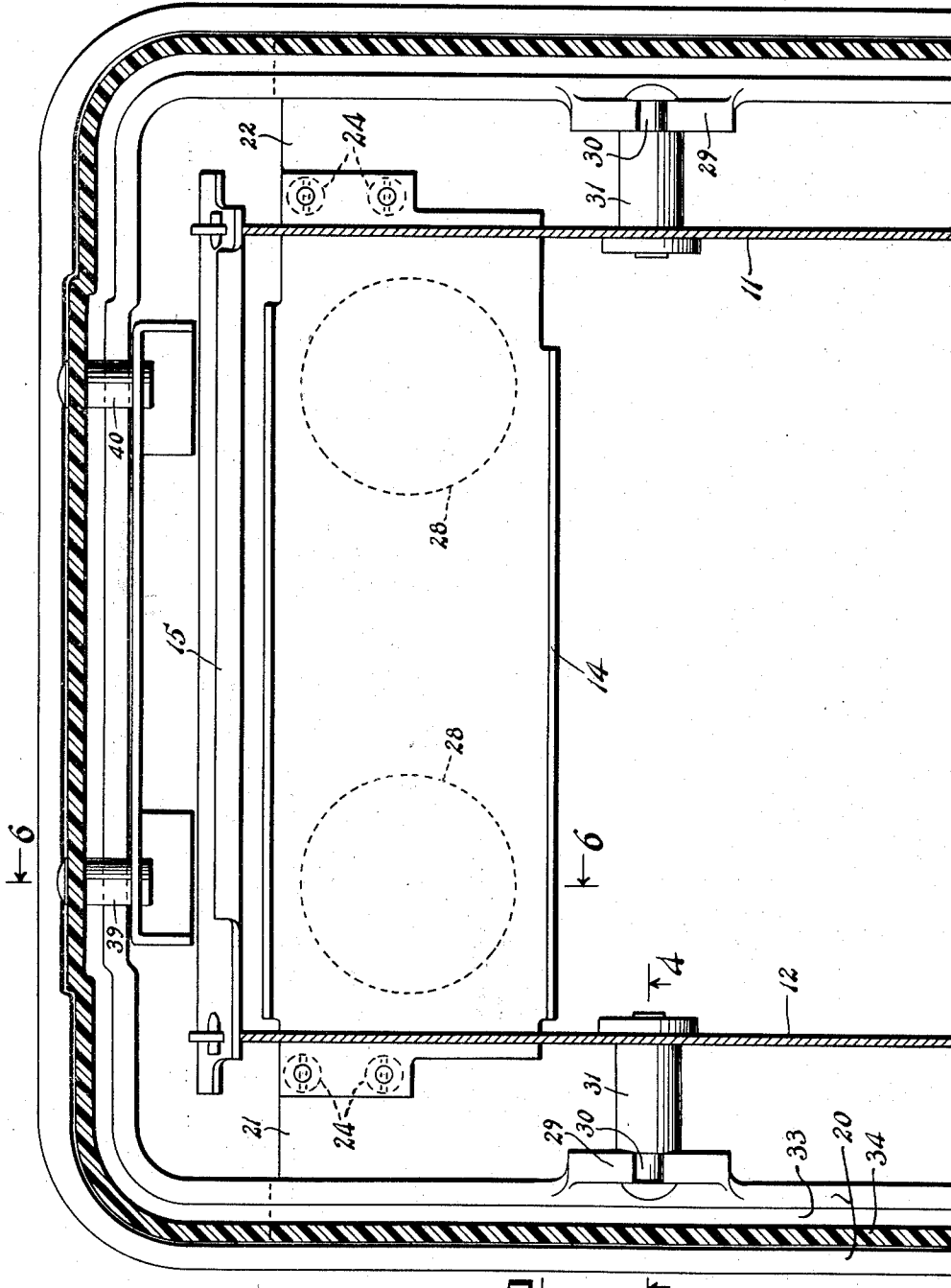
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5 Sheets-Sheet 3

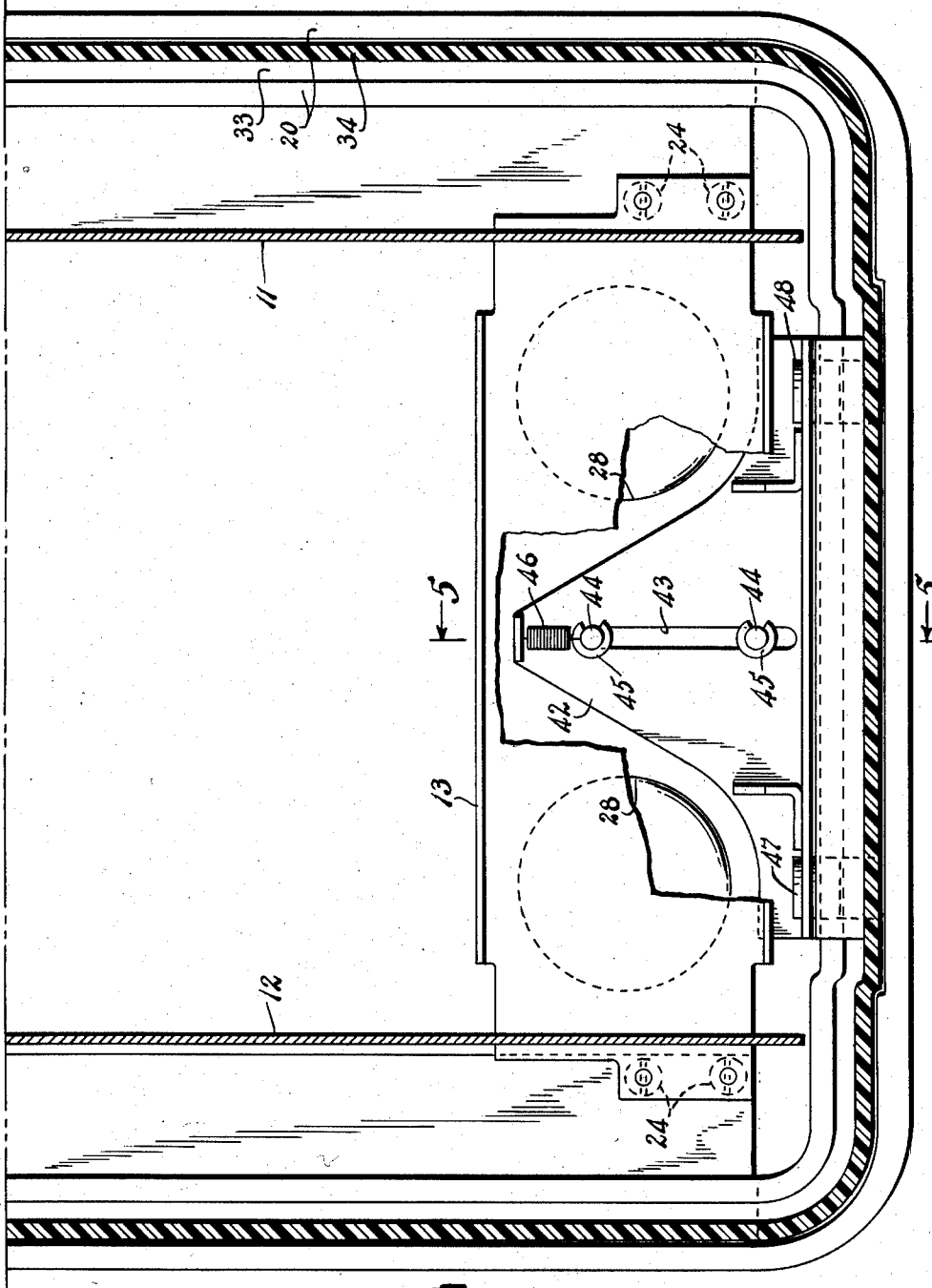


FIG. 3

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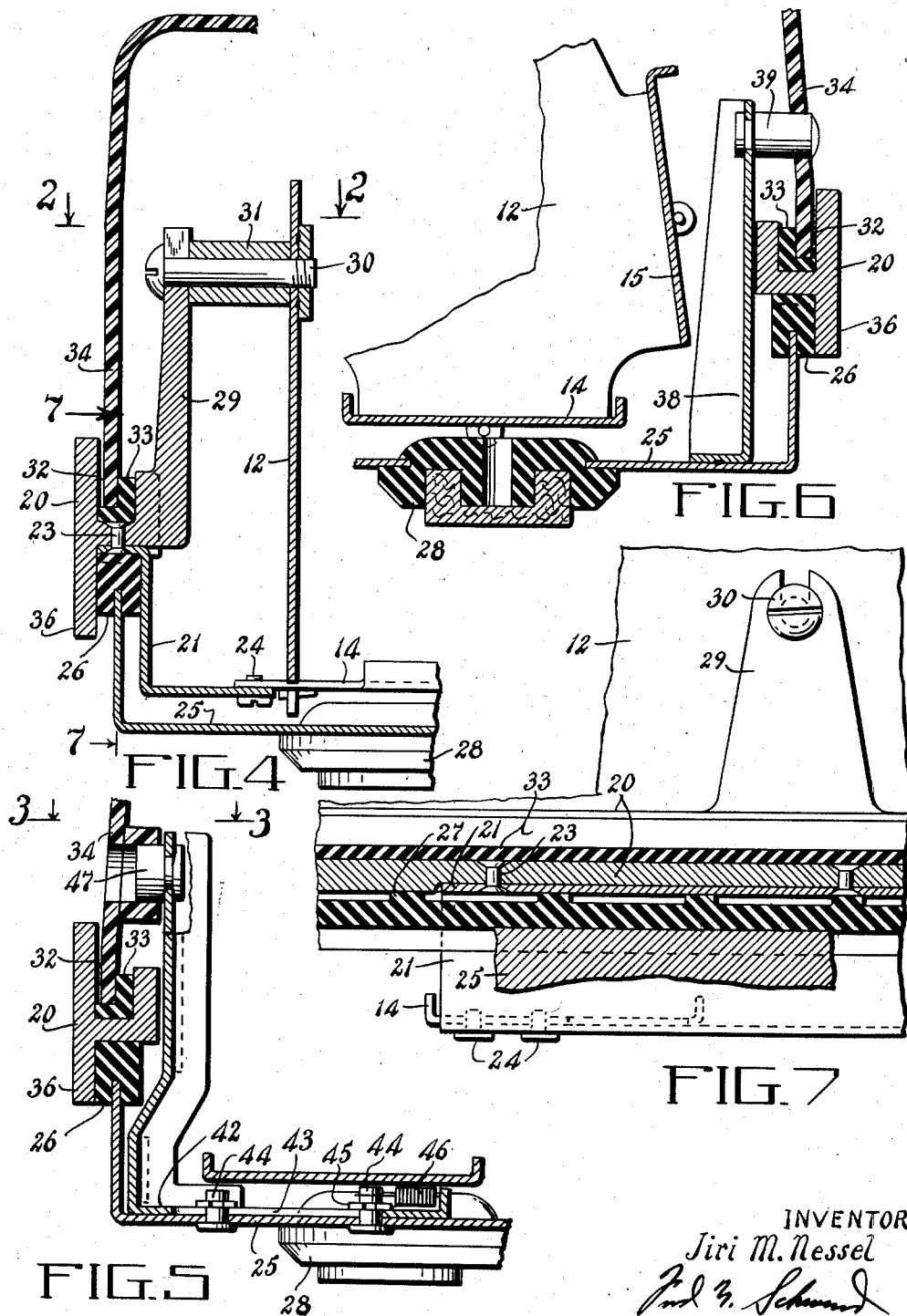
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MACHINE SUPPORTING STRUCTURE

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5 Sheets-Sheet 4



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MACHINE SUPPORTING STRUCTURE

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5 Sheets-Sheet 5

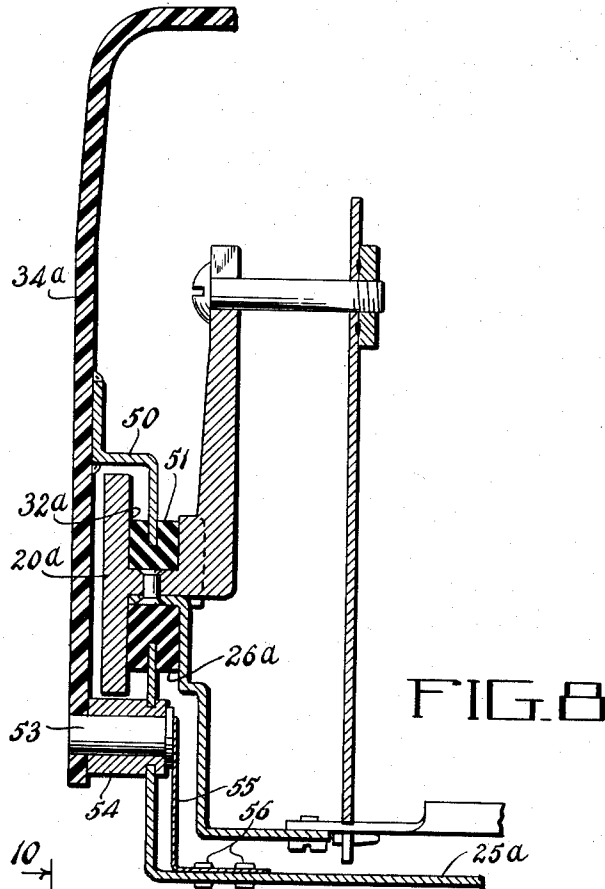


FIG. 8

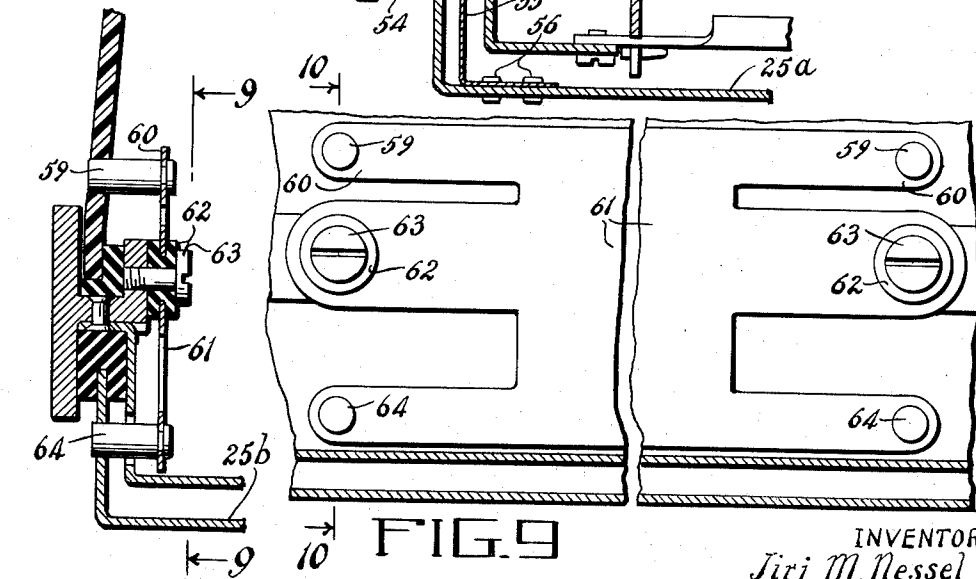


FIG. 9

FIG. 10

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2,843,969

MACHINE SUPPORTING STRUCTURE

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Application December 31, 1956, Serial No. 631,926

7 Claims. (Cl. 45—68.1)

This invention relates to business machines such as adding machines, calculating machines, cash registers, etc., and has particular reference to supporting structures for such machines.

Heretofore, machines of the above type were generally mounted on a rigid base which extends under the machine and to which various frame members are attached, the base being supported by suitable vibration absorbing feet or the like, while the machine covers are supported by the base or by frame members attached to the base.

Although the above construction is generally satisfactory, the base is usually found to be relatively heavy. Also, although the base may be sufficiently rigid to resist bending and twisting in itself, other frame work attached to the base must be provided to support the mechanism of the machine and should be sufficiently rigid in itself to resist bending and twisting forces applied thereto by the mechanism. Ideally, the rigid base should have rigid sides extending upwardly the full height of the machine to brace the framework and mechanism against such bending and twisting forces, but this would increase the weight of the base still more.

A principal object of the present invention is to provide a business machine of the above type having a relatively light weight rigid base or frame capable of adequately resisting bending and twisting forces applied by the machine mechanism.

Another object is to provide a supporting structure for a business machine, which structure also forms a protective bumper to protect the working parts of the machine from exteriorly applied shocks or forces.

Another object is to provide a novel form of vibration absorbing mounting for a machine of the above type.

Another object is to provide a removable casing for a business machine which may be readily removable to permit access to the interior of the machine.

The manner in which the above and other objects of the invention are accomplished will be readily understood on reference to the following specification when read in conjunction with the accompanying drawings, wherein:

Fig. 1 is a perspective view of an adding machine embodying a preferred form of the present invention.

Fig. 2 is a sectional plan view of the rear portion of the machine and is taken along line 2—2 of Fig. 4.

Fig. 3 is a sectional plan view of the forward portion of the machine and is a continuation of Fig. 2, taken substantially along the line 3—3 of Fig. 5.

Fig. 4 is a transverse sectional view taken along the side of the machine and along line 4—4 of Fig. 2.

Fig. 5 is a sectional view taken along the front of the machine and along line 5—5 of Fig. 3, illustrating the releasable clamping device for maintaining the forward portions of the top and bottom covers in place.

Fig. 6 is a sectional view taken along line 6—6 of Fig. 2 illustrating the means for retaining the rearward portions of the top and bottom covers in place.

Fig. 7 is a fragmentary sectional view taken along line 7—7 of Fig. 4 illustrating the construction of the

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vibration absorbing and supporting strips for the frame and upper cover.

Fig. 8 is a transverse sectional view similar to that of Fig. 4, but illustrating a modified form of the present invention.

Fig. 9 is a rear view taken along the line 9—9 of Fig. 10 illustrating the resilient support for the latching buttons.

Fig. 10 is a transverse sectional view taken along line 10—10 of Fig. 9, but illustrating a modified form of clamping device for the forward portions of the machine covers.

The present invention is particularly adapted for use in connection with an electrically operated key controlled adding machine, such as is disclosed and claimed in the R. E. Boyden Patent No. 2,583,810 issued on January 29, 1952. The details of the adding machine mechanism are omitted for the sake of brevity and clarity since such details are believed unnecessary for an understanding of the invention. Reference may be made to the above Boyden patent for an understanding of the details of the machine. However, it is to be understood that the invention may be equally well applied to other types of business machines.

It should be noted that the machine mechanism is mounted in a machine frame work comprising spaced vertical side frame plates 11 and 12. These frame plates extend longitudinally of the machine on either side thereof and are suitably held in spaced relation to each other by cross braces 13, 14 and 15. This framework or chassis, although relatively rigid, is composed of sheet metal members which are subject to a certain degree of warping, twisting or bending either from internally or externally applied forces.

Included in the machine supported by the above mentioned chassis is a keyboard, generally indicated at 16, upon which an amount to be entered into the machine is set. Depressible control bars, i. e. 17, are provided to initiate and determine the different operational functions of the machine, such as addition, subtraction, totaling, etc.

According to the present invention, the supporting structure of the machine comprises a rigid substantially rectangular brace or frame 20 which is open at its center and which surrounds the machine chassis, the latter comprising the side frame plates 11, 12 and cross braces 13, 14 and 15. The frames 20 is preferably formed of cast aluminum or similar metal to provide a rigid but relatively light supporting frame.

It will be noted that the frame 20 is located above the bottom of the machine, between the bottom and top of the machine chassis, and is connected to the latter by Z-shaped brackets 21 and 22 extending below the side portions of the frame 20 and attached thereto by rivets 23 thereby assisting in stiffening the latter frame as well as providing supporting members for the machine chassis. The cross braces 13 and 15 of the latter are supported upon the brackets 21 and 22 and are attached thereto by screws 24.

The brackets 21 and 22 and likewise the frame 20 are resiliently supported by a bottom cover 25 through a resiliently inverted U-shaped channel 26 of rubber or other vibration absorbing material which is preferably bonded on the upper edges of the sides and end of the bottom cover 25. The rearward and forward end portions of the frame 20 are formed thicker than the side portions thereof so as to rest directly upon the channel 26.

In order to improve the resilient character of the channel 26, the upper edge thereof may be formed with a series of spaced projections 27 (Fig. 7) which engage the undersides of the brackets 21 and 22.

The bottom cover 25 is preferably formed of light sheet metal and while supporting the machine is in turn supported by feet 28, formed of rubber or other vibration absorbing material. The bottom cover also serves to cover the lower portion of the machine chassis and mechanism, and to catch any dirt, oil or the like dropping therefrom.

On reference to Figs. 2, 4 and 7, it will be noted that the frame 20 integrally includes upwardly extending arms 29 detachably connected to adjacent portions of the side plates 11 and 12 by bolts 30 and spacers 31.

In view of the projections, i. e. arms 29 and brackets 21 and 22 extending above and below the frame 20 and attached to the top and bottom portions of the machine chassis, the frame 20 becomes effective to resist any bending or twisting forces applied to the chassis from internally developed forces. At the same time, the frame 20 forms a protective bumper which surrounds the machine proper to protect the same from bending or twisting forces resulting from exteriorly applied shocks.

Referring to Figs. 4, 5 and 6, it will be noted that the frame has a groove 32 formed along the top of its side and end portions, in which is fitted a strip 33 of rubber, felt, or other vibration absorbing material. The latter is L-shaped in cross section to form a support for a top cover 34 which surrounds the upper portion of the machine chassis and has suitable openings therein through which the keyboard 16 and control keys 17 may extend.

It will be noted that the cover 34, when fitted over the strip 33, is spaced slightly from the adjacent portions of the frame 20, as at 35, to prevent any direct contact therewith through which vibrations could otherwise be transmitted.

It will be noted that the supporting frame 20 is formed with a skirt 36 which extends therearound to hide from view the rubber channel 26 and to locate the frame on the strip. As seen in Fig. 1, the skirt may be formed deeper along its mid-portion at 37 to provide greater strength in this region.

Means are provided to removably clamp the frame 20 and machine covers 34 and 25 in place relative to each other. For this purpose, an upwardly extending bracket 38 (Figs. 2 and 6) is suitably secured to the rear portion of the bottom cover 25 and has secured thereto two cylindrical studs or buttons 39 and 40. The latter extend through mating holes in the upper cover 34, when the covers are in place.

At the front of the machine, a slide 42 (Figs. 3 and 5) is slideably mounted on the bottom cover 25 and is provided with a guide slot 43 embracing a pair of pins 44 extending upwardly from the bottom cover. Clips 45 hold the slide on the bottom cover.

A spring 46 extending between the slide 42 and one of the pins 44 urges the slide forwardly toward its illustrated position wherein latching studs or buttons 47 and 48 on the slide engage mating holes formed in the cover 34.

When it is desired to remove the upper cover for access into the interior of the machine, the buttons 47 and 48 are pressed inwardly, thereby releasing the forward portion of the upper cover. The latter may then be tilted upwardly to also disengage the same from the rear studs 39 and 40 whereupon it may be completely removed from the machine.

After the top cover 34 is removed, access to the bottom of the machine may be gained by lifting and tilting the frame 20 away from the channel 26 and the bottom cover 25 thereby leaving the underside of the machine exposed.

Fig. 8 illustrates a modified form of the invention wherein the upper cover 34a is extended downwardly beyond and outside of the sides of the rectangular supporting frame 20a. In this case, a Z-shaped bracket 50, suitably secured to the interior of the cover 34a, has a U-shaped channel 51 of vibration absorbing material bonded thereto, the channel resting in a groove 32a formed along the

upper edge of the frame 20a to thereby support the upper cover.

The bottom cover 25a has a second U-shaped channel 26a of vibration absorbing material fitted over the upper edge thereof and located in a mating groove formed in the bottom edge of the frame 20a to thereby resiliently support the frame and chassis of the machine. Machine supporting feet (not shown), preferably of vibration absorbing material, are attached to the bottom cover 25a.

Means are provided for releasably clamping the top and bottom machine covers 34a and 25a together. For this purpose, a number of latch studs are provided, one of which is shown at 53. The latter is slideably mounted in a bushing 54 attached to the bottom cover 25a and pressed outwardly by a leaf spring 55 attached at 56 to the bottom cover. The latch studs normally extend through mating holes in the top cover 34a, thereby holding the covers and the frame 20a in place relative to each other.

In order to remove the covers, the latch studs, i. e. 53, are pressed inwardly to release the upper cover so that the latter may be removed, thus permitting removal of the machine from the bottom cover as well if desired.

Figs. 9 and 10 illustrate a modified form of latching device for the cover arrangement illustrated in Figs. 1 to 7, inclusive. In this design, upper latching studs 59 are attached to oppositely extending fingers 60 of a resilient spring member 61. The latter is mounted on annular grommets 62 of rubber or other vibration absorbing material which are secured to the frame 20 by screws 63. When the upper cover 34a is in place, the latching studs 59 extend through mating openings in the cover, thus locking the same in place.

A pair of lower latching studs 64 are mounted on oppositely extending fingers of the spring element 61 and these studs normally extend through mating openings in the bottom cover 25b to thereby lock the latter in place relative to the frame 20.

In this construction, either the top or bottom cover may be removed independently of the other.

Although I have described my invention in detail and therefore have used certain terms and language herein, it is to be understood that the present disclosure is illustrative rather than restrictive and that changes and modifications may be made without departing from the spirit or scope of the invention as set forth in the appended claims.

Having thus described the invention, what I desire to secure by United States Letters Patent is:

1. In a business machine having a main chassis frame subject to flexing, the combination comprising a substantially rectangular narrow rigid frame open at its center and surrounding said chassis frame, means attaching said chassis frame to said rectangular frame for stiffening said chassis frame, a top cover surrounding the upper portion of said chassis frame and supported by said rectangular frame, a bottom cover surrounding the lower portion of said chassis frame and supporting said rectangular frame, and means for supporting said bottom cover.

2. In a business machine having a main chassis frame subject to flexing, the combination comprising a substantially rectangular narrow rigid frame open at its center and surrounding said chassis frame, means attaching said chassis frame to said rectangular frame for stiffening said chassis frame, a top cover surrounding the upper portion of said chassis frame, means of said rectangular frame including vibration absorbing material for supporting said cover; a bottom cover surrounding the lower portion of said chassis frame, means on said bottom cover including vibration absorbing material for supporting said rectangular frame; and machine supporting means on said bottom cover.

3. In a business machine having a main chassis frame subject to flexing, the combination comprising a sub-

stantially rectangular narrow rigid frame open at its center and surrounding said chassis frame, means attaching said chassis frame to said rectangular frame for stiffening said chassis frame, a top cover surrounding the upper portion of said chassis frame, means on said rectangular frame including vibration absorbing material for supporting said cover; a bottom cover surrounding the lower portion of said chassis frame, means on said bottom cover including vibration absorbing material for supporting said rectangular frame, releasable latching means extending between said top and bottom covers for maintaining said rectangular frame and said covers in place relative to each other, and machine supporting means on said bottom cover.

4. In a business machine having a main chassis frame subject to flexing, the combination comprising a rigid substantially rectangular frame open at its center and surrounding said chassis frame, said rectangular frame being located between the top and bottom of said chassis frame, said rectangular frame having rigid upwardly and downwardly extending projections thereon, means attaching said projections to the upper and lower portions of said chassis frame, a top cover surrounding the upper portion of said chassis frame, means on said rectangular frame including vibration absorbing material for supporting said cover; a bottom cover surrounding the lower portion of said chassis frame, means on said bottom cover including vibration absorbing material for supporting said rectangular frame; and machine supporting means on said bottom cover.

5. In a business machine having a main chassis, the combination comprising a rigid substantially rectangular frame open at its center and surrounding said chassis, a strip of vibration absorbing material located along the top of the sides and ends of said frame, a top cover surrounding the upper portion of said chassis and resting on said strip, a bottom cover surrounding the lower portion of said chassis and having upstanding sides and ends, a second strip of vibration absorbing material located

along the top of said sides and ends of said bottom cover, said frame resting on said second strip, and means comprising vibration absorbing material for supporting said bottom cover.

6. In a business machine having a main chassis, the combination comprising a rigid substantially rectangular frame open at its center and surrounding said chassis, a strip of vibration absorbing material located along the top of the sides and ends of said frame, a top cover surrounding the upper portion of said chassis and resting on said strip, a bottom cover surrounding the lower portion of said chassis and having upstanding sides and ends, a second strip of vibration absorbing material located along the top of said sides and ends of said bottom cover, said frame resting on said second strip, releasable latching means extending between said covers for maintaining said frame and said covers in place relative to each other, and means comprising vibration absorbing material for supporting said bottom cover.

7. In a business machine having a main chassis, the combination comprising a substantially rectangular frame open at its center and surrounding said chassis, said frame having grooves along the top and bottom edges thereof, vibration absorbing material in said grooves, a top cover surrounding the upper portion of said chassis and resting on the vibration absorbing material in one of said grooves, a bottom cover surrounding the lower portion of said chassis and having upstanding sides and ends, vibration absorbing material in the other of said grooves resting on the top of said sides and ends of said bottom cover, means comprising vibration absorbing material for supporting said bottom cover, and releasable latching means extending between said covers for retaining said frame and said covers in place relative to each other.

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