

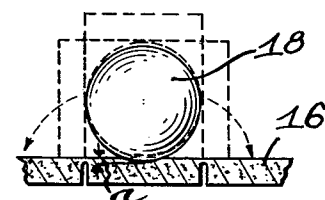
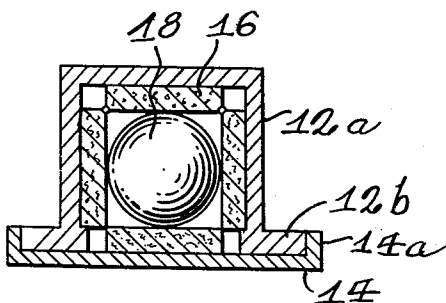
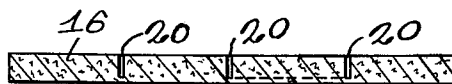
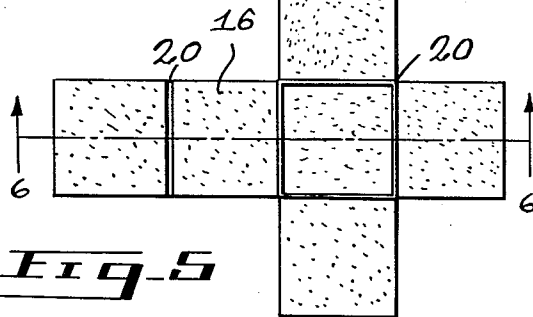
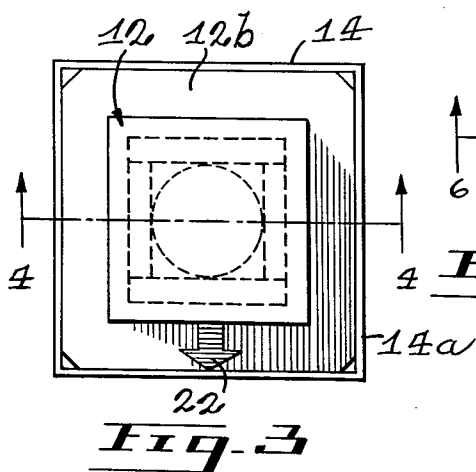
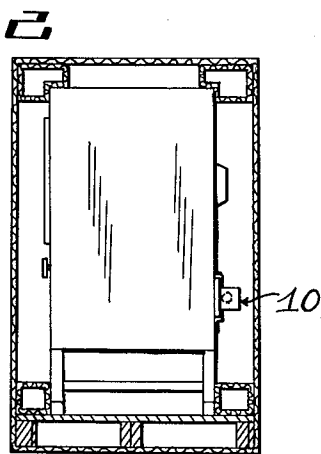
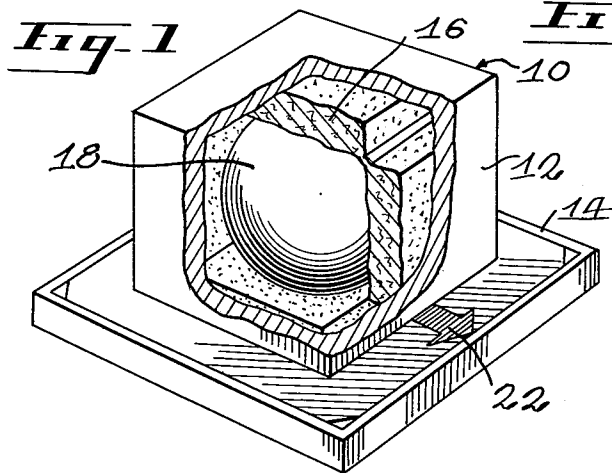
Feb. 20, 1962

J. L. RIPS

3,021,813

SHOCK GAUGE

Filed July 25, 1960



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3,021,813

SHOCK GAUGE

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Filed July 25, 1960, Ser. No. 44,946
8 Claims. (Cl. 116—114)

The present invention relates to devices for indicating and gauging shocks which may be applied to a parent body to which the device is attached, for example, a box or crate which contains a relatively fragile object or objects.

The present invention aims to provide a device of this nature which is extremely simple in construction and yet will provide a complete record which can be interpreted to show the severity and direction of shock loads to which the parent body may have been subjected.

More specifically, the device of the invention comprises essentially a central mass or body having sufficient weight to be affected by shocks imparted to the parent body and which is fitted snugly within and surrounded by a fixed enclosure of a material having a surface of lesser hardness than the central body. Accordingly, movement of the central body under shock impact in any direction acts to permanently deform the surface of the enclosure in the direction of the shock. This permanent impression or indent can then be interpreted against a predetermined scale to give an accurate reading of the intensity of the shock.

As a method of producing a translatable record of the direction and intensity of shock impacts to a movable body, the invention includes the steps of placing a central body of predetermined weight and surface hardness within an enclosure having surrounding surfaces having a lesser deformation resistance than the said central body, fixing the enclosure to the movable body and finally interpreting any deformation of the enclosure by said central body in terms of shock impact imparted to said movable body.

It will be understood that while the surface of the surrounding enclosure is described as preferably of lesser hardness than the central body it could possibly be of equal hardness but of lesser deformation resistance, for example, a thin layer or coating of hard material which would fracture or star under the impact of the central body leaving a permanent record of shock impact.

Having thus generally described the nature of the invention, particular reference will be made to the accompanying drawings showing by way of illustration, a preferred embodiment thereof, and in which:

FIGURE 1 is a view in perspective elevation and partially in section showing one preferred construction of the device in accordance with the invention as it would appear assembled and ready for installation in a parent body.

FIGURE 2 is a somewhat diagrammatic view showing in vertical cross section a packing crate containing a television set with the shock recording device of the invention attached.

FIGURE 3 is a view in top plan on a reduced scale of the construction shown in FIGURE 1.

FIGURE 4 is a cross-sectional view of the construction shown in FIGURE 3 along the line 4—4.

FIGURE 5 is a view in plan of the blank making up the shock indicating interior enclosure of the device.

FIGURE 6 is a cross-sectional view of the arrangement shown in FIGURE 5 along the line 6—6.

FIGURE 7 is a somewhat diagrammatic view of the interior enclosure as it would appear when opened up for reading with the central mass shown as having made an impression under shock impact.

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With particular reference to FIGURES 1 and 3 of the drawings a preferred embodiment of a shock indicating device according to the invention consists of a separable enclosure 10 having an outer shell 12 adapted for mounting on a base 14, a liner 16 and a central body 18 in the shape of a ball.

The shell 12 and base 14 provide an enclosure for the liner 16 and ball 18 with the base 14 being constructed so as to provide a means whereby the device can be attached to a parent body, for example, as shown in FIGURE 2. The liner 16 is preferably constructed of a flat sheet of material, as shown in FIGURE 5, which is divided by indents or slots 20 so as to be foldable to a cubical shape closely fitting within the shell 12. As shown most clearly in FIGURE 4, for example, the shell 12 is made as having a hollow rectangular body 12a accommodating the liner 16 and an outstanding peripheral flange 12b which fits snugly within an upstanding flange 14a provided on the base 14. The shell 12 and base 14 can be made of any suitable material, for example, both can be moulded from plastic with the flange 12b of the shell being a press fit within the flange 14a of the base.

The central body or ball 18 can also be made of any suitable material for example, metal, wood or plastic providing it has sufficient weight to react to shocks imparted to the parent body.

The assembly is made by enclosing the ball 18 within the folded liner 16 and then inserted within the shell 12. The shell 12 is then inserted in the base 14 and the whole attached to a parent body. The flange 12b of the shell 12 is preferably provided with locating indicia, as indicated at 22, so that the liner 16 when unfolded can be oriented with the direction of shock impact relative to the parent body.

The liner 16 is made of a material or materials or at least has a surface coating such that when the ball 18 is subjected to a shock loading it will mark, indent or otherwise alter the adjacent liner surface so that with proper interpretation of these marks, indentations or alterations, the magnitude and direction of such shock loading is readily and accurately determined.

As will be appreciated by reference to the preceding description and accompanying drawings the main elements of the device may be varied within a wide range without departing from the invention. The basic concept of placing a mass or body within a fixed enclosure of more readily deformable material and evaluating shock impact by reference to deformation of the surfaces of said enclosure can be carried out by the use of shock indicating bodies having a shape other than spherical and the shape of the enclosure also could be varied accordingly.

The interpretation of the marks, indentations or alterations can be made in many ways a relative scale being prepared for example by controlled deformation of liner material similar to that to be used in the device under circumstances corresponding to the mass and shape of the central body and the results calculated by known measuring means. Thus, complete comparative scales or records can be prepared for distribution with the devices of the invention for ready interpretation of shocks imparted to the parent body.

I claim:

1. A method of producing a translatable record of the direction and intensity of shock impacts imparted to a movable body, comprising the steps of completely confining a central body of predetermined weight and surface hardness within an enclosure having surrounding surfaces of lesser deformation resistance than said central body, fixing said enclosure to said movable body and

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finally interpreting any deformation of said enclosure surface by said central body in terms of shock impact imparted to said movable body.

2. A method of producing a translatable record as claimed in claim 1, wherein said central body is of spherical shape and said enclosure surrounding surface is of cubical form.

3. A method of producing a translatable record of the direction and intensity of shock impacts imparted to a movable body, comprising the steps of completely confining a central body of predetermined weight and surface hardness within an enclosure having surrounding surfaces of lesser hardness than said central body, fixing said enclosure to said movable body, and finally removing and opening said enclosure and interpreting any deformation of said enclosure surface by said central body in terms of shock impact imparted to said movable body.

4. A method of producing a translatable record as claimed in claim 3 wherein said central body is of spherical shape and said enclosure is of cubical form.

5. An impact shock recording device adapted for attachment to a movable body, comprising a hollow enclosure shell having inner surfaces, a central body fitting snugly within said enclosure shell and against said inner surfaces, said central body having at least an outer surface having a greater deformation resistance than the sur-

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rounding inner surfaces of said enclosure shell and sufficient mass to deform said enclosure inner surfaces when said shell is subjected to impact shocks in any direction.

6. An impact shock recording device as claimed in claim 5 wherein said central body is a sphere and the surrounding surfaces of said hollow body are in the form of a cube.

7. An impact shock recording device adapted for attachment to a movable body comprising a hollow outer enclosure shell, a removable liner having inner surfaces and being mounted within said outer shell, and a central body snugly fitting within said removable liner against said inner surfaces, said central body having at least an outer surface having a greater deformation resistance than the surrounding inner surfaces of said removable liner, said central body having sufficient mass to deform said liner inner surfaces when said enclosure shell is subjected to impact shocks in any direction.

8. An impact shock recording device as claimed in claim 7 wherein said central body is of spherical form and said liner is of cubical form.

References Cited in the file of this patent

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