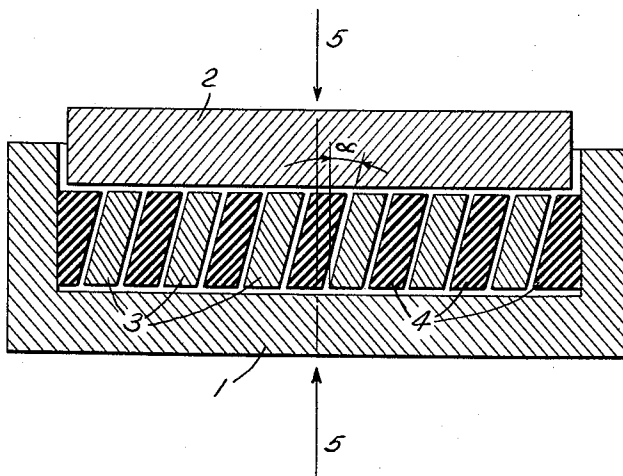


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SAFETY RESILIENT MEANS FOR MACHINERY SUBJECTED TO HIGH
STRESSES, PARTICULARLY FOR ROLLING
MILLS, CALENDERS AND THE LIKE
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SAFETY RESILIENT MEANS FOR MACHINERY SUBJECTED TO HIGH STRESSES, PARTICULAR- LY FOR ROLLING MILLS, CALENDERS AND THE LIKE

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3 Claims. (Cl. 267—1)

The present invention has as an object a safety resilient means for machinery subjected to high stresses, such as rolling mills, calenders, presses and the like in which high pressures have to be exerted and the material is at the same time forced to undergo a pre-established deformation.

It is obvious that during operation eventual changes in the temperature of the material and, in some cases, an imperfect or disturbed setup of the machinery can originate efforts so high as to exceed the values foreseen by the designer and cause damage to the machinery or equipment, sometimes in an irreparable way. The matter is so much more important in that it is not generally possible to foresee by theoretical calculation the magnitude of the normal working stresses and of the percentage of their increase deriving from various abnormal working conditions.

In order to prevent this serious danger there are already in use some safety devices constituted by metal blocks, generally of cast iron or steel, interposed in the chain of the organs originating the stresses and which should break when the stress attains a pre-established magnitude. However, it happens in practice that the breaking strain of the said blocks is not determinable, even only within a reasonable approximation, and they, therefore, break prematurely, causing the operation to be interrupted for no sufficient reason, or, on the contrary, they result too resistant and determine the breakage of the organs they should have protected.

This twofold defect is remedied by the safety elastic means according to the invention, in which a suitably formed housing contains metallic bars arranged at an angle with the direction of the force to be transmitted and alternating with rubber cushions apt to exert an effort in a transversal direction. The advantages of this solution in the possibility of having an elastic means apt to withstand high specific pressures, this end not being attainable with other means known at present.

The device in question absorbs the peak loads up to a certain value, this increasing the extension of the working diagram.

For greater clarity reference is made to the attached drawing, representing a cross-sectional elevation of an embodiment of the elastic safety means of the present invention.

In the drawing 1 indicates a substantially box-shaped body having for instance a rectangular base constituting, together with the cover 2 a casing containing the elastic portion constituted by rigid rectangular pressure-transmitting metal bars 3, alternating with rubber cushions 4. The bars are inclined at a small angle with respect to the line of action of force 5. By effect of the force 5 having such a direction as will press the cover 2 towards the box 1, the bars 3 abutting both against the cover 5 and the body 1 will tend to assume a greater inclination, i. e. to cause said angle to increase, but this deformation will be counteracted by the reaction originated by the compression of the rubber cushions 4, cooperating with the side walls of box 1.

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I claim:

1. A cushioning device comprising, in combination, a pair of parallel plate members movable towards and away from each other, one of said plate members having at least one portion extending at an angle therefrom in direction towards the other plate member outside the path of movement of the latter; a set of rigid pressure-transmitting elements arranged between said plate members and having ends abutting, respectively, against the same, said rigid pressure-transmitting elements being inclined with respect to said plate members towards said one portion of said one plate and being movable from a less-inclined position to a more inclined position when said plate members are moved toward each other; means between the plate members guiding said members for substantially rectilinear movement toward and away from each other; and a set of elastic cushions located intermediate adjacent pressure-transmitting elements so that when said first and second plate members move toward each other under the action of pressure against the same, said rigid pressure-transmitting elements tend to turn to said more inclined position by compressing said elastic cushions, one of said elastic cushions being located at one end of said set of rigid pressure-transmitting elements and abutting against said portion extending from one of said plate members.

2. A cushioning device comprising, in combination, a pair of movable parallel plate members, one of said plate members being formed as a box with side walls for guiding the other plate member for movement in the space inside said walls; a set of rigid pressure-transmitting elements arranged between said plate members and having ends abutting, respectively, against the same, said rigid pressure-transmitting elements being inclined with respect to said plate members and being movable from a less-inclined position to a more inclined position when said plate members are moved toward each other; and a set of elastic cushions located intermediate adjacent pressure-transmitting elements so that when said first and second plate members move toward each other under the action of pressure against the same, said rigid pressure-transmitting elements tend to turn to said more inclined position by compressing said elastic cushions.

3. A cushioning device comprising, in combination, a pair of movable parallel plate members, one of said plate members being formed as a box with side walls for guiding the other plate member for movement in the space inside said walls; a set of rigid pressure-transmitting elements arranged between said plate members and having ends abutting, respectively, against the same, said rigid pressure-transmitting elements being inclined with respect to said plate members and being movable from a less-inclined position to a more inclined position when said plate members are moved toward each other; and a set of elastic cushions located intermediate adjacent pressure-transmitting elements so that when said first and second plate members move toward each other under the action of pressure against the same, said rigid pressure-transmitting elements tend to turn to said more inclined position by compressing said elastic cushions, one of said elastic cushions being located at either end of said set of rigid pressure-transmitting elements and adjacent to one of said side walls.

References Cited in the file of this patent

UNITED STATES PATENTS

287,659	Gifford	Oct. 30, 1883
2,108,746	Erichsen	Feb. 15, 1938
2,356,246	Jones	Aug. 22, 1944
2,641,463	Mulcahy	June 9, 1953
2,706,112	Carrier	Apr. 12, 1955