Sept. 19, 1961 L. S. SUOZZO 3,000,600

FLOOR TYPE SPRING SUPPORT

Filed May 20, 1959

FIG. 1

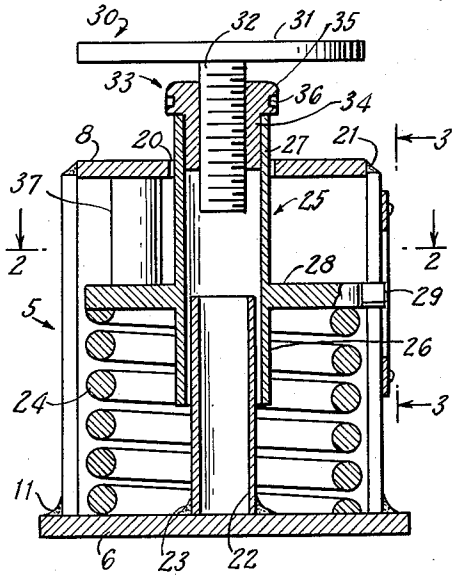


FIG. 2

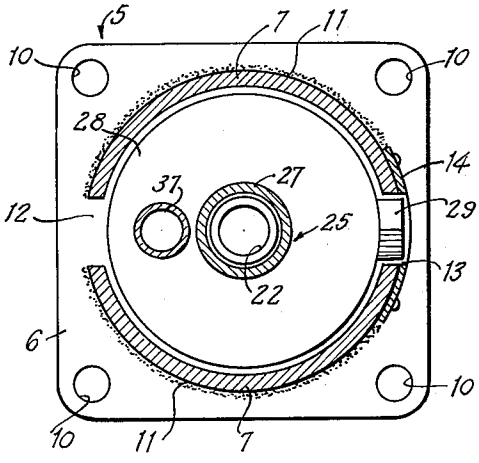
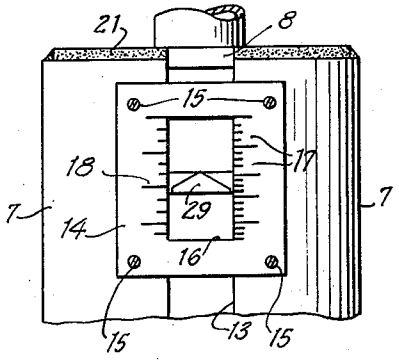


FIG. 3



INVENTOR.
LEONARD S. SUOZZO

BY F. J. Lisarra

ATTORNEY

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FLOOR TYPE SPRING SUPPORT

Leonard S. Suozzo, Hackensack, N.J., assignor to Bergen Pipesupport Corp., New York, N.Y., a corporation of New York

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3 Claims. (Cl. 248—54)

This invention relates generally to spring supports. The invention pertains, more specifically, to a floor type spring support for piping and the like having improved and simplified features of design and construction.

Conventional floor type spring supports are objectionable for a number of reasons. For one thing, the load column, usually in the form of a tubular plunger, is externally threaded to engage internal threads in a ring-type plate which serves as a spring backing plate. The column threads, by virtue of their external location, are subject to damage and impairment, during handling, and to collection of dust and other foreign particles, during use. Such damage and impairment often adversely affects assembly and adjustment of the support to meet particular requirements.

The present invention overcomes this objection in that the tubular plunger is devoid of external threads. Moreover, the spring backing plate is integral with the tubular plunger and is not subjected to turning action at any time.

Another objection to conventional floor type spring supports is that the loading of its spring cannot be adjusted after assembly is completed. While the spring may be pre-compressed at the time of assembly, such precompression remains constant. In other words, the spring is not capable of being loaded further or preset to another and higher value prior to installation.

This invention not only contemplates precompression of the spring but also allows for presetting the support to "cold load" position at the time of assembly. This is accomplished by a load preset element which is introduced into the housing by way of a window and inserted between the spring bearing plate and the upper wall of the housing. The preset load element may be readily removed through the window when installation is completed. This feature is important as it simplifies installation and eliminates difficult and time consuming field adjustment.

One of the features of this invention is that height adjustment is readily accomplished by merely turning the load plate or an adjusting sleeve which registers with the tubular plunger. The parts are so constructed and arranged as to permit ready removal of the load plate and adjusting sleeve without turning or in any way disturbing any parts within the housing.

A primary object of the invention is to provide a floor type spring support having improved and simplified features of design and construction.

Another object of the invention is to provide a spring support of the character indicated wherein certain moving parts are protetced against damage during handling or to impairment due to collection of dust or other foreign particles during use.

A further object of the invention is to provide a floor type spring support which may be readily preset to any desired cold load position at the time of manufacture.

A still further object of the invention is to provide a floor type spring support that is simple and compact in design; that is rugged and durable in construction; that is reasonable in manufacturing, installation and maintenance costs; and that is capable of performing its intended functions in an entirely satisfactory manner.

The enumerated objects and other objects, together with the advantages of the invention, will be readily understood by persons trained in the art from the following detailed description and the accompanying drawing which respectively describe and illustrate a preferred and recommended form of spring support of this invention.

In the drawing wherein like reference numerals identify like parts throughout the several views:

FIG. 1 is a view in central vertical cross-section of a floor type spring support constructed in accordance with the invention;

FIG. 2 is a view taken along line 2—2 of FIG. 1; and

FIG. 3 is a view taken along line 3—3 of FIG. 1.

Reference is first had to FIGS. 1 and 2 which illustrate a housing that is generally denoted by numeral 5. The housing consists of a bottom wall or base 6, a pair of upstanding side walls 7 and a top wall 8.

Base 6 is preferably rectangular in configuration and is provided with a plurality of drill holes 10 for reception of screws or the like whereby the housing may be anchored to a floor. The base is welded to the side walls, as indicated at 11.

The side walls 7 are preferably arcuate in transverse configuration and are spaced apart to define a pair of windows 12 and 13 which extend from the base to the top wall. An indicator plate 14 (FIG. 3) is positioned across window 13 and is attached to the side walls by screws 15. The indicator plate has a vertical slot 16 which is aligned with window 13. This plate is provided with a first scale having graduations 17 for indicating the preset loading on the device prior to installation or the actual load carried by the device when it is in active service. The indicator plate is provided with a second scale having graduations 18 for indicating the load travel distance.

Top wall 8 is preferably circular and is formed with a central through opening 20. The top wall is welded to the upper ends of side walls 7, as indicated at 21.

An upstanding guide tube 22 is positioned centrally on base 6 and is rigidly affixed thereto by a weldment 23. A helical compression spring 24 is coaxial with the guide tube and bears at its lower end against base 6.

A tubular plunger 25 includes a lower part 26, which embraces and is slidable relative to guide tube 22, and an upper part 27, which extends through top plate opening 20 and terminates above the housing. Integral with the plunger is an external continuous flange or spring backing plate 28. This plate is normal to the axis of the plunger and bears against the upper end of the spring. Plate 28 is provided with an integral, laterally extending indicator element 29 which projects into window 13 and slot 16. The indicator element cooperates with graduations 17 and 18 to denote the amount and travel of the load.

Mounted on plunger 25 is a load carrying unit 30 which includes a load plate 31 and a depending, externally threaded stem 32. This stem preferably consists of a solid rod which is normal to the plane of plate 31. Rod 32 carries an internally threaded tubular adjusting means 33 which includes a sleeve 34 that registers with the upper end of the plunger and a head 35 that bears against the upper extremity of the plunger. Head 35 is provided with a plurality of circumferentially spaced blind bores 36 for reception of a suitable tool to effect turning of the adjusting means relative to rod 32. If desired, the adjusting means may be restrained against turning and load plate 31 may be rotated relative thereto to effect requisite height adjustment of that plate.

The free height of spring 24 may be equal to the clear internal height of the housing. Alternatively, the free height of the spring may be greater than the clear internal height of the housing, in which case the spring is precompressed at the time the device is assembled.

If desired, the loading on the spring may be preset to meet any desired cold load position of the support within the design limits of the support. This is accomplished by inserting a preset element 37 which is preferably in the form of a piece of tubing that is disposed between and bears against plate 28 and top wall 8. Element 37 is introduced in the housing by way of window 12 and inserted to the illustrated position after moving plunger 25 downwardly to the necessary extent against the action of spring 24. Element 37 is removed through window 12 after the support is installed in the field.

The operation of the illustrated form of the invention is deemed self evident from the foregoing description and the drawing. It appears advisable to point out that base 6 limits downward travel of plunger 25 and, therefore, spring plate 28 and load plate 31. Upward travel of the plunger and load plate is limited by plate 28 engaging the underside of housing top wall 8.

The height of the load plate may be readily adjusted by turning the same relative to adjusting means 33 or by restraining the load plate against turning and then turning adjusting means 33 relative thereto. The load plate and adjusting means may be disengaged from the remainder of the support device by simply moving the same upwardly and out of plunger 25. This permits of ready inspection of the interior of the plunger and the guide tube. Windows 12 and 13 afford convenient inspection of the other parts that are located within the housing.

From the foregoing, it is believed that the construction, operation and advantages of my present invention will be readily comprehended by persons skilled in the art. It is to be clearly understood, however, that various changes in the construction described above and illustrated in the drawing may be made without departing from the scope of the invention, it being intended that all matter contained in the description or shown in the drawing shall be interpreted as illustrative only and not in a limiting sense.

I claim:

1. In a support device of the character described, a housing comprising a base, a top wall spaced above the base and a side wall extending from the base to the top wall, said top wall having a through opening, an upstanding guide tube within the housing, said guide tube being mounted on the base and aligned with said opening, a tubular plunger coaxial with the guide tube and including a lower part slidable relative to the guide tube and an upper part extending through said opening and above the top plate, a bearing member carried by and positioned intermediate the ends of the plunger, spring means coaxial with the guide tube and plunger and positioned between the base and the bearing member, and a load carrying unit mounted on the plunger and comprising a load plate, an externally threaded member depending from and normal to the load plate, an internally threaded tubular adjusting member engaging the threaded member, said adjusting member including a first part that is slidably and rotatably positioned in the upper part of the plunger and a second part that bears against the upper extremity of the plunger and limits downward sliding movement of the adjusting member relative to the plunger.

2. A support device according to claim 1 wherein the housing is provided with a window that is defined at least in part by the top wall and side wall and wherein the devices also includes a member which is removably positioned between the top wall and the bearing member and which maintains the spring means under a predetermined load, said last mentioned member being adapted to be withdrawn from the housing through said window.

3. A support device according to claim 1 wherein the housing top wall and the bearing member are substantially circular and wherein said opening is formed substantially centrally in the top wall, the parts being so constructed and arranged that the housing limits downward travel of the plunger and upward travel of the bearing member.

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