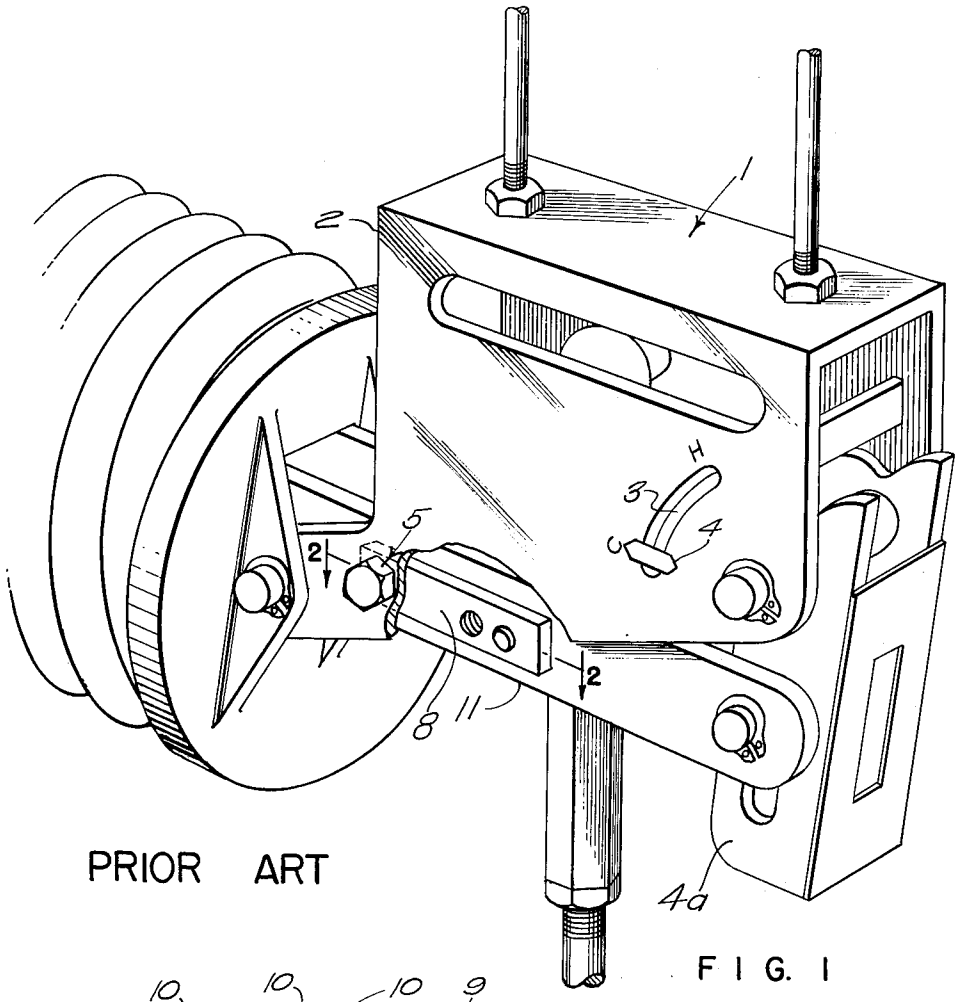
March 21, 1961 P. C. SHERBURNE 2,975,995

PIPE HANGER CLAMP STOP

Filed Sept. 3, 1958 3 Sheets-Sheet 1




PRIOR ART

FIG. 1

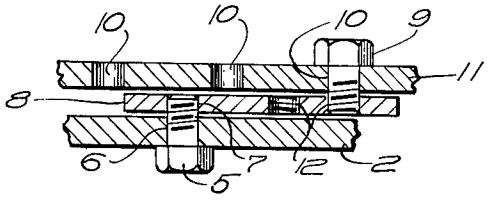



FIG. 2

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PIPE HANGER CLAMP STOP

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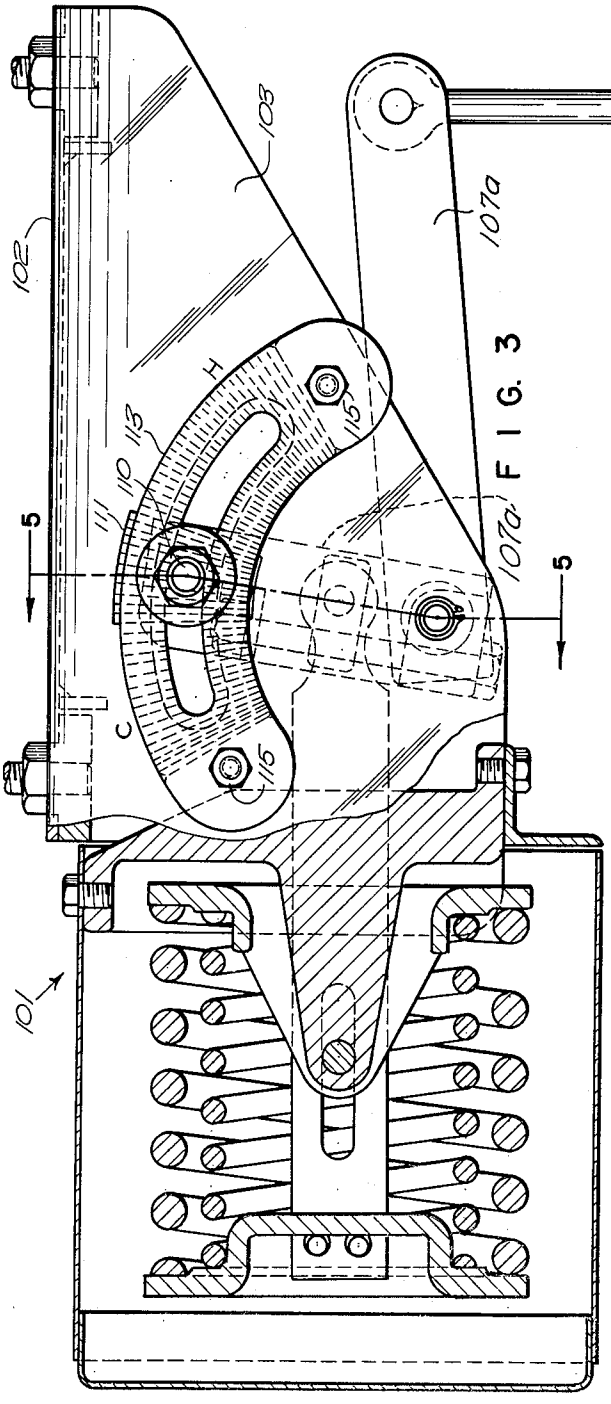


FIG. 3

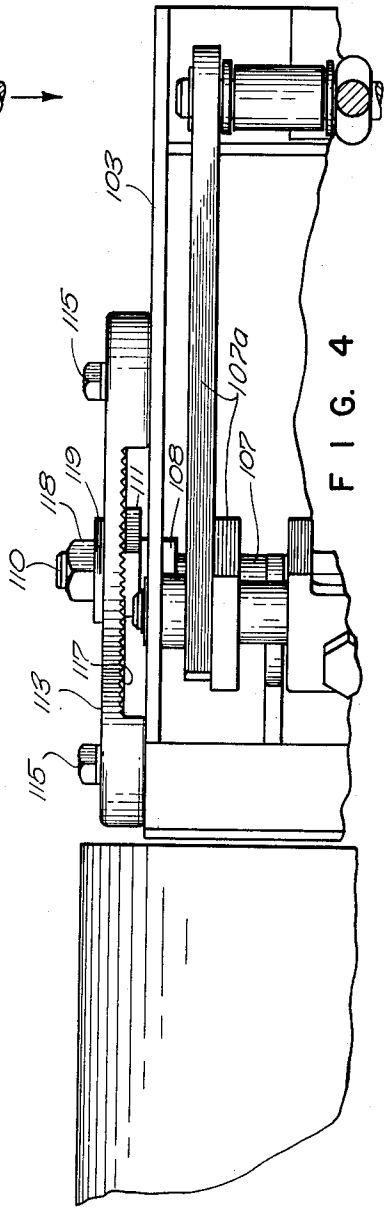


FIG. 4

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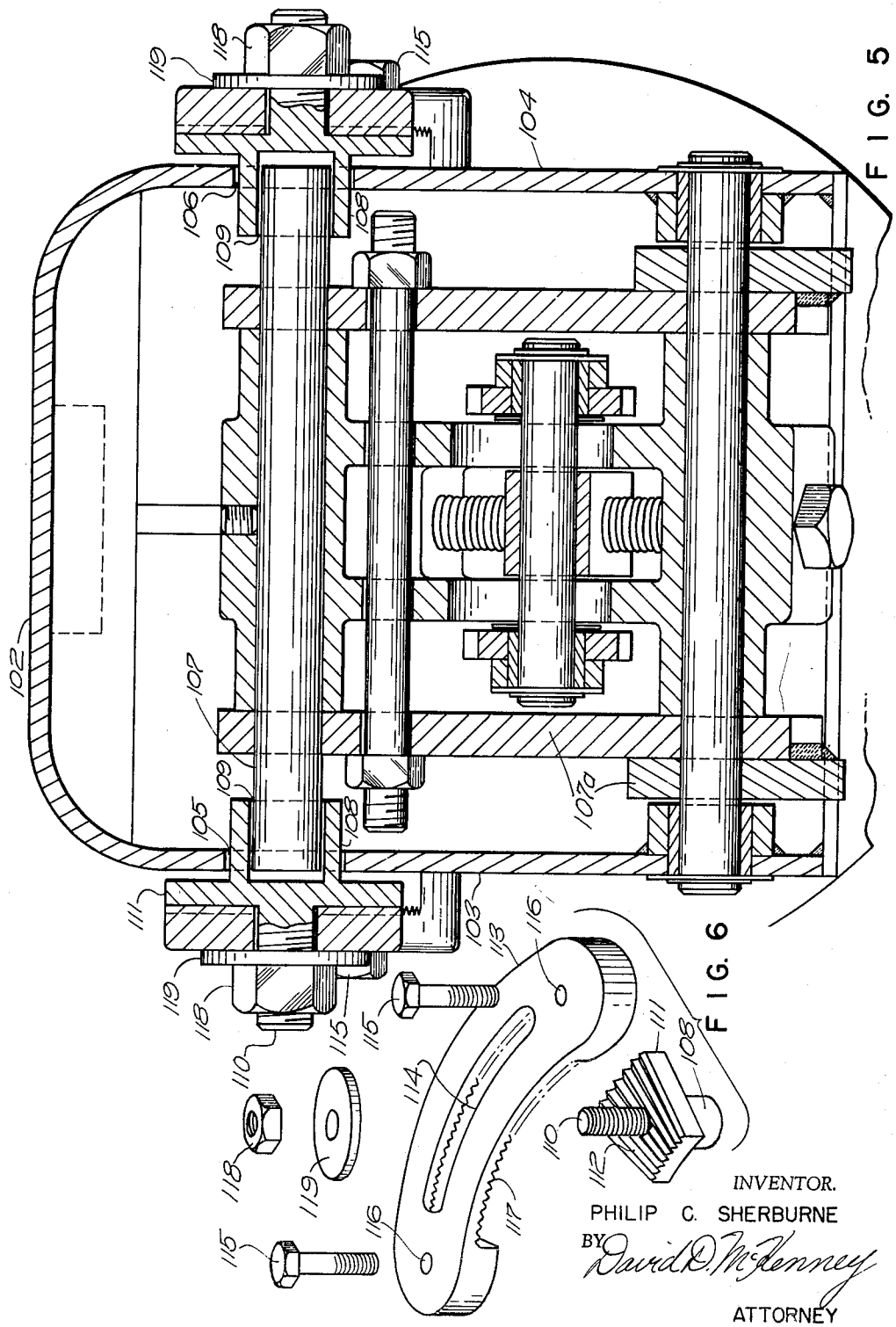


FIG. 5

FIG. 6

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United States Patent Office 2,975,995
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# PIPE HANGER CLAMP STOP

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4 Claims. (Cl. 248—54)

This invention relates generally to improvements in spring devices which exert a substantially constant supporting force on a load movable vertically within a limited range, and more specifically relates to a removable clamp stop for such devices.

A spring support typical of the type referred to above is the hanger known in the trade as the constant support hanger for supporting piping which is subject to vertical travel due to changes in temperature. Since the weight and travel of the piping to be supported determine the hanger size and there are many weights and travels there is a large number of hanger sizes available to the public. Each of these is designed to support piping within a given load range for a given travel.

In the normal course of events, the purchaser of such a pipe hanger calculates in advance and as accurately as possible the weight, travel and direction of travel between hot and cold conditions for the particular section of pipeing he desires to support and orders from the hanger manufacturer a hanger which includes this weight and travel within its range. Thereupon, the hanger manufacturer prepares this size of hanger or selects it from those in stock, adjusts it to the load and travel specified by the customer and places on its frame two marks to indicate the positions of the parts for the cold and hot positions of the pipe. The hangers are then sent out from the factory with the parts immobilized in their "cold" positions so as to permit installation in the system. This immobilization of the parts involves deflecting the spring and maintaining it deflected.

The prior practice in immobilizing the hangers was to pass a bolt through one end of a metal strap to the hanger frame and bolt the other end of this strap to the lever connecting the spring to the crank arm. For structural reasons there were generally only two or three bolt holes in the lever so that the hanger could be immobilized in only a limited number of positions, it being impractical to drill the holes specially for each hanger. The result, upon removal of the strap after installation, was generally found to be that the hanger required a final readjustment of considerable degree to make up for the error which was imposed by the limited number of immobilizing positions. Furthermore because of the close spacing between frame, strap and lever the placing of the bolts was an awkward, inconvenient, and time consuming procedure. Moreover, due to the spacing of the holes, rather delicate adjustment of the lever was required to align a hole in the lever with a hole in the strap.

In constrast to these prior devices applicant's device is accurate to one half the base width of one of the teeth on a lock plate which will be described, and this distance is so small that no readjustment is necessary when the lock plate is released. Further, because the lock plate and other parts in applicant's device are generally on the outside of the hanger frame the immobilization and release of the hanger are simple procedures.

After the installation has been completed and tested



and the system placed in operation it is desirable that the hanger, under its hot working conditions, be adjusted so that the indicator pin will be at the hot or "H" point previously computed and stamped in the frame. This is true in hangers employing any immobilizing devices and it means that the hangers usually require a final adjustment for the hot working conditions to furnish the desired support. Consequently, after a period of time, when the system is shut down for maintenance (during which the system is tested with water under pressure) the hangers very rarely return to their original cold position. One reason for this is that the final hot working adjustment usually has reoriented the operating range of the hanger within its total range. If, during the maintenance period, the hangers can be immobilized for the testing in this new cold position, then upon restoring the system to operation it will be found that the hangers will be operating at their correct "H" position. However, this has not been possible with the prior practice of using straps and bolts, because of the likelihood that none of the limited number of immobilizing positions will correspond to the new cold position, so that considerable movement has been required to align a bolt hole in the strap with a bolt hole in the lever. This means that each time the system using hangers with the prior devices is shut down the position of the pipe with respect to the hangers must be adjusted so that the pipe will again be properly supported under the water load at the required alignment to prevent unnecessary stress in the system and to permit the system to drain properly after the water test, and then upon restoration of the system to operation, an additional adjustment must be made to bring the hanger back to its proper hot or "H" position.

Because the present invention permits a hanger to be immobilized in any operating or cold position without extensive movement, none of the above described additional adjustments are necessary when a system is shut down and then restored to operation.

An object of this invention is to provide an improved clamp stop which will permit a hanger to be accurately pre-set.

Another object of this invention is to provide a stop which will not require the removal of material from the hanger spring lever and thus possibly cause structural weakening.

Still another object of this invention is to provide a clamp stop which will fix a hanger in any desired cold position so that upon restoration of the hanger to operation subsequent corrective adjustments will not be required.

Other objects will appear hereinafter.

The present invention and its objects will be better understood by those skilled in the art from the following description taken with the drawings which accompany this specification and in which:

Figure 1 is a perspective view partly broken away showing a constant support hanger immobilized in the cold position by the prior art bolted locking device;

Figure 2 is a cross-sectional detail of the prior locking device taken along the line 2—2 of Figure 1;

Figure 3 is a side elevation sectional view showing a constant support hanger with the locking device of the present invention fastened thereto and locking said hanger at an intermediate position;

Figure 4 is a partial view of the apparatus of Figure 3 as viewed from below;

Figure 5 is an end sectional view taken along line 5—5 of Figure 3 and showing a clamp stop at each end of the indicator pin;

Figure 6 is an exploded perspective of the components of the clamp stop itself.

Referring now more particularly to the drawings, Figs. 1 and 2 which show the prior art device have been included to assist in an understanding of the prior proposals inasmuch as no patents or literature show them, as far as is known. In these figures the numeral **1** indicates a standard form of constant support spring hanger which has a frame **2** with a slot **3** through which extends an indicator pin **4** fastened to a bell crank *4a*. To lock said hanger, a bolt **5** is passed through hole **6** in the frame and screwed into threaded hole **7** of strap **8** (see Fig. 2). A bolt is also passed through any one of holes **10** in the lever **11** (fastened to an end plate, not shown, on the outer end of the hanger spring) and then screwed into the more convenient of threaded holes **12** in the strap **8**. It is thus seen that it would require considerable movement to align a hole **10** with a hole **12** before the hanger rod **11** would be immobilized and that much material is removed from the lever **11** during the formation of holes **10**.

Turning now to the present invention clearly shown in Figures 3 to 6 inclusive, the frame of the hanger **101** is indicated at **102**. Through the side portions **103** and **104** of the frame are slots **105** and **106** through which indicator pin **107**, fastened to a bellcrank lever **107***a* of the hanger, extends. During the operation of the hanger the position of the indicator pin will vary between the "C" (cold) and "H" (hot) points (seen in Figure 3) of the slot **105**.

To immobilize the hanger the following procedure is set out. A cap **108** having a hollowed portion **109** is fitted over the end of pin **107**. Extending outward from the base of the cap is a threaded rod **110**. At the junction of the cap and rod is a shoulder portion **111** having teeth **112** on its outwardly exposed face. The preferred form of this invention shows the rod, shoulder portion and cap as a single unit, but it is obvious that the rod **110** may be a separate unit inserted through the base of the cap **108** and retained there and that shoulder portion **112** may be a separate unit bored so as to fit over the rod **110** against the base of cap **108**. A slotted plate **113** is placed over the rod with the slot **114** in the plate straddling the rod and having the centerline of its slot superimposed over the centerline of the adjacent slot **105** in the frame. Fastening this plate to the frame are threaded bolts **115** which are passed through holes **116** in the plate and into tapped holes in the frame. On the inner surface of the plate are teeth **117** which are equal in size and spacing to the teeth **112** of the shoulder portion. When the nut **118** is screwed down on the rod **110** into abutment with washer **119**, the cap and shoulder portion will be drawn outwardly causing the teeth **112** of the shoulder portion to interlock with the teeth **117** of the plate **113**, thereby locking the indicator pin **107** and thus immobilizing the hanger.

To free the hanger after any necessary adjustments have been performed, bolts **115** are removed and the entire locking assembly lifted clear thus leaving the indicator pin **107** free to move in slot **105** as the hanger lever **107***a* moves with load movements.

It will be understood by those skilled in the art that the hollowed portion **109** may be placed in the end of the indicator pin **107** and a projection instead of cap **108** extended from member **111** and inserted in said hollowed portion, to obtain the described locking action, without deviating from the spirit of said invention.

I claim:

1. In a constant support hanger of the type described having a frame and a lever member pivoted thereon, a clamp stop assembly comprising an elongated toothed surface on said frame extending along the path traced by a point on said lever member when the lever swings about its pivot, a clamp member having a point thereon, a projection on one of said members at its said point, a socket on the other said member at its said point receiving said projection, said clamp member also having a toothed surface presented to said toothed surface on said frame, and means for drawing said toothed surfaces into interlocking engagement, whereby the lever may be fixed with respect to the frame at any selected position in its range of swing.



2. In a constant support hanger of the type described wherein said hanger has a frame member and a lever pivoted thereon with an indicator pin extending therefrom through a slot in said member, a clamp stop device comprising a cap extending through said slot in the frame member and engaging the end portion of said indicator pin, a projecting member extending externally of said cap, a flat shoulder extending perpendicularly outwardly of said projecting member at the latter's base and substantially parallel to the frame member, said shoulder having closely spaced teeth on its outermost surface, a slotted member fastened to said frame member externally of and substantially parallel to said shoulder with its slot superimposed over the slot in the frame and receiving said projecting member through its slot, said slotted member having teeth on its surface nearest the shoulder and complementary to the teeth on said shoulder, and means cooperative with said projecting member for forcing said teeth on said shoulder into engagement with said teeth on said slotted member.

3. In an adjustable spring device having a frame member and a lever pivoted thereon with an indicator pin extending therefrom through a slot in said member, a clamp stop device comprising a cap extending through said slot and engaging the end portion of said pin, a threaded rod extending externally of said cap, a flat shoulder portion extending perpendicularly outwardly of said rod at the latter's base and substantially parallel to the frame member, said shoulder portion having closely spaced teeth on its outermost surface, a slotted member fastened to said frame member externally of and substantially parallel to said shoulder portion with its slot superimposed over the slot in the frame and receiving said rod through its slot, said slotted member having teeth on its surface nearest the shoulder portion and complementary to the teeth on said shoulder portion, and a threaded nut on said rod for forcing said teeth on said shoulder portion into engagement with said teeth on said slotted member.

4. In an adjustable spring device having a frame member and a lever pivoted thereon with an indicator pin extending therefrom through a slot in said member, a clamp stop device comprising a cap extending through said slot and engaging the end portion of said pin, a threaded rod extending externally of said cap, a flat shoulder extending perpendicularly outwardly of said rod at the latter's base and substantially parallel to said shoulder portion and integral with said rod and said cap, said shoulder having closely spaced teeth on its outermost surface, a slotted member fastened to said frame member externally of and substantially parallel to said shoulder portion with its slot superimposed over the slot in the frame and receiving said rod through its slot, said slotted member having teeth on its surface nearest the shoulder and complementary to the teeth on said shoulder and a threaded nut on said rod for forcing said teeth on said shoulder into engagement with said teeth on said slotted member.

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