Jan. 31, 1928. 1,657,670

B. F. FITCH

CRANE SAFETY DEVICE

Filed July 11, 1925 2 Sheets-Sheet 1

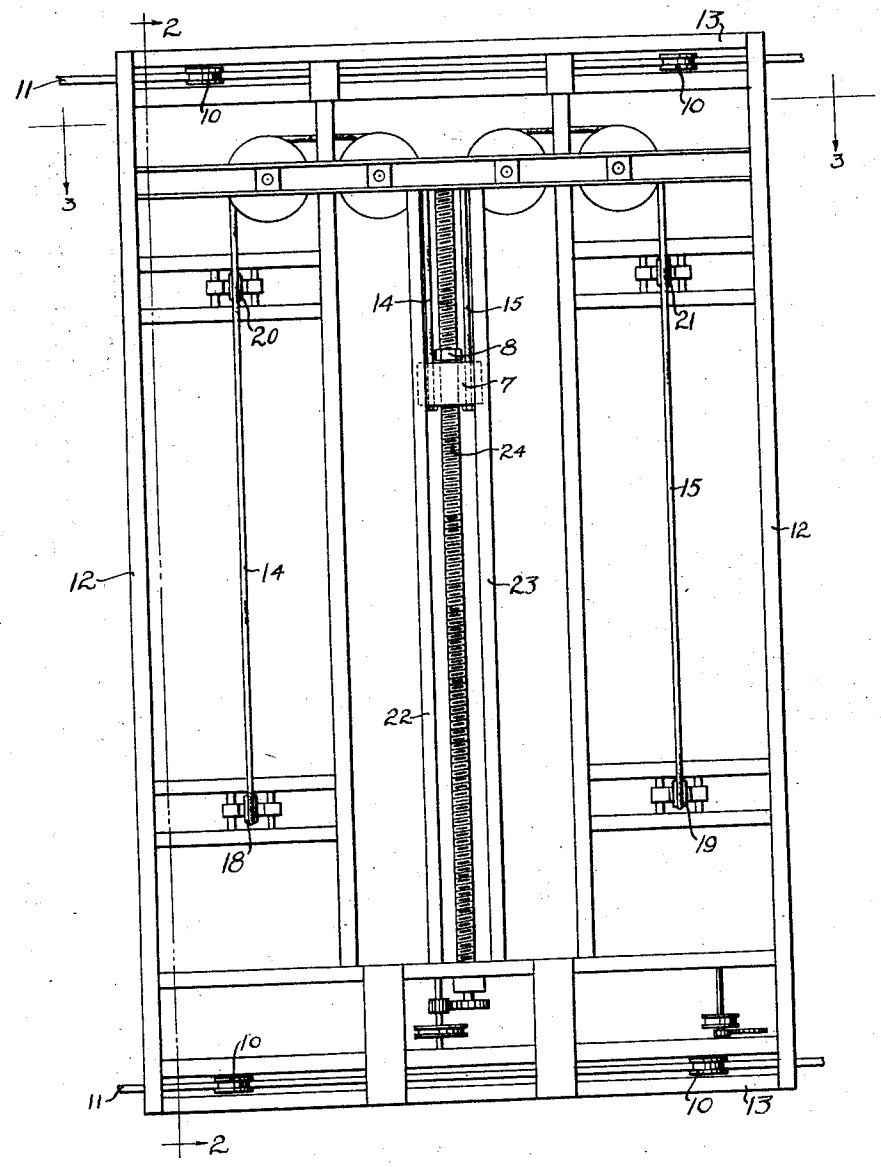


FIG-1

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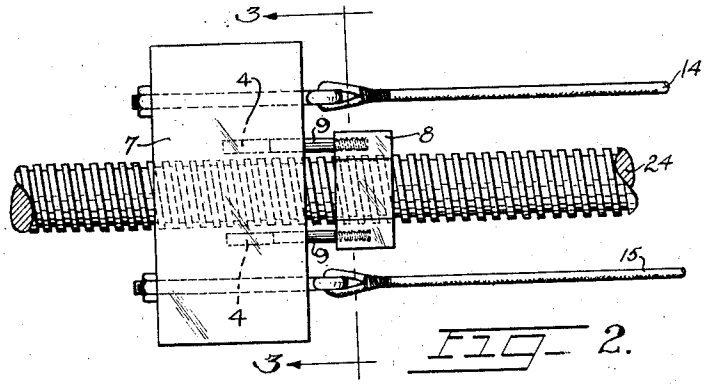


FIG. 2.

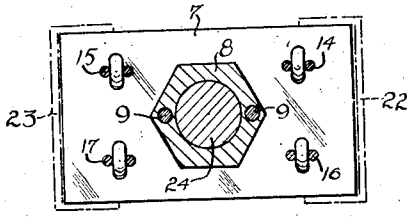


FIG. 3.

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UNITED STATES PATENT OFFICE.

BENJAMIN F. FITCH, OF GREENWICH, CONNECTICUT.

CRANE SAFETY DEVICE.

Application filed July 11, 1925. Serial No. 42,891.

This invention relates to a mechanism which is adapted for use in connection with the raising of a load by means of a crane.

In the operation of a crane embodying a screw and nut couple, one member of which is rotated, while the other member is moved along the crane and is attached to the load, there is considerable strain placed upon the threaded portions of the coacting member especially when a heavy load is being raised or lowered. Moreover, if any wear should occur in such threaded portion it is difficult to determine the extent of such wear without dismantling a large part of the crane structure.

One of the objects of the present invention is the provision of a safety appliance which may be used in connection with the operation of a crane embodying a screw and nut couple as part of the hoisting mechanism. More particularly, my invention contemplates the provision of an emergency nut which normally functions without bearing any of the load stresses, but which is adapted to counteract such stresses and thereby to prevent damage in the event of failure of the threaded portion between the screw and nut couple.

I have illustrated my invention in connection with an overhead traveling crane wherein Fig. 1 is a plan view of such crane; Fig. 2 is a plan view on an enlarged scale showing the emergency nut feature embodying my invention; and Fig. 3 is a section taken on the plane indicated by the line 3—3 in Fig. 2.

The crane which I have illustrated in connection with my invention is illustrated as being supported by wheels 10 which travel on an overhead track 11. The wheels are journalled within a frame which may comprise longitudinal members 12 and transverse members 13 which are arranged in the form of a rectangle. The frame work may comprise channel beams which are held together in any convenient manner.

The hoisting mechanism shown comprises cables 14, 15, 16 and 17 which extend over sheaves 18, 19, 20 and 21 respectively. The sheaves are arranged adjacent the corners of a rectangle whereby the vertical reaches of the cables may engage a removable truck body adjacent the four corners of a rectangle. To move the sheaves simultaneously I have shown a screw and nut couple which is disposed adjacent the mid portion of the frame. The load carrying nut 7, as shown, is attached to the cables and is arranged to be guided while moving longitudinally of the frame by guides 22 and 23. Such movement is effected whenever the screw or threaded shaft 24 is rotated.

An important advantage of my invention is the fact that a simple expedient is provided for insuring safe operation of the hoisting apparatus against failure of the threads on the nut where a screw and nut couple is employed in connection with such apparatus. A further advantage is the fact that normally the emergency nut is out of contact with the load bearing nut, wherefore, the emergency nut normally assumes no load stresses during the normal operation of the load bearing nut.

In the preferred form, the safety appliance embodying my invention comprises an emergency nut indicated at 8 which may be threaded onto the shaft 24 so as normally to be out of contact with the nut 7, but to be operatively connected therewith, if the nut 7 should fail. As shown the connection is made by pins 9 which are rigid with the nut 8 but are loosely mounted in sockets 4 in the other nut. The nut 7 is ordinarily made of bronze and is arranged to carry all of the load stress while the nut 8 is preferably made of steel and is normally inactive but may carry the load as an emergency.

In the event of failure of the nut 7 due to wear on the threads, the nut 7 will be forced against the nut 8 whereupon the load stress will then be placed upon the emergency nut. The pins prevent one nut from turning with reference to the other nut while the guides prevent the load bearing nut from turning whenever the shaft is rotated. In this way, I provide an emergency feature which would be sufficiently strong to support the load for a limited time.

I claim:

In a hoisting mechanism, the combination with a frame, of a rotatable screw shaft mounted thereon, a main nut in threaded engagement with the shaft, a plurality of eye-bolts extending through the main nut on opposite sides of the shaft and adapted

to be attached to load supporting cables, said main nut having a plurality of sockets therein opening in a direction toward the cables, an emergency nut spaced from the main nut and in threaded engagement with the shaft and having pins carried thereby and projecting into said sockets, the depth of said sockets being sufficient to permit abutting of the main nut with the auxiliary nut in case of failure of the threads of the main nut.

In testimony whereof, I hereunto affix my signature.

BENJAMIN F. FITCH.