Jan. 14, 1958 R. W. LANG 2,819,789

HOIST BLOCK

Filed Aug. 10, 1956 2 Sheets-Sheet 1

FIG. 1

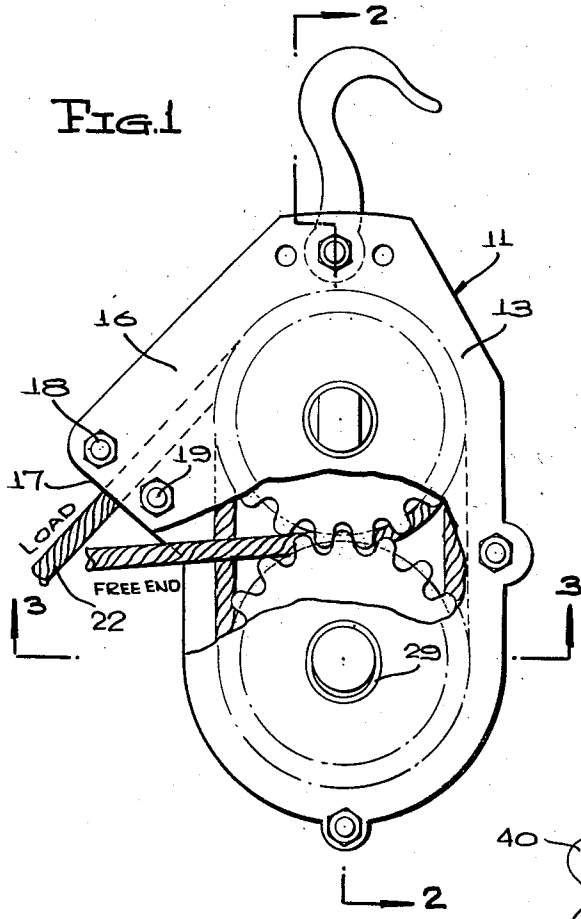


FIG. 2

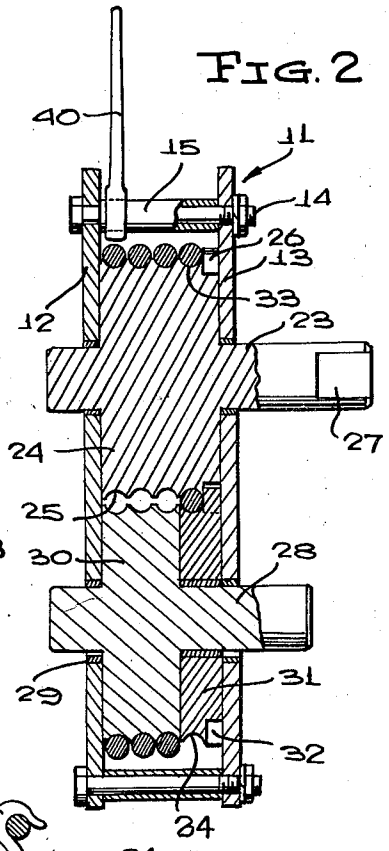


FIG. 1-A

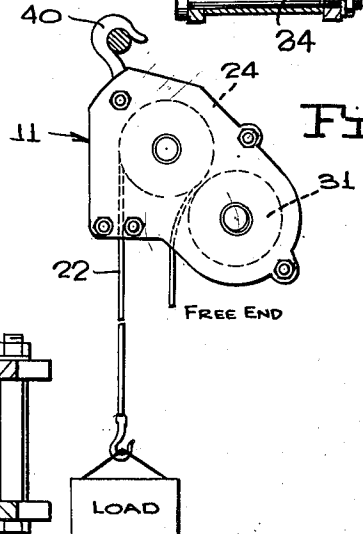
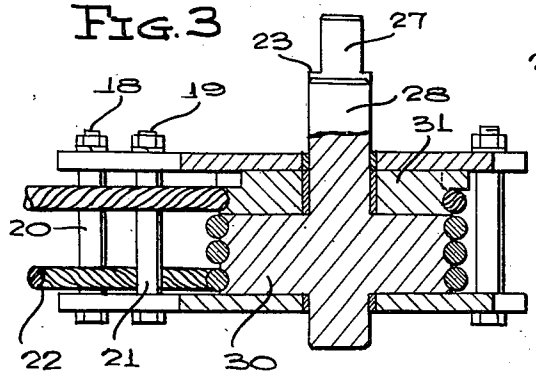


FIG. 3



INVENTOR.
RAYMOND W. LANG.

BY

McMorrow, Berman & Davidson
ATTORNEYS

Jan. 14, 1958 R. W. LANG 2,819,789

HOIST BLOCK

Filed Aug. 10, 1956 2 Sheets-Sheet 2

FIG. 4

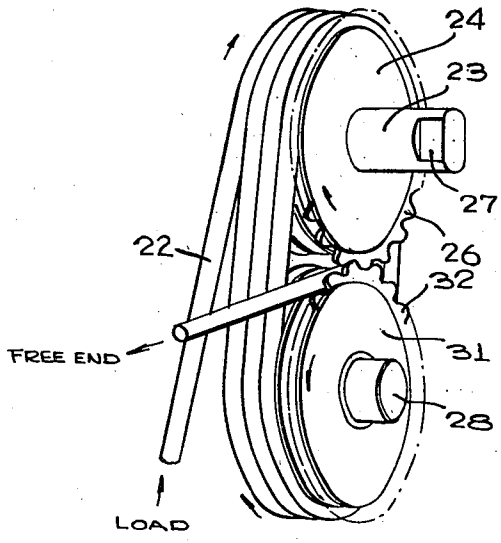


FIG. 5

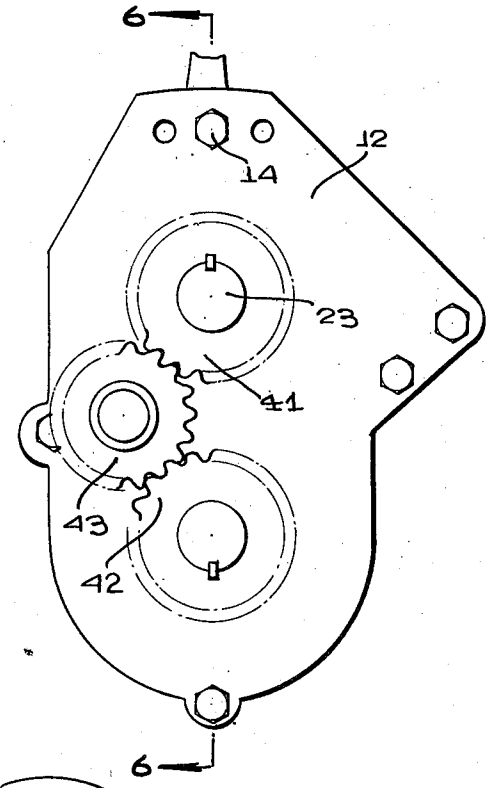
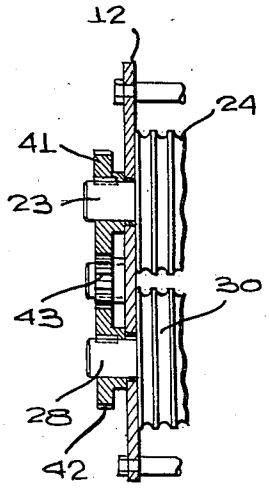


FIG. 6



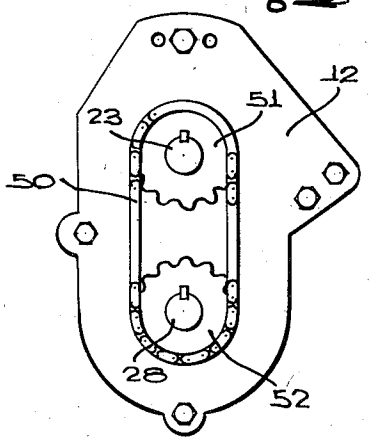


FIG. 7

INVENTOR.
RAYMOND W. LANG

BY

McMorrow, Berman + Davidson
ATTORNEYS

United States Patent Office 2,819,789 Patented Jan. 14, 1958

2,819,789

HOIST BLOCK

Raymond W. Lang, Fresno, Calif.

Application August 10, 1956, Serial No. 603,311

5 Claims. (Cl. 203—220)

This invention relates to improvements in hoist blocks, and more particularly to a hoist block of the type provided with means to clampingly secure a portion of the cable employed thereon to prevent slippage of the cable relative to the hoist block under loading conditions.

A main object of the invention is to provide a novel and improved hoist block which is simple in construction, which provides a positive means of applying the forces involved in the raising and lowering of a load thereby to the cable employed without deforming the cable or damaging it in any way, and whereby the life of the cable is greatly extended as compared to that found in devices of the prior art.

A further object of the invention is to provide an improved hoist block which is relatively inexpensive to manufacture, which is rugged in construction, which allows the user to insert any length of cable, whereby the travel distance of the load is limited only by the length of the cable employed, and wherein means is provided for positively holding the cable against the pull of the load, greatly decreasing the hazards in devices of this type heretofore encountered from slippage of the cable relative to the hoist block under loading conditions.

Further objects and advantages of the invention will become apparent from the following description and claims, and from the accompanying drawings, wherein:

Figure 1 is a side elevational view, partly broken away, of a hoist block constructed in accordance with the present invention.

Figure 1*a* is a diagrammatic side elevational view of the hoist block of Figure 1 illustrating the manner in which the hoist block is mounted to support a load.

Figure 2 is a vertical cross sectional view taken on line 2—2 of Figure 1.

Figure 3 is a horizontal cross sectional view taken on line 3—3 of Figure 1.

Figure 4 is a diagrammatic view illustrating the manner in which the cable is wound around the hoist block sheave in Figures 1 to 3.

Figure 5 is a fragmentary side elevational view illustrating the modification of the hoist block of the present invention.

Figure 6 is a fragmentary vertical cross sectional view, to a reduced scale, taken on line 6—6 of Figure 5.

Figure 7 is a side elevational view illustrating a further modification of the hoist block of the present invention.

Referring to the drawings, and more particularly to Figures 1 through 4, 11 designates generally an improved hoist block according to this invention, the hoist block 11 comprising a housing consisting of a pair of spaced plate members 12 and 13 rigidly connected together by a plurality of bolts 14 and spaced in parallel relationship by respective sleeve elements 15 mounted on the bolts between the plate members, as is clearly shown in Figure 2. The plate members are formed at their upper portions with laterally extending projections 16 having downwardly and inwardly inclined edge portions 17, the projections

16 being connected by a pair of spaced parallel bolts 18 and 19 located adjacent the edge portions 17 and being provided with spacer sleeves 20 and 21 thereon between the plate projections 16, defining guide means for the loaded portion of a cable 22 engaged on the hoist block. As shown in Figure 1, the free end portion of the cable passes beneath the lower guide bolt 19 and is arranged in a manner presently to be described.

The cable 22 may be any suitable flexible member of substantial strength, such as steel wire rope, or the like.

Designated at 23 is a first shaft which is journaled between the upper portions of the plates 12 and 13 and which is integrally formed with a multiple grooved pulley 24 having the peripheral grooves 25.

As shown in Figure 2, the pulley 24 is rotatably received between the plates 12 and 13, and is formed adjacent the plate 13 with the gear teeth 26. Shaft 23 is provided at one end with a non-circular portion 27, whereby the shaft may be coupled to any suitable power means, such as an electric motor, or similar drive means.

Designated at 28 is a second shaft which is rotatably and slidably mounted between the plates 12 and 13 below and parallel to the shaft 23, the shaft 28 being received in elongated bearings 29, said bearings being elongated vertically, as viewed in Figures 1 and 2, whereby the shaft 28 may move between a position wherein it is rotatably supported in the upper portions of the elongated bearings 29 and the lower ends of said elongated bearings, as viewed in Figures 1 and 2.

Integrally formed with the shaft 28 is a multiple groove pulley 30 similar to the pulley 24 but having one less peripheral groove therein, as is clearly shown in Figure 2. Rotatably mounted on shaft 28 between the pulley 30 and the plate 13 is a peripherally grooved disc member 31 whose peripheral groove is in registry with the end peripheral groove of the pulley 24. The disc member 31 is formed with the peripheral gear teeth 32 which mesh with the gear teeth 26 of pulley 24.

As shown in Figure 4, the cable 22 is engaged around the respective pulleys 24 and 30, the turns of the cables being received in the peripheral grooves of said pulleys, the free end of the cable passing between the end peripheral groove of pulley 24, shown at 33 and the peripheral groove of the disc member 31 shown at 34. As will be readily apparent the load applied to the cable 22 will create tension in the cable which will cause the pulley 30 to be moved toward the pulley 24, whereby the shaft 28 likewise will be moved toward the pulley 24, causing the disc member 31 to approach said pulley 24 and to exert clamping force on the free end of the cable, disposed in the groove 33 and groove 34. Since the disc member 31 is gearingly coupled to the pulley 24 because of the meshing engagement of the gear teeth 26 and 32, disc member 31 rotates in a direction opposite to pulley 24, whereby clamping force may be exerted on the free end of the cable at all times responsive to the rotation of the driving shaft 23, and whereby the cable is positively coupled to the main pulley 24 and moves responsive to the rotation of said main pulley, either in a direction to wind up the cable and to lift the load or in the opposite direction to unwind the cable and to lower the load.

It will be noted that the plurality of turns of the cable around the pulleys 24 and 30 provides a means coupling the pulleys together for simultaneous rotation in the same direction, the rotation of the pulley 30 being independent of the rotation of the disc member 31, since the disc member 31 is merely rotatable on the shaft 28.

As shown in Figures 1, 2 and 3, a suitable supporting hook 40 may be secured to the top spacer sleeve 15, whereby the block may be suitably supported when in use.

In the form of the invention shown in Figures 5 and 6,

the pulleys **24** and **30** are supported between the plates **12** and **13** in the same manner as in Figures 1 to 4 and are positively coupled together by the provision of respective gears **41** and **42** on the ends of shafts **23** and **28** and an idler gear **43** rotatably mounted on the plate member **12** between the gears **41** and **42** and in meshing engagement with said gears **41** and **42**, whereby the pulleys **24** and **30** are coupled together for simultaneous rotation in the same direction. The structure of Figures 5 and 6 is otherwise the same as in Figures 1 to 4.

As an alternative means of coupling the pulleys **24** and **30** together for simultaneous rotation, a sprocket chain **50** may be employed engaging on sprocket wheels **51** and **52** secured respectively on the ends of shafts **23** and **28**, as shown in Figure 7, whereby the shafts **23** and **28**, otherwise supported in plates **12** and **13** in the same manner as in Figures 1 to 4, are coupled together for simultaneous rotation in the same direction, and whereby the pulleys **24** and **30** are thus similarly coupled together for simultaneous rotation in the same direction. The structure of Figure 7 is otherwise the same as in Figures 1 to 4.

While certain specific embodiments of the improved hoist block have been disclosed in the foregoing description, it will be understood that various modifications within the spirit of the invention may occur to those skilled in the art. Therefore it is intended that no limitations be placed on the invention except as defined by the scope of the appended claims.

What is claimed is:

1. In a hoist block, a housing comprising a pair of spaced plate members and means rigidly connecting said plate members in parallel relation, a first shaft journaled between said plate members, a plural-grooved pulley rigidly secured on said first shaft, a second shaft, means rotatably and slidably supporting said second shaft between said plate members for adjustment toward said pulley, a second plural-grooved pulley rigidly secured on said second shaft, a disc member having a peripheral groove rotatably mounted on said second shaft adjacent the end peripheral groove of the first named pulley, means coupling said first named pulley and disc member for simultaneous rotation in opposite directions, whereby the ends of a cable engaged on the pulleys may be clampingly received between said end groove and the groove in the periphery of said disc member, and means coupling said pulleys together for simultaneous rotation in the same direction.

2. In a hoist block, a housing comprising a pair of spaced plate members and means rigidly connecting said plate members in parallel relation, a first shaft journaled between said plate members, a plural-grooved pulley rigidly secured on said first shaft, a second shaft, means rotatably and slidably supporting said second shaft between said plate members for adjustment toward said pulley, a grooved pulley rigidly secured on said second shaft, a disc member having a peripheral groove rotatably mounted on said second shaft adjacent the end peripheral groove of the first named pulley, meshing gear teeth on the peripheries of said first named pulley and said disc member coupling said first named pulley and disc member for simultaneous rotation in opposite directions, whereby the end of a cable engaged on the pulleys may be clampingly received between said end groove and the groove in the periphery of said disc member, and means coupling said pulleys together for simultaneous rotation in the same direction.

3. In a hoist block, a housing comprising a pair of spaced plate members and means rigidly connecting said plate members in parallel relation, a first shaft journaled between said plate members, a plural-grooved pulley rigidly secured on said first shaft, a second shaft, means rotatably and slidably supporting said second shaft between said plate members for adjustment toward said pulley, a grooved pulley rigidly secured on said second shaft, a disc member having a peripheral groove rotatably mounted on said second shaft adjacent the end peripheral groove of the first named pulley, meshing gear teeth on the peripheries of said first named pulley and said disc member coupling said first named pulley and disc member together for simultaneous rotation in opposite directions, whereby the end of a cable engaged on the pulleys may be clampingly received between said end groove and the groove in the periphery of said disc member, and a cable engaged around the pulleys and received in the top portions of the grooves of the first named pulley and in the lower portions of the grooves of the second named pulley, coupling said pulleys together for simultaneous rotation in the same direction.

4. In a hoist block, a housing comprising a pair of spaced plate members and means rigidly connecting said plate members in parallel relation, a first shaft journaled between said plate members, a plural-grooved pulley rigidly secured on said first shaft, a second shaft, means rotatably and slidably supporting said second shaft between said plate members for adjustment toward said pulley, a grooved pulley rigidly secured on said second shaft, a disc member having a peripheral groove rotatably mounted on said second shaft adjacent the end peripheral groove of the first named pulley, meshing gear teeth on the peripheries of said first named pulley and said disc member coupling said first named pulley and disc member for simultaneous rotation in opposite directions, whereby the end of a cable engaged on the pulleys may be clampingly received between said end groove and the groove in the periphery of said disc member, and a gear train carried by said shafts and said housing coupling said pulleys together for simultaneous rotation in the same direction.

5. In a hoist block, a housing comprising a pair of spaced plate members and means rigidly connecting said plate members in parallel relation, a first shaft journaled between said plate members, a plural-grooved pulley rigidly secured on said first shaft, a second shaft, means rotatably and slidably supporting said second shaft between said plate members for adjustment toward said pulley, a grooved pulley rigidly secured on said second shaft, a disc member having a peripheral groove rotatably mounted on said second shaft adjacent the end peripheral groove of the first named pulley, meshing gear teeth on the peripheries of said first named pulley and said disc member coupling said first named pulley and disc member for simultaneous rotation in opposite directions, whereby the end of a cable engaged on the pulleys may be clampingly received between said end groove and the groove in the periphery of said disc member, sprocket wheels on the respective shafts, and a sprocket chain engaged on said sprocket wheels coupling said pulleys together for simultaneous rotation in the same direction.

References Cited in the file of this patent

UNITED STATES PATENTS

1,682,083 Johnston ..... Aug. 28, 1928