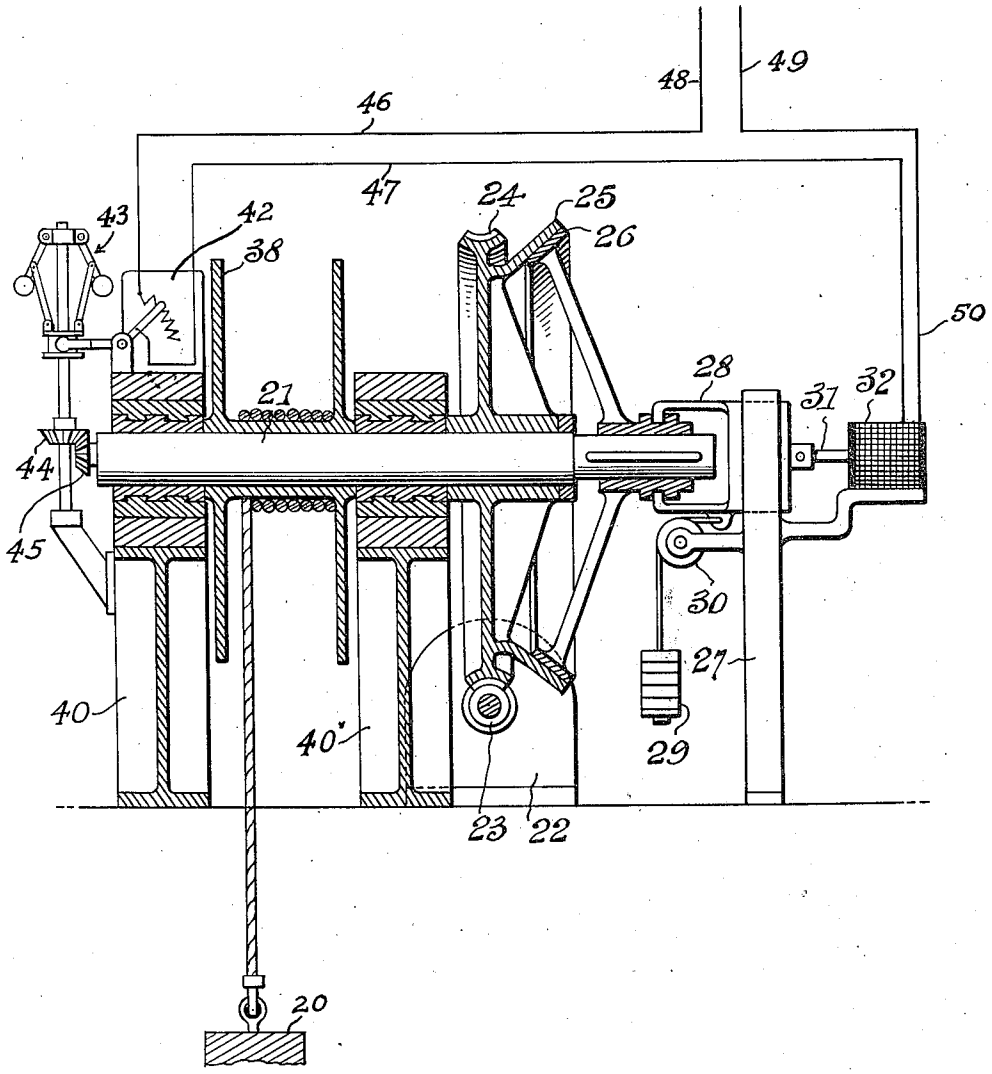
Aug. 29, 1944. J. KALIX 2,356,762

HOIST

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HOIST

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2 Claims. (Cl. 192—90)

(Granted under the act of March 3, 1883, as amended April 30, 1928; 370 O. G. 757)

The invention described herein may be manufactured and used by or for the Government for governmental purposes, without payment to me of any royalty thereon.

This invention relates to improvements in hoisting apparatus adapted for use in dam gates such as shown in my copending application Serial No. 430,038, filed February 9, 1942, now Patent No. 2,311,666, dated Feb. 23, 1943, of which this application is a division.

It is an object of this invention to provide an improved hoisting mechanism which will insure a smooth operation of the gate with the minimum of power requirements.

It is a further object of my invention to provide a hoisting mechanism which may be readily removed for maintenance and repairs.

These and other objects of my invention will be clear from a consideration of the following description and the accompanying drawing in which the figure represents a vertical cross-section of an embodiment of the invention.

The operation of my improved hoisting mechanism will be clear from a consideration of the drawing. The drum 38 is rotated by means of a motor 22 which carries a worm gear 23 which in turn drives the wheel 24 loosely mounted on the main shaft 21 which is supported by pedestal bearings 40 and 40'. The wheel 24 is provided with a friction disk or driving clutch member 25 arranged to be engaged by the driven clutch member 26 which is slidably keyed to the main shaft 21. A support 27 is arranged to act as a bearing sleeve for the clutch operator 28. An adjustable weight 29 is arranged through a system of idlers 30 to normally force the driven clutch member 26 into engagement with the friction disk 25. The clutch operator carries a plunger 31 arranged to be operated by the solenoid 32. During hoisting operations, the solenoid 32 is unenergized and the weight 29 keeps the driven clutch member 26 engaged with the driving clutch member 25. Since the clutch 25 is keyed to the main shaft 21, operation of the motor 22 will cause the drum 38 to rotate, elevating the gate 20. As the wheel 24 cannot drive the worm gear 23, deenergization of the motor 22 will leave the gate locked in position as long as the solenoid 32 remains unenergized. When it is desired to lower the gate, the solenoid 32 is energized. The energization of the solenoid releases the clutch 26 and allows the drum 38 to rotate, the gate being lowered by its own weight. The relative slip between the clutch 26 and the friction disk 25 will determine the rate of closing and may be controlled by regulating the amount of current supplied to the solenoid. The rate of fall may be automatically controlled by connecting the solenoid current controller or rheostat 42 to a governor 43 connected by bevel gears 44 and 45 to the main shaft 21. The rheostat is connected by conductor 46 to a power line 48 and to the solenoid 32 by the conductor 47, and the solenoid is connected to a power line 49 by the conductor 50.

While I have illustrated a particular embodiment of my invention, it is to be understood that I do not wish to be limited to the particular details and arrangement disclosed since various modifications within the spirit of the invention will suggest themselves to one skilled in the art.

Having described my invention, what I claim as new and wish to secure by Letters Patent is:

1. A device for the purpose set forth comprising a rotatably mounted shaft, a hoisting drum rigidly connected to said shaft and adapted to elevate and lower a gate, a driving clutch member including a worm wheel rotatably mounted upon said shaft, a driven clutch member provided with a grooved sleeve, slidably keyed to said shaft and adapted to rotate therewith, a motor driven worm gear in mesh with said worm wheel adapted to rotate said drum upon frictional engagement of said clutch members, a clutch operating member connected to said driven clutch member, an adjustable weight and a solenoid connected to said clutch operating member and adapted to move said driven clutch member respectively into and out of frictional engagement with said driving clutch member, a governor operatively connected to said shaft, a current controller connected to be operated by said governor for controlling the energization of said solenoid and thereby regulating the speed of said drum.

2. A device for the purpose set forth comprising a shaft rotatably mounted in pedestal bearings, a hoisting drum rigidly connected to said shaft and adapted to elevate and lower a gate, a driving clutch member formed integral with a worm wheel rotatably mounted upon said shaft, a driven clutch member provided with a grooved sleeve slidably keyed to said shaft and adapted to rotate therewith, a motor driven worm gear in mesh with said worm wheel adapted to rotate said drum upon frictional engagement with said clutch members, a support, a clutch operator slidably mounted in said support and connected to said driven clutch member by engagement with the grooves in said sleeve, an adjustable weight

connected with said clutch operator adapted to normally retain the clutch members in frictional engagement, and a solenoid including an energizing circuit therefor mounted upon said bearing support and connected with said clutch operating member adapted to cooperate with said adjustable weight to control the degree of frictional engagement of said clutch members for elevating said gate and for lowering the same, and a governor, a current controller connected to be operated by said governor, said current controller embodying means in said energizing circuit and operable by said governor to regulate the energization of the solenoid and thereby control the degree of relative slip between the clutch members and the speed of said drum.

JOHN KALIX.