

K. IWAHORI.

HOIST.

APPLICATION FILED MAY 20, 1909.

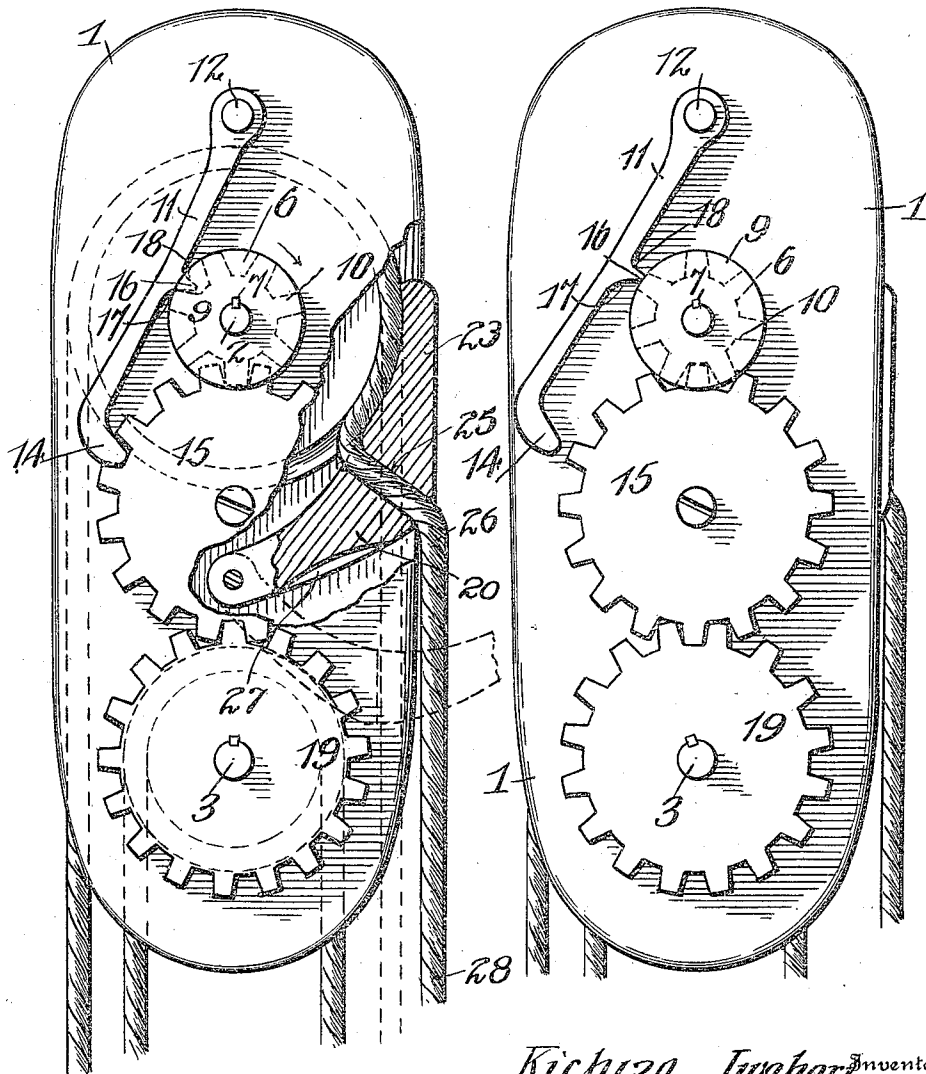
952,742.

Patented Mar. 22, 1910.

2 SHEETS—SHEET 1.

Fig. 1.

Fig. 2.



Kichizo Iwahori Inventor

Witnesses

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2 SHEETS—SHEET 2.

Fig. 3.

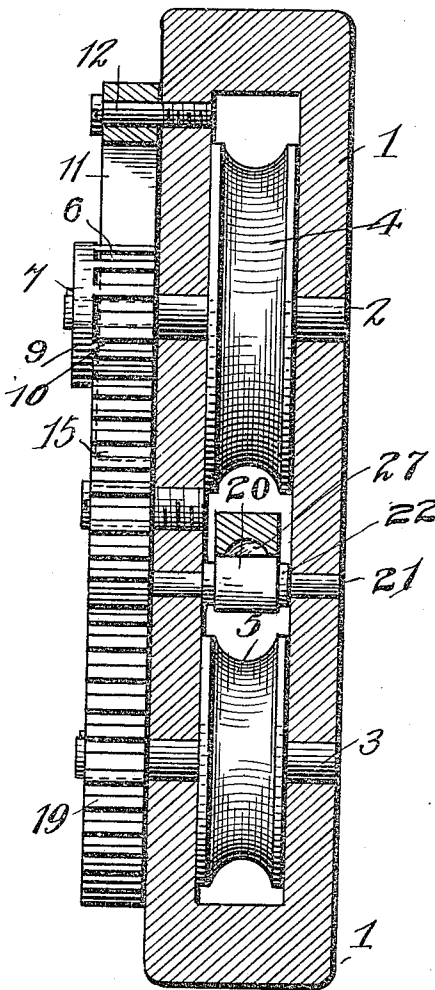


Fig. 4.

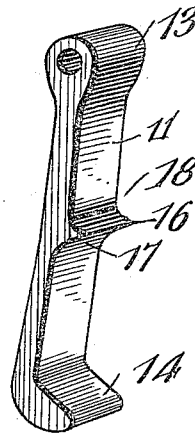


Fig. 5.

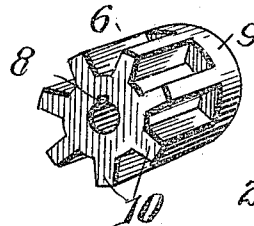
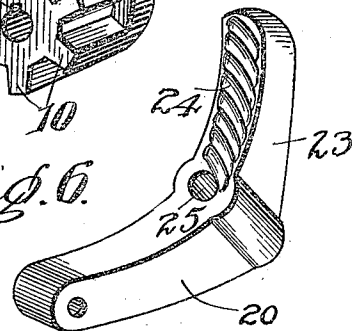


Fig. 6.



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UNITED STATES PATENT OFFICE.

KICHIZO IWAHORI, OF WORCESTER, MASSACHUSETTS.

HOIST.

952,742.

Specification of Letters Patent. **Patented Mar. 22, 1910.**

Application filed May 20, 1909. Serial No. 497,324.

To all whom it may concern:

Be it known that I, KICHIZO IWAHORI, a citizen of Japan, residing at Worcester, in the county of Worcester and State of Massachusetts, have invented certain new and useful Improvements in Hoists, of which the following is a specification, reference being had therein to the accompanying drawing.

This invention relates to pulley blocks and has for its object the production of novel means for automatically locking the gears and preventing the same from rotating in one direction.

Another object of this invention is the production of a pulley block, which is simple in construction, efficient in operation and consists of a comparatively small number of parts.

With these and other objects in view this invention consists of certain novel constructions, combinations, and arrangements of parts as will be hereinafter fully described and claimed.

In the drawings: Figure 1 is a side elevation of the block, showing the block with the pawl in a locked position. Fig. 2 is a side elevation of the same, showing the pawl in an unlocked position. Fig. 3 is a longitudinal section of the same. Fig. 4 is a detail perspective of the locking pawl. Fig. 5 is a detail perspective of the gear for controlling the locking pawl. Fig. 6 is a detail perspective view of the clamping dog.

Referring to the drawings by numerals, 1 designates a casing upon which is journaled shafts 2 and 3, and upon the shafts 2 and 3, and inside of the casing 1, are positioned pulleys 4 and 5. Mounted upon the outer end of the shaft 2 is a pawl-controlling gear 6, which is fixedly secured to the shaft 2 by means of a locking-pin 7, which pin fits in a longitudinally-extending slot 8, formed in the gear wheel and registering with a slot formed upon the shaft 2, therefore, holding the gear 6 against independent rotary movement upon the shaft. It will, therefore, be obvious that the rotation of the gear 6 will be controlled by the rotation of the pulley 4 and vice versa. The gear 6 is provided upon the outer edge thereof with a flange-portion 9, which extends around the periphery of said gear wheel, and has extending to one side thereof teeth portions 10, consti-

tuting the gear. The outer edge of the teeth portions 10 are in the same plane with the outer edge of the flange 9. A dog or pawl 11 is pivotally mounted upon the casing 1 by means of a bolt or screw 12, which passes through the outer-enlarged end 13 of the pawl.

The pawl 11 is provided, at its lower end, with a tooth-engaging portion, or inwardly-extending portion, 1^a, which is adapted to engage teeth upon an intermediate gear 15 hereinafter described. Intermediate the ends of the dog 13 is formed a tapering inwardly-extending portion 16, which is slightly curved upon its lower face 17 and is straight upon its upper face 18, so as to bind against the teeth 10 upon the gear wheel 6. As the gear wheel 6 is rotated and the extension 16 engages the wheel between two of the teeth, and as the gear wheel 6 is rotated farther in the direction of the arrow, shown in Fig. 1, the pawl will be raised out of engagement with the gear wheel 15 for the reason that the edge of the teeth 10 will engage the slightly curved end of said inwardly-extending tapering portion 16 and thereby push the pawl 11 out of engagement with the teeth of both the gears 6 and 15. However, as soon as the gear is rotated, so as to allow the pawl or dog to readily engage the teeth or gears, which is caused by its own weight, the same will engage the teeth of both of the gears and prevent either of the pulleys 4 or 5 from rotating. When the gear 6 tends to rotate left-handedly, or so to speak, counter-clockwise the teeth 10 will bind against the upper surfaces 18 of the inwardly-extending portion 16 and the teeth upon the gear 15 will bind against the lower end of the inwardly-extending portion 14, and thereby firmly hold the pawl in engagement therewith.

It will be obvious that by having the gear 6 provided with a flange around the outer edge thereof, and the inwardly-extending portion abutting against said flange, that the pawl 11 will be held against lateral movement and remove most of the strain from the pivot 12. The function of the flange 9 can readily be seen from Fig. 1, as the inwardly-extending portion 16 is positioned between two of the teeth, the flange 6 will engage the side of the inwardly-ex-

tending portion, and, therefore, it will be obvious that the pawl will be held against any lateral movement.

Secured to the shaft 3, in a similar manner as the gear 6, is a gear 19, which meshes with the intermediate gear 15, hereinbefore mentioned, and the gears are so arranged as to mesh with each other and cause one pulley to rotate when the other is rotated. It will, therefore, be obvious that by having a locking means constructed, as hereinbefore described, that for this reason both pulleys will be firmly locked and held against rotation in one direction.

A dog 20 is pivotally secured within the casing 1 by means of a pivot pin 21 and collars 22 are positioned upon each side of the dog 20 and hold said dog out of contact with the sides of the casing. The dog 20 is provided with an angularly-disposed portion or upwardly-extending portion 23, which is provided upon its inner face with a roughened or corrugated portion 24. The dog 20 is provided intermediate its ends with a transversely-extending aperture 25 through which is adapted to pass a rope 26, which passes over the pulleys 4 and 5. The dog 20 is provided upon its under surface with a groove 27, so as to prevent the rope passing around the pulley 5 from being engaged by the dog and thereby causing the same to wear when the dog is in the position shown in dotted lines in Fig. 1. When the lifting force is released upon the end 28 of the rope 26, the rope will tend to slide over the pulley in the opposite direction in which the pulleys had been previously revolving, and as this happens the dog will be swung from the position shown in dotted lines to the position shown in full lines and the roughened or corrugated face 24 will engage the rope and firmly hold the same in engagement with the pulley, and prevent it from sliding thereover.

What I claim is:

1. In a device of the class described the combination with a casing, of a plurality of shafts extending therethrough, pulleys carried by each shaft, gear wheels carried by each shaft and adapted to be rotated when said pulley is rotated, a gear wheel interposed between the first-mentioned gear wheels, and means carried by said casing and adapted to engage said intermediate gear and one of said first-mentioned gears for preventing the rotation of said pulleys in one direction.

2. In a device of the class described the combination with a casing, shafts passing through said casing and having pulley wheels secured thereto, gear wheels carried by said casing, a pivoted pawl carried by said casing and adapted to engage one of said gears at one end, and means formed

intermediate the ends of said pawl and adapted to engage another of said gear wheels for holding both of said wheels against rotation in one direction.

3. In a device of the class described the combination with a casing, gears carried by said casing, of a pivoted pawl provided with an angle extension, formed upon one end thereof, said angle extension adapted to engage teeth upon one of said gears, said pawl provided with an inwardly-extending tapering portion adapted to engage teeth upon one of the other gears, whereby when said last-mentioned gear is rotated in one direction the angle extension upon the lower end of said pawl will be withdrawn from said first-mentioned gear and allow the same to be rotated in one direction, and when said last-mentioned gear is rotated in the opposite direction said pulley will engage teeth on both of said gears and hold said gears against rotation in the opposite direction.

4. In a device of the class described the combination with a casing, a pawl-controlling gear, a lower gear, and an intermediate gear meshing with said pawl-controlling gear and said lower gear, of a pivoted pawl carried by said casing, said dog-controlling gear provided on the periphery thereof with a flat portion terminating in laterally-extending gear teeth, said pawl provided with teeth-engaging portions intermediate its ends and adapted to engage said teeth, and said flange adapted to prevent lateral movement of said pawl upon said casing when in engagement with said flange.

5. In a device of the class described, the combination with a casing, pulleys carried thereby, gear wheels carried by said casing and cooperating with said pulleys, means adapted to engage said gear wheels for holding the same against rotation in one direction, a dog pivotally mounted within said casing between said pulleys, and provided with an angularly disposed portion, said angular portion corrugated upon the inner surface thereof, said dog provided with a transversely extending aperture intermediate its ends, being adapted to receive a cable adapted to pass over the pulleys, and said dog adapted to grip the cable when the same is released and bind the cable upon one of said pulleys for preventing the sliding of the cable from the pulleys.

6. In a device of the class described, the combination with a casing, pulleys carried thereby, a dog pivotally mounted upon said casing intermediate said pulleys, said dog provided with an angularly disposed portion, and provided with an aperture extending transversely therethrough near the junction of said angularly disposed portion and the body portion of the dog, and said aperture adapted to receive a cable adapted to

pass over said pulleys, said dog provided
upon its under surface with a groove adapt-
ed to prevent the dog from engaging the
cable adapted to pass around one of said
5 pulleys, and said dog adapted to be thrown
into an operative position when the cable
is released.

In testimony whereof I hereunto affix my
signature in presence of two witnesses.

KICHIZO IWAHORI.

Witnesses:

HOWARD E. CRANDELL,

WILLIAM A. VAN DEVENTER.