

No. 857,382.

PATENTED JUNE 18, 1907.

W. F. BUCH.
SAFETY APPLIANCE FOR HOISTING MECHANISMS.

APPLICATION FILED APR. 3, 1907.

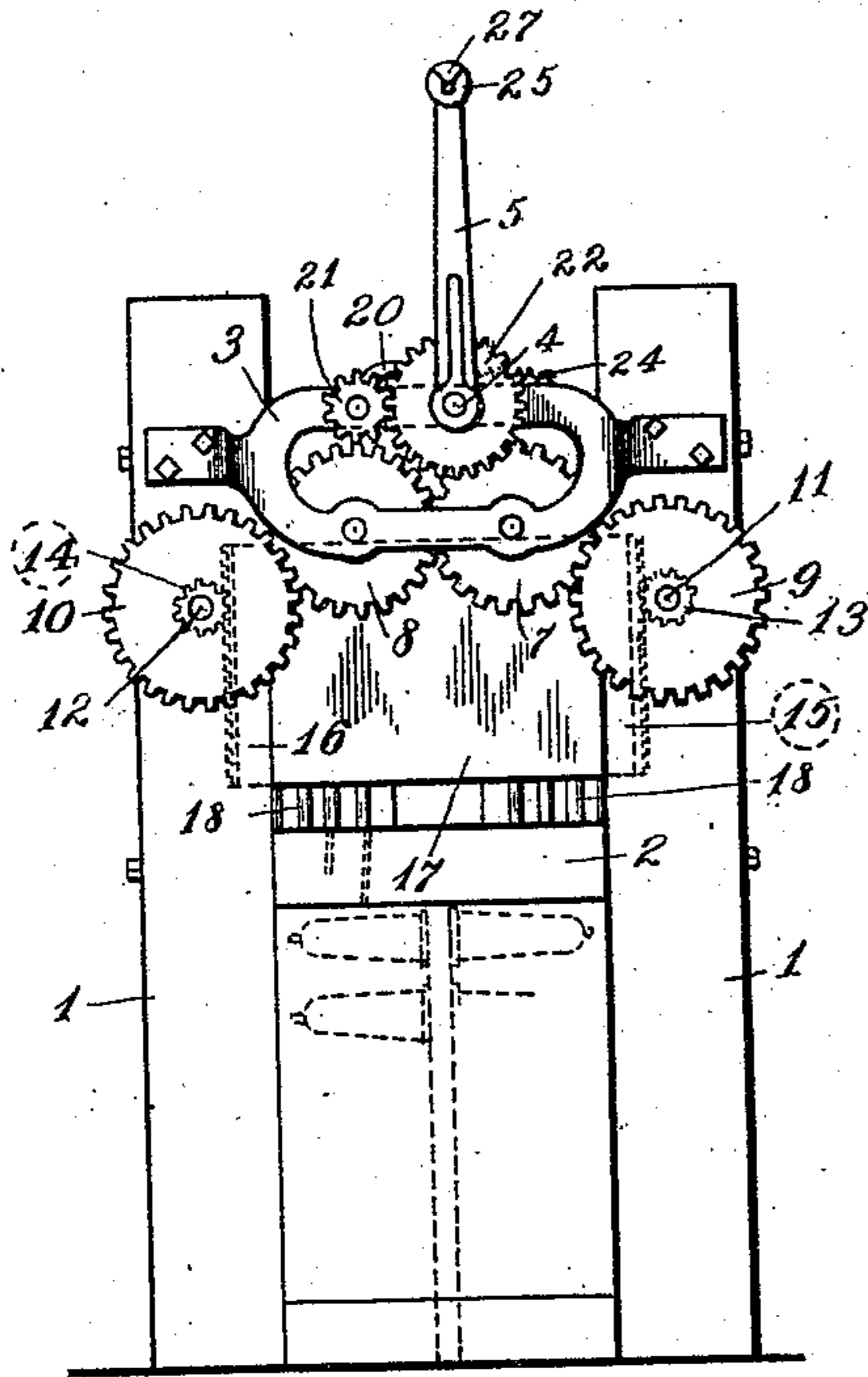


FIG. 1

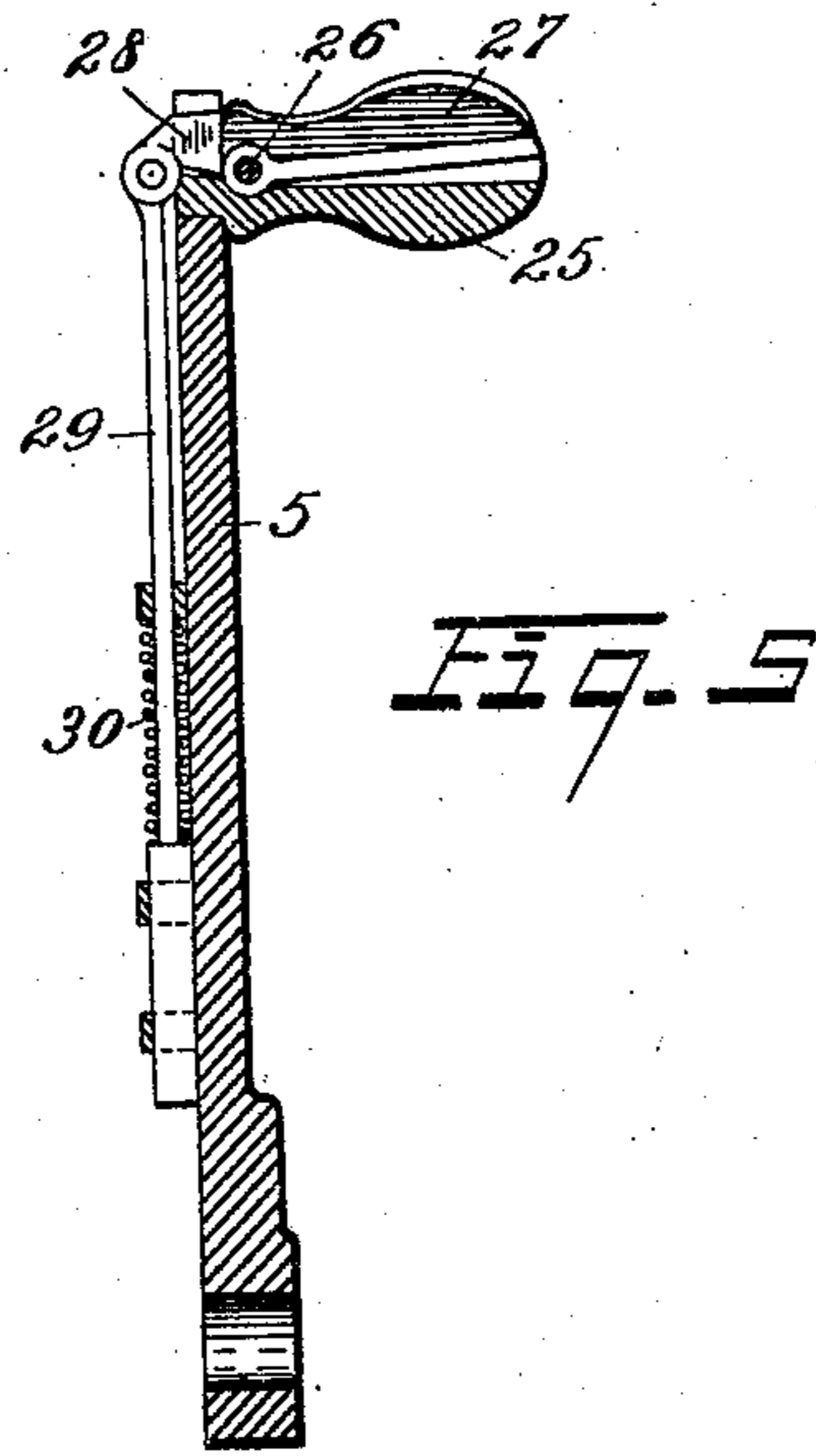


FIG. 5

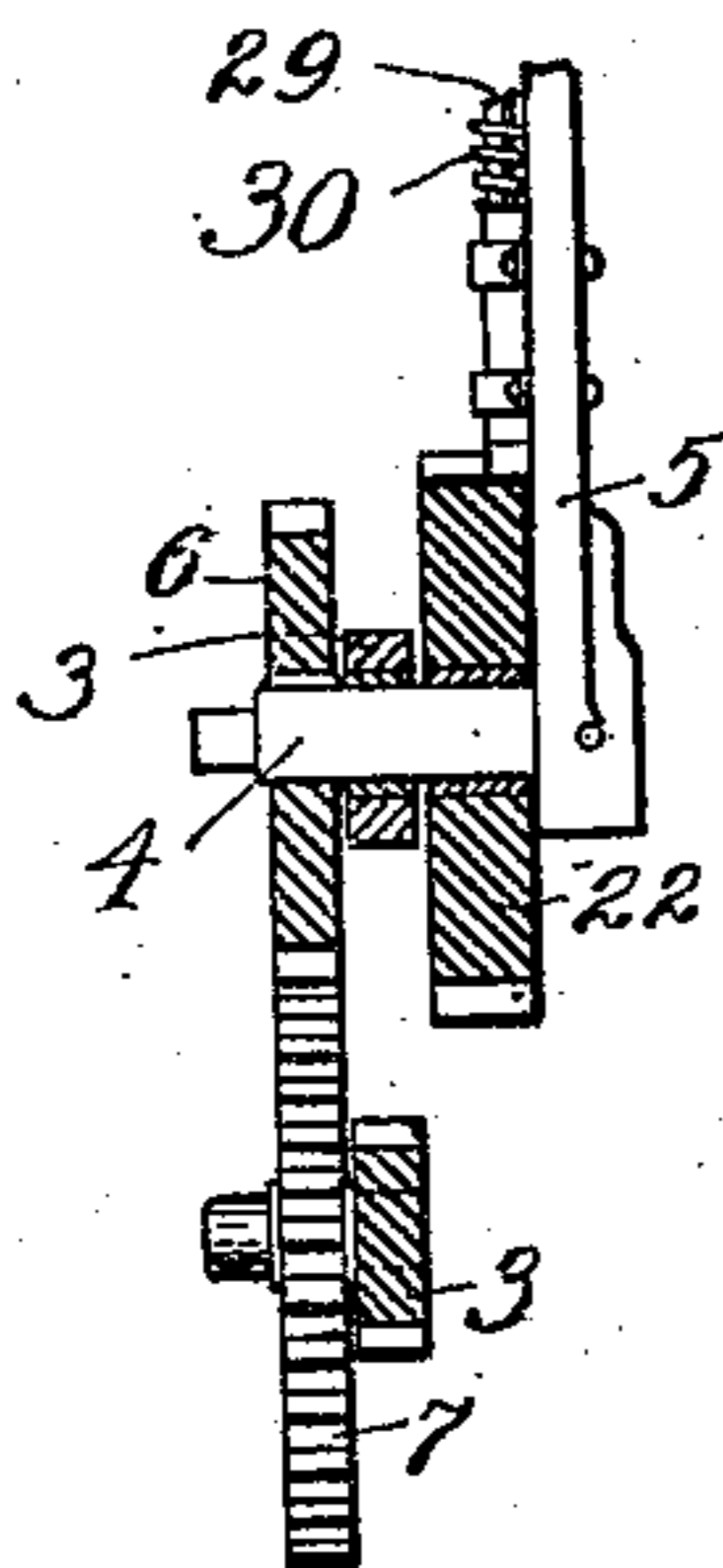


FIG. 4

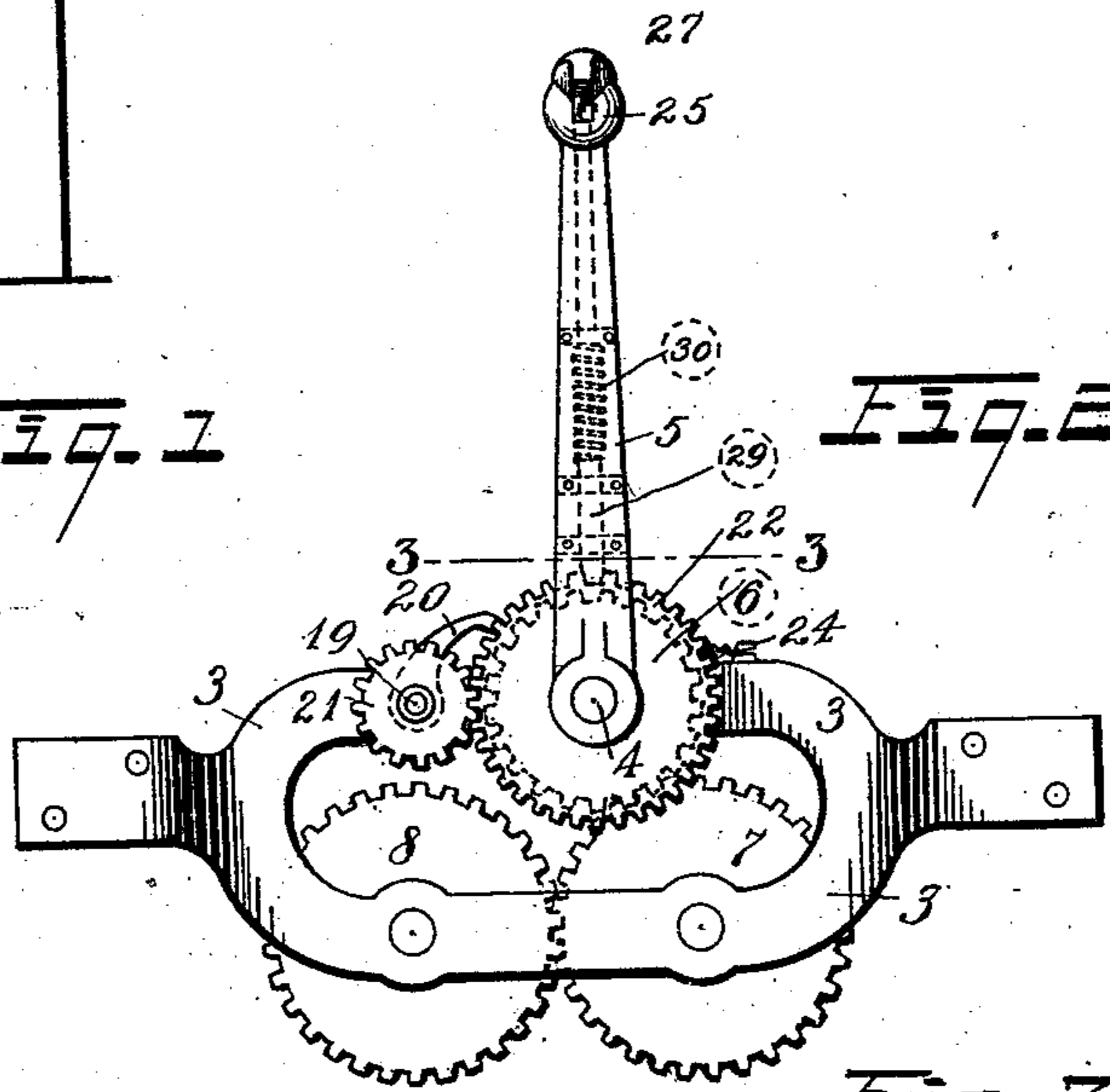


FIG. 2

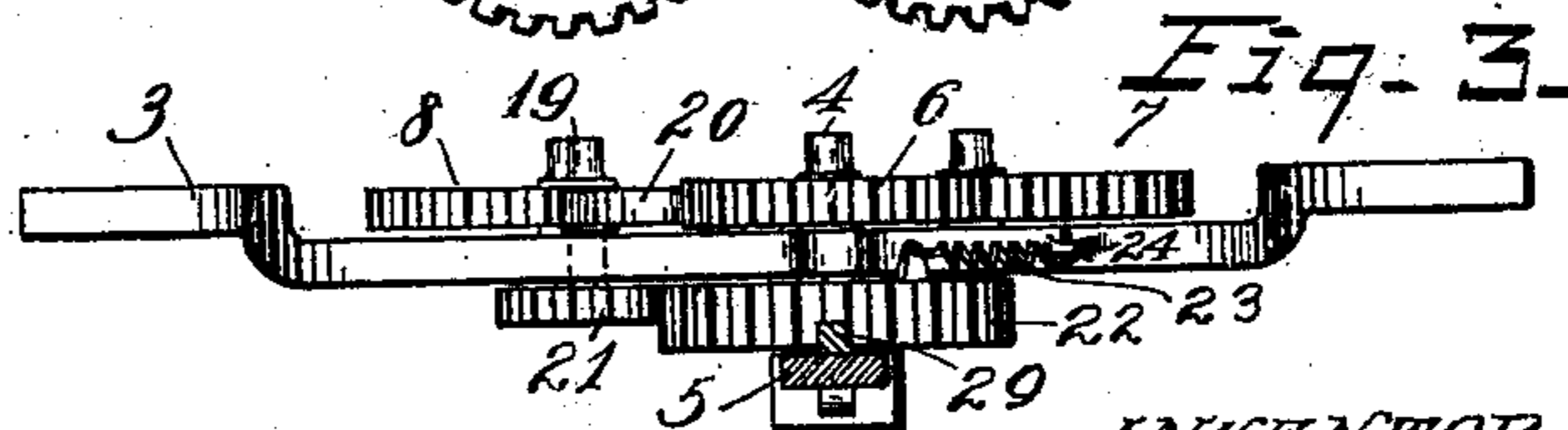


FIG. 3

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SAFETY APPLIANCE FOR HOISTING MECHANISMS.

No. 857,382.

Specification of Letters Patent.

Patented June 18, 1907.

Application filed April 3, 1907. Serial No. 366,085.

To all whom it may concern:

Be it known that I, WILLIAM F. BUCH, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented a certain new and useful Improvement in Safety Appliances for Hoisting Mechanism, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings.

This invention relates in general to hoisting mechanism, and has more specific reference to mechanism in candle molding machines for producing a relative movement between the candle molds and the part carrying the ejecting pistons, whereby the candles are pushed out of the molds. In these machines, the parts to be moved have considerable weight, and the same have been elevated and lowered by means of a crank that is geared through a train of spur gearing to racks. Owing to the weight of these parts, there has been great danger of the crank getting beyond control of the operator and flying about in its operation, in which event it is liable to strike the operator and severely injure him.

The object of my invention is to provide a safety appliance for the hoisting gears, such as will permit the parts to be readily raised or lowered in the normal operation of the machine, but which will immediately and automatically arrest the movement of the crank in case the same should slip out of the grasp of the operator.

In the drawings forming a part hereof, Figure 1 is a partial end view of a candle molding machine having my improved hoisting apparatus connected thereto. Fig. 2 is an enlarged side elevation of portions of the hoisting mechanism shown in Fig. 1. Fig. 3 is a top plan view of the mechanism shown in Fig. 2, the crank being shown in section taken on line 3—3 of said Fig. 2. Fig. 4 is a view partly in elevation and partly in section, the section being taken vertically through the main crank shaft, Fig. 2; and Fig. 5 is a detail sectional view of the operating crank and the grip lever and pawl controlled by it.

Taking up a more detailed description of the invention by reference to the drawings, in which the same reference character designates the same part throughout the several views, 1 represents the main frame of the

candle molding machine, and 2 is a piston frame connecting the opposite sides of said frame.

3 represents a stationary plate that is secured to the one end of the machine, and in which the main crank shaft 4 is journaled.

5 is the crank which is pinned or otherwise secured to the shaft 4. Keyed or otherwise secured to the shaft 4 inside the plate 3 is a pinion 6, said pinion meshing with a gear 7 that is journaled on a stud that is carried by the plate 3. This gear 7 meshes with a similar gear 8 that is also mounted upon a stud upon the frame 3, and the two gears 7 and 8 mesh respectively with gears 9 and 10 that are keyed or otherwise secured to shafts 11 and 12 journaled in the frame. These shafts each carry a pair of pinions, 13 and 14, but one pinion of each pair being shown, which mesh with vertical rack bars 15 and 16 that are secured to the sides of the mold box 17.

From this description, it will be understood that when the crank 5 is turned to the right as shown in Fig. 1, the gears 9 and 10 will be rotated in a direction to cause the racks 15 and 16 to move upwardly and thereby lift the mold box 17 so that the pistons 18 thereon project but slightly into the molds, not shown. When the crank is turned backwardly the pistons will be thrust into the molds and will eject the candles therefrom in a manner well understood in this art.

Journaled in the plate 3 is a short rock shaft 19, said shaft carrying on one end a detent pawl 20, said pawl being adapted to engage with the teeth of the gear wheel 6 and to prevent the backward rotation thereof. On the opposite end of said rock shaft, I secure a pinion 21, said pinion meshing with a gear 22 that is loosely mounted on the main shaft 4 just inside the crank 5. To this gear 22, I attach one end of a coil spring 23, the other end of said spring being secured to a hook or lug 24 on the plate 3. This spring is adapted to normally hold the gear wheel 22 in such position that the pinion 21 and the shaft 19 will be rotated so as to carry the detent pawl 20 out of engagement with the pinion 6.

The handle 25 of the crank 5 is formed in two parts, pivoted together at 26, and so shaped that when the parts are pressed together, the crank handle will be substantially round so as to turn readily in the hand of the operator. The outer part of the handle is a

grip lever 27 having an arm 28 extending inside of the pivot, to which arm I pivot a plunger rod 29, said rod being guided by the crank handle and being so shaped at its lower end as to fit between the teeth on the gear wheel 22. Surrounding this rod 29 is a coiled spring 30, said spring tending to normally hold the end of the rod into engagement with the teeth on the said gear wheel.

During the hoisting and lowering operation, the operator grasps the handle of the crank and depresses the grip lever 27, thereby releasing the rod 29 from the gear 22, whereupon the spring 23 rotates said gear slightly and thereby lifts the detent pawl 20 out of engagement with the gear 6. If at any time, during either the hoisting or lowering operation, the operator desires to stop, it is only necessary for him to release the grip lever 27, and permit the rod 29 to interlock with the gear wheel 22. When this takes place, the weight of the mold box 17 is sufficient to rotate the crank 5 backwardly, said motion turning the gear wheel 22 and rocking the detent pawl into engagement with the gear 6. The parts will therefore remain at rest in this position until the grip lever 27 is again depressed, when the spring 23 will cause the detent pawl to be again lifted. If, at any time, the operator should lose control of the crank, he will necessarily loosen the grip lever 27, which will permit the rod 29 to engage with the gear 22 and thus instantly lock the parts from motion in the manner above described.

While I have described my invention as being particularly applicable to candle molding machines, and have illustrated it as so applied, it is obvious that it is of more general application.

The details of the invention may be somewhat modified without departing from the spirit thereof, and I desire it to be understood that the following claims are not limited to such details any further than is made necessary by the specific terms employed, or by the prior state of the art.

I claim:

1. In a hoisting device, a drive shaft, a crank for turning said drive shaft, a hoisting mechanism connected with said drive shaft, a detent pawl, a member loosely mounted on the drive shaft, connections between said member and said detent pawl, means for normally holding the detent pawl out of operative position, and means on the crank for controlling said member, whereby, when the crank gets beyond control of the operator said member will throw the detent pawl into engagement with the hoisting mechanism and prevent the backward movement thereof.

2. In a hoisting device, a main drive shaft, a crank for turning said drive shaft, a gear secured to the drive shaft, and a hoisting mechanism connected with said gear, a de-

tent pawl, means for normally holding said detent pawl out of operative position, a member loosely mounted on the drive shaft, connections between said member and said detent pawl, and means on the crank for controlling said member, whereby, when the crank gets beyond control of the operator said member will throw the detent pawl into engagement with the said gear and thereby prevent the backward movement of the hoisting mechanism.

3. In a hoisting mechanism, a main drive shaft, a crank for turning said drive shaft, a train of hoisting gears geared with said shaft so as to be driven thereby, a detent pawl adapted to engage said train of gearing and hold the same against backward movement, a gear loosely mounted on the drive shaft, said gear being connected with the detent pawl, means for normally holding the detent pawl out of operative position, and means carried by the crank and adapted to engage said loosely mounted gear whereby, when the operator loses control of the crank, said loosely mounted gear will become connected with the crank and will rock the detent pawl into engagement with the train of gearing and thereby prevent the backward movement of said train of gearing.

4. In a hoisting mechanism, a main drive shaft, a crank for turning said drive shaft, a train of hoisting gear geared with said shaft so as to be driven thereby, a detent pawl adapted to engage said train of gearing and hold the same against backward movement, a gear loosely mounted on the drive shaft, said gear being connected with the detent pawl, means for normally holding the detent pawl out of operative position, a grip lever carried by the crank, and connections between said grip lever and said loosely mounted gear whereby, when the operator loses control of the crank, said loosely mounted gear will become connected with the crank, and will rock the detent pawl into engagement with the train of gearing and thereby prevent the backward movement of said train of gearing.

5. In a hoisting mechanism, a main drive shaft, hoisting mechanism connected with and driven by said shaft, a crank secured to said shaft for rotating the same, said crank having a handle, a grip lever connected with said handle, a loose gear mounted on the drive shaft, a pinion meshing with said loose gear, a detent pawl connected with said pinion whereby, when the gear is turned in one direction, the pawl will be thrown into engagement with the hoisting mechanism to prevent backward movement thereof, means for normally holding said pawl out of operative position and means connected with the grip lever for engaging the said loose gear, whereby when the crank moves backwardly with the grip lever released, the detent will

be thrown into engagement with the hoisting mechanism, and will thereby arrest the same.

6. In a hoisting mechanism, a drive shaft, a driving gear connected with and driven by said shaft, hoisting mechanism connected with said gear, a crank secured to said shaft for rotating the same, said crank having a handle, a grip lever connected with said handle, a loose gear mounted on the drive shaft, a pinion meshing with said loose gear, a detent pawl connected with said pinion whereby, when the gear is turned in one direction, the pawl will be thrown into engagement with the driving gear on the drive shaft to prevent backward movement thereof, means for normally holding said pawl out of operative position and means connected with the grip lever for engaging the said loose gear, whereby when the crank moves backwardly with the grip lever released, the detent will be thrown into engagement with the driving gear, and will thereby arrest the hoisting mechanism.

7. In a candle molding machine, a mold box, rack bars connected with said mold box, a main drive shaft, gearing connecting said main drive shaft with said racks, whereby, when the main drive shaft is turned in one direction, the mold box will be lifted and when the shaft is turned in the opposite direction, the mold box will be lowered, a crank connected with the main drive shaft, a handle and a grip lever on said crank, a gear loosely mounted on the main shaft, a detent pawl, a pinion connecting said detent pawl and said gear, means for normally holding the detent pawl out of operative position, and connections between the grip lever and said loosely mounted gear whereby when the grip lever is released, the gear will be turned with the crank and the detent pawl will be thrown into engagement with the hoisting gears to hold the latter positively against reverse movement.

8. In a candle molding machine, a mold box, rack bars connected with said mold box, a main drive shaft, gearing connecting said main drive shaft with said racks, whereby, when the main drive shaft is turned in one direction the mold box will be lifted and when the shaft is turned in the opposite direction, the mold box will be lowered, a crank connected with the main drive shaft, a handle and a grip lever on said crank, a gear loosely mounted on the main shaft, a detent pawl, a pinion connecting said detent pawl and said gear, a spring engaging said gear and normally holding the detent pawl out of operative position, and connections between the grip lever and said loosely mounted gear whereby when the grip lever is released, the gear will be turned with the crank and the detent pawl will be thrown into engagement

with the hoisting gears to hold the latter positively against reverse movement.

9. In a hoisting mechanism, a drive shaft, hoisting mechanism connected with and driven by said shaft, a crank secured to said shaft for rotating the same, said crank having a handle, a grip lever connected with said handle and adapted to be pressed into the same so that the handle and the grip lever form a continuous and smooth surface for the hand, a loose gear mounted on the drive shaft, a rock shaft, a pinion on said rock shaft and meshing with said loose gear, a detent pawl carried by the said rock shaft and adapted to engage the hoisting mechanism when the rock shaft is turned in one direction, a spring connected with the loose gear and normally holding the same in such position that the detent will be out of engagement with the hoisting mechanism, and means connecting the grip lever with the said loose gear whereby, when the crank moves backwardly with the grip lever released, the detent pawl will be thrown into engagement with the hoisting mechanism against the tension of the said spring, and will thereby arrest the movement of said hoisting mechanism.

10. In a hoisting mechanism, a drive shaft, hoisting mechanism connected with and driven by said shaft, a crank secured to said shaft for rotating the same, said crank having a handle, a grip lever connected with said handle and adapted to be pressed into the same so that the handle and the grip lever form a continuous and smooth surface for the hand, a loose gear mounted on the drive shaft, a rock shaft, a pinion secured to said rock shaft and meshing with said loose gear, a detent pawl carried by the said rock shaft and adapted to engage the hoisting mechanism when the crank is turned backwardly, a spring connected with the loose gear and normally holding the same in such position that the detent will be out of engagement with the hoisting mechanism, and a spring-pressed plunger adapted to connect the grip lever with the said loose gear whereby, when the crank moves backwardly with the grip lever released, the plunger will be thrown into engagement with the loose gear and the detent pawl will be thrown into engagement with the hoisting mechanism so as to arrest the movement of said hoisting mechanism, the spring connected with the loose gear rocking the pawl out of operative position when the grip lever is again pressed into the handle.

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

WILLIAM F. BUCH.

Witnesses:

S. E. FOUTS,
J. B. HULL.