(No Model.)

3 Sheets—Sheet 1.

O. CROSBY.

COAL CHUTE.

No. 599,769. Patented Mar. 1, 1898.

FIG. 1.

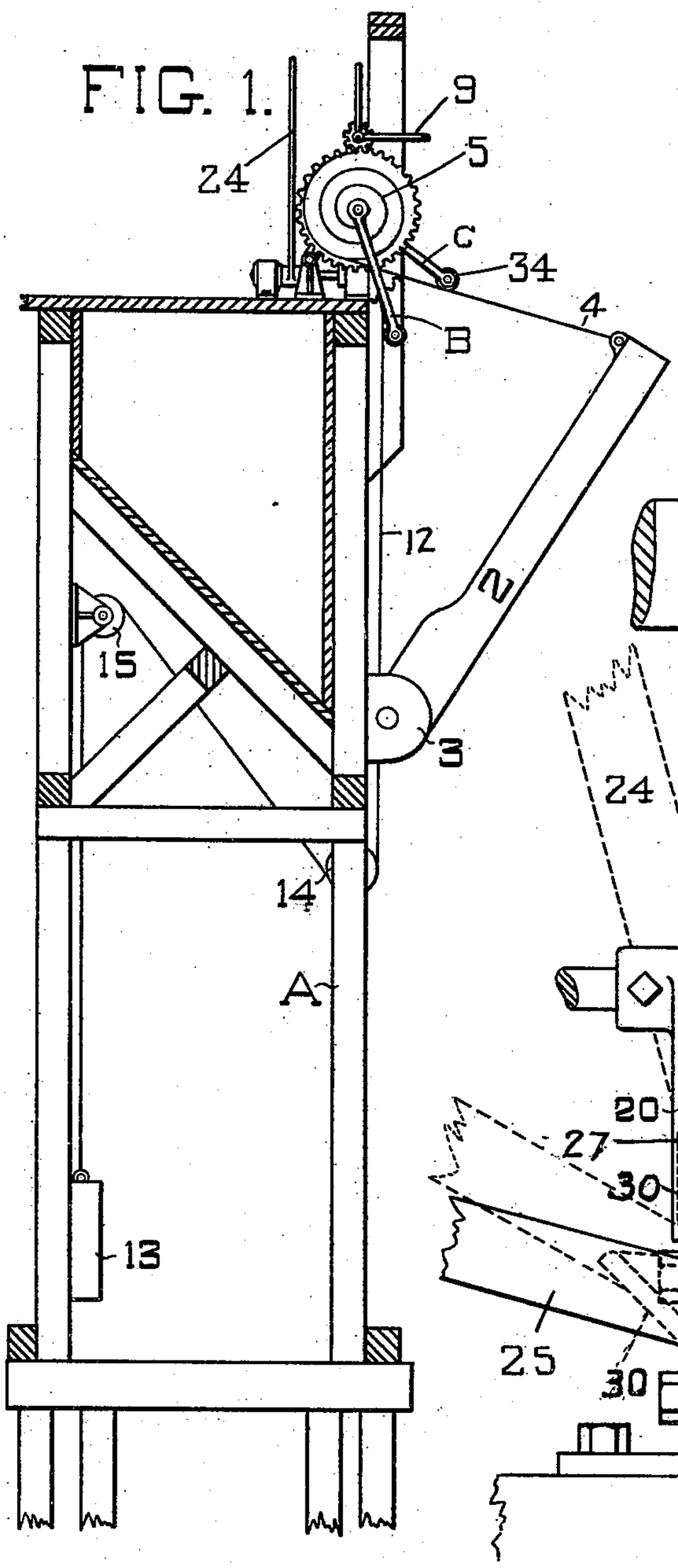
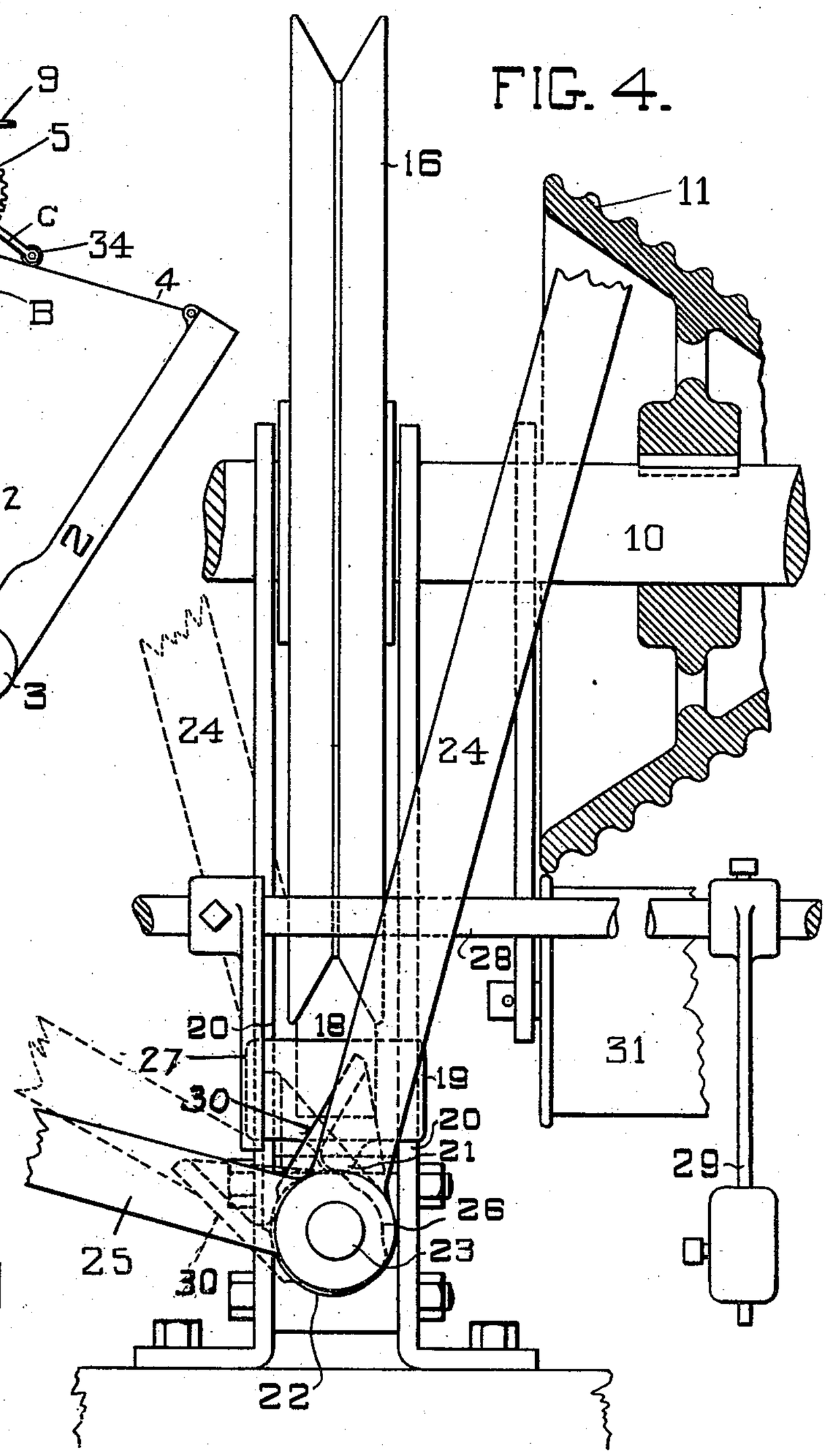


FIG. 4.



WITNESSES:

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(No Model.)

3 Sheets—Sheet 2.

O. CROSBY.

COAL CHUTE.

No. 599,769. Patented Mar. 1, 1898.

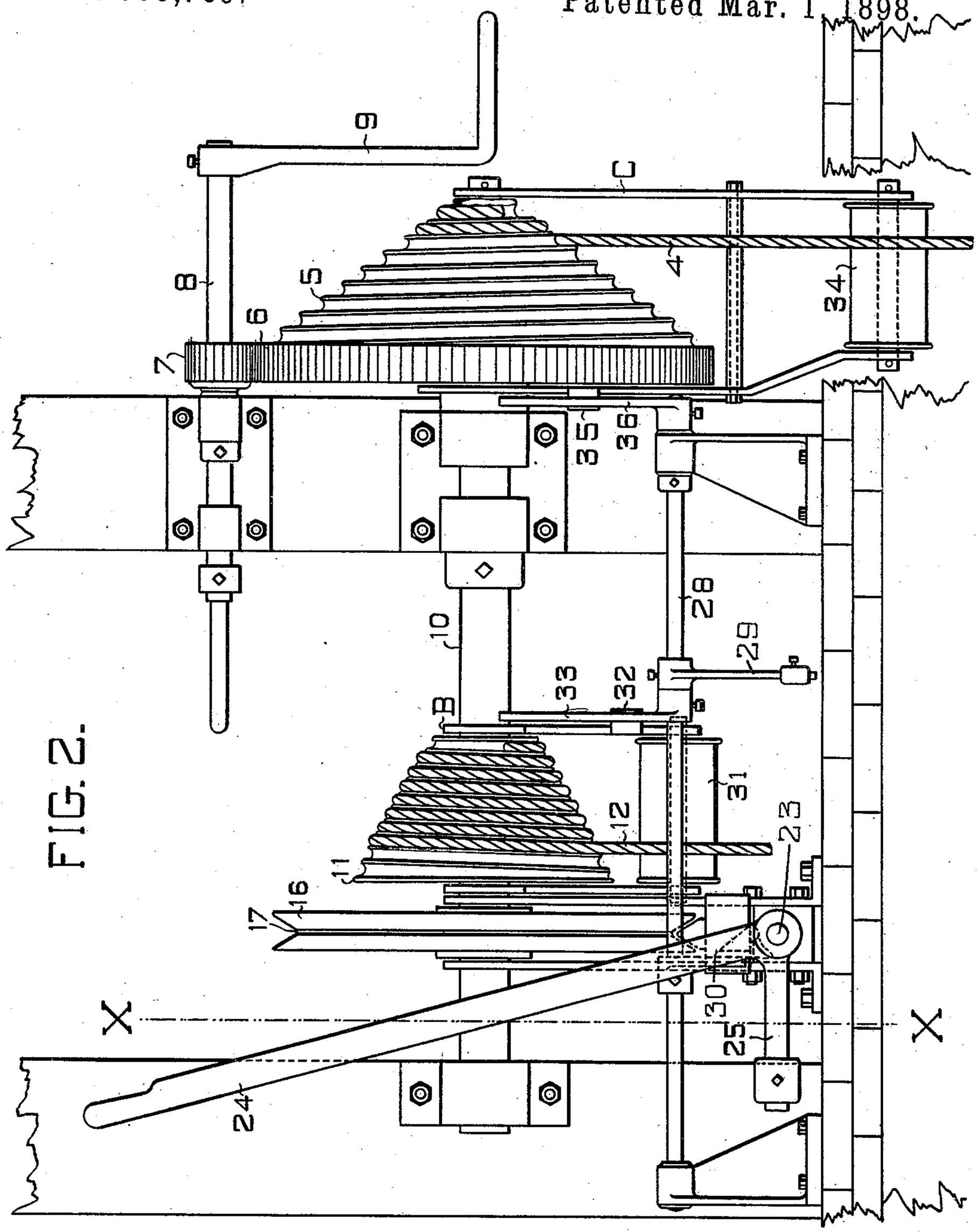

FIG. 2.

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(No Model.)

3 Sheets—Sheet 3.

O. CROSBY.

COAL CHUTE.

No. 599,769.

Patented Mar. 1, 1898.

FIG. 3.

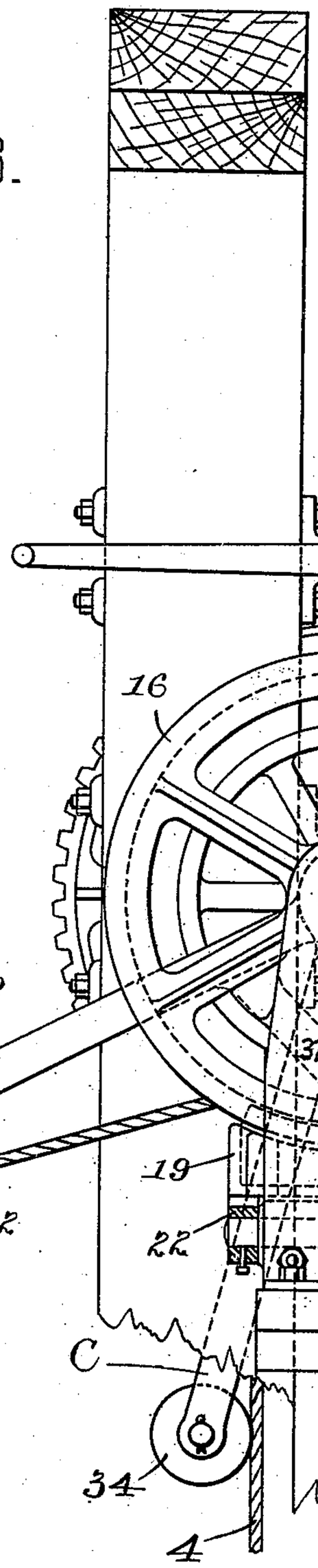
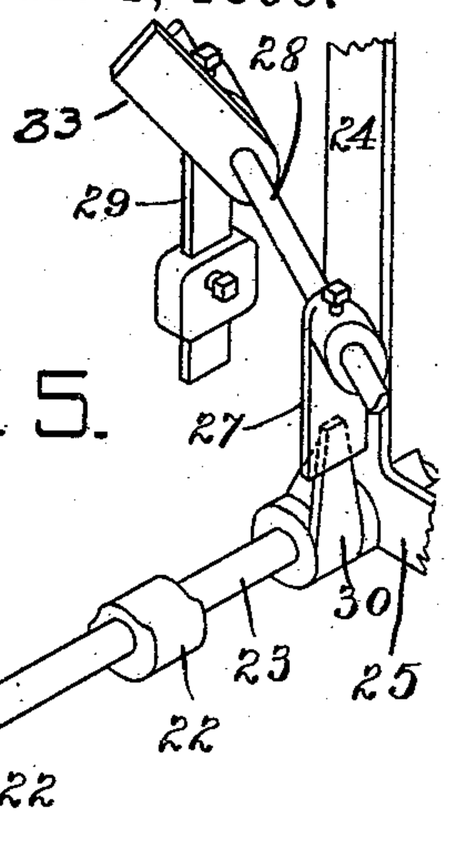


FIG. 5.



WITNESSES:

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UNITED STATES PATENT OFFICE.

OLIVER CROSBY, OF ST. PAUL, MINNESOTA.

COAL-CHUTE.

SPECIFICATION forming part of Letters Patent No. 599,769, dated March 1, 1898.

Application filed May 28, 1896. Serial No. 593,445. (No model.)

To all whom it may concern:

Be it known that I, OLIVER CROSBY, of St. Paul, Ramsey county, Minnesota, have invented certain Improvements in Coal-Chutes, of which the following is a specification.

My invention relates to improvements in counterbalanced coal-chutes; and it consists of the improved features of construction hereinafter particularly described and claimed.

In the accompanying drawings, forming part of this specification, Figure 1 is a side elevation of a hinged coal-chute, its supporting-frame and counterbalancing-weight, shown fitted with my improvements. Fig. 2 is a detail side elevation of the weight and chute supporting cables and their hoisting-drums, together with my improved attachments. Fig. 3 is a detail end elevation of the same. Fig. 4 is a partial detail of the counterbalancing-weight cable-drum and attachments, and Fig. 5 is a perspective detail of the brake-operating mechanism.

My invention is designed to provide automatic means for stopping the operation of the apparatus in case the hoisting-cable of the chute should break, thereby preventing injury to the operator or to the apparatus, and whereby also the apparatus may be mechanically stopped whenever necessary for the purpose of repair or otherwise.

In the drawings, A represents the frame to which the coal-chute 2 is connected by the hinge 3.

4 is a chute-hoisting rope or cable; 5, the spirally-grooved winding-drum for the cable; 6, its driving-gear; 7, the pinion meshing therewith, mounted upon the shaft 8, operative by means of the crank 9. Fixed upon the shaft 10, which carries the drum 5, is the similar spirally-grooved drum 11 for the cable 12, which supports the counterweight 13, running, as shown, over the sheaves 14 and 15 in the ordinary way. Also mounted upon the shaft 10 is the friction-drum 16, provided with a circumferential V-shaped groove 17. Underneath this drum is arranged the wedge-shaped friction-block 18, fitted to the groove 17 and adapted to be thrust therein to stop the rotation of the drum and its connected shaft and the drums 5 and 11. This block is carried by the cross-head 19, working on the guides 20 and having a projection or boss 21, which rides upon the periphery of the cams 22, and, according to the position of the cams, is held in engagement with the drum 16 or is allowed to drop out of its groove and release the same. The cams 22 are mounted upon the rock-shaft 23, operative by means of the hand-lever 24, which is normally held in the position shown in Fig. 2 by the counterweighted arm 25, in which position the recessed portion 26 of the cams 22 stands contiguous to the boss 21, allowing the block 18 to drop out of engagement with the drum 16. The rock-shaft 23 is held normally in this position by means of the arm 27, depending from the rock-shaft 28, normally held in substantially vertical position by means of the weighted arm 29 upon the shaft 28. In this position the arm 27 engages the spur 30, fixed to the shaft 23, and prevents turning of the shaft 23 under the impulse of its weighted arm 25, the lever 24 standing in mid-position, as indicated by full lines in Fig. 2 and by dotted lines in Fig. 4. When the shaft 28 is rocked, so as to disengage the arm 27 from the spur 30, the weighted arm 25 serves to turn the shaft 23 and turn the cams, so as to lift the block 19 and carry the wedge 18 into engagement with the drum 16, so as to automatically stop its rotation, as hereinafter described, the lever 24 standing in the extreme dotted-line position shown in Fig. 4.

When it is desired to stop the drum 16 and its shaft 10 mechanically, the lever 24 is thrown over in the opposite direction into the position shown in full lines in Fig. 4, whereby the cams 22 are oppositely turned, so as to lift the wedge 18 into engagement with the drum 16 to stop the apparatus.

In order to automatically stop the apparatus in case either the chute-hoisting cable or the counterweight-supporting cable should break, thereby endangering the lives of the operators at the cranks, I provide the following-described attachments for releasing the rock-shaft 23, so as to throw the wedge 18 into engagement with the drum 16.

The bails B and C are hung to freely turn or swing out the shaft 10, the bail B inclosing the counterweight-supporting drum 11 and the bail C the chute-hoisting drum 5. The bail B carries an antifriction-roll 31 equal in length to the drum 11, adapted to ride

upon the cable 12. The bail also carries a laterally-projecting spur or arm 32, which, in case the cable 12 breaks, permitting the bail to drop into vertical position, will strike against the upwardly-projecting arm 33 upon the rock-shaft 28, causing it to turn sufficiently to free the rock-shaft 23, which then turns and throws the wedge 18 into engagement with the drum 16. Similarly the bail C carries an antifriction-roll 34, riding upon the chute-supporting cable 4 and provided with a laterally-extending spur or arm 35, adapted similarly to engage the arm 36 upon the rock-shaft 28, whereby the breaking of the cable 4 will cause the stopping of the apparatus in the same manner as described in reference to the breaking of the cable 12.

It will thus be seen that by means of my improved attachment the chute-hoisting mechanism may be stopped at any time or in any position mechanically, as desired, and is automatically stopped in case of the breaking of either cable, thereby preventing any injury to the operators or attendants from the destructive motion of the released part of the mechanism or any injury to the apparatus itself.

I claim—

1. The combination with a counterbalanced hoist of the class described, of a brake therefor normally held out of engagement therewith, and the automatic means for tripping said brake, restrained by engagement with the hoisting and counterbalancing-weight cables while the same are under tension, but released so as to trip said brake by the slackening or breaking of either of said cables.

2. In an apparatus of the class described, the combination with the common drum-shaft, of the clutch or brake attachment therefor held normally out of engagement therewith, the swinging arms carrying idler-pulleys which ride normally upon the chute-hoisting and weight-supporting cables respectively, but which are adapted to trip or release said clutch or brake mechanism when allowed to swing out of normal position by the breaking of either cable.

3. In an apparatus of the class described, the combination with the drum-shaft, of the friction-clutch attachment therefor, the counterweighted rock-shaft for normally holding said clutch out of engaging position, the bails hung loosely upon said drum-shaft and carrying idler pulleys or rolls normally riding respectively upon the cables of said drums when under tension, said bails being each adapted independently in case of the breaking of its contiguous cable to trip said rock-shaft, and throw said clutch into engagement with said drum-shaft.

4. In an apparatus of the class described, the combination with the common drum-shaft, of the grooved friction-drum mounted thereon, the shoe fitted to the groove in said drum, the counterweighted rocking counter-shaft carrying cams for thrusting said shoe into engagement with said drum, the locking device for holding said counter-shaft with its cams out of engagement with said shoe, the idler roll or pulley riding upon each of the cables connected to the drum-shaft, and adapted, when released by the breaking of its cable, to trip said counter-shaft-locking device, permitting it to turn so as to throw said cams into engagement with said shoe, so as to stop the rotation of the drum-shaft.

5. In an apparatus of the class described, the combination with the shaft, the drums secured thereon, and the hoisting and counterbalancing-weight cables running respectively upon said drums, of the friction-drum also carried by said shaft, the brake therefor held normally out of engagement therewith, and the automatic means for operating said brake, normally restrained by engagement with said cables under tension, and released so as to operate said brake by the slackening or breaking of either cable.

6. In an apparatus of the class described, the combination with the common drum-shaft, of the spirally-grooved winding-drums, the chute-hoisting cable running upon one of said drums, and the counterbalancing-weight cable running upon the other, the grooved friction-drum also fixed upon said shaft, its shoe, the means for normally holding said shoe out of engagement with said friction-drum, and the means for automatically throwing said shoe into engagement with said drum, normally held out of engagement therewith by said cables while under tension, and adapted to swing into engagement when released by the slackening or breaking of either of said cables.

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

OLIVER CROSBY.

Witnesses:
T. D. MERWIN,
MINNIE L. THAUWALD.