No. 675,222. Patented May 28, 1901.

H. J. KIELY.

SUGAR CANE MILL.

(No Model.) (Application filed Nov. 23, 1900.)

3 Sheets—Sheet 1.

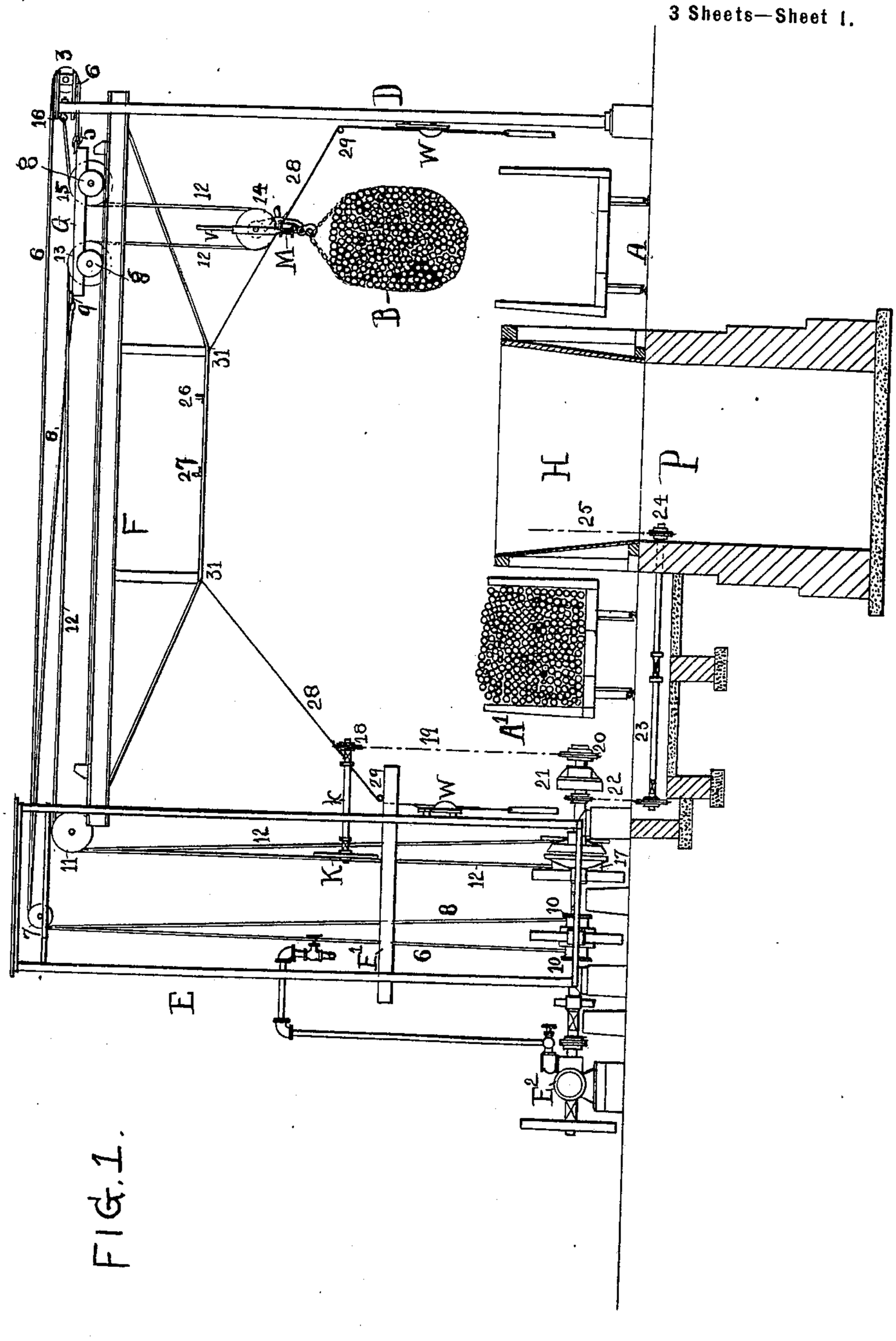

FIG. 1.

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FIG. 2.

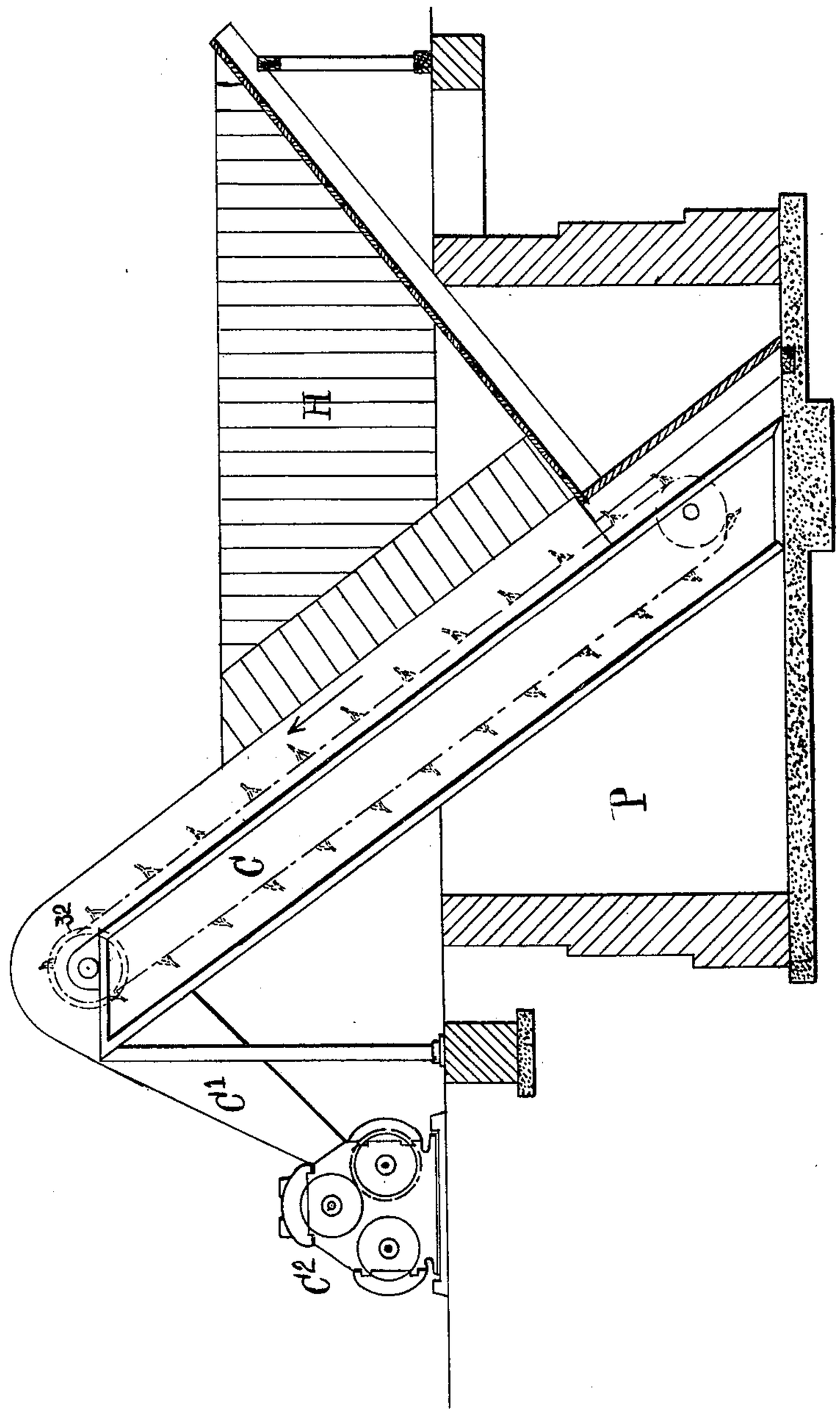

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FIG. 4.

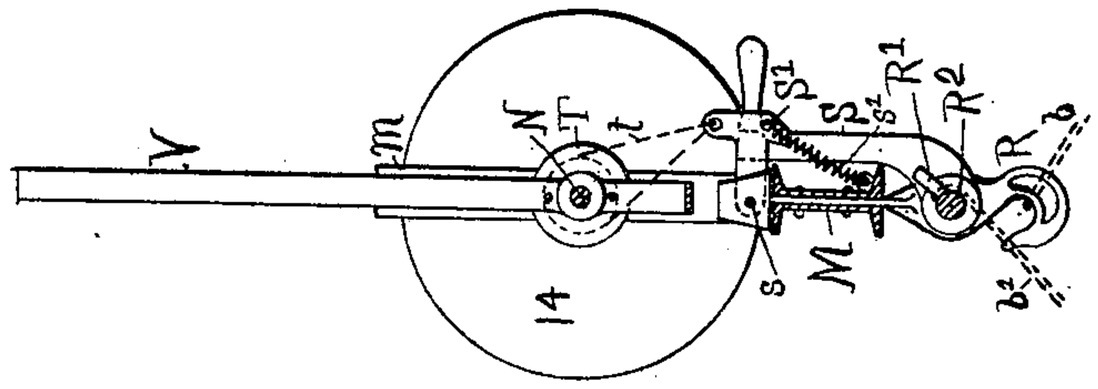
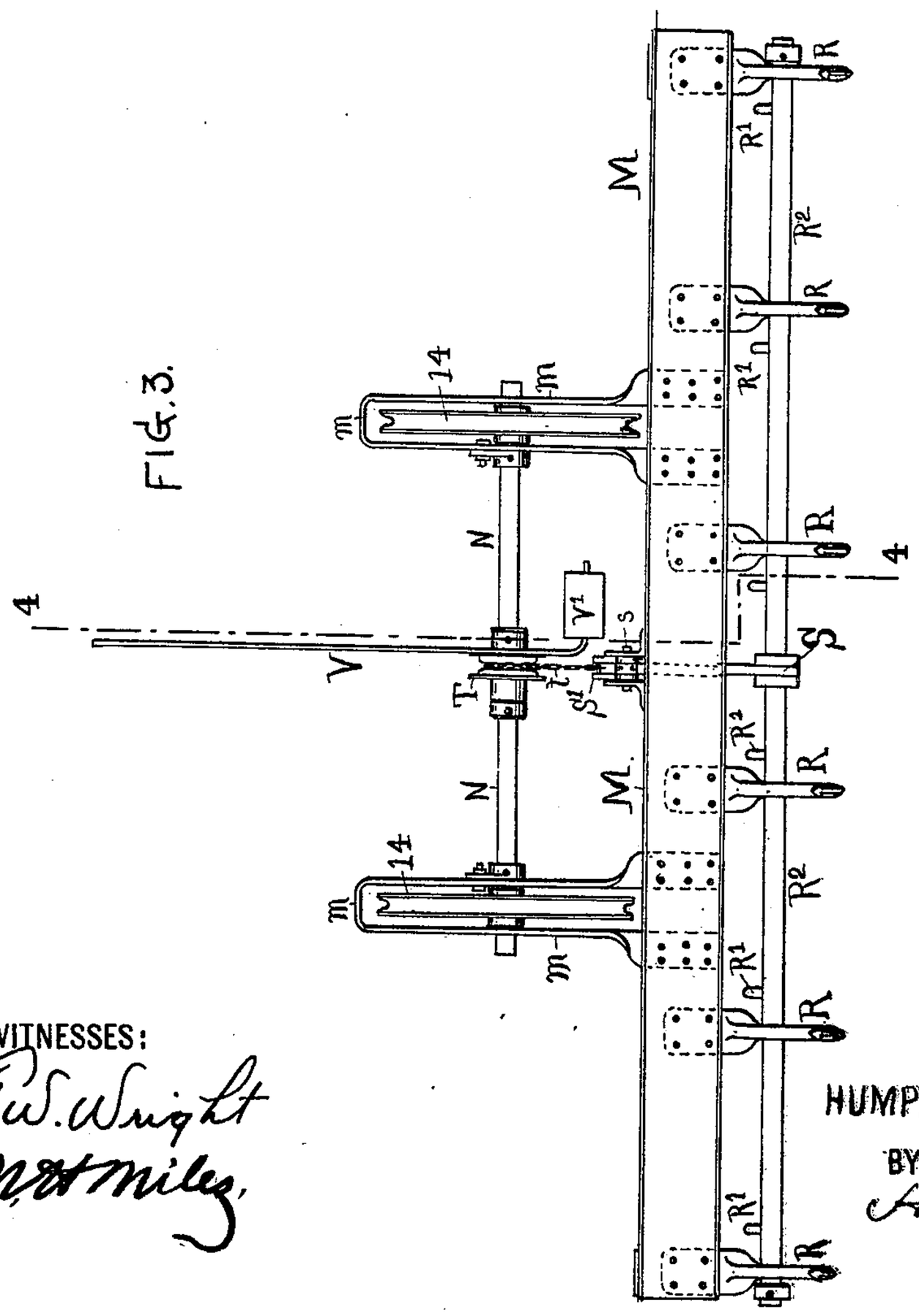


FIG. 3.



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UNITED STATES PATENT OFFICE.

HUMPHREY J. KIELY, OF BROOKLYN, NEW YORK, ASSIGNOR TO THE LINK-BELT ENGINEERING COMPANY, OF NEW YORK, N. Y.

SUGAR-CANE MILL.

SPECIFICATION forming part of Letters Patent No. 675,222, dated May 28, 1901.

Application filed November 23, 1900. Serial No. 37,535. (No model.)

To all whom it may concern:

Be it known that I, HUMPHREY J. KIELY, a citizen of the United States of America, residing in the borough of Brooklyn, county of Kings, State of New York, have invented Improvements in Sugar-Cane Mills, of which the following is a specification.

The object of my invention is to simplify and improve the construction of sugar-cane mills, facilitate the handling and manipulation of the cane on its way from the car or wagon to the crushing-rolls, and insure the delivery of the canes to the latter in the best manner and for the most effective work, and this without any direct handling of the canes by attendants.

In the accompanying drawings, Figure 1 is an elevation, with the pit in cross-section, of my improved cane-handling apparatus. Fig. 2 is a longitudinal section through the elevator proper and pit drawn to a larger scale. Fig. 3 is an enlarged side elevation of the hoisting-carrier. Fig. 4 is a sectional view on the line 4 4, Fig. 3.

The sugar-cane is usually brought to the crushing-mills on flat-cars or wagons and thrown from the latter into a pit, in which is an inclined elevator to carry the canes up out of the pit and thence along a conveyer to the crushing-rolls. This elevator and conveyer are intended by their combined operation to result in the delivery of the canes to the rolls evenly and well arranged for the best crushing effect; but in practice it is found that the described construction of the cane-handling appliances does not deliver the canes satisfactorily.

It is one of the main objects of my invention to so construct the apparatus that the canes will be delivered to the rolls evenly and satisfactorily for the most effective action of the crushing-mills. For this purpose I provide an overhead traveling crane, whereby the canes can be hoisted out of the cars or wagons in bulk and deposited in quantity into the elevator-hopper. In this way I can keep the hopper supplied with a large quantity of canes, with the result that there will be a uniform delivery of canes by the elevator, so much so that the usual conveyer between the elevator and rolls may be dispensed with and the canes can be delivered directly by the elevator-chute to the crushing-rolls with a thoroughly effective action by the latter on the canes.

In Fig. 1 I have shown two tracks or ways for flat-cars A and A′, one on each side of the elevator-hopper and pit P; but it will be understood that my invention may be used with but one such car-track or wagon-way.

Over the pit and tracks is erected a steel or other suitable structure, comprising at one side a tower-like framework E and at the other side a girder-frame D, the two being connected with each other by two or more cross-beams F, constituting an overhead track for a traversing hoisting carriage or truck G. This carriage may have wheels *g g* to run on the tracks on the beams F, so that the carriage may be brought to a position over the car A or the hopper H or the car A′, as desired. For this purpose one end of a rope or chain 6 may be connected at 5 to one end of this carriage G, and passing around suitable guide-pulleys at 3 and 7 goes to a hoisting-drum 10. A second hauling-rope 8 from another hoisting-drum 10 passes over a second pulley at 7, and thence is connected at 9 to the carriage G. The hoisting-drums 10 10 are controlled by the operator standing on the platform E′ through the medium of any suitable means—such as levers, rods, and clutches—which it is not necessary to describe, but by the manipulation of which either drum may be connected up to be operated by the engine E^2 to cause the desired traverse of the hoisting truck or carriage G.

A pair of hoisting ropes or chains 12 are adapted to be wound upon hoisting-drums 17, which are under suitable control from the platform E′, and after passing over pulleys at 11 go to the carriage G, and there they pass over pulleys 13 and down to and under a pair of pulleys 14, Figs. 1 and 3, on the carrier M. Thence the ropes pass up and over pulleys 15, Fig. 1, on the carriage G, and the ends of the ropes are made fast at 16 to the frame.

The construction of the carrier will be more fully understood on reference to Figs. 3 and 4. It consists of a beam M (in this case of two channel-irons) with straps *m m*, through

which passes the fixed shaft N for the sustaining-pulleys 14 to turn on. Fixed to the beam M, I provide a suitable number of hooks R and a shaft R^2, turning in bearings in the hooks R and carrying a series of pins or hooks R'. Keyed to this shaft R^2 is an arm S, the outer end of which is adapted to engage with and be locked by the latch S', (hinged at *s* to the beam M,) so as to normally hold the shaft R^2 from turning and keep the pins R' in the positions shown in Figs. 3 and 4. A spiral pull-spring *s'* may be added to aid in keeping the latch down, Fig. 4.

As described in my patent of November 13, 1900, No. 661,878, when the loaded cane-car reaches the crushing-mill chains are passed around the canes on the car. One end, *b*, of each chain is hooked onto the hook R. The opposite end, *b'*, is hooked onto an adjacent hook or pin R', so that on then winding up the hoisting-ropes 12 the carrier will be raised and the canes elevated in a huge load, as at B, Fig. 1. The truck G, with the elevated load, is then traversed to bring the load over the elevator-hopper, and then the chains are released to drop the canes in a mass into the hopper. This I do automatically by the following means: The outer end of the latch S', Fig. 4, is connected by a cord or chain *t*, which passes around and is made fast to a pulley T, free to turn on the shaft N. To this pulley is secured a vertical trip-lever V, whose lower end has a counterweight V', such as to normally keep the lever in the vertical position shown and so to normally leave the latch in the engaging position. (Shown in Fig. 4.) When, however, the load has been hoisted, as shown at the right of Fig. 1, and the carriage or truck G is then traversed to a position over the pit, the upper end of the trip-lever V' will come into contact with a suitable fixed stop 26 on the frame. The trip-lever will thus be tilted and the pulley T turned accordingly, so as to pull on the cord *t* and raise the latch S' out of engagement with the arm S. The strain of the chains on the pins R' will at once cause the shaft R^2 to turn and let the ends *b'* of the chain slip off the pins R', and the load of canes will fall into the elevator-hopper. A second tripping-stop 27 is provided for use in unloading the cars at A'.

In order that the operator on the platform E' may know for greater certainty when the load has been sufficiently elevated, I may provide an automatic audible signal consisting of a gong W, to be operated by the cord 28, which, being connected to the frame at 31, passes over a pulley 29 and is weighted at its lower end. When the carrier rises, as shown at the right of Fig. 1, it comes into contact with and raises the rope 28 and so causes the gong W to be struck. This signaling device is duplicated on opposite sides of the pit.

The inclined elevator C, as shown in Fig. 2, extends from near the bottom of the pit to above the top of the hopper H and there delivers the canes into the chute C', which in turn delivers the canes directly to the crushing-rolls C^2. As I have before explained, the ability to deliver the canes in bulk into the elevator-hopper H by means of the overhead traveling crane insures a uniform and satisfactory delivery of the canes, so much so that instead of providing an intermediate conveyer between the elevator and rolls the canes can be delivered direct from the elevator-chute C' to the rolls C^2, as shown in Fig. 2.

The elevator C may be driven in any suitable way from the same motive apparatus as controls the hoisting and the overhead truck G. Thus, as shown in Fig. 1, by throwing a clutch 21 into gear with the power-shaft, driven by the engine E^2, rotary motion may be transmitted through a chain 22 to a shaft 23 and by a chain-wheel 24 and chain 25 to a wheel 32, Fig. 2, on the upper shaft of the elevator C. The clutch 21 may be controlled from the platform E' by means of a capstan-wheel K on a shaft *k* through a chain-wheel 18, chain 19, and chain-wheel 20 on the clutch 21.

By combining with the hopper and the inclined elevator therein to draw out the canes to be delivered to the crushing-rolls an overhead traveling hoisting-crane constructed and adapted to deliver the canes to the hopper in large and compact masses I am enabled to secure automatically a uniform delivery of the canes to the crushing-rolls, and consequently a thoroughly efficient action by the latter on the canes.

I claim as my invention—

1. The combination of the hopper of a cane-crushing mill and an inclined elevator therein with crushing-rolls, to which the canes are delivered after leaving the said inclined elevator and means constructed and arranged to deliver the canes in large and compact masses to the hopper and its inclined elevator, whereby the canes are delivered uniformly to the crushing-rolls, substantially as described.

2. The combination of the hopper of a cane-crushing mill and an inclined elevator therein, with crushing-rolls, to which the canes are delivered after leaving the said inclined elevator and an overhead traveling crane extending over said hopper and inclined elevator and constructed and arranged to deliver the canes in large and compact masses to the hopper and its inclined elevator, whereby the canes are delivered uniformly to the crushing-rolls, substantially as described.

3. The combination of the hopper of a cane-crushing mill and an inclined elevator therein with crushing-rolls, to which the canes are delivered after leaving said inclined elevator, an overhead traveling crane having a carrier and chains and an automatic tripping means to release the chains when the load is over the hopper, the whole being constructed and arranged to deliver canes in large and compact masses to the hopper and its inclined

elevator whereby the canes are delivered uniformly to the crushing-rolls, substantially as described.

4. A cane-hoisting carrier having two sustaining-pulleys and two sets of hooks for the chains, and means for releasing one set of hooks at the desired time, substantially as described.

5. A cane-hoisting carrier comprising a beam and sustaining-pulleys therefor, a series of fixed hooks for the binding-chains, a shaft carrying a second set of hooks and means for locking and releasing the shaft.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

HUMPHREY J. KIELY.

Witnesses:

S. C. CONNOR,

F. WARREN WRIGHT.