

(No Model.)

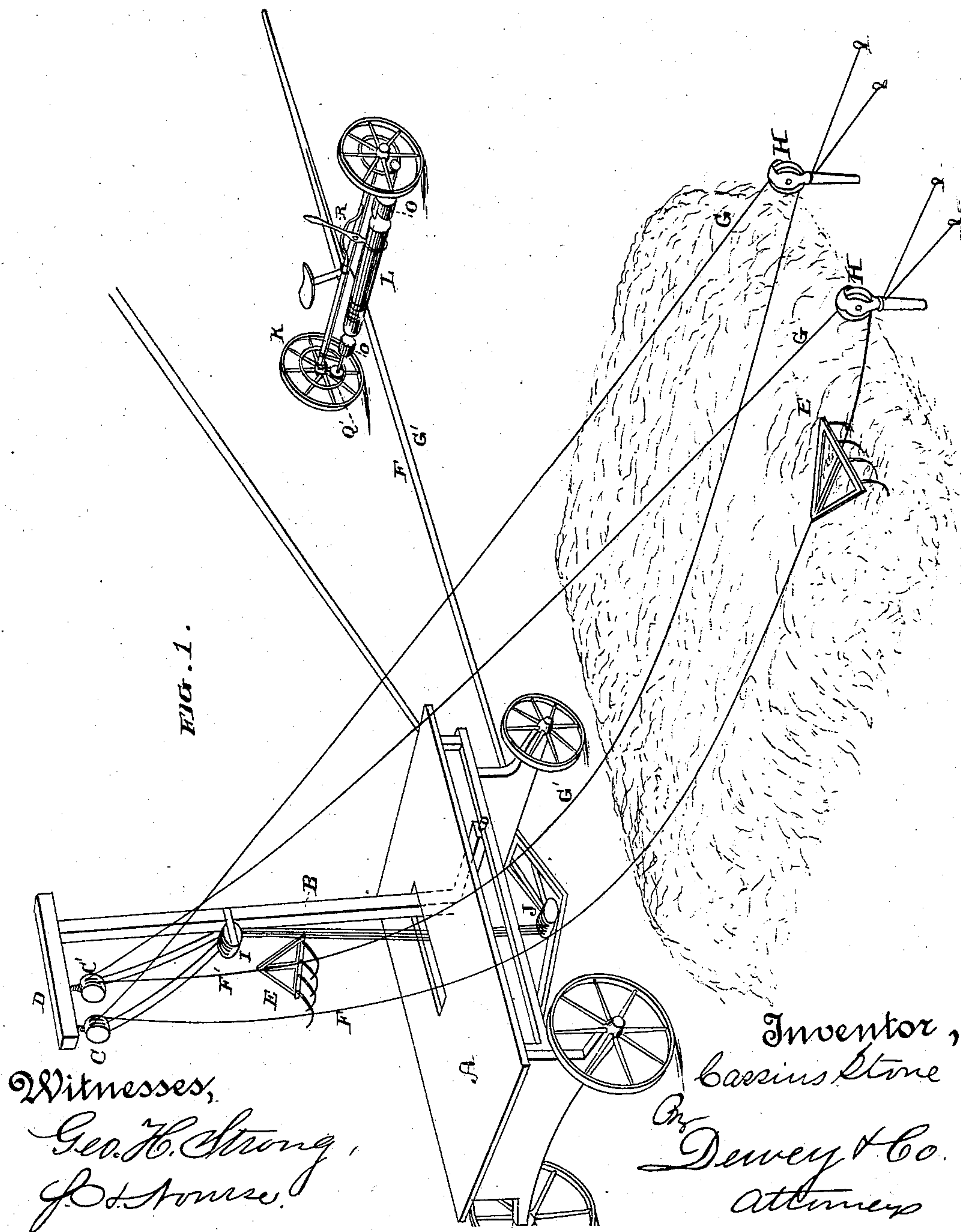
2 Sheets—Sheet 1.

C. STONE.

APPARATUS FOR WORKING DERRICK FORKS.

No. 304,968.

Patented Sept. 9, 1884.



Witnesses,
Geo. H. Strong,
J. H. Stone.

Inventor,
Cassius Stone
By
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Attorneys

(No Model.)

2 Sheets—Sheet 2.

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FIG. 2.

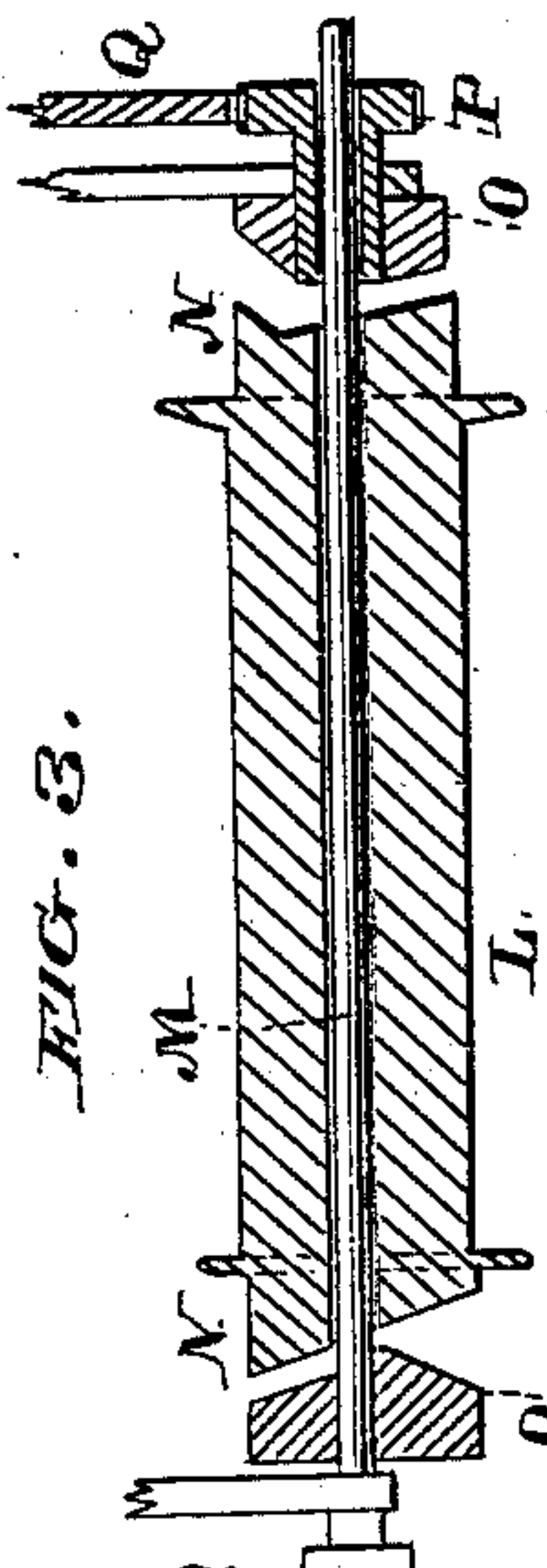
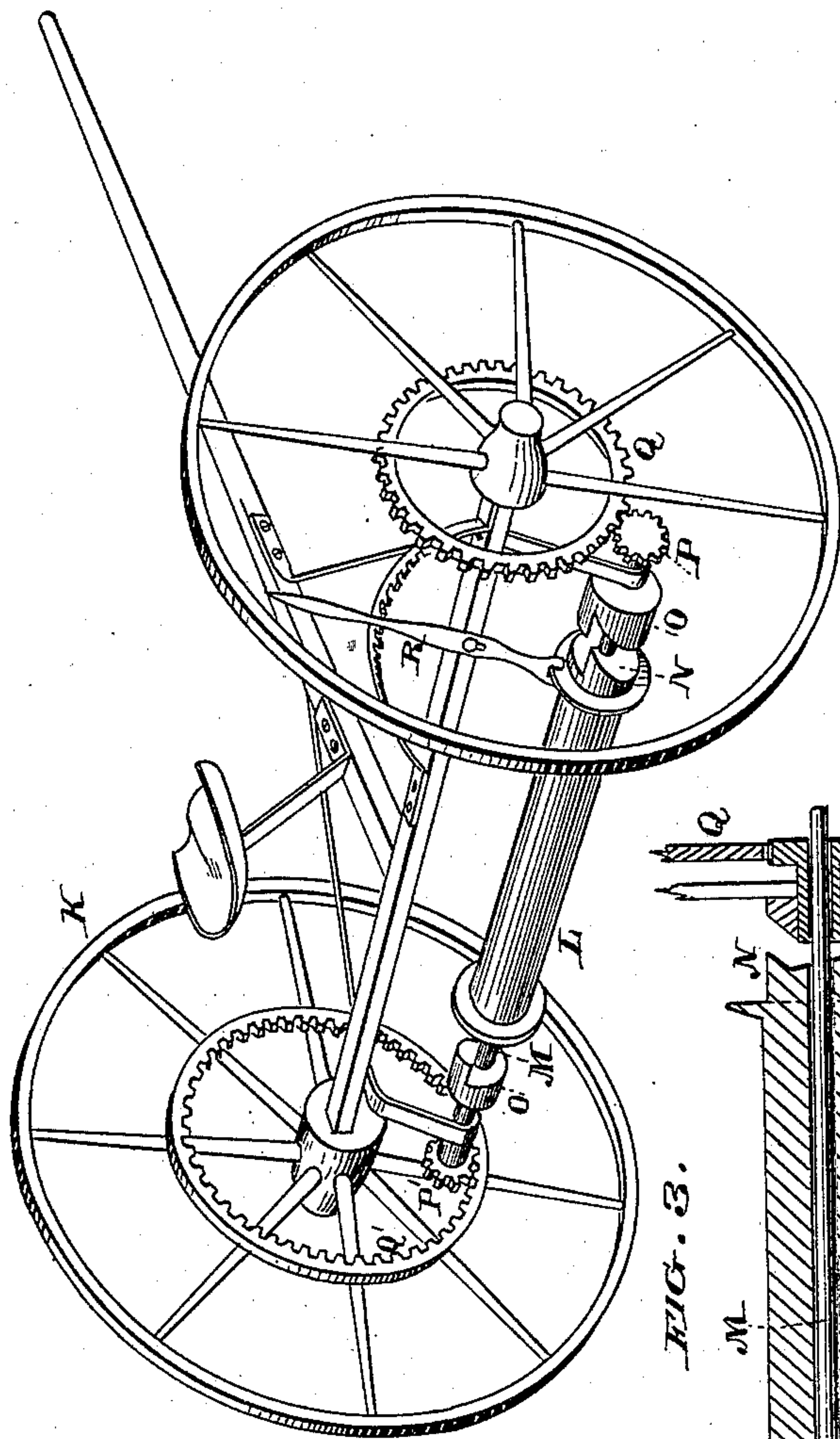


FIG. 3.

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UNITED STATES PATENT OFFICE.

CASSIUS STONE, OF WALNUT CREEK, CALIFORNIA.

APPARATUS FOR WORKING DERRICK-FORKS.

SPECIFICATION forming part of Letters Patent No. 304,968, dated September 9, 1884.

Application filed March 5, 1884. (No model.)

To all whom it may concern:

Be it known that I, CASSIUS STONE, of Walnut Creek, county of Contra Costa, and State of California, have invented an Improvement in Apparatus for Working Derrick-Forks; and I hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to an apparatus for working derrick-forks and carrying unthrashed straw from the stack to the feed-table of a thrashing-machine.

It consists of two forks with ropes attached to them to draw up the loaded fork, and at the same time return the empty one for another load, an arrangement of pulleys over which these ropes pass, and carts to the axle of each of which the rope for hauling up one fork is attached, while the rope for hauling down the other fork is connected with a drum upon the cart, this drum being revolved by gearing so as to take up any slack in the rope; or it may be allowed to rotate freely when desired. The carts are hauled away and backed up to the derrick alternately, so that the forks are worked alternately.

Referring to the accompanying drawings for a more complete explanation of my invention, Figure 1 is a view of my apparatus. Fig. 2, Sheet 2, is an enlarged view of the cart. Fig. 3 is a longitudinal section of the drum and the clutches.

In many parts of the country the grain is stacked as soon as cut, and is afterward thrashed from the stack. These stacks are usually from sixty to eighty feet long, forty feet wide, and twelve feet high. The thrashing-machine is set near the stack. The derrick-wagon and feed-table A is set in proper relation with the thrashing-machine, so that the straw may be easily delivered from the table to the self-feeder of the thrashing-machine. The derrick-mast B is set up and braced by the proper guys, and pulley-blocks C C' are suspended from the horizontal arm D at the top of the mast. The forks E are usually hauled up, when loaded, by horse or steam power, and after the load has been discharged upon the table the fork is hauled back by hand to the point on the stack where it is to be set for a new load. This work of hauling the fork

back is the most exhausting part of the labor of the forker, and as it must be hauled the entire width of the stack much of the time, only the strongest men are able to do the work.

In my apparatus, F F' are the ropes by which the forks are hauled up with their loads, and G G' are the ropes by which they are hauled back again, both being attached to the forks. The rope by which the loaded fork is hauled up is suitably attached to the fork and extends to one of the pulleys, as C. The rope G, by which it is hauled back, passes around a pulley, H, supported upon a standard behind the stack and suitably guyed or braced. From this pulley the rope G passes over the block C'. The lifting-rope of one fork and the returning-rope of the other fork lead over one pulley, and all the ropes from both pulleys pass through a four-pulley guide-block, I, upon the mast, and thence down through an opening in the table and around pulleys in a block, J, from which they lead to the carts or other power by which they are operated. The lifting-rope of one fork and the return-rope of the other form one pair, as it were, and lead to one cart K, and the other two ropes lead to the other cart. The horses attached to these carts are driven away and backed up to the derrick alternately, one being driven out while the other backs up. The action will be that the cart which is driven away will hoist one fork, and will draw on the return-rope of the other fork to haul it back, the other cart backing meanwhile, so as to slack its lifting-rope as it is hauled back by the first cart.

In order to keep the thrashing-machine supplied with straw, it is necessary to haul the fork which is being returned back more rapidly than the other is being hoisted, in order to give the forker time to select a place and set the fork for its load, and it is also necessary sometimes to take up the return-rope of the opposite fork and keep it out of the way as the cart is backed when this fork is not hauled entirely across the stack for its load. This is effected by means of a drum or roller, L, to which the return-rope is attached, the lifting-rope being attached to the axle of the cart. This drum revolves loosely upon a shaft, M, and has its ends provided with clutch-jaws N,

to engage similar jaws, O O', which are connected, respectively, with the pinions P P' at opposite ends of the shaft. The pinion P is driven by teeth upon the outside of the gear-wheel Q, which is fixed to one of the bearing-wheels of the cart, so to revolve with it, and the pinion P' is driven by the teeth of an inside gear-wheel, Q', fixed to the other wheel of the cart.

It will be manifest that when the drum is engaged with the clutch O, by moving the lever R it will be rotated backward when the cart moves forward, and forward when it moves back, or in the opposite direction from the rotation of the wheels. When thrown into contact with the clutch O', it will be driven by the internal gear, Q', and will rotate in the same direction with the wheels. When its stands between the clutches, it remains loose upon its shaft, and may be revolved by any pull upon the rope coiled upon it.

The operation will then be as follows: The rope G' being coiled around the drum from below, and the rope F being secured to the axle of the cart, when the latter is driven forward, it begins to hoist the fork connected with it the other cart being backed at the same time. As it is necessary to haul the empty fork back quicker than the cart moves to haul the full one up, the lever R is moved so as to throw the clutches N and O into gear, when the drum will be revolved very rapidly, so as to wind the rope G' upon it, and thus draw the opposite empty fork back, the cart to which it is attached being backed at the same time to relieve its hoisting-rope and allow it to be drawn back. It will thus arrive at the point where it is to be set for a new load some time before the other fork has discharged its load, and the forker will have time to select the best place and to set the fork.

When the cart is being backed up and its fork is being hauled back, it may be moving faster than the opposite fork is being raised, and the rope G', not being hauled out of the way, might become fouled on the ground. The lever R is then thrown over, so as to engage the roller or drum with the clutch O'. This causes the drum to be rotated, so as to wind up any slack of the rope G', and thus keep it out of the way as the cart backs.

If it is desired to allow the rope to unwind freely from the drum, the latter is thrown out of gear with both clutches, and stands between them. It will then revolve freely upon the shaft. By this apparatus the forks may

be handled rapidly and accurately. Either fork may take its load from a point close to the derrick, or from the most distant part of the stack, and the opposite fork may be returned while the first is being hoisted, and left either at the nearest point or the most distant, by the use of the geared roller, as described.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a derrick-fork-hoisting apparatus, and in combination with a derrick-wagon and feed-table, the two forks, with the hoisting-ropes F F' and the return-ropes G G', in combination with the pulley-blocks C C', over each of which the hoisting-rope of one fork and the return-rope of the other pass and are carried to a cart or other mechanism by which they may be drawn forward and back, substantially as herein described.

2. In a derrick-fork-hoisting apparatus having a derrick-wagon and feed-table, the forks E, with the hoisting and return ropes F G, pulleys C C', and operating mechanism, in combination with the pulleys H, fixed at the rear of the stack, and over which the return-ropes pass, substantially as herein described.

3. In a derrick-fork-hoisting apparatus, and in combination with a derrick-wagon and feed-table, the forks, hoisting and return ropes, pulleys C, C', and H, and the carts K, to each of which the hoisting-rope of one fork and the return-rope of the other are attached, substantially as herein described.

4. The carts K, with the external and internal gears upon the bearing-wheels, and the pinions engaging them and having the clutches O O', in combination with the roller L, turning loosely upon its shaft, the clutches N at its opposite ends, and the lever R, by which the roller may be engaged with the clutches at either end, substantially as herein described.

5. The carts K, with the rollers L, clutches, and driving-gears, as shown, in combination with a derrick hoisting apparatus, having the forks, hoisting and return ropes, and direction-pulleys, the hoisting and return ropes being connected with the carts and winding-drums, substantially as herein described.

In witness whereof I have hereunto set my hand.

CASSIUS STONE.

Witnesses:

H. C. LEE,
S. H. NOURSE.