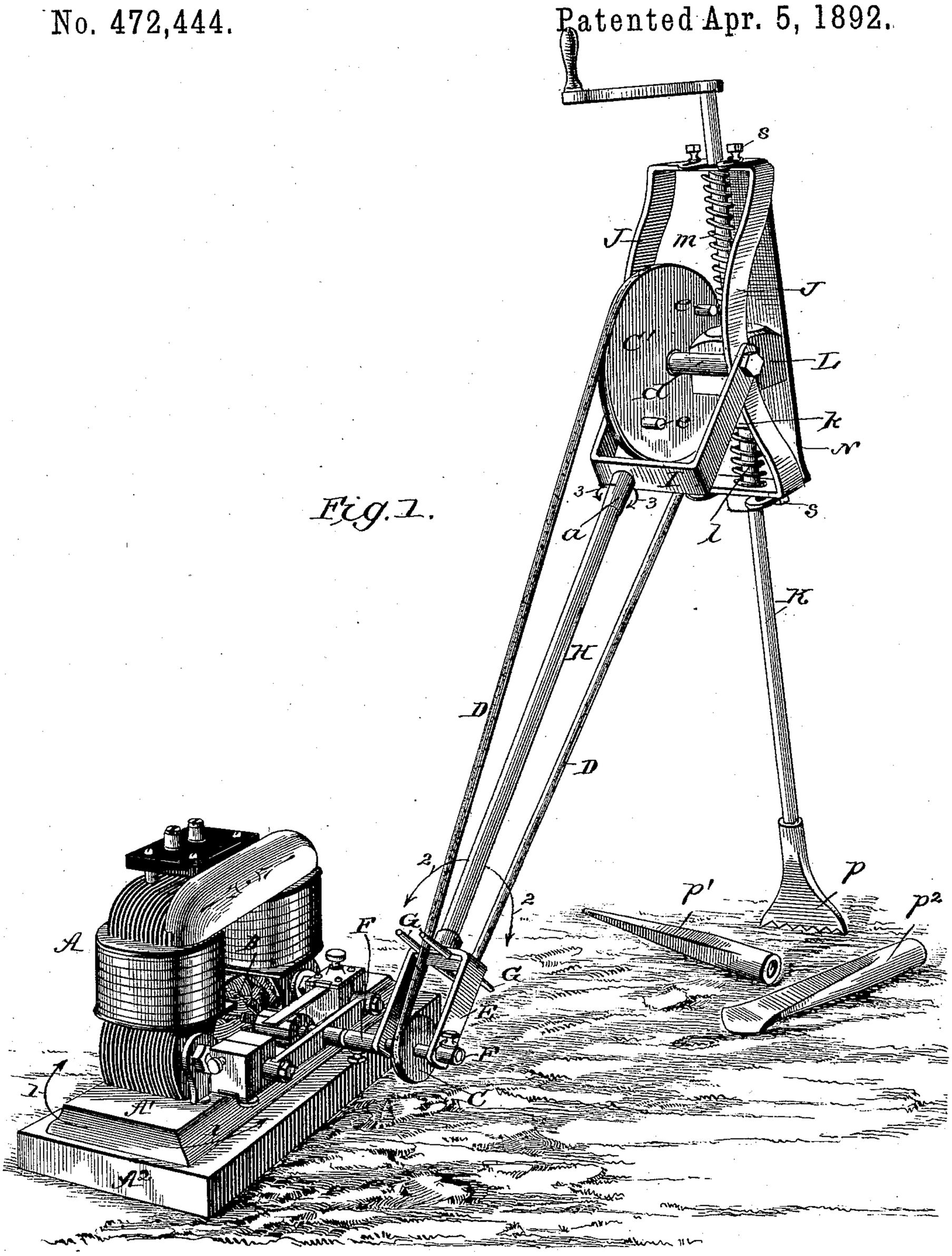
(No Model.) 2 Sheets—Sheet 1.

# J. FISH.

## ELECTRIC MINING PICK AND DRILL.

No. 472,444. Patented Apr. 5, 1892.

Fig. 1.

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(No Model.) 2 Sheets—Sheet 2.

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## ELECTRIC MINING PICK AND DRILL.

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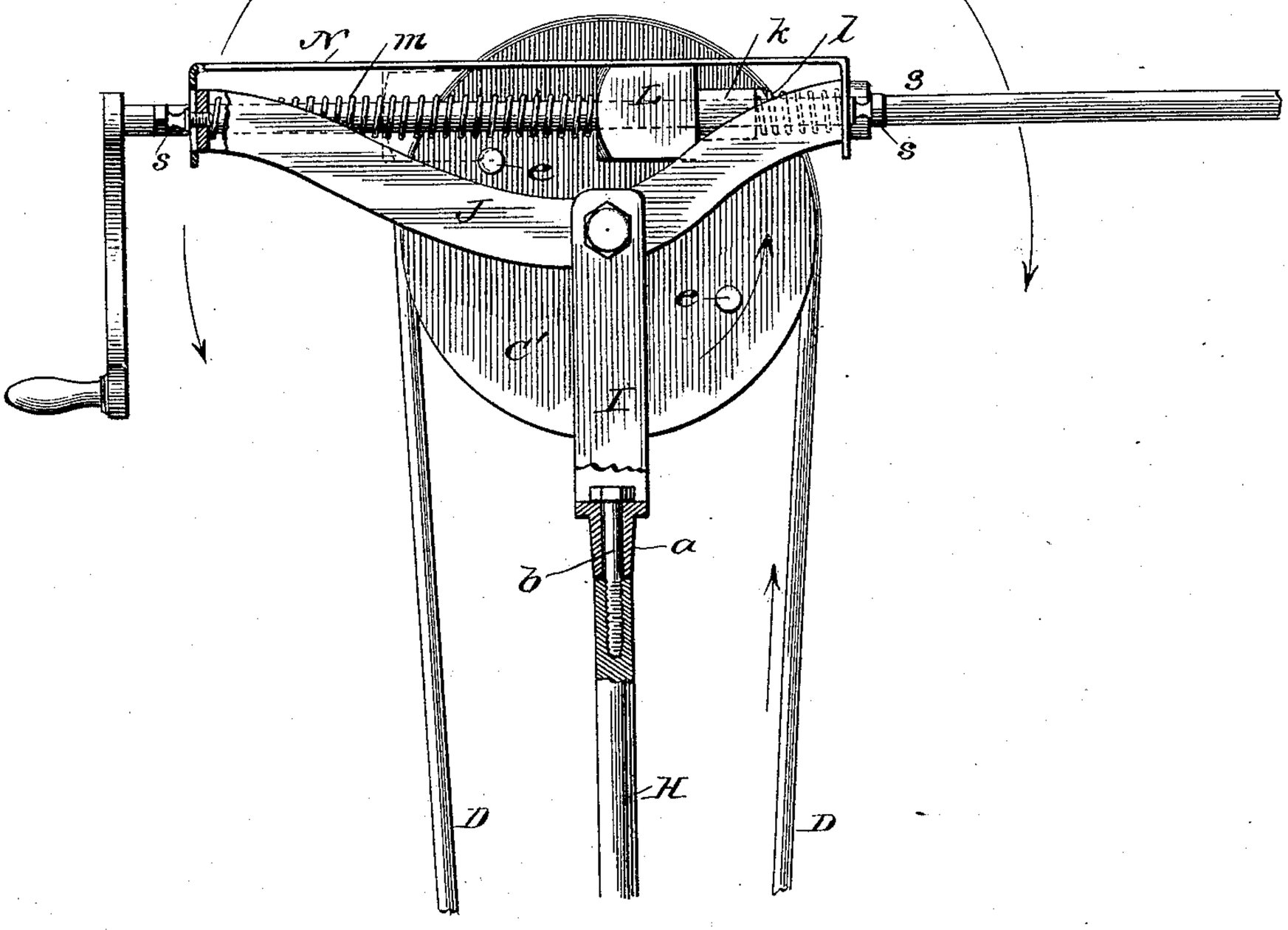
Fig. 2.

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# UNITED STATES PATENT OFFICE.

JOHN FISH, OF SOUTH BEND, INDIANA, ASSIGNOR OF ONE-HALF TO GEORGE M. FISH AND MANNING FISH, OF JOLIET, ILLINOIS.

## ELECTRIC MINING PICK AND DRILL.

SPECIFICATION forming part of Letters Patent No. 472,444, dated April 5, 1892.

Application filed April 29, 1891. Serial No. 391,002. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN FISH, of South Bend, in the county of St. Joseph and State of Indiana, have invented a new and useful Improvement in Electric Mining Picks and Drills, of which the following is a specification.

My invention is in the nature of a new mining-machine to be used either as a pick or drill and arranged to be operated by an electric motor.

It consists in the peculiar construction and arrangement of the various parts, whereby the drill is made universally applicable for all positions and directions of cut, as hereinafter fully described.

Figure 1 is a perspective view of the entire machine set up in position for working, and Fig. 2 is an enlarged view of the drill mechanism shown in section.

A is the electric motor, which may be of any preferred type. B is its armature, whose shaft is extended outside the motor far enough to receive the rigidly-keyed pulley C, that carries the driving-belt D for the drill mechanism. The electric motor is mounted upon a base A′, and this is mounted upon and secured to a sub-base $A^2$ by a strong pivot having a vertical axis that permits the motor to be rotated horizontally about such vertical axis, as shown by the arrows 1 1. This permits the drilling devices to swing together in a horizontal circle around the motor and, without changing the position of the sub-base of the motor, permits the drilling to be done in various positions about the same. Upon the extended armature-shaft is hung the forked frame E, whose branches are arranged upon opposite sides of the driving-pulley C, and are retained upon the said shaft by means of collars F F, fixed upon the shaft by binding-screws or keys. The frame E has parallel guide-arms G for the belt D, and said frame is rigidly attached to the long arm H, that carries at the outer end the drilling mechanism. The connection of the frame E and arm H to the armature-shaft, as thus described, is such as to permit the arm and drilling devices to be swung or adjusted to any position about the armature-shaft as an axial center, as indicated by the arrows 2 2. At the outer end of the arm H is carried the forked frame I, which has a long hub or tubular bearing *a*, through which passes an axial pin or stem *b*, that forms a swiveling joint for the frame I with the arm and permits the said frame and drill mechanism which it carries to be rotated axially about the arm H as a center, as shown by the arrows 3 3. This swivel connection may be formed by a screw-pin or lag-screw having its head inside the frame and its threaded portion extending down into an interior screw-thread in the hollow end of the arm; or the arm may have a reduced end passing through the hub of the frame and secured by a nut at the end.

At the upper ends of the forked frame I is fulcrumed a yoke-shaped rocking frame J, having downwardly-curved side bars. This frame is fulcrumed upon an axial pin or shaft that extends through both the branches of the forked frame and the yoke-shaped frame, and upon this axial pin there revolves the large pulley C′, which is connected with and driven by the small pulley C by belt D. This large pulley C′ is set to one side of the frame I in line with the arm H by means of a sleeve *d* and carries upon its inner face one or more laterally-projecting pins or tappet-lugs *e*.

In the rocking frame J, in suitable bearings in its end section, there reciprocates the drill-rod K, whose angle may be changed by the adjustment of the frame about its fulcrum, as shown by arrows 4 4. This drill-rod has attached to it a collar or anvil *k*, and between this collar and the end of the frame J is a spiral spring *l*, encompassing the drill-rod. On the opposite side of the collar and sliding on the drill-rod is a hammer-block L, and between this hammer-block and the opposite end of the frame is a long spiral spring *m*. Now as the pulley in this rocking frame revolves its laterally-projecting pins or lugs force back the hammer-block against the long spring *m*, compressing the latter until the pin passes the block, at which time the compressed spring exercises its tension and forcibly drives the hammer-block against the anvil or collar on the drill-rod and imparts thereto a blow, which is repeated in such rapid succession as to give a very effective cutting action to the drill-point or tool-carrier at the end of the rod.

To prevent the hammer-block from rotating on the drill-rod, said block is made square, and a flat face-plate N is secured to the yoke-frame so as to act as a guide for the hammer-block in its reciprocation and keep it from turning. This face-plate has its ends bent down and slotted and adjustably secured to the yoke shaped frame by means of set-screws *s*. To the lower end of the drill-rod are attached points or tools adapted for various kinds of work, as shown at $p\ p'\ p^2$.

The machine as thus described may be used as a mining drill or pick, as may be desired, and the adjustability of its parts permit it to be used in any position in which it may be desired to drive a cutting.

Having thus described my invention, what I claim as new is—

1. The combination, with an electric motor, of a drilling device and supporting-frame therefor hung upon the extended armature-shaft of the motor, and devices connecting the shaft and drill for operating the drill, substantially as and for the purpose described.

2. The combination, with the extended armature-shaft in an electric motor, of a drive-pulley fixed rigidly thereon, a supporting-arm loosely hung thereon and bearing at its outer end a drilling device and operating-pulley, and an endless belt extending from the driving-pulley to the operating-pulley at the outer end for working the drill, substantially as shown and described.

3. The combination, with a swinging arm for carrying drilling devices, of a forked frame swiveled to the outer end of said arm, a rocking frame fulcrumed on the outer ends of the forked frame and having bearings for a reciprocating drill-rod, a drive-pulley journaled on the fulcrum-shaft of said rocking frame and provided with lateral projections, and an anvil or collar and hammer-block arranged on the drill-rod with springs and operated upon by the projections of the pulley, substantially as shown and described.

4. The combination of the swinging arm H, the frame I, swiveled thereto and provided with a pin *d*, carrying operating-pulley C′, with laterally-projecting lugs, the rocking frame J, fulcrumed upon the pin *d* and carrying reciprocating drilling devices operated upon by the lugs of pulley C′, substantially as shown and described.

JOHN FISH.

Witnesses:
JOHN KIRK,
WILLIAM S. HAYS.