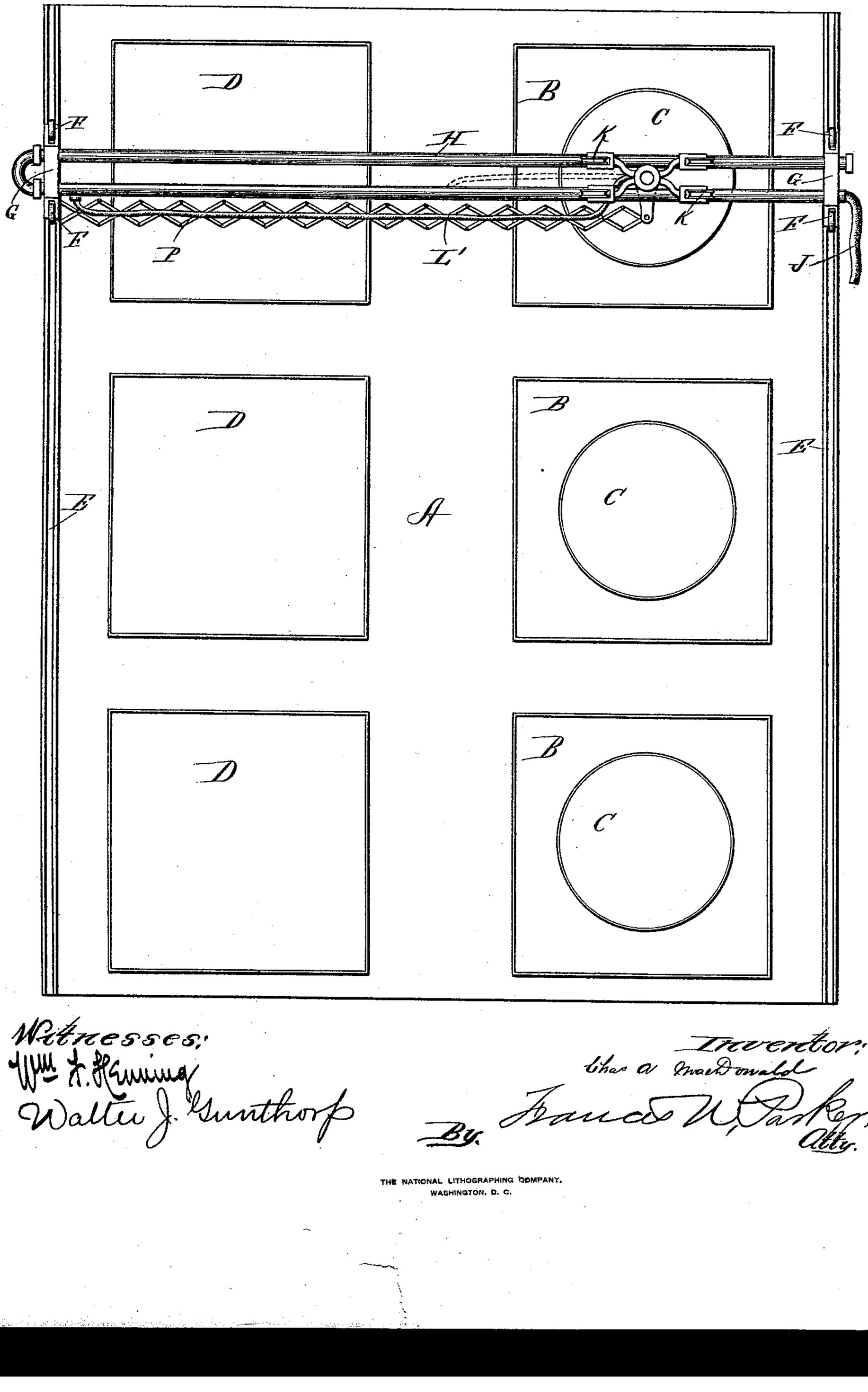
(No Model.) 2 Sheets—Sheet 1.

C. A. MacDONALD.

PNEUMATIC CAN HOIST FOR ICE MACHINES.

No. 517,468. Patented Apr. 3, 1894.

Fig. 1.



Witnesses:
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Walter J. Gunthorp

Inventor:
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(No Model.) 2 Sheets—Sheet 2.

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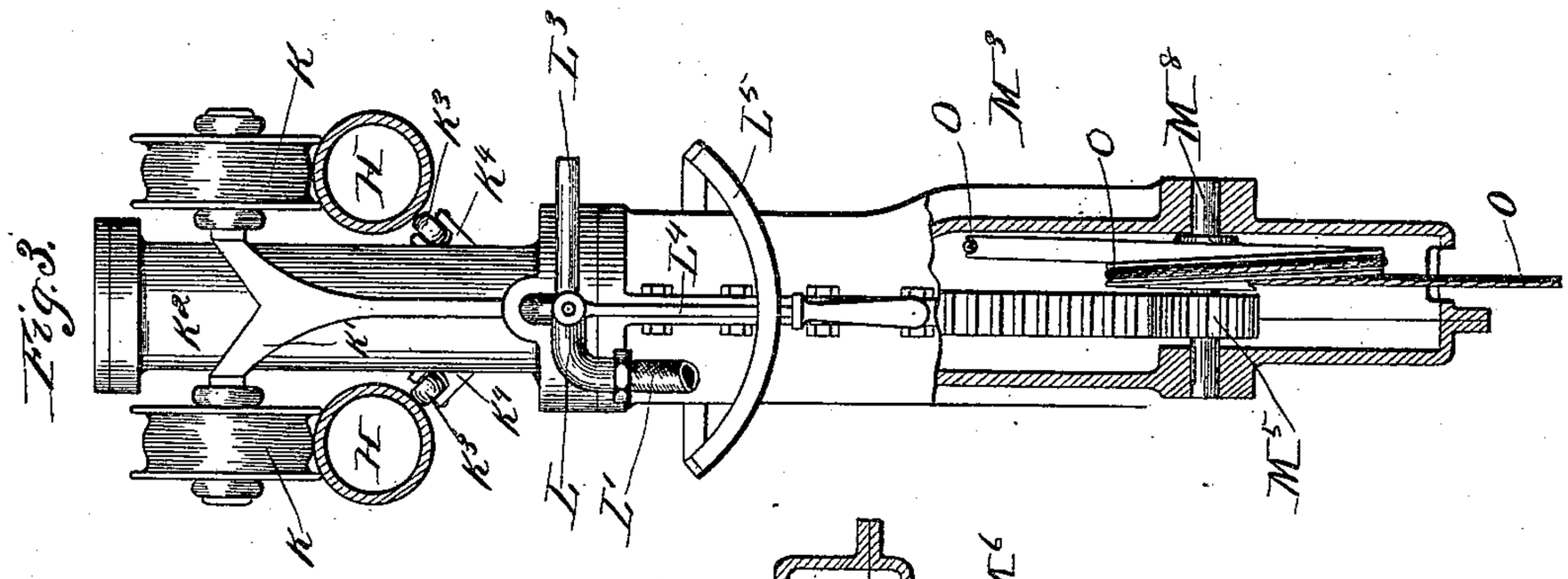

Fig. 3.

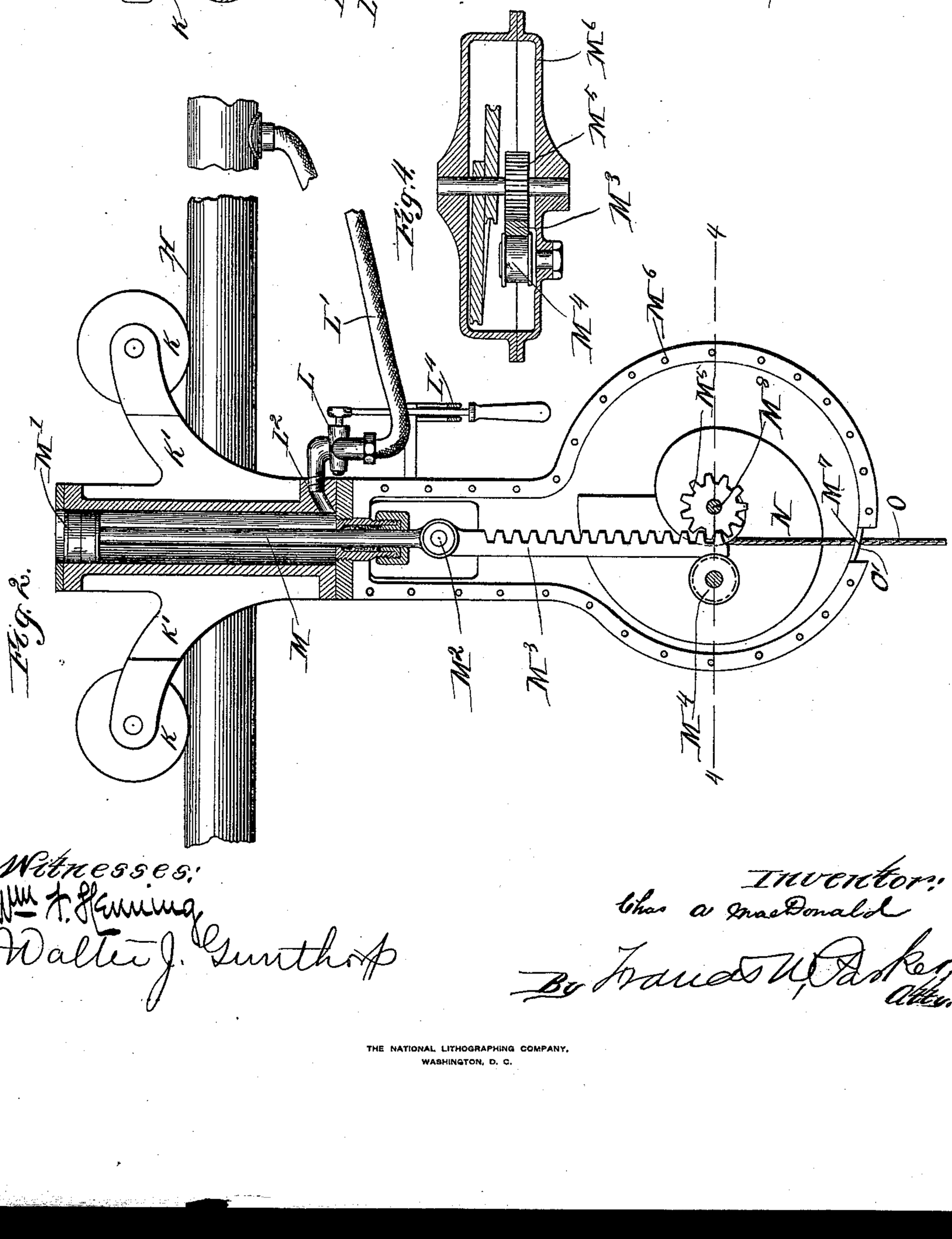

Fig. 2.

Fig. 4.

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UNITED STATES PATENT OFFICE.

CHARLES A. MACDONALD, OF CHICAGO, ILLINOIS.

PNEUMATIC CAN-HOIST FOR ICE-MACHINES.

SPECIFICATION forming part of Letters Patent No. 517,468, dated April 3, 1894.

Application filed August 22, 1892. Serial No. 443,790. (No model.)

To all whom it may concern:

Be it known that I, CHARLES A. MACDONALD, a citizen of the United States, residing at Chicago, Cook county, Illinois, have invented a new and useful Improvement in Pneumatic Can-Hoists for Ice-Machines, of which the following is a specification.

My invention relates to pneumatic can hoists, and has for its object to provide convenient means whereby cans of ice and the like may be lifted and moved about in ice making plants. It is illustrated in the accompanying drawings, wherein—

Figure 1, is a plan view, partially diagrammatic, of an ice plant, with my can hoist apparatus applied thereto. Fig. 2, is a side elevation, with parts shown in section, of the can hoist. Fig. 3, is an end elevation of the same. Fig. 4, is a detail.

Like parts are indicated by the same letter in all the figures.

A is the room or chamber in which the articles to be handled by the hoist are situated. I have suggested, diagrammatically, tanks B B, containing cans C C to be lifted and transferred to the tanks D D.

E E are rails along the side of the room adapted to receive the trunnions F F of the carriages G G, upon which the ends of the transverse pipes H H are secured. These pipes serve as compressed air receivers, and also as tracks for the can hoist. They may be provided at one end with the short connection pipes J J, whereby to be connected with air compressors to store the pipes.

K K are trunnions on the arms K′ K′, which project from the cylinder K^2.

K^3 K^3 are small guide rollers on the standards K^4 K^4, which rollers engage the lower part of the pipes H H.

At one side and toward the lower part of the cylinder is fixed the three-way valve L, having the hose connection pipe L′, which leads to the reservoir pipes H H, a connection with the aperture L^2, which leads into the cylinder, and an open-air discharge way L^3. This valve is provided with the handle L^4, which moves along the guide plate L^5.

Within the cylinder is the piston rod M, having at one end the piston M′. The other end of the piston rod projects from the cylinder and is pivotally secured at M^2 to the rack bar M^3, which is held by the idler M^4, against the pinion M^5, in the housing M^6. The housing M^6 has an aperture M^7, for the passage of the rack bar M^3. The pinion is secured on a short shaft M^8, journaled in the sides of the housing and carrying a spiral grooved pulley N about which plays the cord O, which is free to move through a slot O′ in in the bottom of the housing.

P is a pair of lazy tongs, to which, under certain circumstances, the hose connection L′ may be secured. The hose pipe in this case is connected along the various sections of the lazy tongs so as to fold up or extend with them, and the lazy tongs will be rigidly supported at one side to the carriage which carries the pipes H H, and at the other to the hoist, and the hose pipe will be connected at one side to the reservoirs and lead thence to the can hoists.

The use and operation of my invention are as follows: There are various occasions upon which it is desirable to move objects, as for example, ice cans in ice machine plants. Thus in the manipulation of such cans it is sometimes desirable to withdraw them from the tanks in which the ice has been frozen and to carry them a certain distance and then deposit them in tanks in which the cake of ice may be melted out, or to receptacles in which the cans or cakes of ice may be received. Under such conditions the cans are usually found immersed in a fluid. Assuming, therefore, that such cans are to be handled in an ice machine plant, or as illustrated in Fig. 1, the carriages carrying the reservoir pipes will be pushed back to where connection can be made with an air compressor, when said pipes will be stored with compressed air. These pipes are treated simply in this application as storage tanks, and the details of their connections and the manner of storing them are not brought out. They are then disconnected and the pipes are moved until they come over the can to be hoisted. The can hoist is then moved on such storage pipes to the point where it comes over the can to be hoisted. The rope is then made fast to the can and the parts are so arranged that the point of departure of the rope from the pulley is substantially at its greatest distance of engagement from the center of such pulley. Under these

circumstances the piston is near the bottom of the cylinder. If now the hand lever of the two-way valve be operated, compressed air from the reservoir pipes will be supplied beneath the piston and the piston will be forced upwardly and the rack bar will rotate the pinion and its shaft and also the pulley so as to wind up the rope and raise the can. As the rope winds, its point of departure from the pulley rapidly approaches the center of the pulley so that the rate at which the can rises is constantly diminished, though the speed of rotation may be the same. This is to compensate for the increasing effective weight of the can, incident to its gradual removal from the fluid in which it is immersed. When the can is removed from its receptacle, the reservoir pipes may be moved and the can hoist may be moved along such pipes until the can is brought to the place where it is to be deposited. By then reversing the hand lever the connection between the cylinder and the reservoir pipes will be cut off and the air will be freed from the cylinder and the can will be permitted to descend. If the lazy tong construction is used, though it is not always necessary and would only be required in the case of an arrangement where a considerable transverse excursion was to be taken by the can hoist, the hose is supported at all points, no matter what the distance of the can hoist cylinder from the point of connection with the reservoir pipe.

I claim—

1. In a can hoist, the combination of compressed air reservoir pipes, supported so as to be moved sidewise and a can hoist proper supported on such pipes so as to travel therealong, and means for connecting such can hoist with such pipes so that the pressure thereof may be used to operate the can hoist.

2. In a can hoist the combination of reservoir pipes with carriages at their ends, means for connecting them with an air compressor, whereby they may be stored with compressed air, a can hoist supported on such pipe and means for connecting the operating mechanism of such can hoist with such storage pipes.

3. In a can hoist the combination of storage pipes with a can hoist proper supported so as to be removable along such pipes, a cylinder, a piston in such can hoist, a connection from such piston through the can and a hoist connection from such cylinder to such storage pipes.

4. In a can hoist the combination of a cylinder, with a piston, a rack rod connected with such piston, a pinion to engage such rack rod and a pulley associated with such pinion and a rope on such pulley to be attached to the can.

5. In a can hoist the combination of a cylinder, with a piston, a rack rod connected with such piston, a pinion to engage such rack rod and a pulley associated with such pinion and a rope on such pulley to be attached to the can, said pulley having a spiral surface so that the speed of vertical motion of the end of the rope varies with regard to the speed of rotation of the pulley.

6. In a can hoist the combination of a cylinder, with a piston, a rack rod connected with such piston, a pinion to engage such rack rod and a pulley associated with such pinion and a rope on such pulley to be attached to the can, and an idler to hold the rack rod against its pinion.

7. In a can hoist the combination of compressed air reservoir pipes with a can hoist proper, movable along such pipes, a hose pipe connecting the hose proper with the reservoir pipes, and a lazy tong support for such hose which is secured at one end to the pipes and at the other end to the hoist.

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