

(No Model.)

G. W. BROWN.  
SAFETY HOD ELEVATOR.

No. 259,473.

Patented June 13, 1882.

*Fig. 1.*

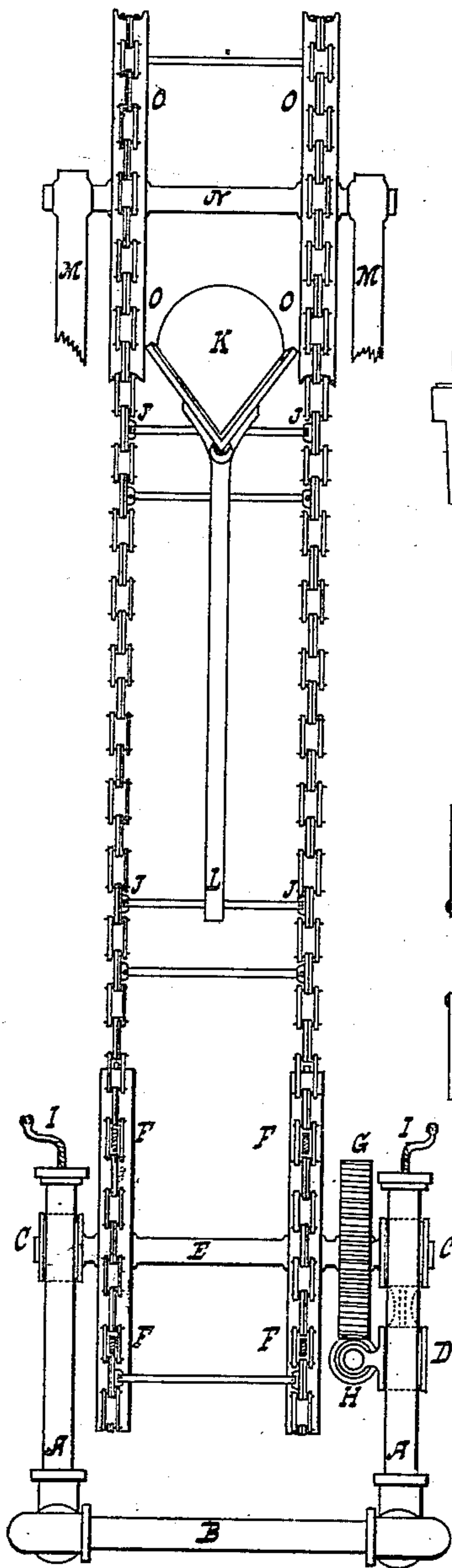


Fig. 3.

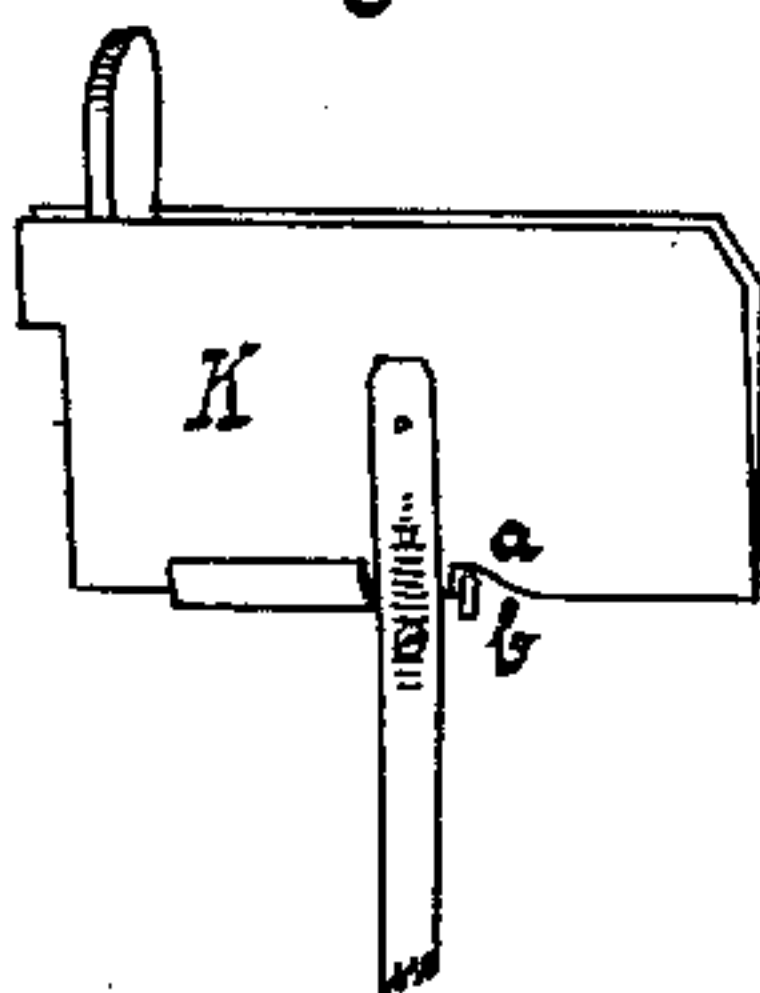


Fig. 4.

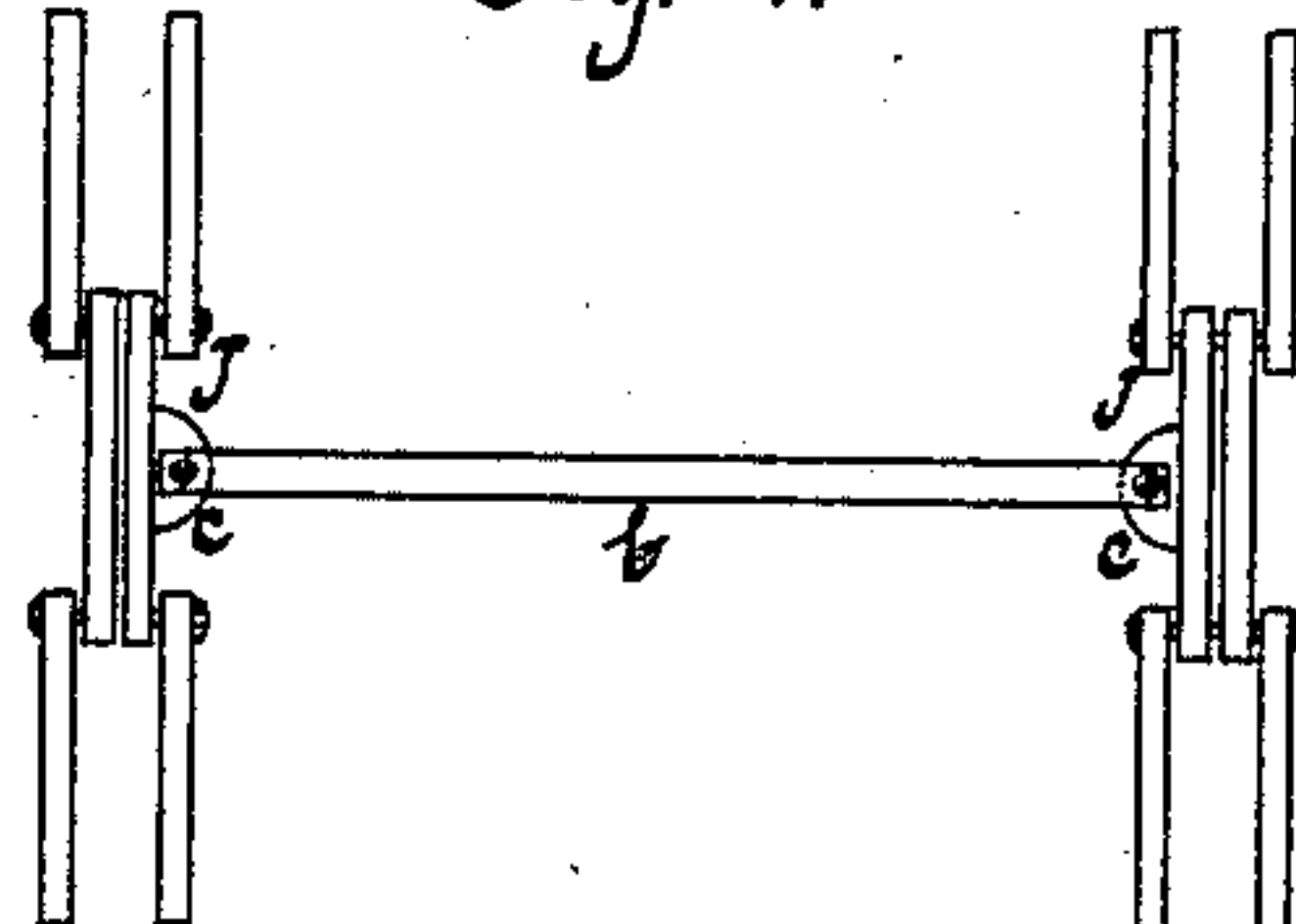
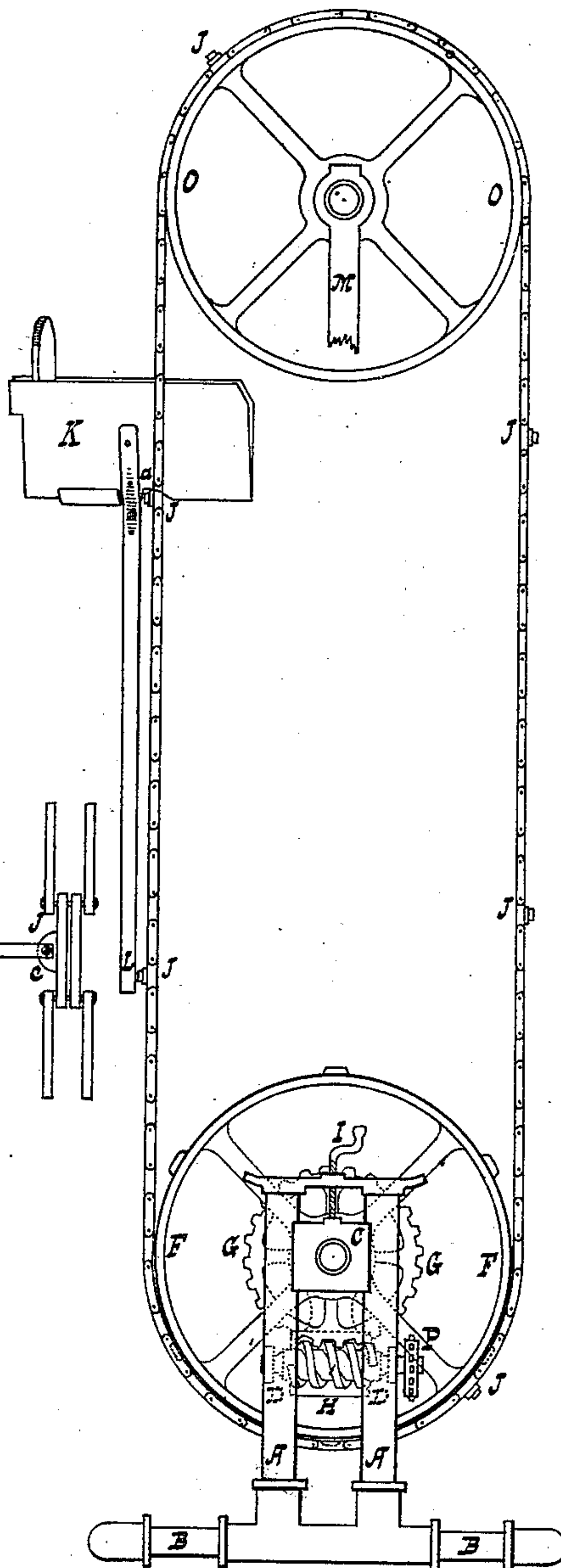


Fig. 2.



Witnesses:

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Inventor:

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# UNITED STATES PATENT OFFICE.

GEORGE W. BROWN, OF NEW YORK, N. Y.

## SAFETY HOD-ELEVATOR.

SPECIFICATION forming part of Letters Patent No. 259,473, dated June 13, 1882.

Application filed June 9, 1881. (No model.)

*To all whom it may concern:*

Be it known that I, GEORGE W. BROWN, of the city of New York, in the county and State of New York, have invented certain new and useful Improvements in Safety Hod-Elevators, of which the following is a specification.

My invention relates to elevating hods by means of an endless flexible chain or rope ladder continuously revolving upon and around two suitable pulleys located respectively at the top and the bottom of a building in course of construction. This method has an element of safety lacking necessarily in platform elevators alternately raised and lowered, since the ladder is always in view and workmen cannot get under it. The endless chain ladders now known to the art and in common use are impracticable in the high buildings now usual in large cities, since the great length of ladder demanded is too heavy to be easily handled at such height, and when hung and loaded with hods sags or bellies, owing to the manner of attaching the hod.

It is the object of my invention to obviate these objections by an improved construction of the ladder itself and an improved manner or method of attaching the hod. The scope of my invention includes the application of steam-power, thereby increasing the working capacity of the ladder to meet the present demand. These objects are attained by the mechanism and in the manner illustrated by the accompanying drawings, wherein—

Figure 1 represents a front elevation, and Fig. 2 a side elevation, of my improved safety hod-elevator, similar letters of reference indicating corresponding parts throughout the views. Figs. 3 and 4 are detailed sectional views.

B B is a base-frame supporting on opposite sides pairs of uprights A A. Between these uprights slide suitable castings, C C, bearing boxes for the shaft E, carrying the driving-pulleys F F, having teeth engaging the links of the chains, and the spur-wheel G. Connected and sliding with one of these castings is a second similar casting, D, having arms carrying boxes bearing the endless screw or worm H, gearing with the spur-wheel G. This whole driving-gear is suspended in and by the endless chains by the pulleys F F, thereby be-

coming self-adjusting to the perpendicular, and adding its weight to increase the tension of the chains and compensate for accidental loosening, whereby the teeth of the driving-pulleys become disengaged from the links. Any additional tension needed can be given by the set-screws I I. The chains pass upward and around the plain flanged pulleys O O upon the shaft N, supported at the desired height by the frames M M.

The chain is constructed, as detailed in Fig. 4, of wrought links pivoted or bolted together to secure flexibility. Hitherto it has been customary to form the rounds of the ladder by continuing the bolts across between the chains at every foot. Rounds so constructed and located are liable to bend or break under the weight of the loaded hods, and the number and size of such rounds greatly increase the weight of the chain per foot, and as now constructed and operated such number and size is necessary. Otherwise the slow movement of hand-power would consume too much time in waiting for succeeding rounds if one were missed, and lighter rounds consequently more dangerous. To obviate these disadvantages I use a rectangular steel bar, *b*, the greater strength of this material and shape permitting the use with safety of a much lighter round than formerly with a hole drilled in each end, and, instead of the ordinary link, a special one, *J*, made with an ear, *c*. This link can be made of cast-iron, or rendered malleable, or punched from wrought-iron, and the ear afterward heated and bent. A cast link can be safely used, since the wrought link by its side gives ample strength, and the cost of manufacture thus reduced. The steel bar is bolted to the ear of this link by an ordinary bolt and nut. Such construction will allow sufficient compensatory movement in the case of one chain advancing on its companion from the periphery of its driving-pulley enlarging with accumulated mortar or dirt, and does away with any cutting into or recessing the links to seat the bar, thereby weakening the link, and permits the chains and rounds to be separated for easy and economical transportation. These bars are to be so located relative to the hod to be supported that while one supports the hod-bowl the next supports the lower part of the hod handle or shank, and will thus be about three feet



apart. This location of the rounds allows the hod to be taken off without hitting its bowl or load against the next upper round or the hod-shank thereon, thereby overthrowing the load, and also allows sufficient open space wherein the laborer can surely and safely adjust the hod to be taken up by the succeeding round, and, owing to the faster movement of steam-power, there is no appreciable delay in waiting for a round.

It is usual to attach the hod to a round of the ladder by means of a hook affixed to the bowl at its open end, and then to allow the hod-handle to swing against another and lower round. This position places great strain on the hod-handle and occasions the weight of the loaded hod to pull away from the line of ascent and belly the ladder, and when a series of loaded hods are being elevated this bellying is correspondingly increased, and thereby the tension, without a corresponding increase in the traction, and thus a greater expenditure of power is necessitated without more work done. To obviate these difficulties I let into the bottom of the hod-bowl a suitable notch, *a*, fitted to afford the hod a seat on the round near the line of the center of gravity of its load. I prefer to line this notch with metal to prevent wear, and made sufficiently broad to give the hod a firm seat on the bar and prevent lateral oscillation. As shown, the incline of the notch is toward the open end of the hod-bowl, which facilitates seating it on the bar and does not necessitate lifting to remove it, and is sufficient to enable the hod to retain its seat. The lower part, *L*, of the hod-shank reaches and rests against the next lower bar. The hod is thus hung perpendicularly and in the line of ascent, and therefore no sagging or bellying of the ladder is occasioned, and, moreover, strain upon the hod-handle is removed. To attach the hod to the ascending ladder, the laborer approaches with a loaded hod on his shoulder and shanks or rests it on the bottom end of its shank in front of the line of ascent, then leans the bowl between the passing rounds until an ascending round engages the notch and carries the bowl upward until its shank swings and rests

against the next lower round. The hod is thus easily, safely, and firmly attached and held. When the desired height is reached another laborer approaches and takes the hod off onto his shoulder, the peculiar construction of the notch facilitating this movement, and carries it to its destination.

In applying steam-power I use an endless screw or worm, *H*, gearing with the spur-wheel *G*, to communicate motion to the shaft *E*, carrying the driving-pulleys *F F*. This gearing transmits the power from the steam-engine with the diminished rate of speed at which it is desirable and necessary to run the ladder, and also holds the ladder in place in case of accident, thus forming an automatic safety-stop. Motion is communicated to the endless screw by the chain-wheel *P*, receiving its motive power from the engine by a chain belt.

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

1. A hod-elevating ladder composed of parallel endless chains connected with rounds, constructed and affixed substantially as specified.

2. A hod-elevating ladder composed of parallel endless chains connected with rounds, as described, and so located that one shall support the hod by its bowl and the next lower one afford a resting-place for its shank at the lower part thereof.

3. An endless hod-elevating ladder combined with a detachable hod having a notch in the bottom of the hod-bowl, near the middle of its length and the line of the center of gravity of the load, and suited to afford a seat for the hod-bowl on a round of the ladder.

4. A hod-elevating apparatus combined with and operated by worm-gearing and connecting mechanism.

5. An endless hod-elevating ladder combined with motive mechanism suspended therein and thereby, substantially as described.

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Witnesses:

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