No. 713,204. Patented Nov. 11, 1902.

C. CARLSON.

HOD ELEVATOR.

(Application filed Jan. 29, 1902.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.

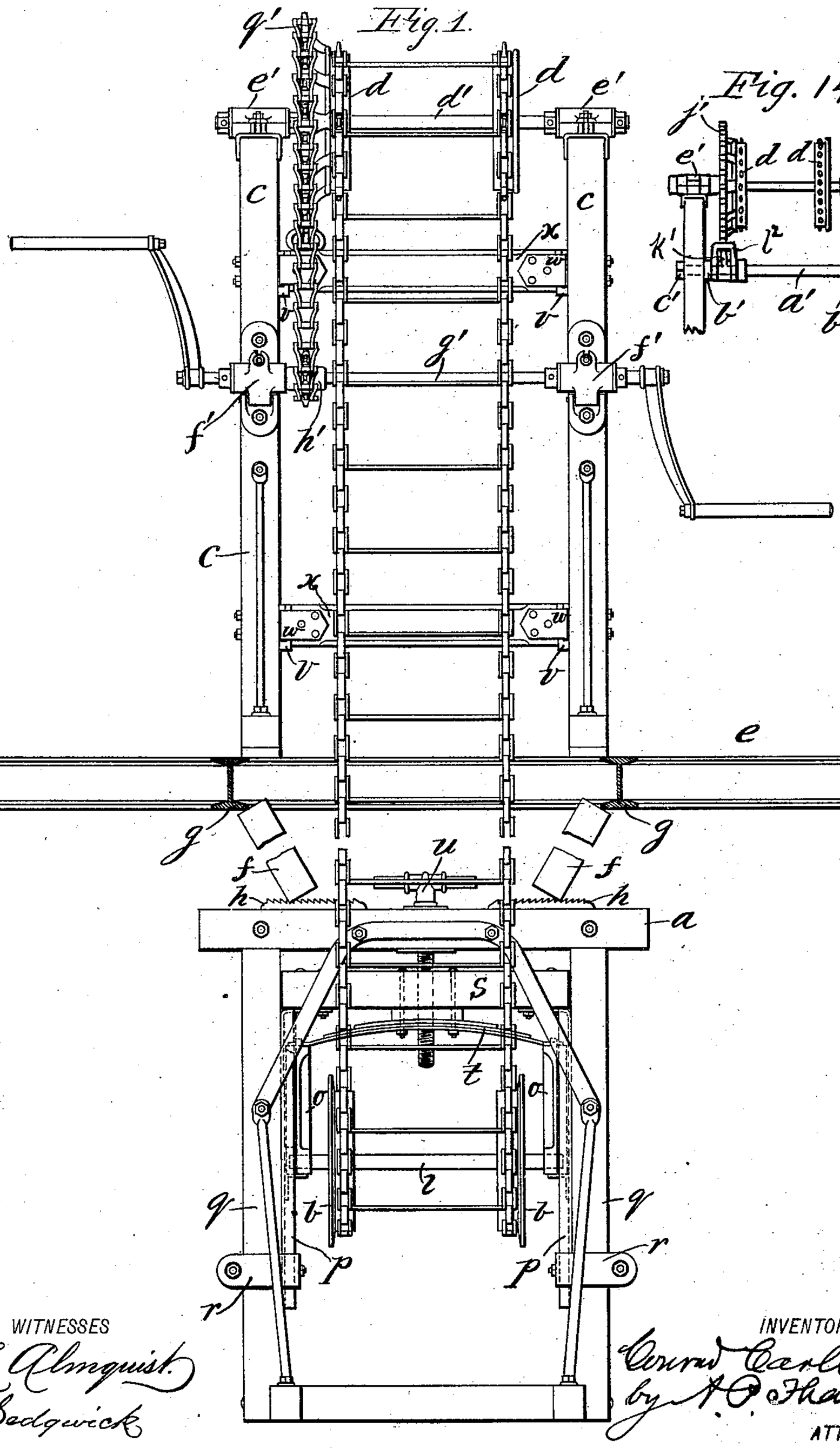

Fig. 14.

WITNESSES

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Fig. 12.

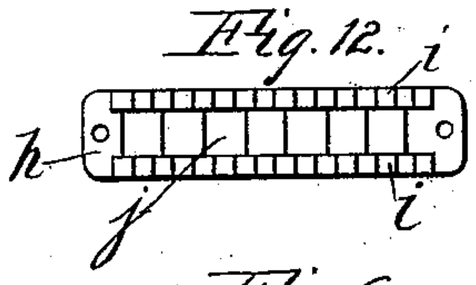


Fig. 2.

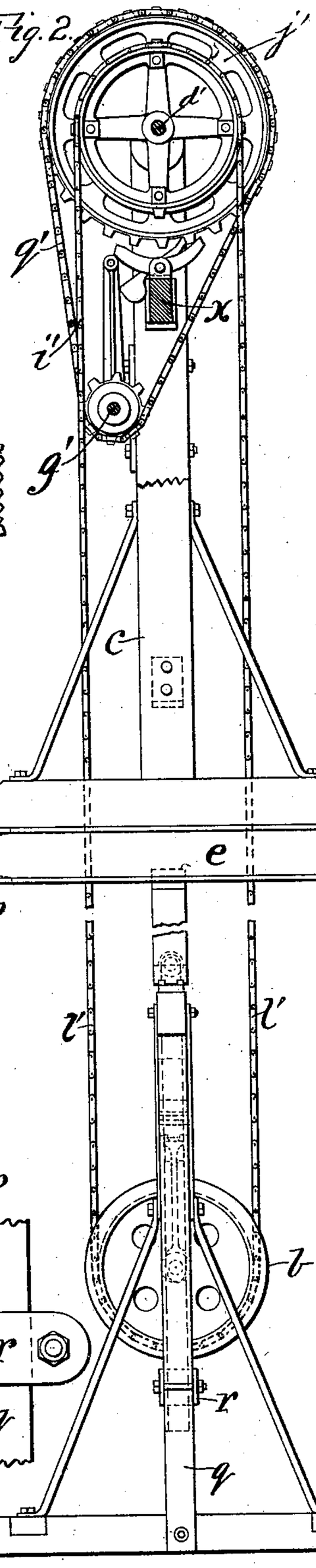


Fig. 13.

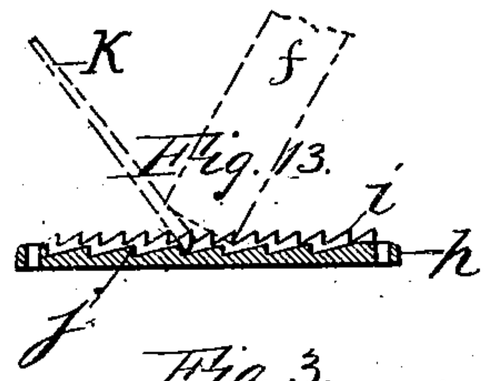


Fig. 6.

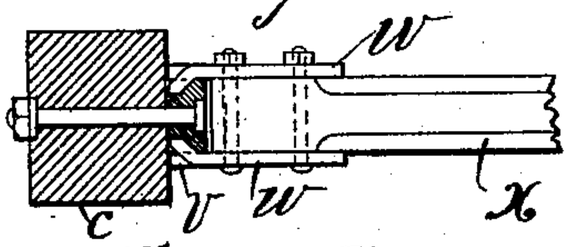


Fig. 7.

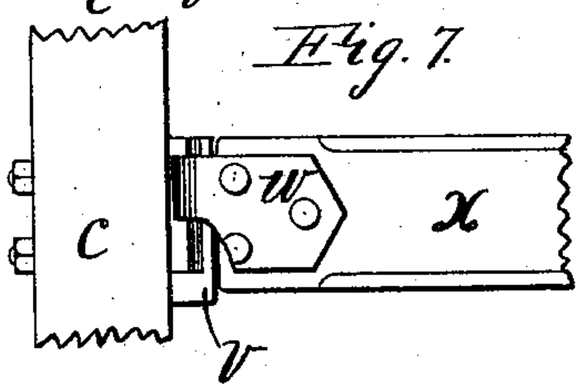


Fig. 8.

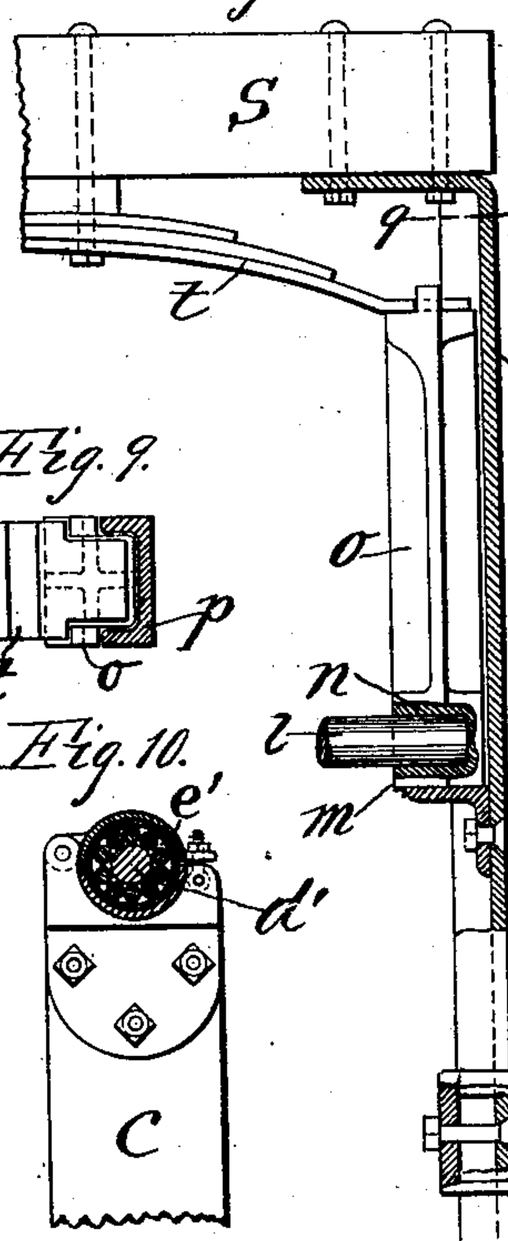


Fig. 9.

Fig. 10.

Fig. 3.

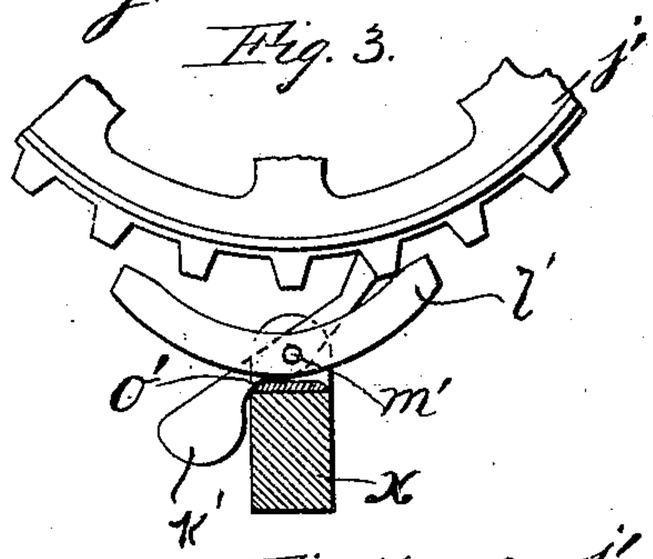


Fig. 4.

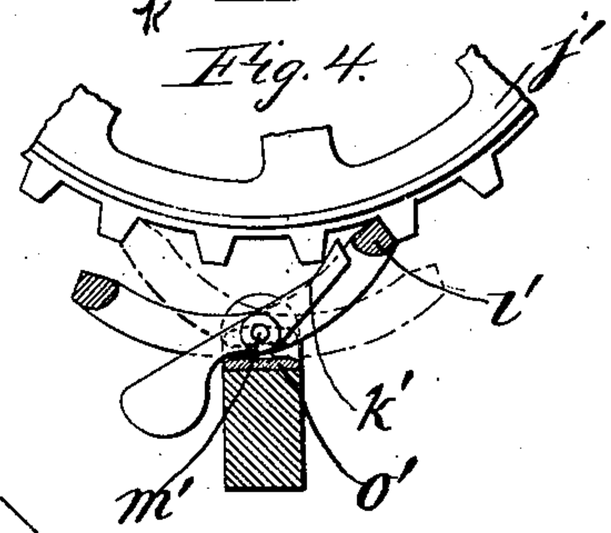


Fig. 5.

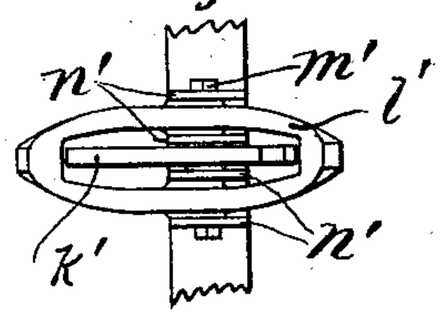
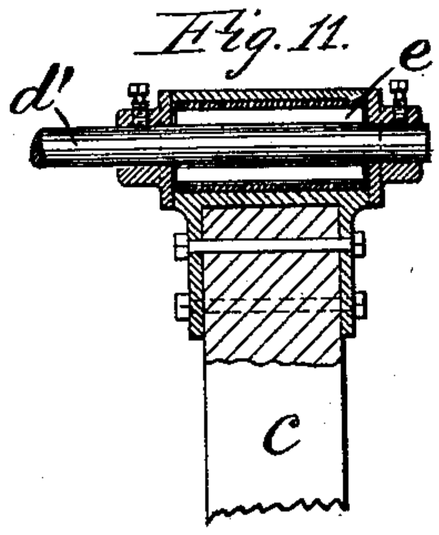


Fig. 11.



WITNESSES

L. Almquist.

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INVENTOR

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by A. D. Thayer

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UNITED STATES PATENT OFFICE.

CONRAD CARLSON, OF BROOKLYN, NEW YORK.

HOD-ELEVATOR.

SPECIFICATION forming part of Letters Patent No. 713,204, dated November 11, 1902.

Application filed January 29, 1902. Serial No. 91,762. (No model.)

To all whom it may concern:

Be it known that I, CONRAD CARLSON, a citizen of the United States of America, and a resident of the borough of Brooklyn, New York city, and State of New York, have invented certain new and useful Improvements in Hod-Elevators, of which the following is a specification.

My invention relates to extensible hod-elevators such as are employed in elevating bricks and mortar in the construction of buildings and required to be extended from story to story as they rise one above another; and it consists of the various details of construction for simplifying and cheapening the construction and increasing the efficiency, as hereinafter described, reference being made to the accompanying drawings, in which—

Figure 1 is a front elevation of my improved elevator. Fig. 2 is a side elevation with some parts in section. Figs. 3 and 4 are details of the automatic safety retaining-pawl mechanism, partly in side view and partly in section and enlarged for greater clearness. Fig. 5 is a plan view of the pawls of Figs. 3 and 4. Fig. 6 is a detail in plan view and partly in section of the frame structure carrying the chain-operating mechanism. Fig. 7 is a detail showing the devices of Fig. 6 in side elevation. Fig. 8 is a detail of the chain-carrying-wheel mechanism of the lower extremity of the chain-range, partly in side elevation and partly in vertical section. Fig. 9 represents a horizontal section on line 9 9 of Fig. 8. Fig. 10 is a transverse section of a roller-bearing such as I purpose to use for the shaft of the chain-operating wheels. Fig. 11 is a longitudinal section of the said roller-bearing. Fig. 12 is a plan view of a ratchet-bar to be used for the struts employed to stay the housings of the chain-carrying wheels for the lower range of the chains under the floor-beams of the structure next above where the housings are seated. Fig. 13 is a longitudinal vertical section of said ratchet-bar. Fig. 14 is a detail in front elevation, showing a modification of the frame structure and retaining-pawl mechanism of the lower chain-carrying wheels.

In Figs. 1 and 2 the complete apparatus is represented, *a* being the housings for the lower chain-carrying sprocket-wheels *b*, and *c* being the housings for the upper chain carrying and driving wheels *d*. The housings *a* are generally permanently located on the main or ground floor beams, and the housings *c* are placed on the upper-floor beams, as *e*, successively as they are placed in position floor after floor, and the chains *l'* are correspondingly lengthened by additional sections spliced in, as is commonly practiced in machines of this character.

The housings *a* are usually stayed for permanency during their use in the structure being built by struts, as *f*, bearing at one end on the top beam of the housings and at the other end against floor-beams, as *g*, and being set obliquely for being made to thrust forcibly on the housings by being shifted along the top beam in the direction in which the angle of the thrust is increased by such shift.

While the upper ends of the struts can be so placed against the beams *g* as to avoid any damage of slipping thereon, care must be taken to avoid slipping of the lower ends, which cannot be so placed on the beams of the housing. I have therefore provided ratchet-plates, as *h*, for holding them, said plates to be attached to the top of the beam, as shown in Fig. 1, and I construct the plates with marginal ratchet-faces *i*, on which to seat the struts, and an intermediate lower ratchet-face *j* to facilitate the use of a pinch-bar *k* for forcing up and tightening the struts, as indicated in Fig. 13.

The shaft *l*, carrying the lower chain-wheels *b*, has its journal-bearings *n* in the lower ends of bars *o*, that are vertically slidable in ways *p*, attached to the posts *q* of the lower housings by clamps *r*, so as to be shifted up and down, said ways being connected at their upper ends to a beam *s*, under which is a semielliptic spring *t*, bearing at its middle against the beam and at its ends bearing on the upper ends of the bars *o*, in which the carrying-wheel shaft *l* is mounted, so that an adjusting-screw *u*, fixed in the housing-beam and screwing through the beam *s*, may when the clamps *r* are relaxed set the shaft *l* to adjust the tension of the chains, and the spring affords yielding tension, which it is obvious is preferable to a positive adjustment.

To facilitate shifting the upper housings *c*

from floor to floor and for transporting them, it is desirable to connect the two parts detachably, which may be done in various ways, one of which may consist of flanged brackets *v* on the housings and hook-ended plates *w* on the connecting-bars *x*, adapted to engage the flanges of the brackets, as shown best in Figs. 6 and 7, so that the connection is readily effected by setting the housings upright at the proper distance apart and dropping the bars so that the hook-plates *w* engage the flanges of the brackets, and disconnection is effected by lifting the beams. Another plan consists of rods *a'* extending at the ends through perforations in the housings, respectively, and having fixed collars *b'* and nuts *c'* to clamp the housings between them. This is the preferable form of connecting the housings, as will appear farther on.

The shaft *d'*, on which the chain-driving wheels *d* are carried, is provided with roller-bearings *e'*, these being the bearings on which the loads are carried, and therefore subject to the greatest friction, and I will also employ like roller-bearings *f'* for the crank-shaft *g'*, which is used with a small sprocket-wheel *h'* and a large sprocket-wheel *j'*, together with a chain *q'*, for driving the shaft *d'* in a power-multiplying system enabling the lifting of heavy loads by hand.

It is desirable and also common to employ retaining-pawl mechanism with one of the sprocket-wheels on shaft *d'* to prevent reverse motion of the chains in case power is relaxed accidentally or otherwise on the cranks; but the pitch of the teeth of such wheels is so great that severe shocks of backlash are liable when a tooth passes the pawl-bit to any considerable extent before such relaxation of power and momentum is acquired in the reverse movement before the pawl takes effect on the sprocket-wheel. To avoid such shocks, I provide two or more pawls so placed that the length of the full back movement is reduced by half, or thereabout, the bits of said pawls being spaced one in advance of the other half the distance of such full back movement. Thus *k'* is one pawl and l^2 another, both adapted to automatically stop back action of the chain-driving wheels and one reaching forward about half the length of a space between the teeth of wheel *j'* farther than the other, so that if back action begins before pawl l^2 can engage a tooth pawl *k'* engages said tooth when it has moved only half as far back, as if only one pawl were used. It will also be noted that the pawls are arranged to coact with one of the large chain-driving wheels instead of the small driving sprocket-wheel, whereby the lost motion on the chain is reduced in the proportion of the difference between the small and the large wheels in size, and thus the shocks are proportionately reduced in comparison with the arrangement of the pawls on the small sprocket-wheel.

The pawl l^2 preferably comprises two longitudinal bars arranged side by side with an intermediate space and joined to each other at the ends, whereat the space is somewhat contracted, and pawl *k'* is a single bar placed between the two bars of pawl l^2, both pawls being placed on a single pivot *m'*.

In Figs. 1 to 5, inclusive, the respective bars of the pawls are pivoted between jaws *n'* of a bearing-plate *o'*, placed on housing-connection bar *x*; but in Fig. 14 the round housing-connecting rod *a'* furnishes a pivot for the said pawls and avoids the expense of the jaw-plate, besides being more substantial and reliable, which is the reason for the preference for this form of housing-connecting rod before stated. These pawls are confined between one of the collars *b'* and another collar *p'*.

What I claim as my invention is—

1. The combination with the carrying-wheel housings and the stay-struts, of the strut-retaining ratchet-bars, having the marginal strut-retaining teeth and the intermediate lower pinch-bar-holding teeth.

2. The combination with the lower housings, chain-carrying wheels and their shaft, of the vertically-movable bearings for said shaft, guides for said bearings adjustably supported in the housings, connecting-beam for the guides, spring pendent from said beam, bars connecting said shaft-bearings and spring, and the tension-screw in the housing-beam, and in the guide and spring carrying beam.

3. The combination with the housings, of the chain-driving mechanism, chain-driving wheel and shaft, rods with collars and nuts connecting said housings, and retaining-pawls for one of said chain-driving wheels, said pawls pivoted on one of said housing-connecting rods and coacting with one of said chain-driving wheels.

Signed at New York city this 20th day of January, 1902.

CONRAD CARLSON.

Witnesses:
C. SEDGWICK,
J. M. HOWARD.