

(No Model.)

F. R. WILLSON, Jr.
ELEVATOR.

No. 538,057.

Patented Apr. 23, 1895.

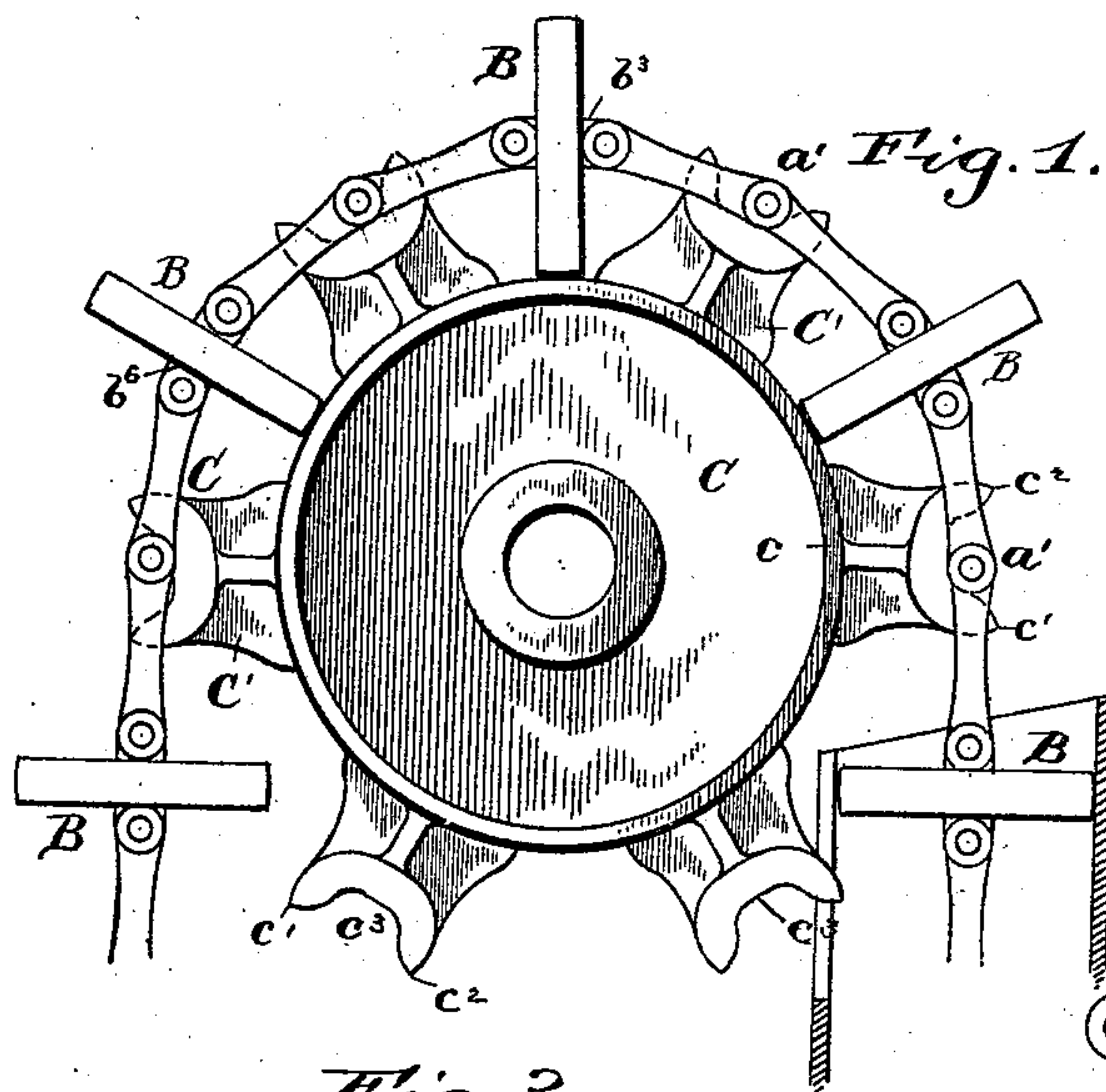


Fig. 2.

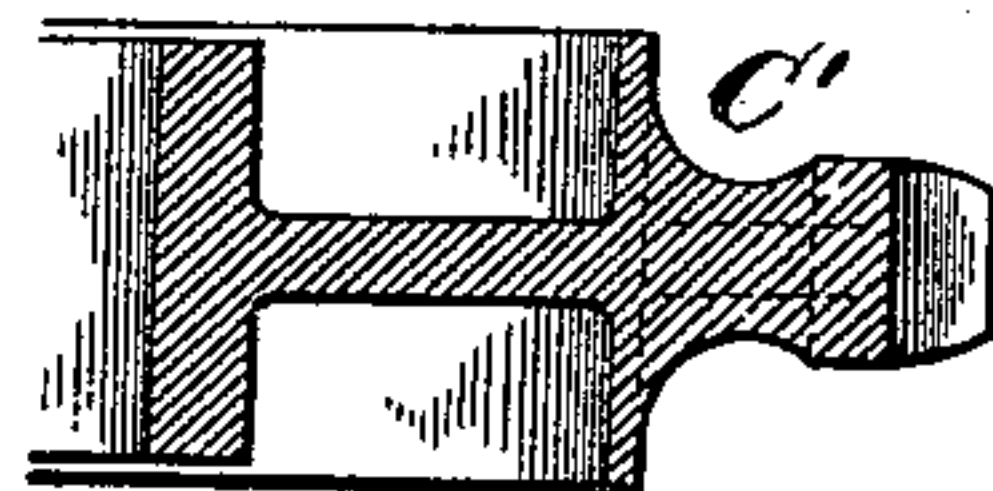


Fig. 4.

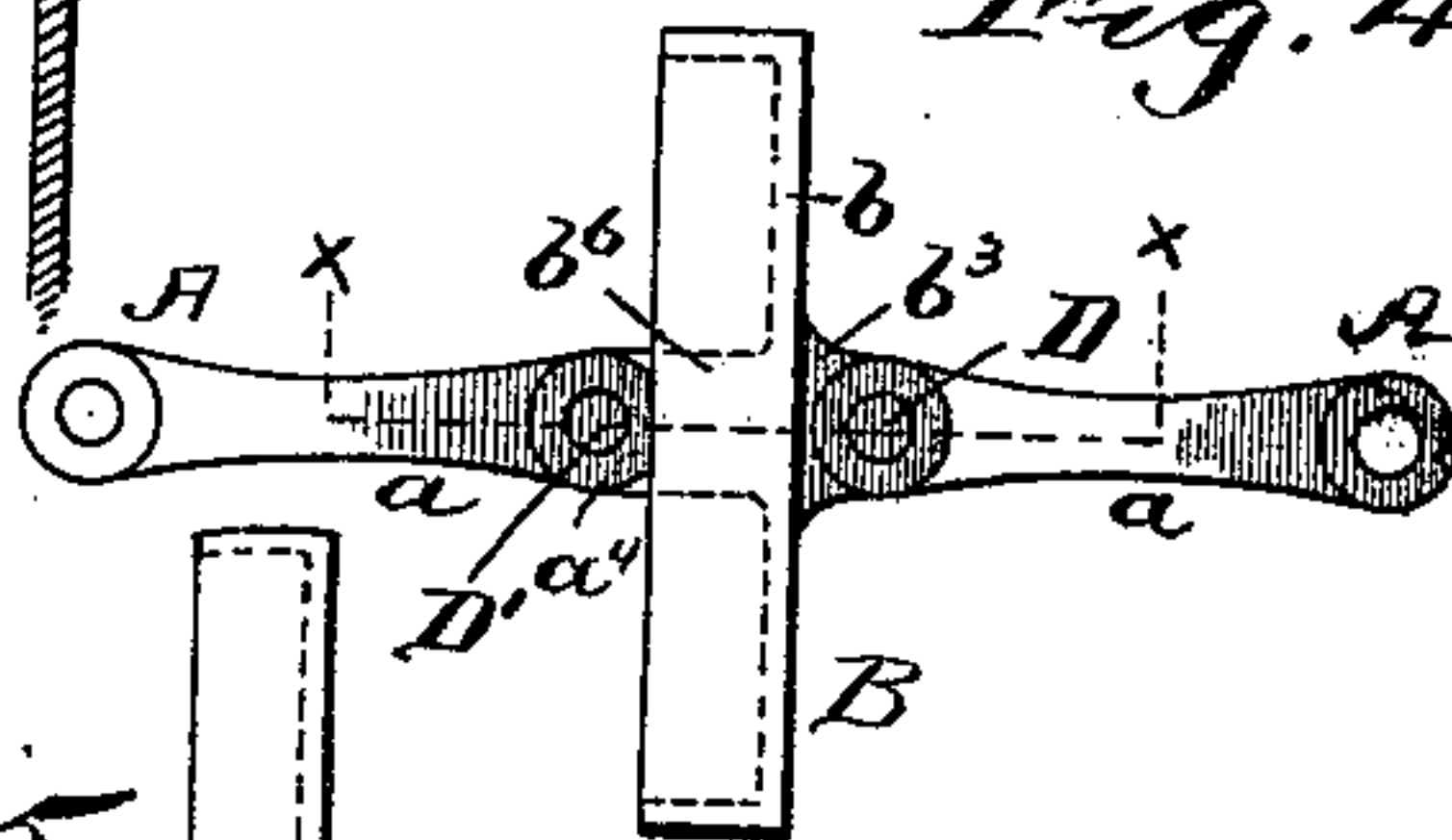


Fig. 3.

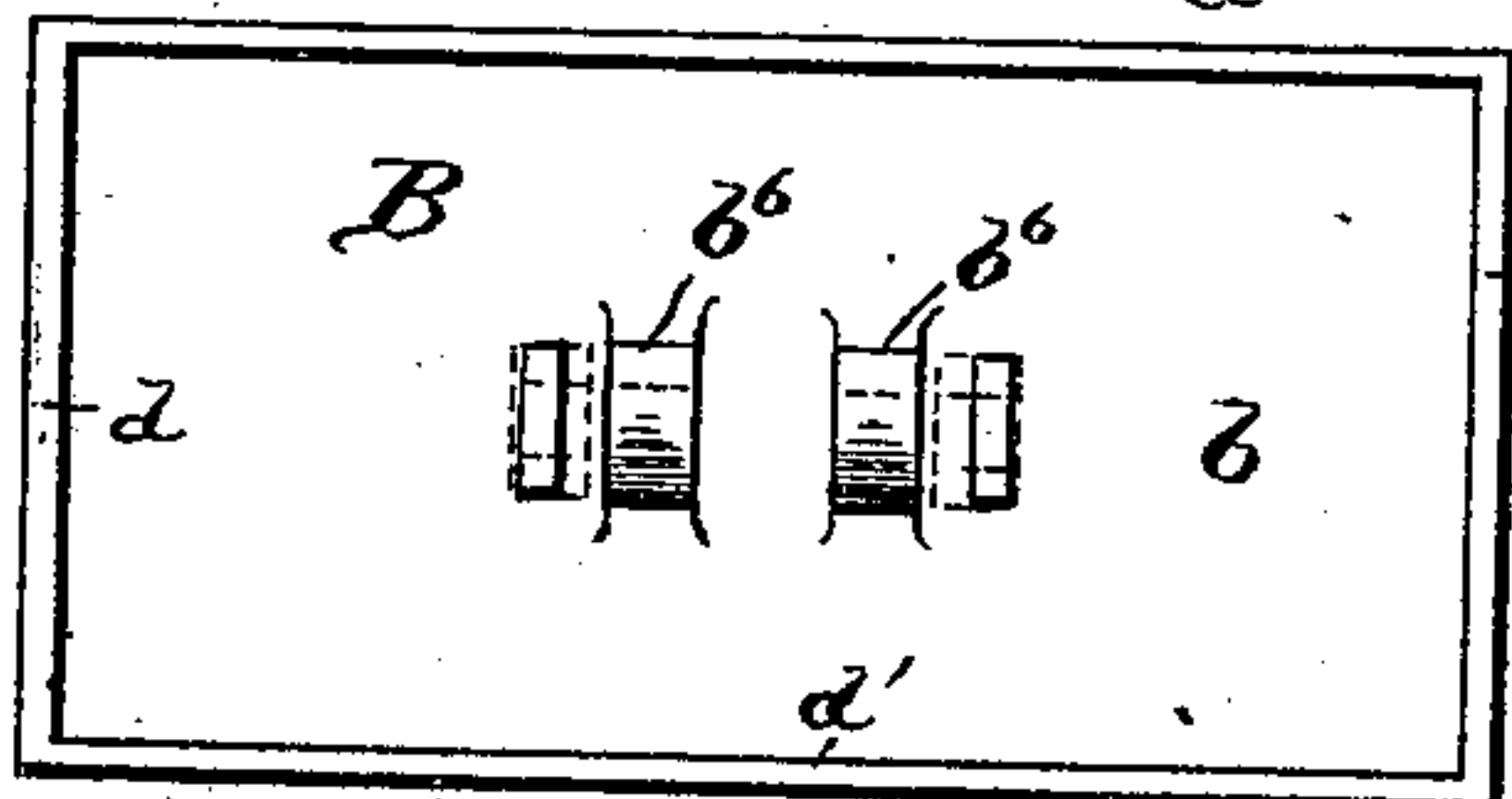


Fig. 5.

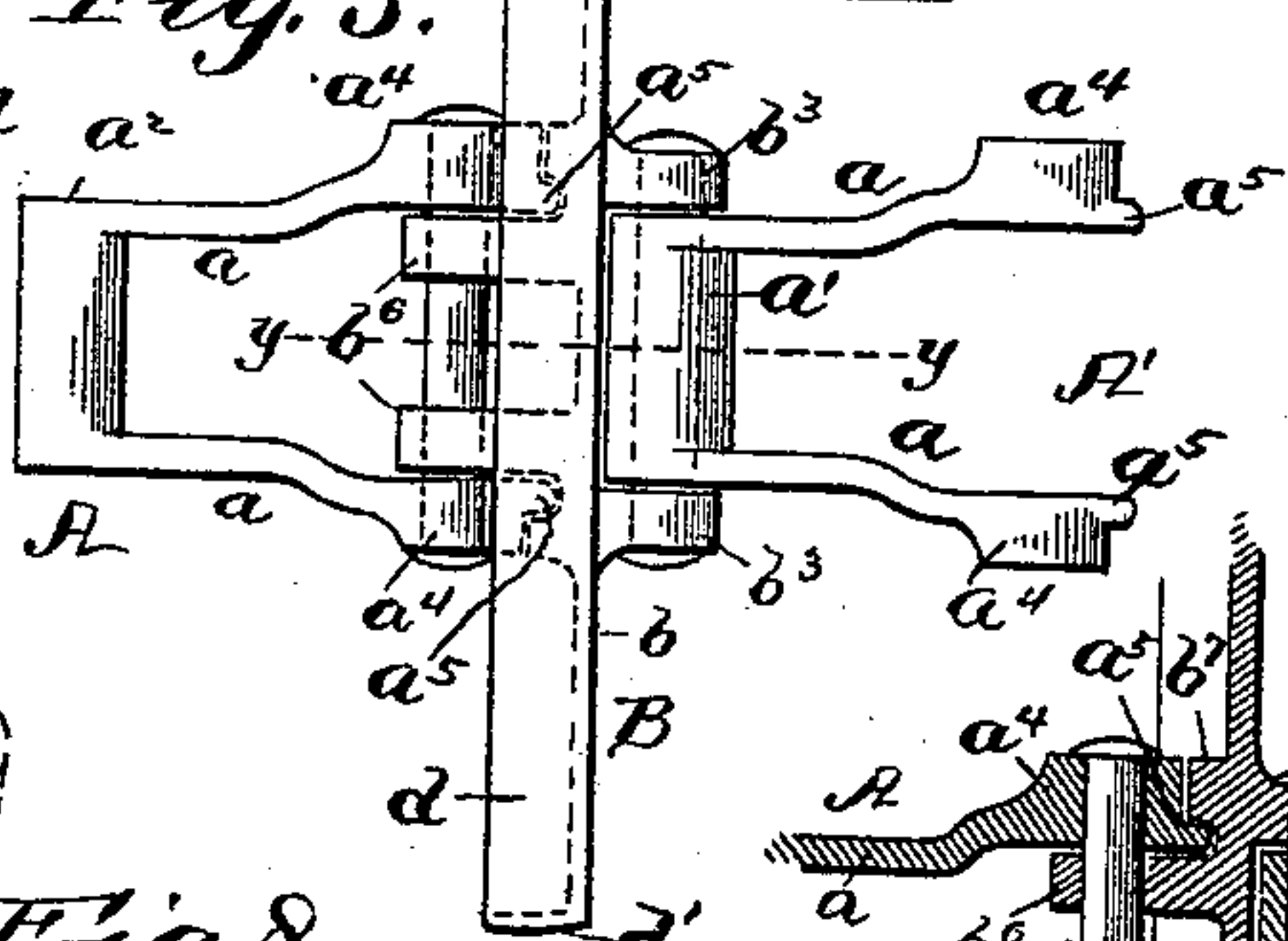


Fig. 6.

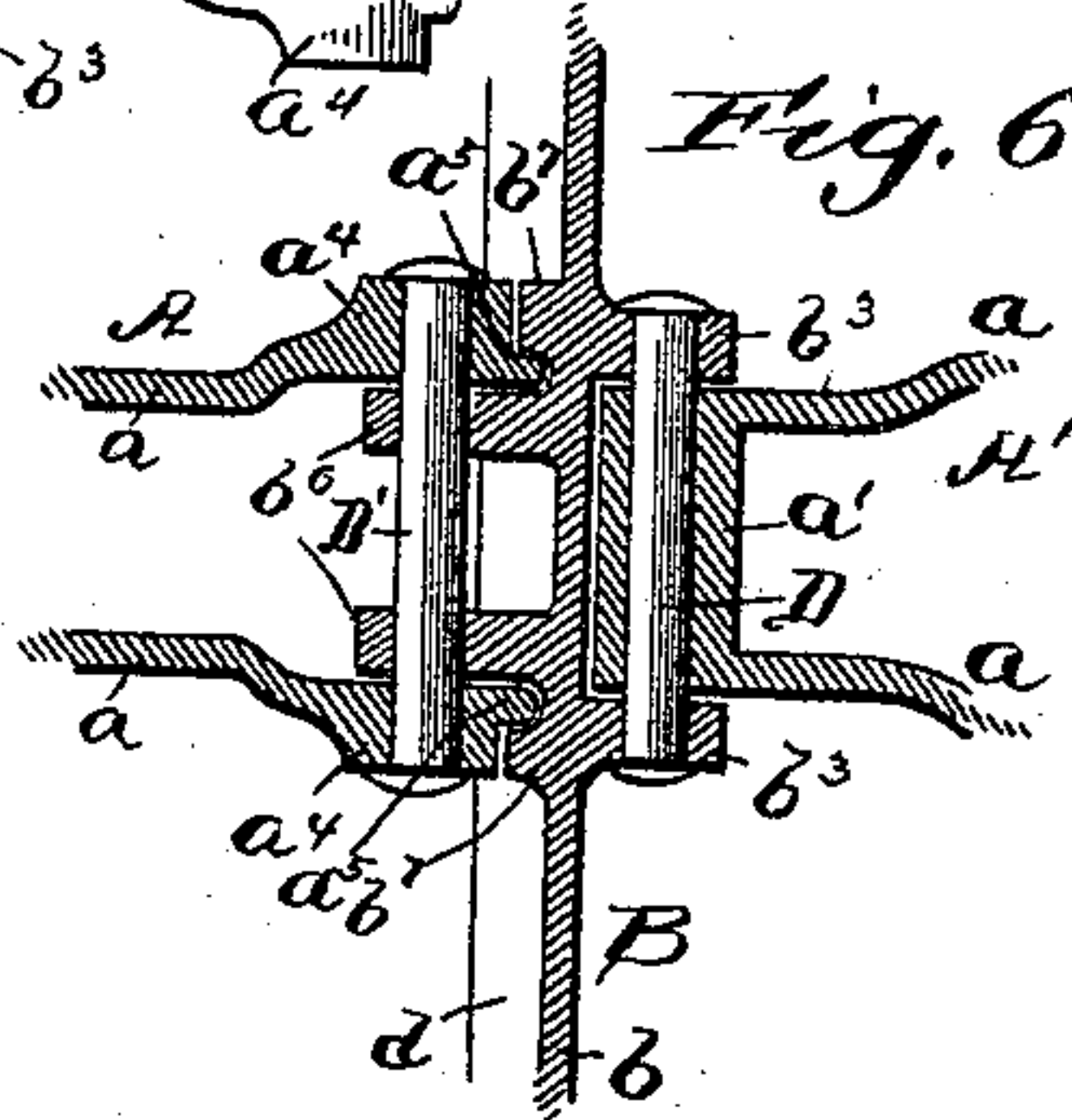


Fig. 7.

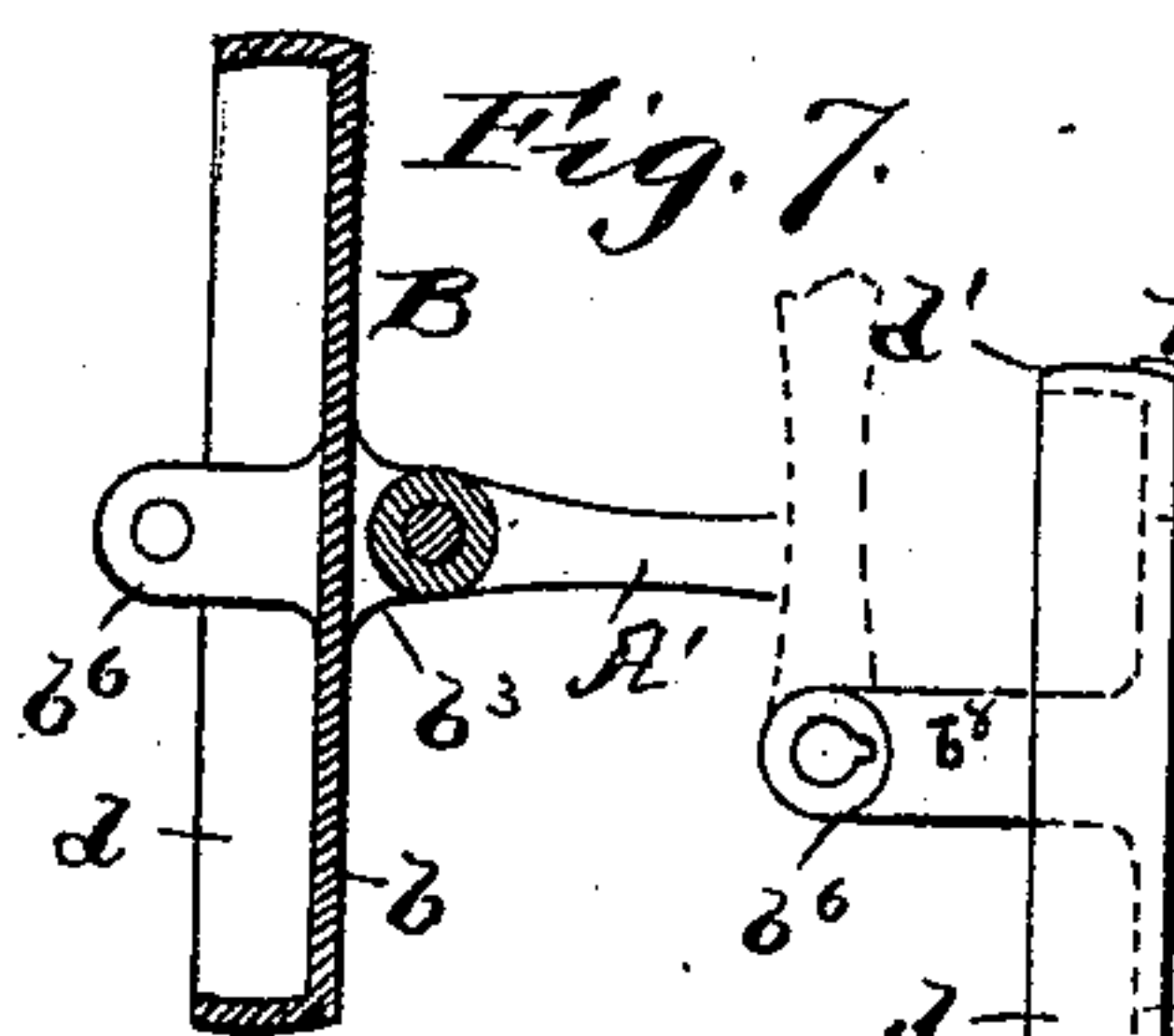


Fig. 8.

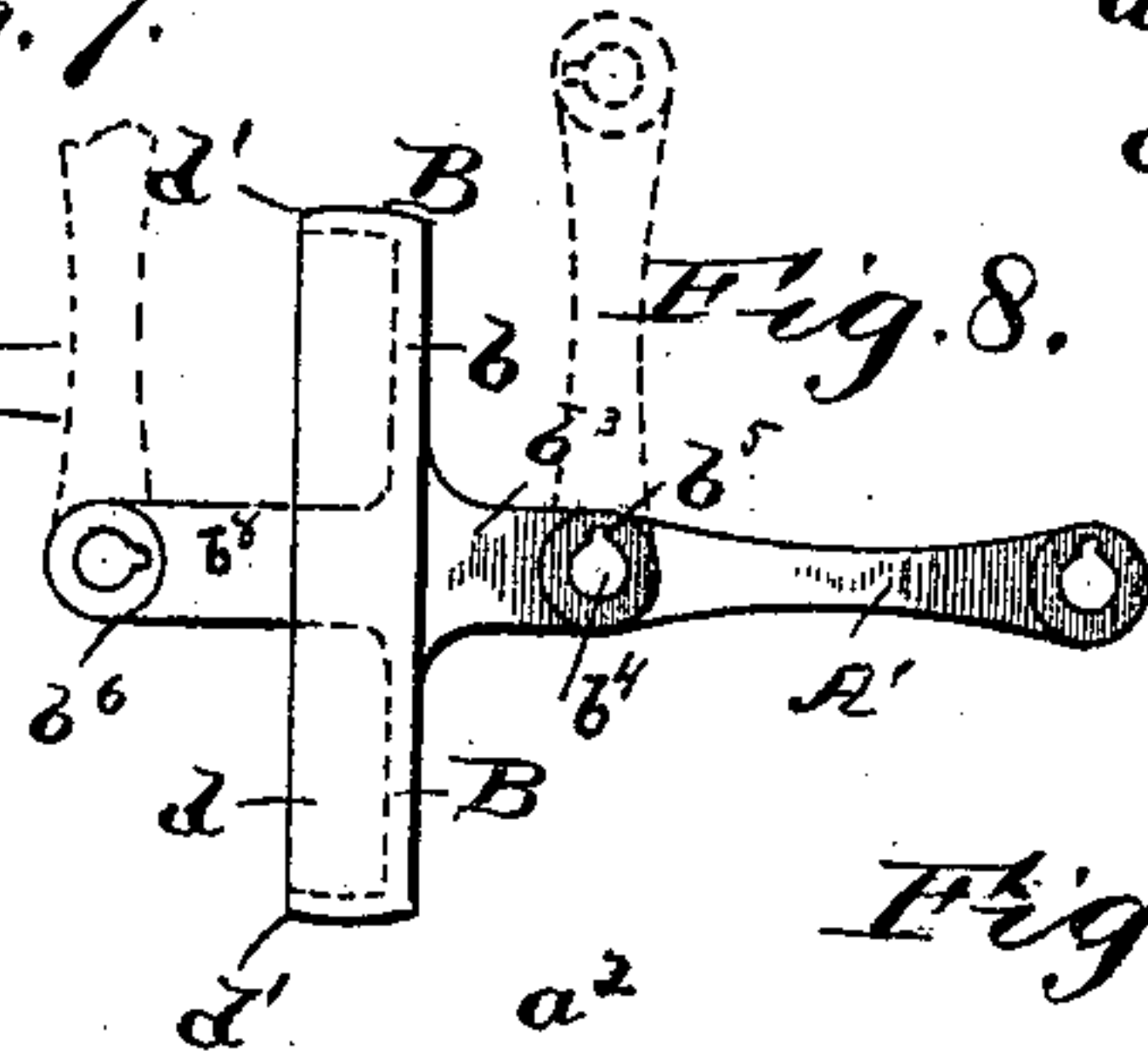
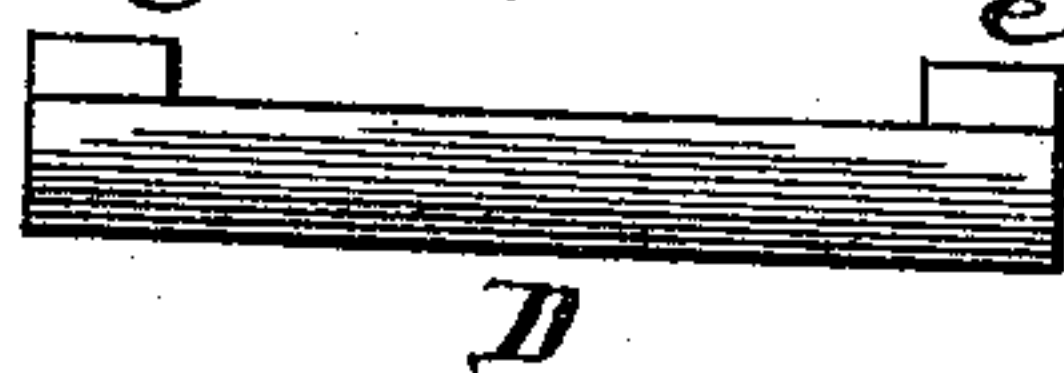


Fig. 9.



Fig. 10.



Witnesses:

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UNITED STATES PATENT OFFICE.

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ELEVATOR.

SPECIFICATION forming part of Letters Patent No. 538,057, dated April 23, 1895.

Application filed September 5, 1890. Serial No. 363,986. (No model.)

To all whom it may concern:

Be it known that I, FREEMAN R. WILLSON, Jr., a citizen of the United States, residing at Columbus, in the county of Franklin and State of Ohio, have invented certain new and useful Improvements in Elevators or Carriers for Water and other Materials, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to improvements in elevators or carriers, it having for its object to provide both an improved chain or flight carrier and improved means for driving the same.

In the drawings, Figure 1 is a side view of the driving or supporting wheel and the chain or flight carrier. Fig. 2 shows a portion of the wheel. Fig. 3 is a face view of one of the flights or buckets. Fig. 4 is an edge view of two links of the chain, one of the flights or buckets attached thereto. Fig. 5 is a plan view of that in Fig. 4. Fig. 6 is a section on the line xx , Fig. 4. Fig. 7 is a section on the line yy , Fig. 5. Fig. 8 shows a modification of the means for connecting the links to the flight or bucket. Fig. 9 is another view of the parts in Fig. 8.

The links at the sides of each flight or bucket are represented by $A A'$, and there may be as many of these as are desired between any two successive flights. Each link as shown in the drawings, is composed of side bars $a a$, and a tubular end bar a' , the side bars a terminating in perforated ends a^4 , each of these end pieces having a flange a^5 .

The flight or bucket is indicated as a whole by B . It is preferably cast in shape, and has a bottom or plate b transverse to the line of chain, side walls $d d$ and end walls $d' d'$. The latter are relatively thicker, and rounded on their outer faces, for a purpose to be described.

$b^3 b^3$ are perforated ears projecting from one face of the flight or bucket, and $b^6 b^6$ are ears projecting from the opposite face, there being supplemental projections, or flanges at b^7 . The distance between the inner faces of ears $b^3 b^3$ is about equal to the length of the tubular end bar a' ; and the distance between the outer faces of ears b^6 is about equal to that

between the inner faces of the ends a^4 of the links.

$D D'$ are pintles adapted to pass through the apertures in the ears b^3 and b^6 respectively, and also through the apertures in the tubular end bars a' and through the apertures a^6 in the ends a^4 .

The manner of coupling two adjacent links to one of the flights or buckets will be readily understood. The link A' is coupled to the ears b^3 by placing the tubular end bar a' between said ears, and then passing the pintle through them and riveting or otherwise fastening it in place. The link A is similarly fastened by slipping the ends a^4 into place outside the ears b^6 (the flanges a^5 lying inside the projections b^7), and then inserting the pintle D' and securing it in place.

If desired the links of the chain may be made detachable from the flight or bucket. One way for accomplishing this is to form the ears b^3 with notches at b^5 communicating with apertures b^4 , and inclined as shown in Fig. 8, and providing the aperture a^2 in the tubular end bar a' with a groove a^3 . The pintle D has two lugs $e e$ projecting laterally from it. Link A' can be turned up so that notches b^5 coincide with groove a^3 . Then pintle D can be inserted one of its lugs e sliding through said notches and groove until it lies in one of the ears b^3 and the other lug lies in the other ear. Then link A' can be turned down to a working position and will be prevented from accidental disengagement; but it can be disengaged when desired by turning it up into the above described position relative to the ears. The ears b^6 can be provided with grooves b^8 and the apertures a^6 in ends a^4 can have notches a^7 , these parts being capable of being related to each other the same as those above described, and can be similarly connected by the pintle D' .

The parts b^3 and b^6 can be formed separately from the bucket or flight proper, and, if desired, can be made of a different species of metal and have the part B cast thereon.

The walls $d d'$ can be made of any required depth so that the flight or bucket can be adapted for use with any of the numerous mate-

rials that are now commonly transported from place to place by such means. In elevating water they can be comparatively deep; but in being used to lift or push solid and relatively large articles these walls can be narrower, and in fact dispensed with.

As shown in Fig. 1 the elevator moves through one or more troughs, and in order to prevent the edges of the buckets from scraping and having too much friction they are rounded as aforesaid.

In order to drive a carrier or elevator of this sort I have devised a specially constructed wheel, as illustrated in Figs. 1 and 2. The wheel has a central body part C with a rim c. From this rim there extend projections C' each terminating in a recessed end, the recess being so formed as to leave two teeth c' c^2 adapted to enter the open centers of the links A A'. The recess c^3 is of a width somewhat greater than the diameter of the end bar a' of the links. When the parts are constructed and related as shown there are two links between each flight and the next, and in such case I prefer to have the projections C' and the teeth so arranged as that the end bar a' midway between the flights shall rest in the recess c^3 . Each flight is of such width that its edge rests on the rim c in passing around the wheel, and the above described devices for connecting it to the adjacent links are such as to support the flight in an exactly radial position, and it in turn supports the adjacent ends of the links in relation to the wheel in substantially the same way that they would be supported on an ordinary sprocket wheel constructed with teeth adapted to engage with the end bar of every link. In other words, the links of the chain which lie around the wheel are all in substantially the same relation, tangentially, thereto.

The invention is not limited to chain links of exactly the form of those shown, or to a metallic flight or bucket, as substantially the same relations of the parts can be preserved and the same results can be attained with links of other forms and with flights or buckets of other materials, and secured in a more or less modified manner.

What I claim is—

1. In a carrier or elevator, a bucket or flight having projections extending from its opposite sides or faces in opposite directions, the distance between the inner faces of the projections upon one side of the face being substantially equal to the distance between the outer faces of the projections upon the opposite side, and the links hinged to the said projections, substantially as set forth.

2. The combination with the chain-links, of the interposed bucket or flight, having a continuous plate, as at b, transverse to the chain-links, extending on all sides of the same and having ears projecting laterally from the opposite sides or faces of the plate, and formed

integrally with the said plate, and a chain-link on each side of said flight hinged to the said ears, substantially as set forth.

3. The combination with the chain and the flights, of the sprocket wheel having the toothed projections adapted to engage with the chain-links, and the rim between the said projections being arranged substantially as set forth to receive the thrust of the flights, and engage therewith, substantially as set forth.

4. The combination with the chain and the flights secured thereto, of the wheel having projections adapted to engage with the cross bars or connecting bars of some of the links, said flights being adapted to engage with said wheel at points intermediate of said projections, whereby the cross bars, or connecting bars of the chain are all held at substantially the same distance from the center of the wheel, as set forth.

5. The herein described bucket or flight for an elevator or carrier, it being formed of a continuous unbroken flat cast metal plate, having projections on each side integral with it, and adapted to be hinged to chain links, substantially as set forth.

6. The herein described flight or bucket for a carrier or elevator, it having a main plate of metal, formed with projecting side and end walls, to provide a holding cavity, and ears or projections extending oppositely from said main plate, and integral therewith, and adapted to be hinged to the links of a chain said plate being continuous, and extending on all sides out from said ears or projections, substantially as set forth.

7. The combination with the chain having transverse bars a' , and the flights or buckets secured to said chain, of the wheel having projections C', with the teeth c' , c^2 formed at the ends of the projections, the said teeth being separated by the recesses or open spaces c^3 which are of a width greater than the diameters of the said transverse bars, substantially as set forth.

8. The combination with the flight or bucket having the perforated ears or projections extending from the main transverse plate b thereof and integral therewith, of the chain links and the detachable pintles for connecting them, substantially as set forth.

9. The combination, with the flight, or bucket having the integral ears or projections extending therefrom, of the chain-link on each side of the bucket or flight, and detachably secured directly thereto, substantially as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

FREEMAN R. WILLSON, JR.

Witnesses:

FRED. H. CROUGHTON,
HENRY S. ISHAM.