

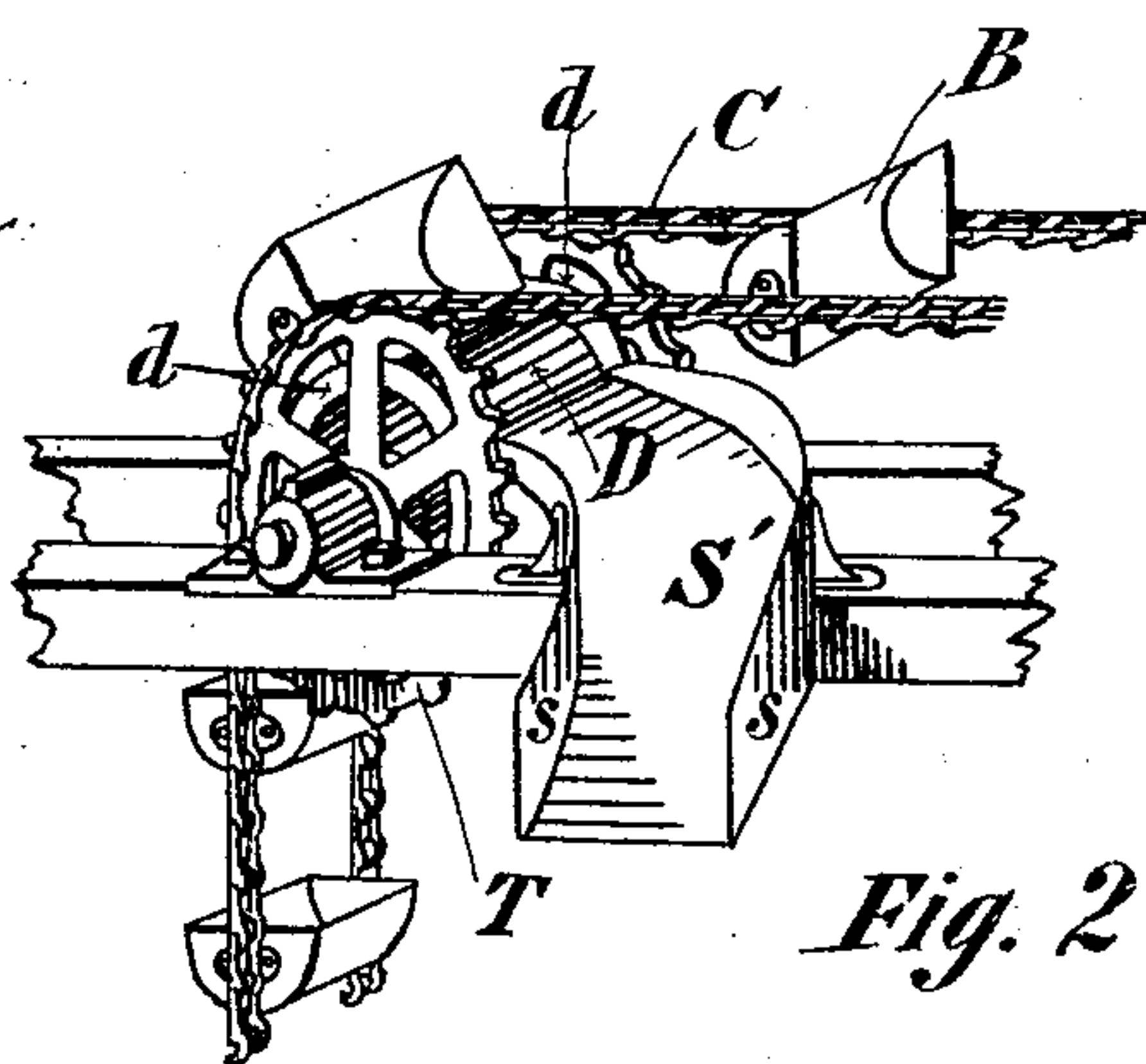
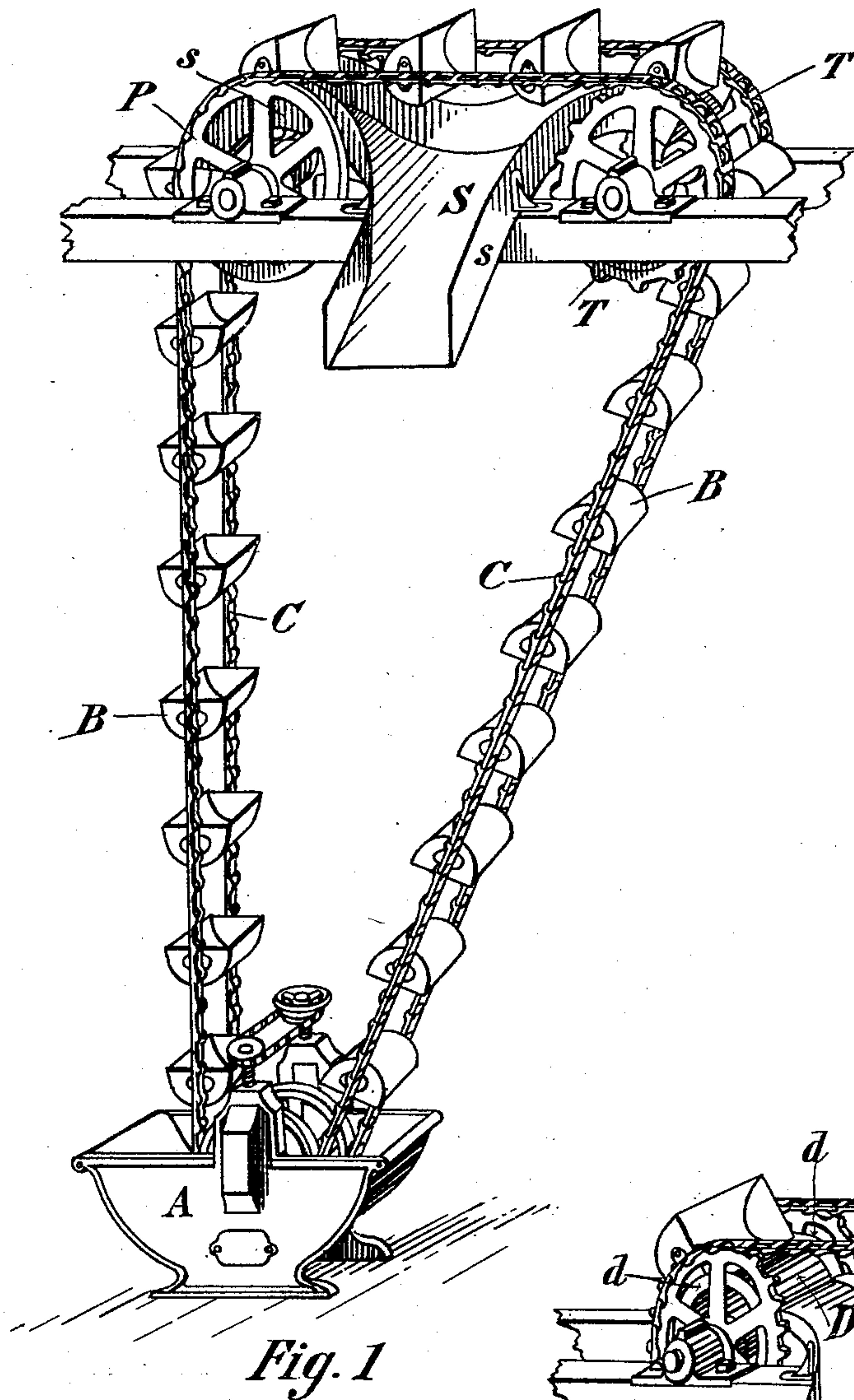
(No Model.)

2 Sheets—Sheet 1.

J. CAVANAGH.
BUCKET ELEVATOR.

No. 482,941.

Patented Sept. 20, 1892.



Witnesses

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John. Gregg

Inventor

Joseph Cavanagh

By his Attorney *E. E. Ewart.*

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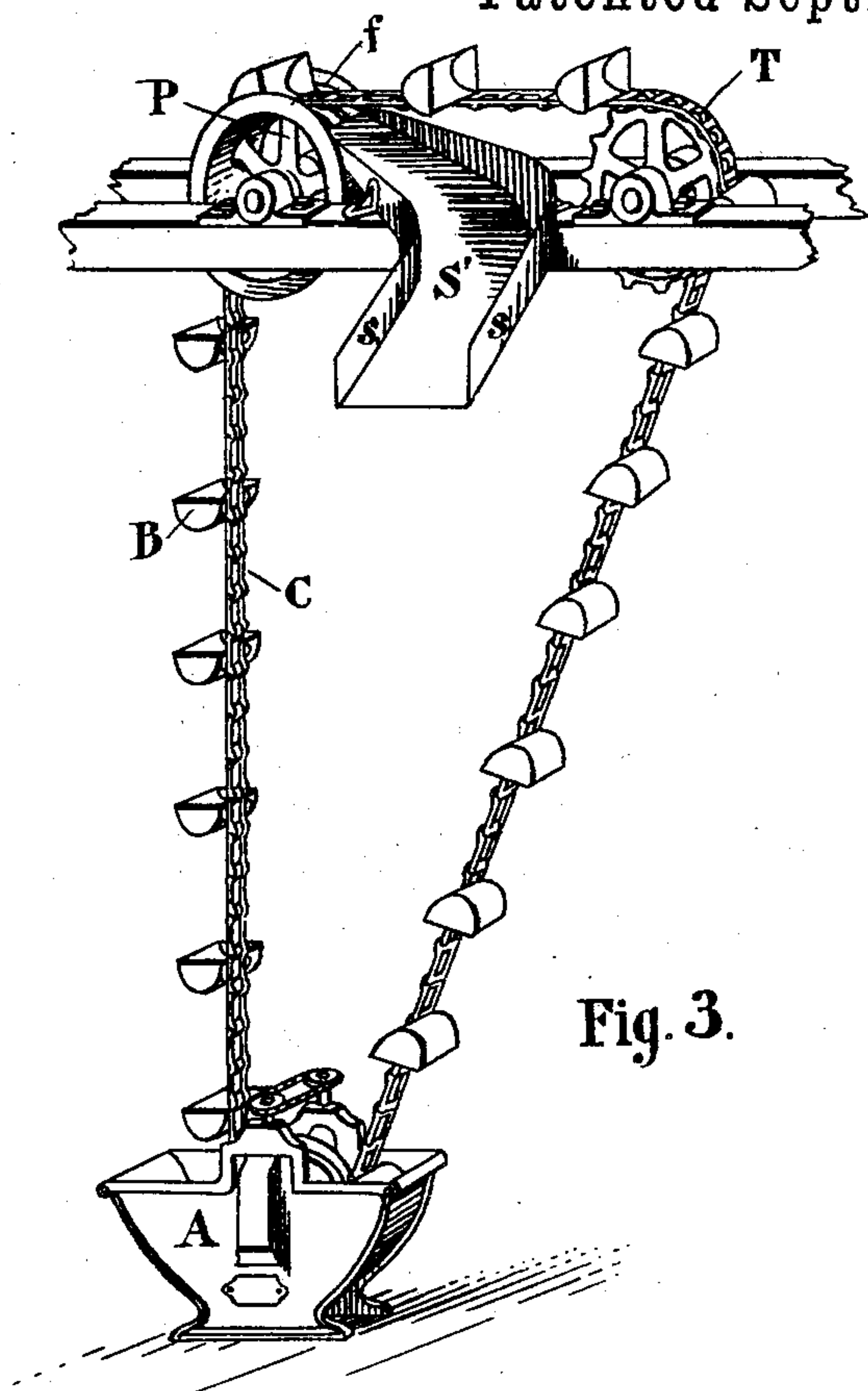


Fig. 3.

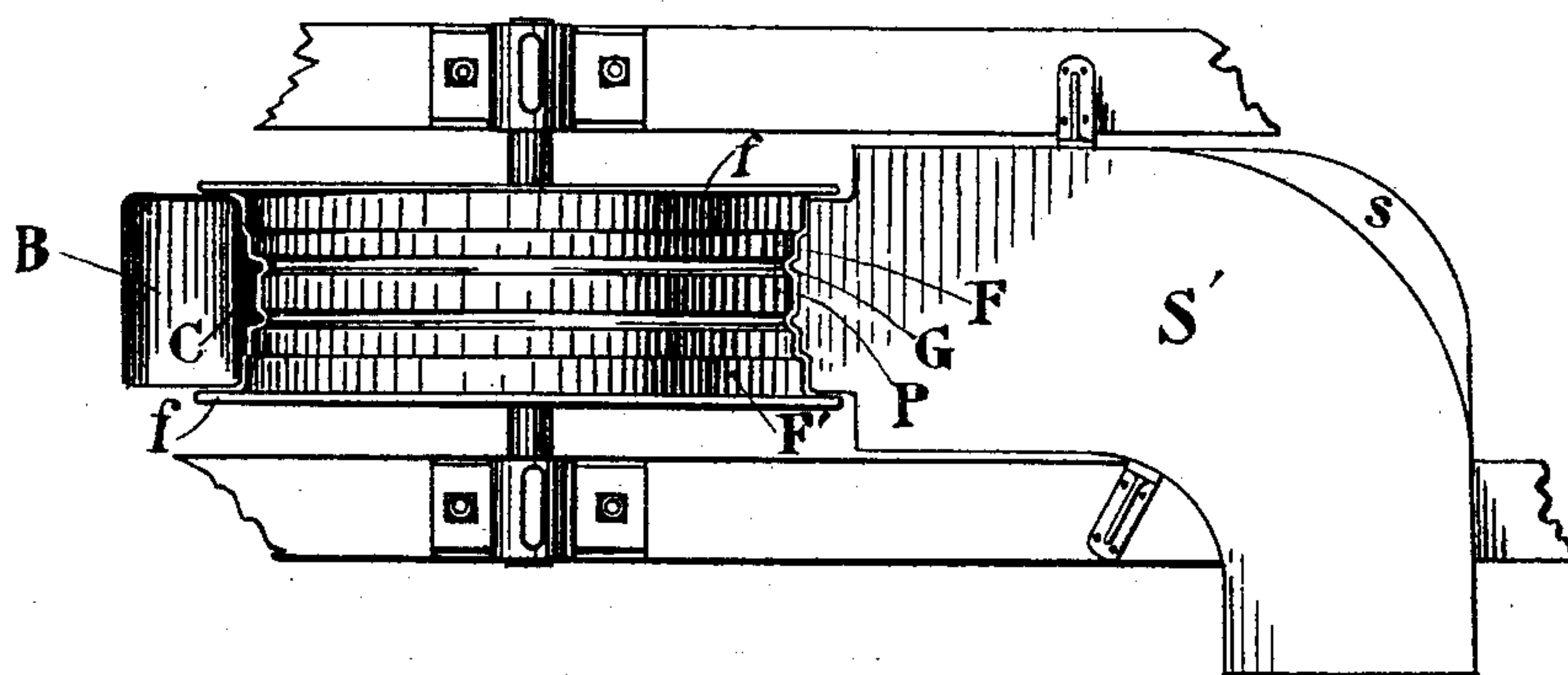


Fig. 4

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UNITED STATES PATENT OFFICE.

JOSEPH CAVANAGH, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO THE
LINK-BELT ENGINEERING COMPANY, OF SAME PLACE.

BUCKET-ELEVATOR.

SPECIFICATION forming part of Letters Patent No. 482,941, dated September 20, 1892.

Application filed May 12, 1890. Serial No. 351,551. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH CAVANAGH, a citizen of the United States, residing in the city of Philadelphia, county of Philadelphia, and State of Pennsylvania, have invented a new and useful Improvement in Bucket-Elevators, of which the following is a specification.

My invention relates to that class of elevators in which buckets are attached in series to endless belts and is applicable to such as employ metal linked belts or any form which does not cover the entire back of the bucket.

In this class of elevators as generally constructed a single head-wheel or set of head-wheels is employed and a comparatively high belt-speed is necessary in order to develop sufficient centrifugal force to discharge the load freely and prevent material dropping back into the machinery when the buckets are tipped or turned in passing around the head. This high speed, however, is especially undesirable in handling coal, potatoes, green corn, and other materials which would be injured commercially or otherwise by breakage, abrasion, or other violence; and the object of my invention is to provide means for the proper discharge of the load without the necessity for centrifugal force and without a fall, thus enabling me to handle the material as slowly and gently as the circumstances of the case may require.

My invention consists in providing, in addition to the regular head wheel or wheels, an auxiliary wheel or set of wheels to carry the belting and buckets beyond the former about horizontally before they return to the boot and in introducing between the head and auxiliary wheels a receiving chute or spout which has one end extending above and beyond the head-shaft, with its bottom inside of the line of travel of the backs of the buckets and curved to conform to that line, the construction and arrangement of said chute being subject to modifications, as hereinafter more fully explained.

To enable those skilled in the art to which my improvement relates to understand and practice the same, I will now proceed to describe my invention more fully, referring to the accompanying drawings, which form part

of this specification, and in which similar parts are designated by similar letters of reference throughout the several views.

Figure 1 is a perspective view of a double-strand centrally-hung bucket-elevator using my auxiliary wheels and receiving-chute. Fig. 2 is a perspective view of a portion of a similar elevator employing a modification of my receiving-chute wherein a supplementary drum on the head-shaft or attached to the head-wheels serves in place of that end of the chute which is curved to conform to the travel of the buckets. Fig. 3 is a perspective view of a substantially similar arrangement adapted to a single-strand elevator; and Fig. 4 is a top view of a portion of Fig. 3, shown on an enlarged scale.

A is the boot of the elevator, where the load is received.

B B are buckets.

C C are chains or linked belts.

T T are ordinary toothed or sprocket wheels such as are generally used to give motion to linked belts.

P P are plain wheels without teeth.

In Figs. 1, 3, and 4 the head-wheels are plain and marked P.

In Fig. 2 the head-wheels are toothed and marked T.

In Figs. 1 and 3 the auxiliary wheels are toothed and marked T.

In Fig. 1, S is the receiving spout or chute.

In Figs. 2, 3, and 4, which show modified forms, the stationary portion is marked S'.

s s are upwardly-projecting sides of chutes or spouts S and S', used to prevent material spilling off laterally. The curved continuation of the chute or spout in Fig. 2 is the supplementary drum D, with its flanges d d corresponding to the sides s s. The supplementary portion in Fig. 4 is shown as a drum, with the outline of its face conformed to the outline of the buckets and their attachment links. The links ride on the face P, which corresponds to the plain wheels described above. The grooves G accommodate the ribs of the links, while the faces F and F' conform to the outlines of the attachment portions of the links and the projections of the buckets beyond the links. The flanges or sides f f correspond to s s and d d in their location

and office. The edge of the receiving end of the stationary portion S' conforms to the outlines of the face of the drum, so that material cannot drop down between the two.

5 Whether the chute S is used alone in its simplest form or a stationary portion S' and supplementary drum are used together, the bottom of the receiving end should conform to the line of travel of the belting and buckets
10 from the point where they begin to turn at the head to the point where they move off horizontally, and the discharging portion should descend gradually, so that the load may not drop abruptly, but flow, roll, or slide
15 without violence along the inclined plane to its destination.

By arranging the receiving-spout of the boot so that the material is delivered directly into the buckets to prevent necessity for their
20 scooping it up out of the bottom of the boot and by running the belt at a slow speed, which is made possible by my improvement, I can handle material gently and overcome the breakage, abrasion, and cutting heretofore
25 experienced and extend the field of operation of this class of machinery.

There is a further advantage to the machinery itself when used for handling heavy and coarse material, for the slow speed reduces greatly the shock on belting and buckets
30 which would ordinarily take place when picking up heavy pieces rapidly.

I have shown how a single strand of chain can be used at the backs of the buckets, and
35 it is plain that a double strand could be so used, if desired, instead of being attached to the ends.

A modification of the chute S as adapted to single-strand elevators, which I have not
40 shown in the drawings, is the extension of the stationary portion S' and s on each side of moving portion marked P in place of the portions marked F, F', G, and f. Whether this or any other modification is employed, it
45 is evident that the wheel over which the load is discharged should be made without teeth, so that it will not be necessary to leave a hole in the end of the spout S' to accommodate the teeth and through which the material
50 could drop.

In double-strand elevators the question of the presence or absence of teeth on any of the wheels is of no importance, so far as my invention is concerned, and either pair of wheels

can be used for drivers, or both pairs can be 55 made to drive in unison by having their shafts connected with belting and wheels or any other suitable device located where there will be no interference with the elevator belting and buckets. In fact, the means or method 60 of driving both single and double strand elevators can be varied to suit the circumstances, the essential consideration in the arrangement of wheels being that the auxiliary wheels should be so placed that the line of travel of 65 the belting and buckets will not run much above a horizontal line in leaving the head-wheels, as there must be given a good opportunity for discharge of the load by the natural flow of the material directly from the buck- 70 ets onto the bottom of the spout or chute.

The chutes or spouts S and S' are preferably made of cast-iron and often furnished double, as shown in Fig. 1, so that they can be used interchangeably for elevators running 75 from right to left or left to right; but it is evident that they can be made of any other suitable material and furnished single from right or left hand patterns, or both, as the elevators can be run in either direction and the dis- 80 charge can be on either side, forward or backward. Of course the relative proportions, locations, and forms of the various parts of the elevator and any other minor details can be varied without departing from my invention; 85 also, the drums and flanges can be connected with the wheels or with each other or with the shafts carrying the wheels or supported in position in any well-known manner.

Having thus fully described my invention, 90 what I claim as new, and desire to secure by Letters Patent, is—

In an endless-belt elevator, the belting and buckets of which are led off about horizontally from the head wheel or wheels, a chute 95 composed of a vertically-curved portion located within the line of travel of the belting and buckets and adapted to receive and support in engagement with the buckets any discharge from them and an inclined portion 100 adapted to deliver the load by the natural flow of the material along the bottom, substantially as shown and described.

JOSEPH CAVANAGH. [L. S.]

Witnesses:

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