No. 702,892. Patented June 17, 1902.

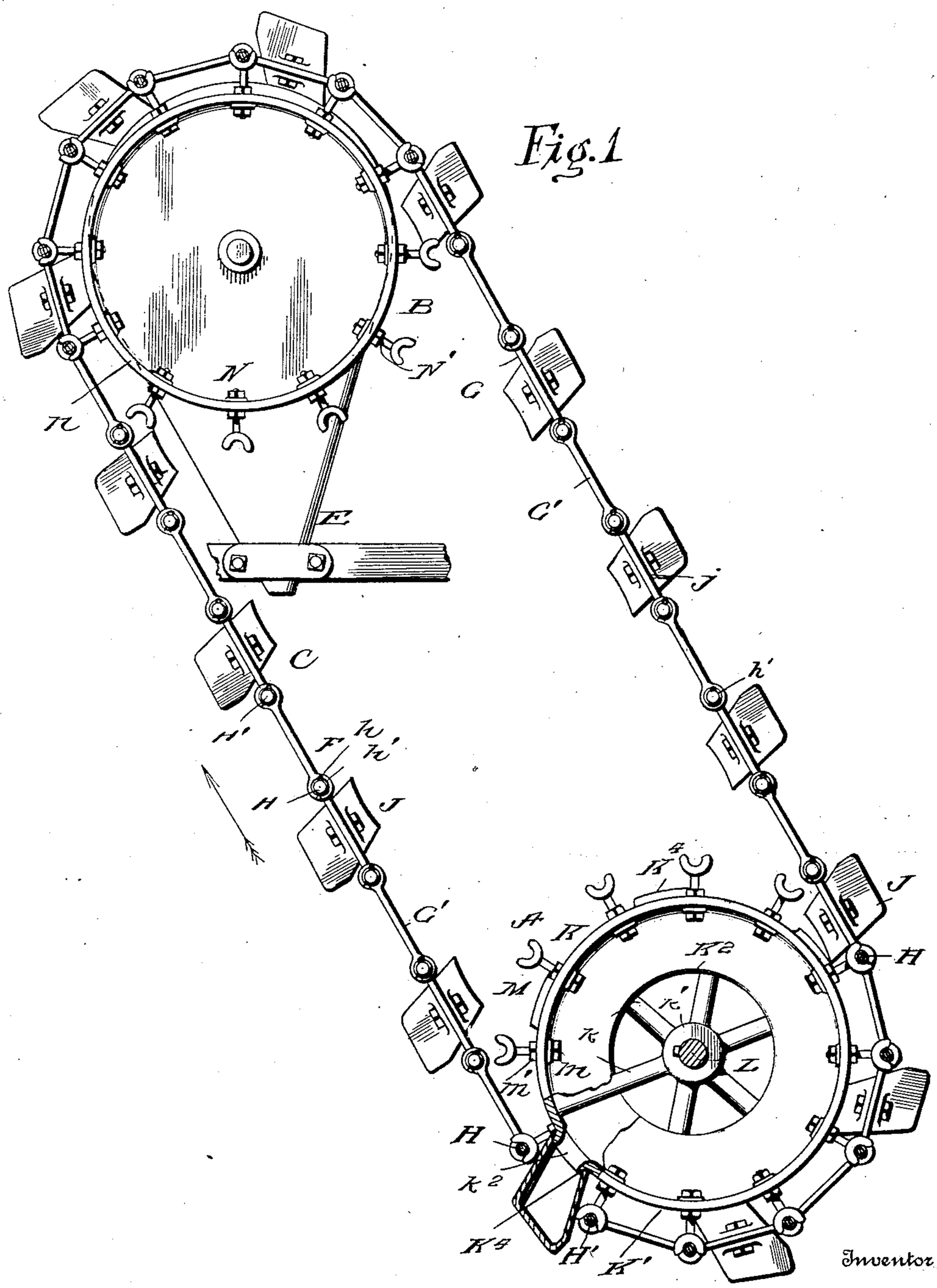
H. A. VEZIN.

ORE ELEVATOR.

(Application filed Dec 19, 1901.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1



Witnesses

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Fig. 2.

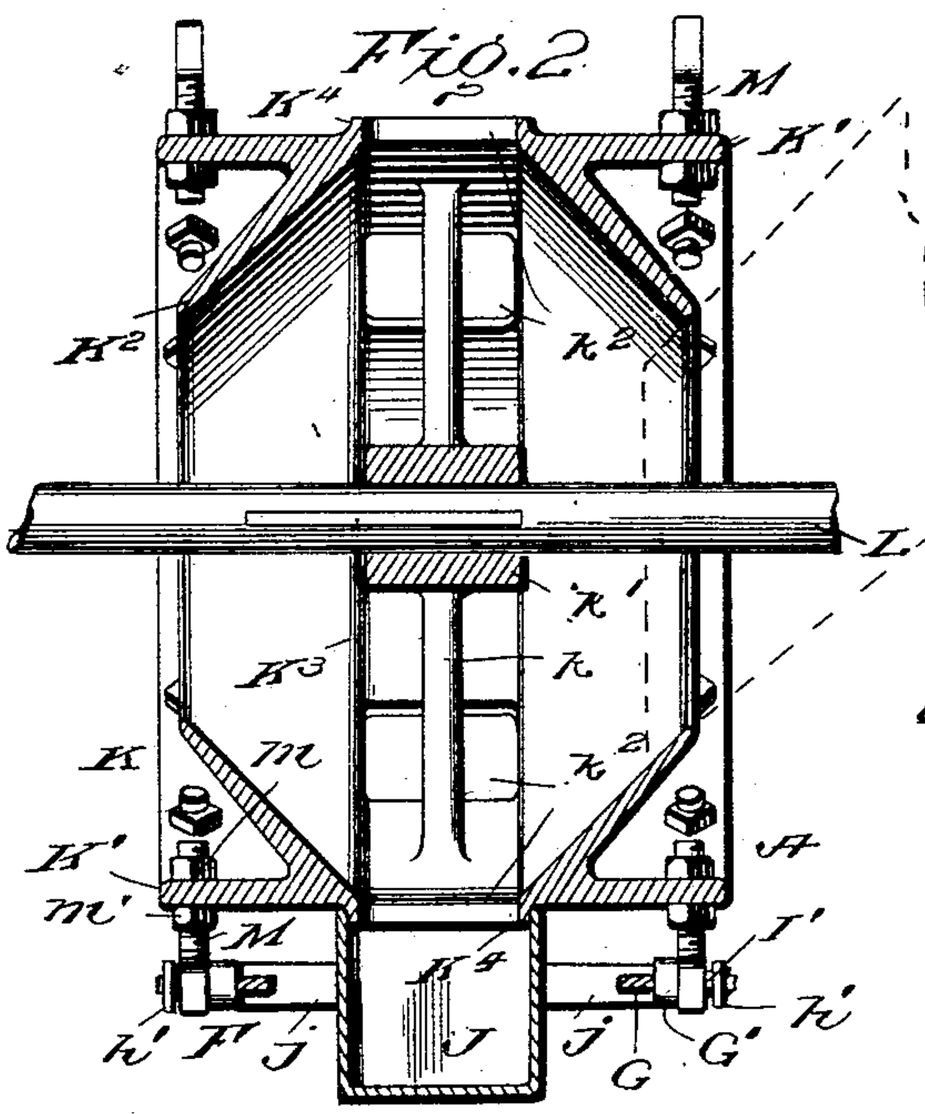


Fig. 3.

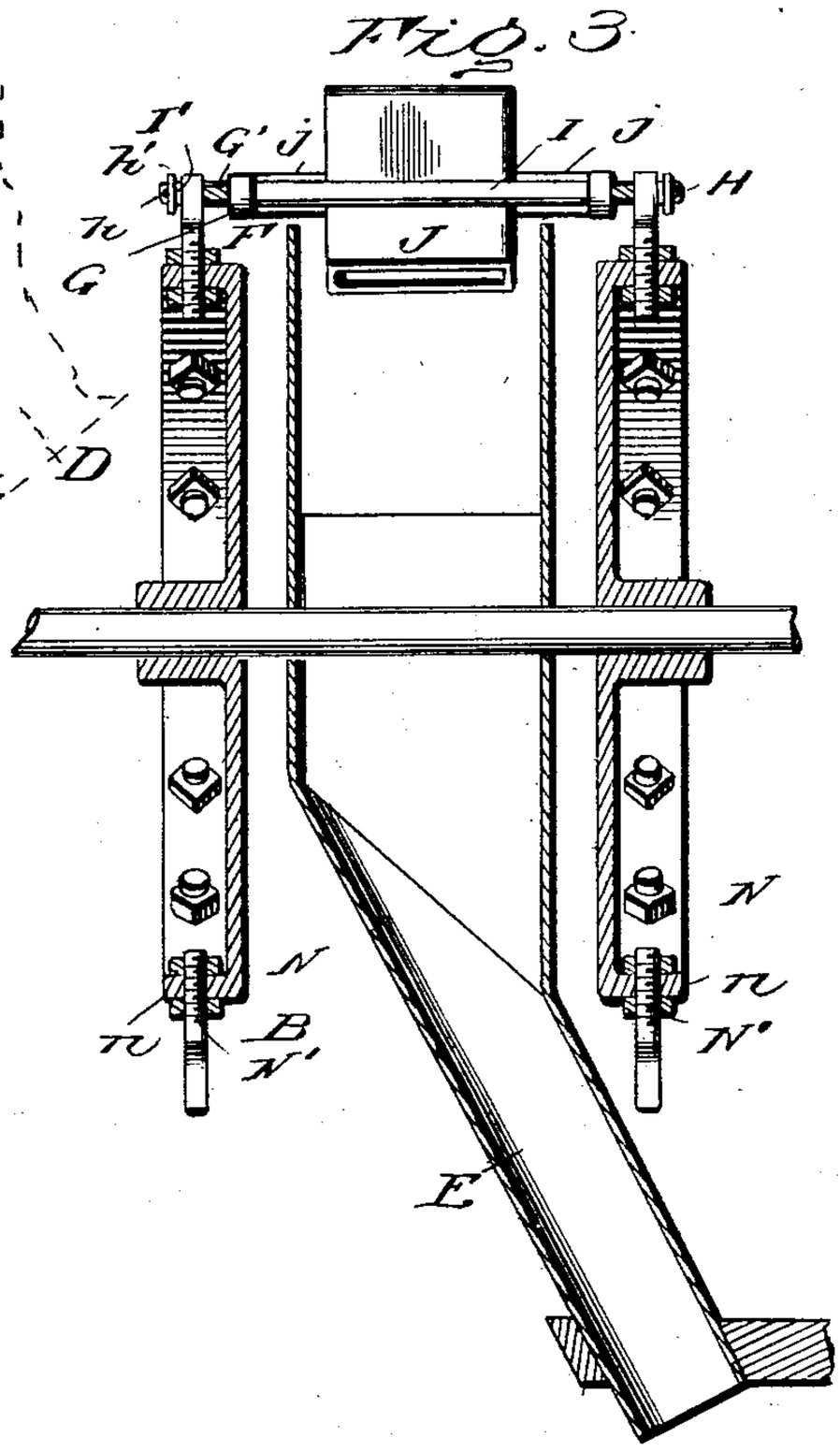
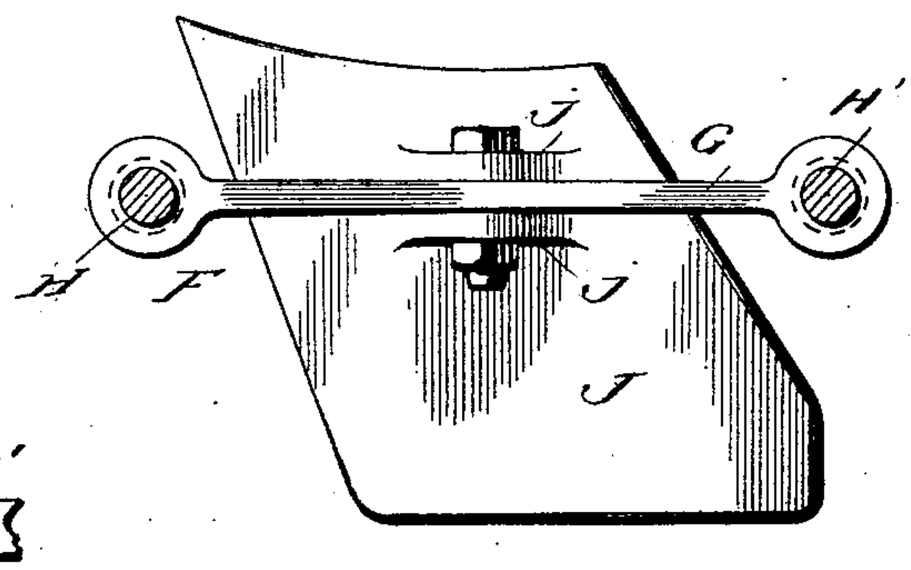


Fig. 4.

Fig. 5.



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UNITED STATES PATENT OFFICE.

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ORE-ELEVATOR.

SPECIFICATION forming part of Letters Patent No. 702,892, dated June 17, 1902.

Application filed December 19, 1901. Serial No. 86,575. (No model.)

To all whom it may concern:

Be it known that I, HENRY A. VEZIN, a citizen of the United States, residing at Denver, in the county of Arapahoe and State of Colorado, have invented certain new and useful Improvements in Ore-Elevators, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to improvements in elevating and carrying mechanisms, more particularly mechanisms of the sort used for elevating finely-reduced material, such as pulverized ore and the like. As is well known, materials of this sort are exceedingly refractory in character—that is to say, are made up of particles of great hardness, which act to cut and rapidly wear the metallic parts which are in contact with them and have motion relatively thereto—as, for example, the surfaces of the articulating parts of the chain-links employed in making such carriers or elevators. The general practice is to so arrange the carrier or elevator and the receptacles which hold the material which is to be taken up by the carrier that the buckets froming part of the latter structure have to scoop up charges of the material as they are dragged through it. When this practice is followed, the finely-reduced particles come into contact with the cross-journal parts or articulating hinge elements of the links and adhere thereto, and as the movements of articulation occur they cut the metal at such places and cause a rapid wear and deteriorating of the chain.

The objects of the present invention are to provide a receptacle for initially holding the material and delivering it to the buckets in such way that it is not necessary for the chain or any other parts thereof to come into contact with the material, they being loaded by the delivery to each bucket of positive charge, and to so construct the chains and the rotary parts which engage with them that they can be kept constantly in accurate pitch relationship.

Figure 1 is a side elevation of an elevating mechanism embodying my improvements. Fig. 2 is a cross-section of the lower rotary receptacle and loading devices. Fig. 3 is a vertical section of the devices at the head of the elevator. Fig. 4 is a top view of one of the buckets and the adjacent parts of the chain. Fig. 5 is a side view of the parts in Fig. 4.

In the drawings an elevator is shown comprising the parts at the foot, (indicated as a whole by the letter A,) the parts at the head, (indicated as a whole by the letter B,) the endless carrier C, the initial delivering-chute D, and the receiving chute or hopper E at the top. The endless carrier is formed of elements each indicated as a whole by F. Each element comprises the inner pair of link-bars G G, the outer pair of link-bars G′ G′, the pintle-rods H H′. Each of the link-bars G and G′ is provided at its end with pintle-apertures. The pintle H hinges together the two links of each chain element, and the pintle H′ connects each element or pair of links to the next. Between the side bars G G of the inner narrow link there are placed spacing-tubes or ferrules I I, and outside of the outer bars G′ G′ of the wider links are placed shorter spacing-tubes or thimbles I′ I′, pins at h, washers at h' being used to hold all of the parts together. The inner or narrower links are used to carry the buckets J. Each of these is formed, in the way shown in the drawings, with four sides and the bottom cast integrally, with elongated arms or lugs j j extending out from the ends and with a peculiarly-shaped mouth having its edges arranged to lie in the surface of a cylinder of a curvature corresponding to that of the rotary receptacle and feeding device to be described. The arms j j of the buckets are secured by bolts, pins, or equivalent to the side bars G G of the narrow links.

The parts at A at the bottom of the elevator comprise a drum K, formed with a series of spider-arms k and the hub k', by which the drum can be secured to the shaft L. The drum is so shaped that in cross-section it has two flange-like or ring-like parts at K′ and two tapering or conical walls K^2, with an approximately cylindrical narrow central part K^3 between the conical wall K^2. In this cylindrical central part there are formed apertures k^2, and on the outer side of the drum there are flanges or lips K^4, extending outward at the edges of these apertures. The material which is introduced into the drum

by the spout or chute D is caused by the conical wall K^2 to move toward the central vertical plane—that is, toward the plane of the apertures k^2—so that it will be in position to escape more or less rapidly through these orifices as they successively come below the material contained in the drum. The flange-like or ring-like part K′ is utilized for engaging the drum with the above-described endless carrier. A series of apertures are formed in each of these flanges K′. Through each of these apertures is inserted a forked threaded pin M, the threaded stem being secured by means of nuts *m m′*. The forks in the pins are so situated that the projecting parts of the pintles or the thimbles I′ thereon shall successively seat themselves in these forks, the parts referred to constituting practically a sprocket mechanism. There is liability for the pitch lengths of the chain elements to vary for either of numerous causes; but when the parts are constructed and related in the way described provision is made for quickly and readily adjusting the rotary parts which engage with the chain, so that there would be compensation for any variation in its distances whether they are to be lengthened or shortened.

If the links or chain elements should become uniformly elongated, the sprocket-pins M can each be adjusted so that its fork shall be at a greater distance from the center of the drum; but if as a result of cold or other causes the pitch distances should be shortened the sprockets can be adjusted to a shorter radius.

If there should be any irregularity in the lengths of the parts in one series of bars G G′ in comparison with those in the other series, there can be compensation made by adjusting the series of sprockets on one side of the wheel to correspond to its series of bars more or less independently of the opposite series.

It will be seen that, in effect, I provide two sprocket-wheels at each end of the elevator, one on the right and one on the left, each having its sprockets independently adjustable in the way described.

The rotary part at the head B of the elevator consists of two sprocket-wheels and a shaft connected thereto, which can be constructed and arranged in the way shown. Each wheel N has a horizontal projecting flange *n*, in which there are formed a series of apertures wherein are inserted a series of the adjustable forked screw-stemmed sprockets N′, which are similar to those at M at the bottom. Thus at the head there are two chain-engaging wheel-like devices having two rows of sprockets adjustable independently of each other—that is to say, each is adjustable independently of the other in its series and those of one series are adjustable independently of those of the other series. The head wheels N N are separated laterally from each other and have an open space between them adapted to receive a hopper or chute into which the material carried by the buckets can be delivered by them successively as they move around the upper shaft.

The mode of operation of the mechanism above described will be readily understood. The pulverized ore or similar material which is to be carried from one point to another is passed through the chute D into the drum or rotary hopper at A. The mass of the material in the drum lies in the lower part thereof, and as the apertures k^2 come successively toward their lowermost positions they register with the open mouth or upper end of one of the buckets J, and the buckets and the wheel are so shaped at their contact-line that as the buckets reach the lower part of the circle of rotation they fit snugly against the periphery of the drum; but I have found that even such snug peripheral fitting is not sufficient to prevent leakage of the finely-reduced material, and hence have constructed a wheel with the tubular projections or lip-like extensions K^4. These enter the upper ends of the buckets some distance and insure that the dusty pulverized material shall enter the buckets properly without any of it escaping through the crevices at the lines of contact. After the buckets are loaded they are successively carried to the head of the elevator, where as they pass around the head shaft they are inverted and the material is delivered to the hopper or chute at E.

I am aware that elevators or carriers have been heretofore made or proposed embodying some of the features of construction which I have set forth; but I believe myself to be the first to have provided the mechanism herein presented having the loading-drum or rotary hopper formed with the projecting filling-tubes which insure that the dusty gritty material shall be deposited properly in the buckets without permitting it to come in contact with the articulating parts of the chain and to have combined with such buckets and filling device and with the chains which carry them sprockets secured and adjusted in the way set forth to permit a perfect and delicate regulation of the movement of the buckets to and from the apertures and filling-tubes, whereby there is not only maintained a perfect registering of the buckets with the loading-wheel, but the proper fitting of the chains to the wheels irrespective of variations in pitch distances.

What I claim is—

1. In an elevator for pulverized ore and similar material, the combination of the loading-drum formed with the peripheral tubes extending beyond the periphery of the drum, the sprocket-wheels rigid with the drum, the series of buckets, the chains carrying said buckets, and the series of forked sprockets with threaded stems, radially adjustable on said wheels, arranged substantially as set forth, whereby the sprockets can be so adjusted as to cause the proper registering of the buckets with the filling-tubes and per-

mit variations in the pitch distances of the sprocket-forks and the chain lengths; substantially as set forth.

2. The combination with the loading-drum, having the vertically-arranged conical parts and the filling-tubes between the conical parts, the two series of independently-adjustable forked sprockets rigidly connected to the filling-drum to form substantially two sprocket-wheels, the sprockets of one series being radially adjustable independently of the sprockets of the other series, the series of buckets adapted to register with the said filling-tubes and the chain carrying said buckets and formed of the alternating inner links with bars, G, G, and the outer links with the bars, G′, G′, the pintles, H, H′, hinging the alternating links together, spacing devices between the inner bars, G, G, and the thimbles, I′, I′, on the pintles outside of the outer bars and adapted to engage with the forks in the adjacent sprockets, substantially as set forth.

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

HENRY A. VEZIN.

Witnesses:
H. BOTTOMLEY,
W. J. CHAMBERLAIN.