

No. 804,810.

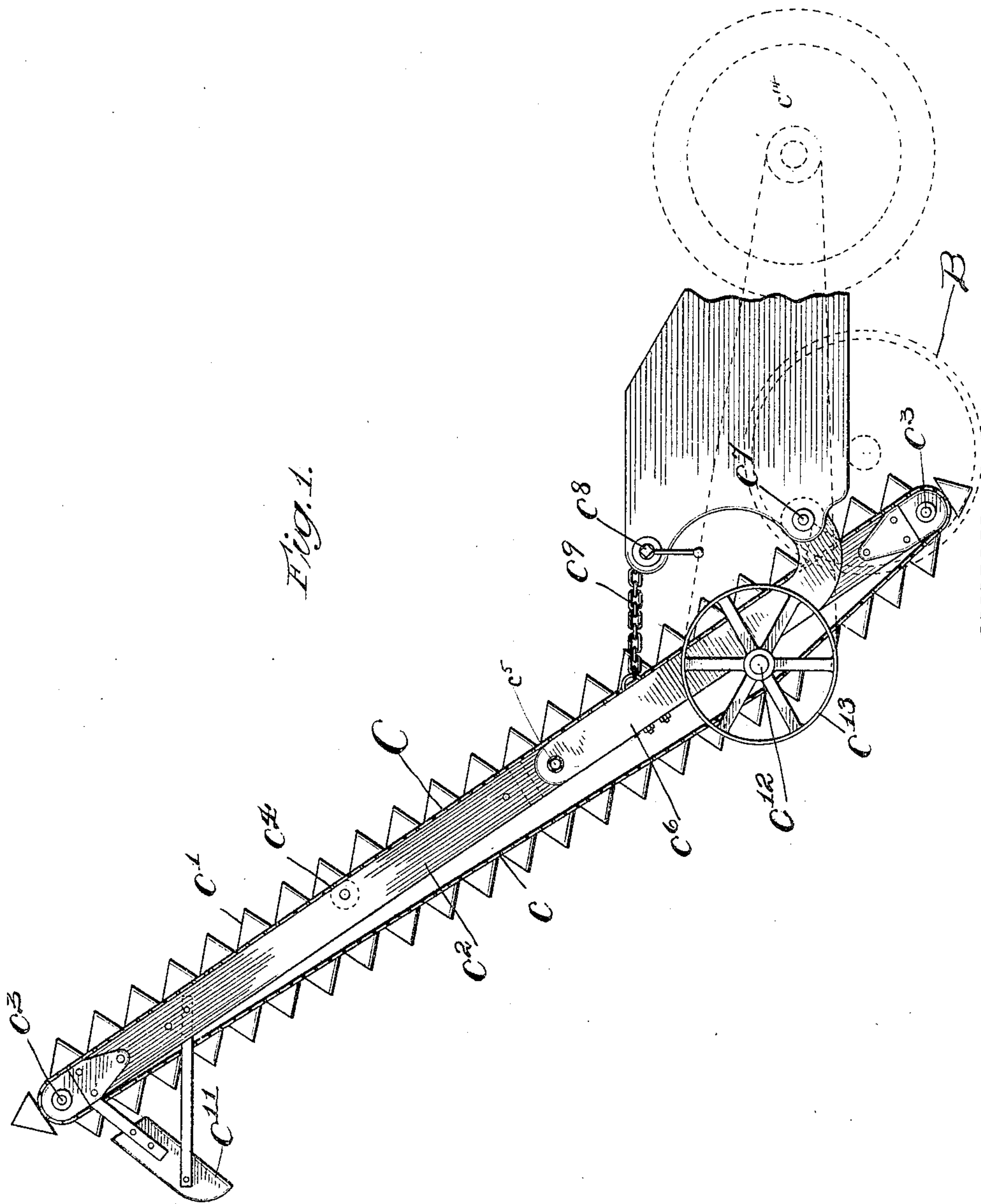
PATENTED NOV. 14, 1905.

T. J. GRAY.

ELEVATING CONVEYER FOR CRUSHING MACHINES.

APPLICATION FILED SEPT. 9, 1904.

2 SHEETS—SHEET 1.



Witnesses:
J. B. Weir
Clarence M. Thorne.

Inventor:
Thomas J. Gray
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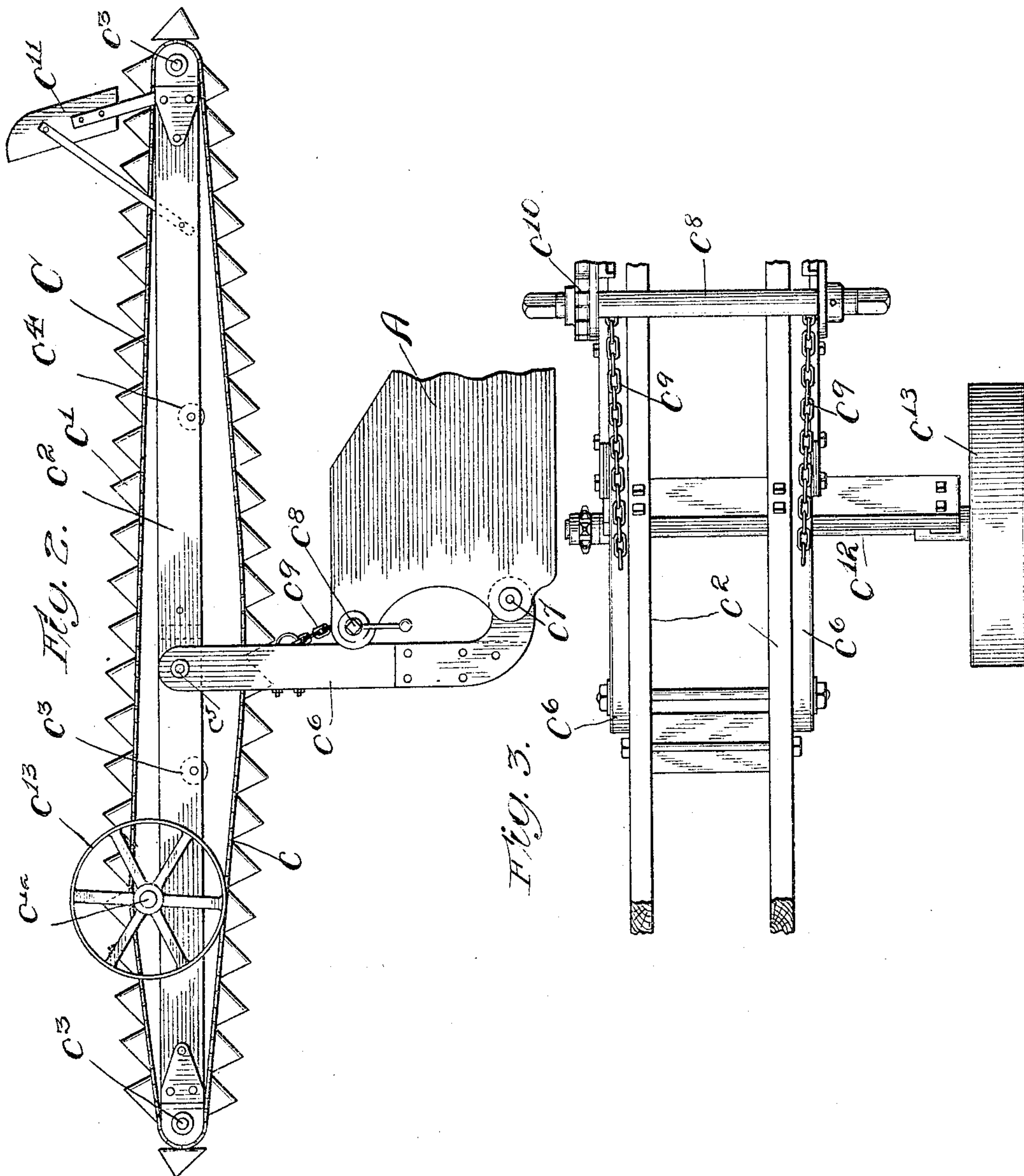
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UNITED STATES PATENT OFFICE.

THOMAS J. GRAY, OF CHICAGO, ILLINOIS, ASSIGNOR TO NATIONAL DRILL AND MANUFACTURING COMPANY, OF CHICAGO, ILLINOIS.

ELEVATING CONVEYER FOR CRUSHING-MACHINES.

No. 804,810.

Specification of Letters Patent.

Patented Nov. 14, 1905.

Original application filed May 21, 1904, Serial No. 209,041. Divided and this application filed September 9, 1904. Serial No. 223,937.

To all whom it may concern:

Be it known that I, THOMAS J. GRAY, a citizen of the United States of America, and a resident of the city of Chicago, county of Cook, and State of Illinois, have invented a certain new and useful Improvement in Elevating Conveyers for Crushing-Machines, of which the following is a specification.

This is a division of my application, Serial No. 209,041, filed by me in the United States Patent Office May 21, 1904, for improvement in crushing machinery, and in this application I have claimed the elevating arrangement, both broadly and specifically; and, general stated, the object of my present invention is to facilitate the manipulation of the elevator in changing it from an inclined or working position to a horizontal position for convenience in transportation by locating the pivotal point of the elevator at or near its center of gravity; and it is also an object, of course, to provide certain details and features of improvement tending to increase the general efficiency and serviceability of an elevating arrangement of this particular character.

In the accompanying drawings, Figure 1 shows the elevator in an inclined or working position. Fig. 2 shows the elevator in a horizontal position. Fig. 3 is an enlarged detail plan view showing the adjusting connections between the elevator and the body of the crusher.

As thus illustrated and referring more particularly to Figs. 1 and 2, it will be seen that the crushing-machine may comprise a body-frame A, preferably mounted upon vehicle-wheels B, so as to adapt the machine for transportation. Also, as shown in Figs. 1 and 2, the machine is provided with an elevator C, which may comprise sprocket chains or belts c , provided with buckets c' of any suitable or desired character. Preferably, however, said elevator is constructed with a frame or body c^2 , provided with rotary end members c^3 over which the conveyer-belt runs, and also with intermediate rolls c^4 , the latter preventing the upper or loaded portion of the conveyer from sagging through the frame. This frame or body c^2 of the elevator is pivoted at c^5 to a couple of swinging arms c^6 , the latter being pivoted to opposite sides of the body-frame at c^7 . A horizontally-disposed drum or winding-shaft c^8 can be mounted upon the body-frame of the machine in any suitable or desired man-

ner and is connected with the arm c^6 by chains or other like flexible connections c^9 . A ratchet device c^{10} of any suitable character is provided and employed as the means for preventing the rotation of the drum or shaft c^8 after the chains are wound up for the purpose of bringing the arms c^6 into the position shown in Fig. 2.

The upper end of the elevator-body may be provided with a suitable spout c^{11} , adapted to receive the product or crushed rock from the upper end of the conveyer-belt. The back or under side of the elevator-frame can be provided with bearings of any suitable character adapted to support a horizontally-disposed shaft c^{12} . As illustrated, this shaft is provided with a belt-pulley c^{13} , adapted to have belt connection with the smaller pulley c^{14} on the main shaft of the machine. With this arrangement the shaft c^{12} can be connected in any suitable manner for driving the conveyer-belt of the elevator. It will be observed at this juncture that the pivotal point c^5 , about which the elevator is free to tilt, is located near the longitudinal center of the elevator. Furthermore, it will be seen that the shaft c^{12} is so positioned as to act as a stop to limit the relative swing between the elevator and the supporting-arm c^6 in one direction. Consequently when the chains c^9 are wound in and the arm c^6 adjusted to a substantially vertical position the elevator is then in condition to have its upper end tilted downward with very little exertion. In fact, with the pivotal point of the elevator arranged substantially at or near the center of gravity, it is only necessary to start the elevator over in the direction desired, and it then falls slowly by its own weight to a horizontal position, as shown in Fig. 2. In this position the elevator can be supported for transportation by braces or props (not shown) having their upper ends engaging the elevator-frame and their lower ends suitably connected with the body-frame of the crusher. Thus with the construction shown it is apparent that I provide my improved crushing-machine with an elevator which may be very easily manipulated for the purpose of raising it to a working position or lowering it to a horizontal or transporting position.

When the elevator is in use, the swinging arms c^6 and the elevator are leaning in the same direction, and the endless conveyer is so operated that the loaded buckets travel upwardly and pass between the axes of the arms

and the elevator—that is to say, between the axis about which the elevator tilts and the axis about which the arms swing—or move relatively to the support upon which they are mounted. Furthermore, it will be seen that the lower portion of the elevator and the said swinging arms c^6 are adapted to close together or shut up in jackknife fashion when the elevator is to be used, the shaft c^{12} , which may have a sprocket or other suitable connection with the conveyer, acting also as a stop for limiting the tilt of the conveyer in one direction relatively to the said swinging arms. Again, it will be seen that the pivotal point or axis c^7 of the said swinging arms is always on a vertical plane at one side of the axis c^5 , whereby the weight of the elevator structure is sufficient to swing the arms outwardly and away from the windlass or adjusting means when it is desired to tilt the elevator up from its horizontal position and into the inclined position necessary for use.

What I claim as my invention is—

1. In apparatus of the character described, a swinging support, a tilting frame mounted on said support, an endless bucket conveyer supported on said frame, and means for operating said conveyer and causing the loaded buckets to travel upwardly between the axes of the said frame and support the receiving side of the elevator being underneath when it is lowered and out of use, substantially as set forth.

2. In apparatus of the character described, a swinging support, a tilting elevator mounted on said support, the elevator and support being adapted to close together in jackknife fashion when the elevator is to be used, and means for adjusting the said support, the receiving side of the elevator being underneath when it is lowered and out of use, substantially as set forth.

3. In apparatus of the character described, a swinging support, a tilting frame on said support, an endless conveyer on said frame, and means for operating said conveyer and causing the loaded portions thereof to move upwardly between the axes of the support and frame the receiving side of the elevator being underneath when it is lowered and out of use, substantially as set forth.

4. In apparatus of the character described, the combination of suitably-mounted swinging arms, means for drawing said swinging arms from an inclined position to a substantially vertical position, and an elevator pivotally mounted on the upper ends of said arms, the lower portion of said elevator being adapted to swing between the said arms, whereby the elevator may be tilted to an inclined position to permit its lower end to receive the load, and whereby said elevator may be tilted to a horizontal or substantially horizontal position for transportation the receiving side of the elevator being underneath

when it is lowered and out of use, substantially as set forth.

5. In apparatus of the character described, the combination of suitably-mounted swinging arms, and an elevator having its middle portion pivotally secured to the upper ends of said arms, together with means for adjusting the arms either to a vertical or an inclined position, the said arms and the lower portion of said elevator being adapted to close together in jackknife fashion, whereby the elevator may be easily adjusted from its working or inclined position to a horizontal or practically horizontal position for transportation the receiving side of the elevator being underneath when it is lowered and out of use, substantially as set forth.

6. In apparatus of the character described, the combination of a suitable body mounted on vehicle-wheels, swinging arms having their lower ends pivoted to one end of the body-frame, means for adjusting said arms from a substantially vertical position to an inclined position, and an elevator having its middle portion pivotally mounted upon the upper ends of said arms, the elevator being adapted to occupy a working position with its lower portion between, and at the same angle, or practically the same angle, as the arms, said elevator being adapted to tilt to a horizontal position when the said arms are adjusted to a vertical or substantially vertical position the receiving side of the elevator being underneath when it is lowered and out of use, substantially as set forth.

7. In apparatus of the character described, the combination of a swinging support, and an elevator pivotally mounted at a point between its ends upon said swinging support, with the lower portion of the elevator adapted to swing between the lower ends of the said support, whereby the lower end of the elevator may be adjusted into position to receive the load, and whereby the elevator may be tilted easily to a horizontal or practically horizontal position when the said swinging support is adjusted to a vertical or substantially vertical position the receiving side of the elevator being underneath when it is lowered and out of use, substantially as set forth.

8. In apparatus of the character described, a swinging support, and an elevator having its intermediate or middle portion pivotally mounted upon the upper end of said support, said elevator being thereby adapted to occupy an inclined position while in use, with the said support inclining in the same direction, and adapted also to tilt easily to a horizontal or substantially horizontal position when the said support is adjusted to a vertical or substantially vertical position the receiving side of the elevator being underneath when it is lowered and out of use, substantially as set forth.

9. In apparatus of the character described, an elevator pivotally supported at or near its

center of gravity, and adjusting means for shifting said pivotal point, whereby the elevator is easily tilted from an upright position to a horizontal position, together with means for
5 operating the elevator and causing the loaded portions thereof to travel upwardly between the said pivotal point and the said adjusting means the receiving side of the elevator being underneath when it is lowered and out of use,
10 substantially as set forth.

10. In apparatus of the character described, a tilting elevator pivotally mounted at a point at or near its center of gravity, whereby the elevator is easily adjusted from one position
15 to another, and a pulley-shaft mounted transversely on the back of the elevator, between the oppositely-traveling portions thereof, and at a point below the said pivotal point, and connected for driving the elevator the receiving
20 side of the elevator being underneath when it is lowered and out of use, substantially as set forth.

11. In apparatus of the character described, the combination of a suitable body, a winding
25 device mounted on said body, a swinging sup-

port mounted on said body, flexible connection between the swinging support and the winding device, and an elevator pivotally mounted on said swinging support, together
20 with means for operating the elevator and causing the loaded portions thereof to travel upwardly between the said winding device and the axis of the elevator the receiving side of the elevator being underneath when it is lowered and out of use, substantially as set forth. 35

12. In apparatus of the character described, the combination of swinging arms, an endless traveling elevator secured to the end of said swinging arms, and having buckets adapted to travel upwardly between the said station-
40 ary axis and the said laterally-movable axis, the receiving side of the elevator being underneath when it is lowered and out of use, substantially as set forth.

Signed by me at Chicago, Illinois, this 25th
45 day of August, 1904.

THOMAS J. GRAY.

Witnesses:

CLARENCE M. THORNE,
LUCY W. WRIGHT.