E. W. BRUDEVOLD.

HEADED WHEAT ELEVATOR.

APPLICATION FILED APR. 30, 1915.

1,201,019.

Patented Oct. 10, 1916.

3 SHEETS—SHEET 1.

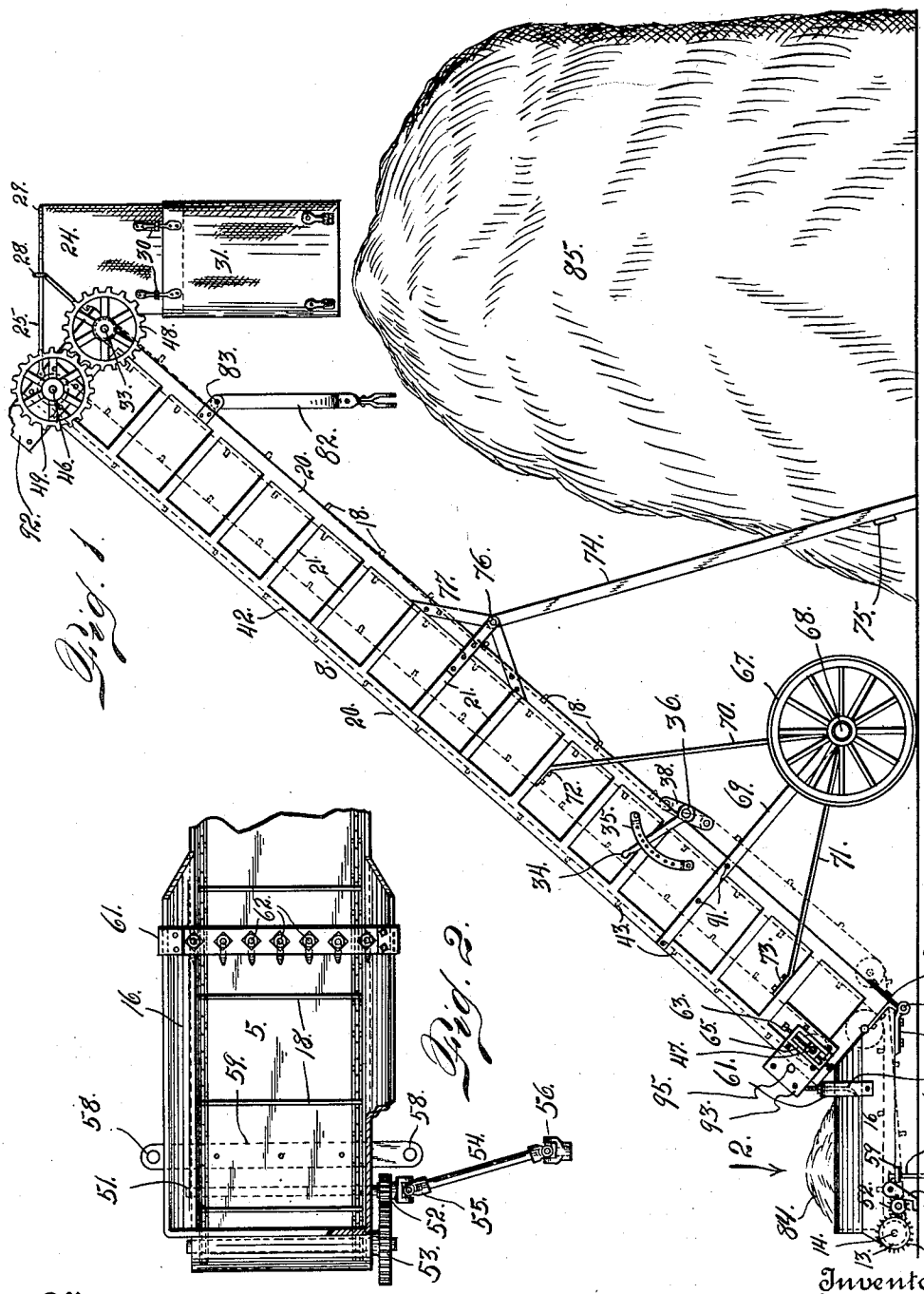


Fig. 1.

Fig. 2.

Witnesses

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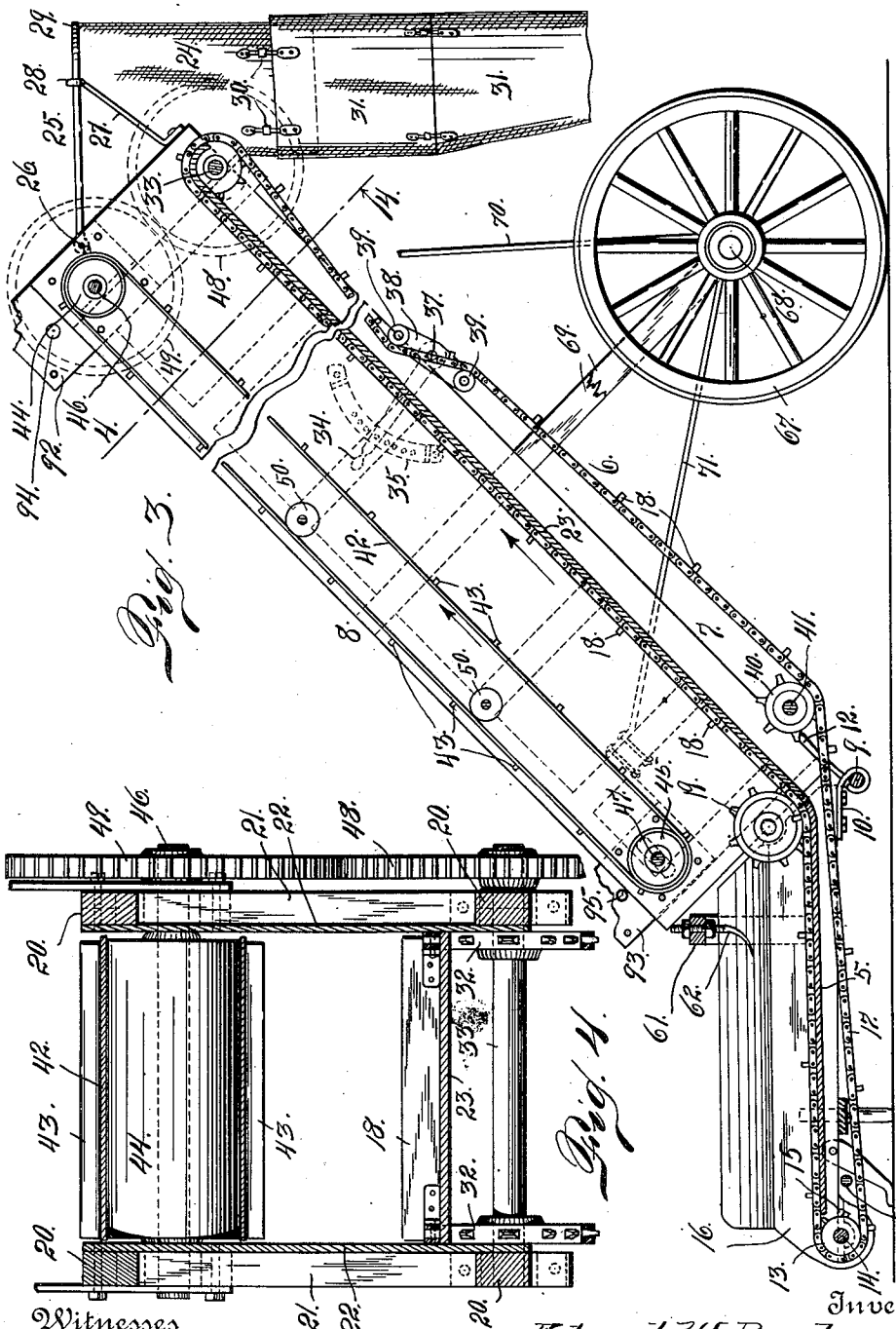


Fig. 3.

Fig. 4.

Witnesses

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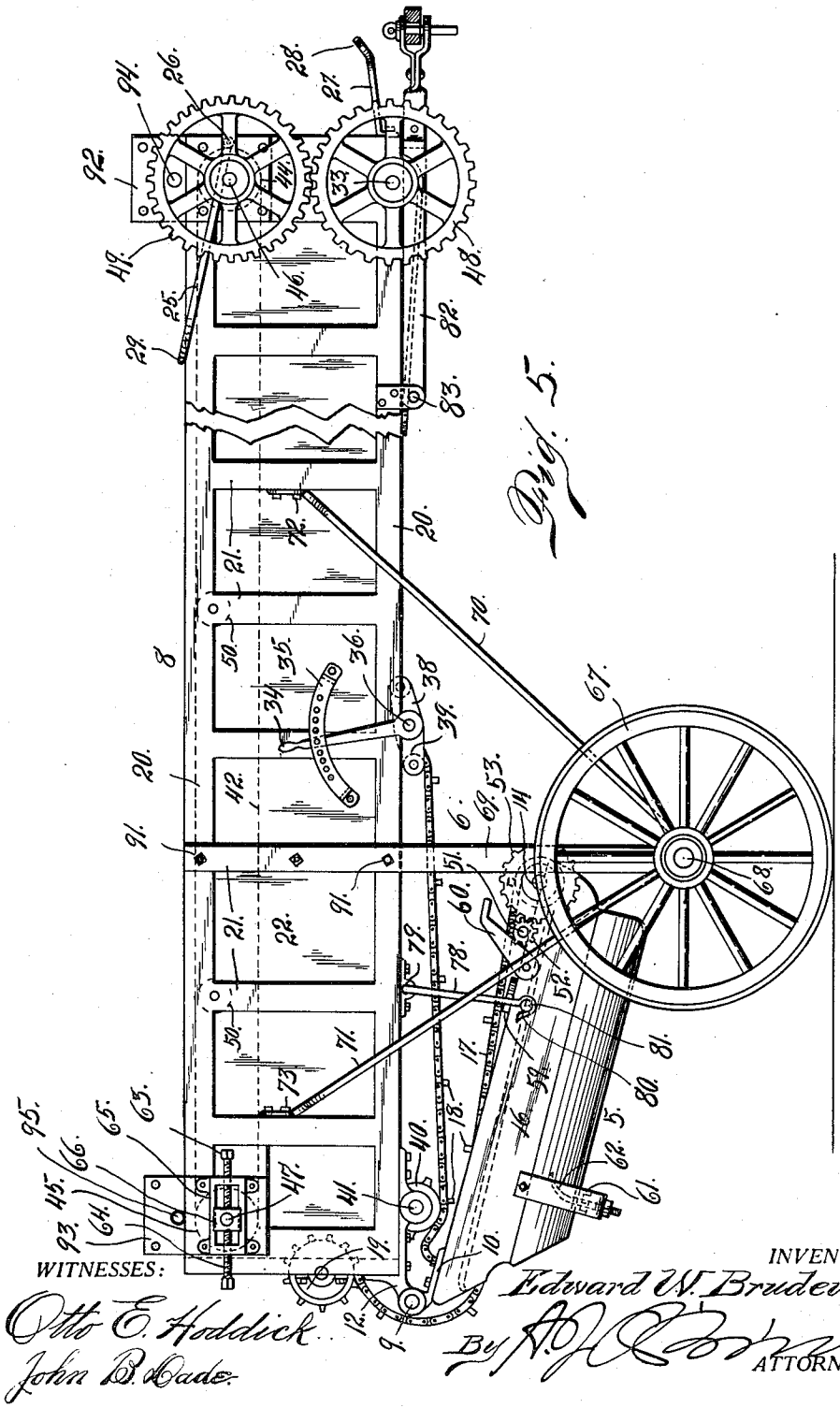


Fig. 5.

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EDWARD W. BRUDEVOLD, OF DENVER, COLORADO.

HEADED-WHEAT ELEVATOR.

1,201,019. Specification of Letters Patent. Patented Oct. 10, 1916.

Application filed April 30, 1915. Serial No. 24,847.

To all whom it may concern:

Be it known that I, EDWARD W. BRUDEVOLD, a citizen of the United States, residing in the city and county of Denver and State of Colorado, have invented certain new and useful Improvements in Headed-Wheat Elevators; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the characters of reference marked thereon, which form a part of this specification.

My invention relates to improvements in elevators more especially adapted for use in handling headed wheat or other grains. In many countries where wheat is extensively grown, it is well known that the heads of the wheat only are removed, this operation being accomplished by the use of what is termed headers. This headed material, whether of wheat or other grains, by reason of the short lengths of straw left with the heads, is quite difficult to handle, since it is comparatively small. For this reason, it is difficult to get the material in place upon a stack, particularly of any considerable height. Again, it is desirable to build these stacks relatively high for the reason that there is more or less waste at both the top and bottom of the stack, in the one case, due to the moisture of the earth and in the other case, due to the exposure to the weather.

Heretofore, so far as I am aware, the elevators employed are incapable of raising the grain to the desired height by reason of the fact that they cannot be set at a sufficiently steep incline or an incline sufficiently approaching the vertical, since this relatively fine or small material has a tendency to fall or slide back or downwardly, under the circumstances just indicated.

Hence, my object is to overcome this difficulty, and to provide an elevator which may be set at a sufficiently steep incline to answer all practicable purposes, and to this end, the primary carrier or conveyer belt is supplemented by an auxiliary carrier arranged in the elevator frame above the primary or main carrier, and engages the material from above or on the side opposite from that where it is engaged by the primary carrier. These two carriers coöperating or acting in conjunction, prevent the relatively fine or small headed material from falling downwardly when the elevator frame is set in a comparatively steep position, thus overcoming the difficulty heretofore explained.

Furthermore, I equip the discharge extremity of the elevator with a sectional canvas conduit, whereby the material, when the discharge extremity of the elevator is raised considerably above the stack, is guided downwardly to the stack, thus preventing the wind from blowing the relatively fine or headed material out of its course and beyond the stack. This conduit is composed of a series of relatively short lengths and these lengths or sections may be gradually removed as the stack increases in height.

Having briefly outlined my improved construction, I will proceed to describe the same in detail, reference being made to the accompanying drawing in which is illustrated an embodiment thereof.

In this drawing,—Figure 1 is a side elevation of my improved headed-wheat elevator shown in position for use. Fig. 2 is a top plan view showing the lower portion of the elevator, and more particularly the platform upon which the material is discharged prior to the beginning of the elevating function proper, the parts being shown on a larger scale. Fig. 3 is a sectional side elevation, partly broken away, the parts being shown on a larger scale. Fig. 4 is a section taken on the line 4—4, Fig. 3, viewed in the direction of the arrow, the parts being shown on a still larger scale. Fig. 5 is an elevation of the device in position for transportation from place to place.

The same reference characters indicate the same parts in all the views.

Let the numeral 5 designate a forwardly located platform which is open at both ends and provided on opposite sides with upwardly projecting parts 16 adapted to confine the material to be handled so that the main endless conveyer or carrier 6 may catch it and remove it from the platform and carry it upwardly, as hereinafter more fully explained.

The platform 5 is hingedly connected with the framework 7 of the elevator 8. The hinge pin (see Fig. 3) is designated by the numeral 9, parts of the hinge being secured to the platform as shown at 10 and other parts to the elevator frame as shown at 12. Located forward of the forward ex-

tremity of the platform 5, is a drum or roller 13 fast on a shaft 14 whose opposite extremities are equipped with sprocket wheels 15 which are engaged by chains 17 which are suitably spaced and connected by transverse bars or flights 18. The upper run of this carrier or conveyer as it reaches the rear extremity of the platform 5, engages a second pair of sprocket wheels 19 which are mounted on the lower or forward extremity of the conveyer frame and serves to guide the upper run of the conveyer at the angle formed by the approximately horizontal platform 5, and the steeply inclined elevator frame.

This elevator comprises a skeleton framework, including longitudinally disposed relatively heavy bars 20 arranged on opposite sides and constituting upper and lower members suitably spaced according to the depth required. These longitudinally disposed bars 20 are connected by other bars 21 which extend at right angles to the longitudinal bars, forming a strong skeleton framework which is rectangular in both plan and end view. To the opposite sides of this framework are secured vertically disposed side members 22 which are suitably spaced and arranged parallel to each other. These side members are of sufficient height to form a relatively deep trough or chute having a bottom 23. This bottom of the elevator frame at its lower or forward extremity joins the rear extremity of the platform 5, the two members virtually forming a continuous bed or support for the grain. The upper run of the conveyer belt or carrier 6 consisting of the chains 17 and the cross slats or flights 18, engages this supporting bed composed of the members 5 and 23, whereby the material which is discharged upon the platform 5, is carried first rearwardly to the end of the platform 5 and thence upwardly on the bottom 23 of the elevator frame, and discharged into a canvas hood 24 which is connected with the upper part of the elevator frame by means of a U-shaped rod 25 hinged to the frame as shown at 26 and supported on opposite sides by spring arms 27, whose upper extremities are shaped as shown at 28 to receive the sides of the part 25. The hood 24 is secured to the U-shaped rod as shown at 29. To the lower extremity of the hood 24 is connected as shown at 30, a canvas member or section 31 which may be of any desired length, or this member 31 may consist of a series of sections which may be removed as the stack increases in height.

At the upper extremity of the elevator frame and extending below the bottom thereof, are two sprocket wheels 32 which are fast on a shaft 33 journaled in the framework. These sprocket wheels are engaged by the chains 17 of the carrier 6. The lower run of this conveyer is engaged by belt tighteners arranged on opposite sides of the elevator and each consists of a lever arm 34 adjustably connected with a quadrant 35. The lower end of this lever arm is rigidly secured as shown at 36 to a short spindle 37 to which is made fast crank arms 38 extending in opposite directions and carrying rollers 39 adapted to engage the upper and lower surfaces of the adjacent chain of the lower run of the main or primary carrier. It is evident that as these devices are adjusted, the tension of the conveyer belt or carrier may be regulated. The lower run of the conveyer also engages sprocket wheels 40 fast on a shaft 41 journaled in the framework and arranged on opposite sides within the path of the chain 17.

Mounted in the upper part of the elevator frame and coöperating with the main or primary carrier 6, is an auxiliary carrier 42, which, as illustrated in the drawing, is composed of an endless belt equipped with transversely arranged flights 43. This auxiliary carrier at its opposite extremities engages upper and lower drums 44 and 45 which are mounted on shafts 46 and 47 respectively, said shafts being journaled in the framework of the structure. During the operation of the machine the upper run of the main carrier and the lower run of the auxiliary carrier are moving upwardly, as indicated by the arrows (see Fig. 3). Consequently, the lower run of the auxiliary carrier coöperates with the upper run of the main carrier to elevate the material after it has reached the bottom 23 of the elevator frame. It will be understood that the lower run of the auxiliary carrier must be so located that it will engage the material on top, while the upper run of the carrier 6 engages the same material on the bottom. In this way, the material as it travels upwardly, is grasped or clamped between two flighted conveyer members which are traveling at uniform speed. Hence, it is impossible for the material to slide back, thus making it practicable to elevate the material when the elevator is set at an inclination sufficiently great for all practicable purposes.

In order that the two carriers may move at uniform speed, the shaft 33 which carries the sprocket wheels 32 which engage the chains of the main carrier at the upper extremity of the elevator frame, is equipped with a gear 48 which meshes with a gear 49 of the same size, which is fast on the shaft 46 which carries the upper drum or roller 44 of the auxiliary carrier. By virtue of this construction, the motion which is transmitted to the main or primary carrier, is also transmitted to the auxiliary carrier.

The construction whereby the carriers are operated is illustrated in Figs. 1 and 2 of the drawing. A shaft 51 is journaled in suitable bearings mounted on the platform 5.

One extremity of this shaft is equipped with a pinion 52 which meshes with a gear 53 fast on the shaft 14 which carries the drum or roller 13 located at the forward extremity of the main or primary carrier. Connected with the shaft 51 beyond the pinion 52, is one extremity of a shaft 54 whose opposite extremity may be connected with any suitable source of power. As illustrated in the drawing, the shaft 54 is connected with the shaft 51 by a universal joint 55. The opposite extremity of the shaft 54 is also equipped with a universal joint 56. Hence, as the shaft 54 is rotated, a corresponding movement will be imparted to the shaft 51 and transmitted through the medium of the pinion 52 to the gear 53, thence to the main carrier 6 and finally to the auxiliary carrier, through the medium of the gears 48 and 49.

When the elevator is in use, it is anchored to the ground in any suitable manner. As illustrated in the drawing, stakes or relatively heavy metal spikes 57 are passed through openings 58 formed in the opposite extremities of a transverse bar 59 which is secured to the bottom of the platform 5 on the under side. These stakes or metal spikes are driven into the ground to a sufficient distance to securely hold the platform in place. The latter is further supported by means of legs 60 connected with the platform on opposite sides and extending downwardly to the ground, when the machine is in use.

The sides 16 of the platform are connected near the rear extremity thereof by an arch-shaped bar 61 which extends above the platform and is equipped with depending forwardly curved fingers 62, which are vertically adjustable on the supporting bar and are adapted to engage the grain or material discharged upon the platform and prevent too large a quantity from passing to the elevator.

The tension of the auxiliary carrier is controlled by means of two bolts 63 and 64 arranged on opposite sides of the lower end of the elevator, each pair of bolts being threaded into the opposite ends of a box 65 in which a block 66 is slidably mounted. These two blocks on opposite sides of the machine constitute the supports for the opposite ends of a shaft 47 which is journaled therein.

The elevator when in use (see Figs. 1 and 3) is partially supported by two wheels 67 which are applied to the opposite ends of an axle 68 which is journaled in a support composed of depending bars 69 and braces 70 and 71 arranged on opposite sides of the said bars. The upper extremities of the bars are secured to the elevator frame as shown at 91, while the upper extremities of the braces are secured to this frame as shown at 72 and 73.

When the elevator is in position for use, it is further supported by means of legs 74 which are connected near their lower extremities by a transverse member 75. The upper extremities of these legs are pivotally connected as shown at 76, to trusses 77 arranged on opposite sides and projecting slightly downwardly from the elevator frame. By adjusting the lower extremities of these legs by moving them either forwardly or rearwardly, it is evident that the inclination of the elevator may be increased or diminished as may be desired.

When the elevator is not in use and it is desired to transport it from one place to another, it may be moved in a manner similar to that of any other wheeled vehicle. In this event, the legs 74 may be detached or swung toward the elevator, whereby they are caused to occupy a position parallel therewith. They may then be connected with the elevator frame in any suitable or well known manner. After this is done, the rear portion of the elevator or that in the rear of the axle 68, is lowered and the forward extremity is raised. In other words, the machine is caused to assume approximately the position shown in Fig. 5 whereby the elevator is parallel or approximately parallel with the ground or surface upon which the machine rests. As soon as the elevator is placed in this position, the platform 5 and its attachments are swung underneath the forward extremity of the elevator by turning the rear end of this platform on its hinge pin 9. When swung to this position, it is supported by means of depending rods 78 which are pivotally connected with the elevator frame as shown at 79, their lower extremities terminating in hooks 80 which are adapted to engage projections 81 formed on the opposite sides 16 of the platform. A draft bar 82 which is pivotally connected with the lower part of the elevator as shown at 83, is then swung forwardly (the hood 24 and the canvas conduit 31 having been removed), after which a team of horses or any other power may be connected with the draft bar when the machine may be drawn from place to place in a manner that will be readily understood. When the hood 24 and canvas conduit 31 are detached, the U-shaped rod or hood-supporting frame 25 is thrown forwardly to the position illustrated in Fig. 5.

From the foregoing description, the use and operation of my improved headed-wheat elevator will be readily understood. When the apparatus is in use, it may be placed in the position illustrated in Fig. 1. The power to be employed in operating the carriers is connected with the shaft 54 and transmitted through the pinion 52 and the gear 53 to the main or primary carrier 6, and from the latter, through the medium of

the gears 48 and 49, to the auxiliary carrier 42. The material to be handled is then discharged upon the platform 5, as indicated at 84 (see Fig. 1). This material is then taken by the forward portion of the upper run of the main conveyer and carried to the elevator where the two carriers, the upper run of the main carrier and the lower run of the auxiliary carrier, coöperate to carry it upwardly and discharge it first into the hood 24 and thence into the canvas conduit 31, whence it passes to the stack 85 (see Fig. 1).

The upper run of the auxiliary carrier is supported by a number of rollers 50 which are suitably mounted on the conveyer frame and provide antifrictional means to prevent the upper run of the carrier from sagging or swinging down farther than is desirable. Attention is called to the fact that the auxiliary carrier may be adjusted by moving it toward or away from the main or primary carrier. Any suitable provision may be made for accomplishing this object. In the drawing, I have illustrated plates 92 and 93 which extend above the elevator frame, at opposite ends, and are provided with openings 94 and 95 adapted to receive the shafts 46 and 47, respectively, carrying the rolls 44 and 45. It must be understood that any suitable provision may be made for adjusting the auxiliary carrier in order that its lower run may be brought into coöperative proximity with the upper run of the main carrier when the machine is in operation. It will also be understood that the lower run of the auxiliary carrier must be in position to engage the material on the upper side, while the upper run of the main carrier is engaging it on the lower side, in order that the two runs may coöperate to perform the elevating function.

Having thus described my invention, what I claim is,—

1. An elevator for headed wheat or similar material, comprising a framework adapted to be supported in an inclined position and including a channel or chute, an endless carrier whose upper run engages the bottom of said channel and whose lower run extends beyond the channel, an auxiliary carrier arranged within the framework above the first named carrier, the lower run of the auxiliary carrier being arranged in opposing relation with the upper run of the first carrier, and a platform extending forwardly from the lower extremity of the elevator frame and hingedly connected with the latter, the first named carrier having a forward extension engaging said platform, the latter forming a continuation of the bottom of the elevator frame but extending therefrom at an angle, and the said platform and carrier extension adapted to be swung under the elevator frame, and means depending from the latter for securing the platform and carrier extension in this position when the machine is being transported.

2. A conveyer of the class described, comprising a frame adapted to be supported in an inclined position, a platform extending forwardly from the lower extremity of the conveyer frame and hingedly connected therewith, the platform when in use occupying a position substantially parallel with the surface where the machine is located, the said platform also adapted to be folded under the conveyer frame when the machine is being transported, means connected with the said conveyer frame for securing the platform in the folded position, an endless conveyer whose upper run engages the platform and the bottom of the conveyer frame, and an auxiliary carrier mounted on the conveyer frame above the first named carrier and coöperating therewith to perform the elevating function.

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

EDWARD W. BRUDEVOLD.

Witnesses:
MAZE KIRBY,
A. EBERT O'BRIEN.