No. 841,376. PATENTED JAN. 15, 1907.

J. H. COPE.

HAY STACKER.

APPLICATION FILED MAY 1, 1906.

5 SHEETS—SHEET 1.

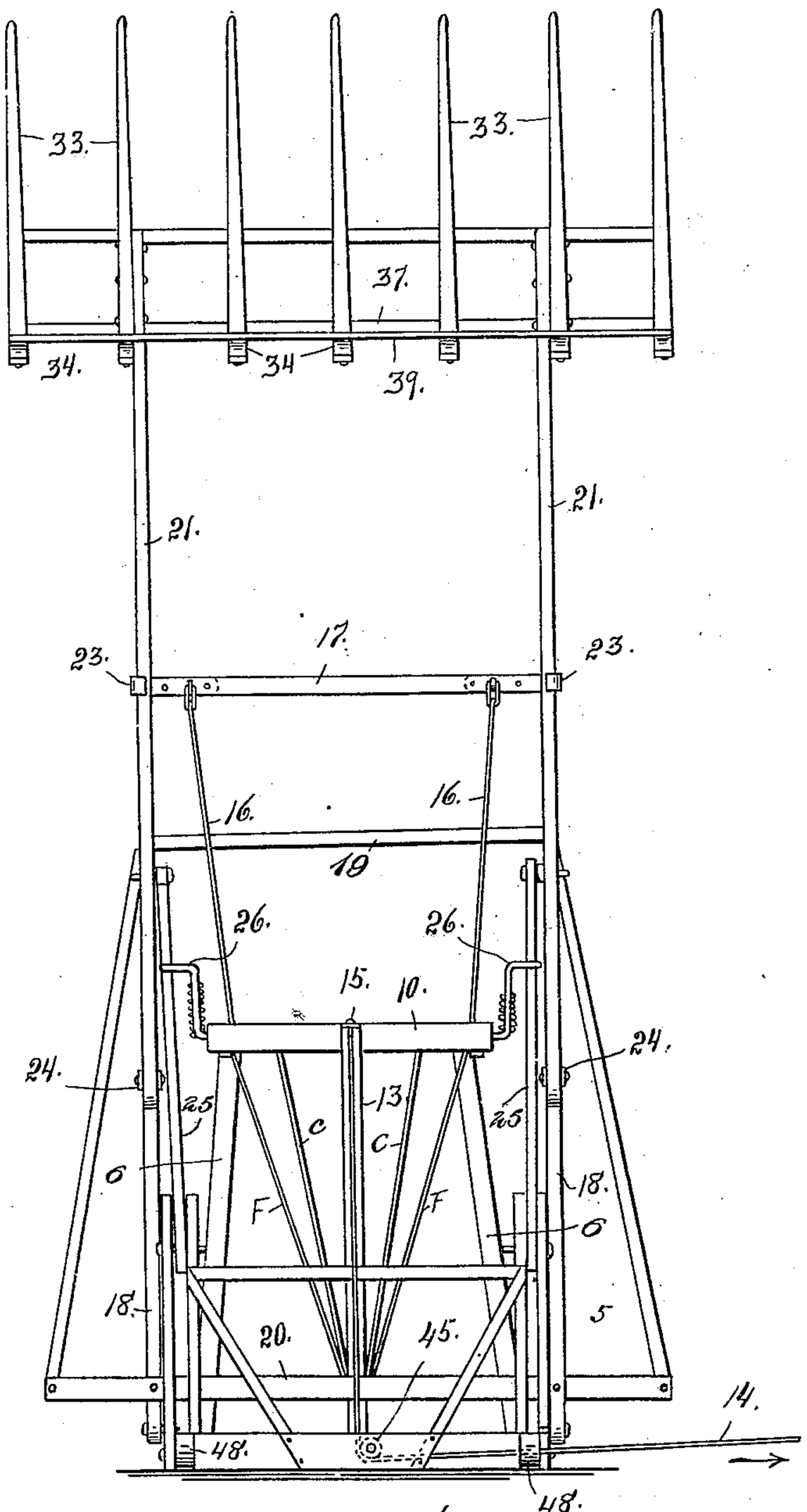

Fig. 1.

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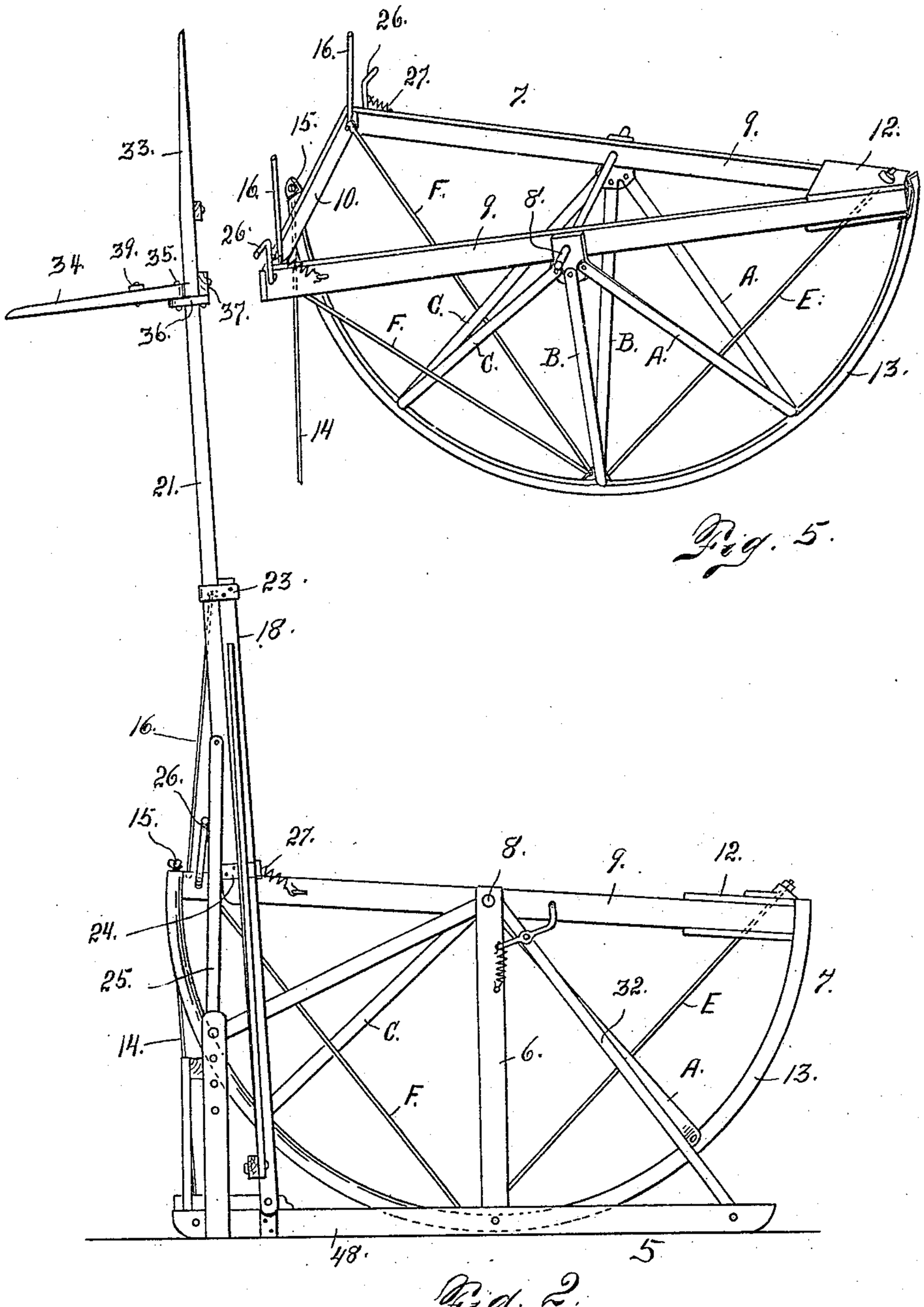

Fig. 5.

Fig. 2.

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5 SHEETS—SHEET 3.

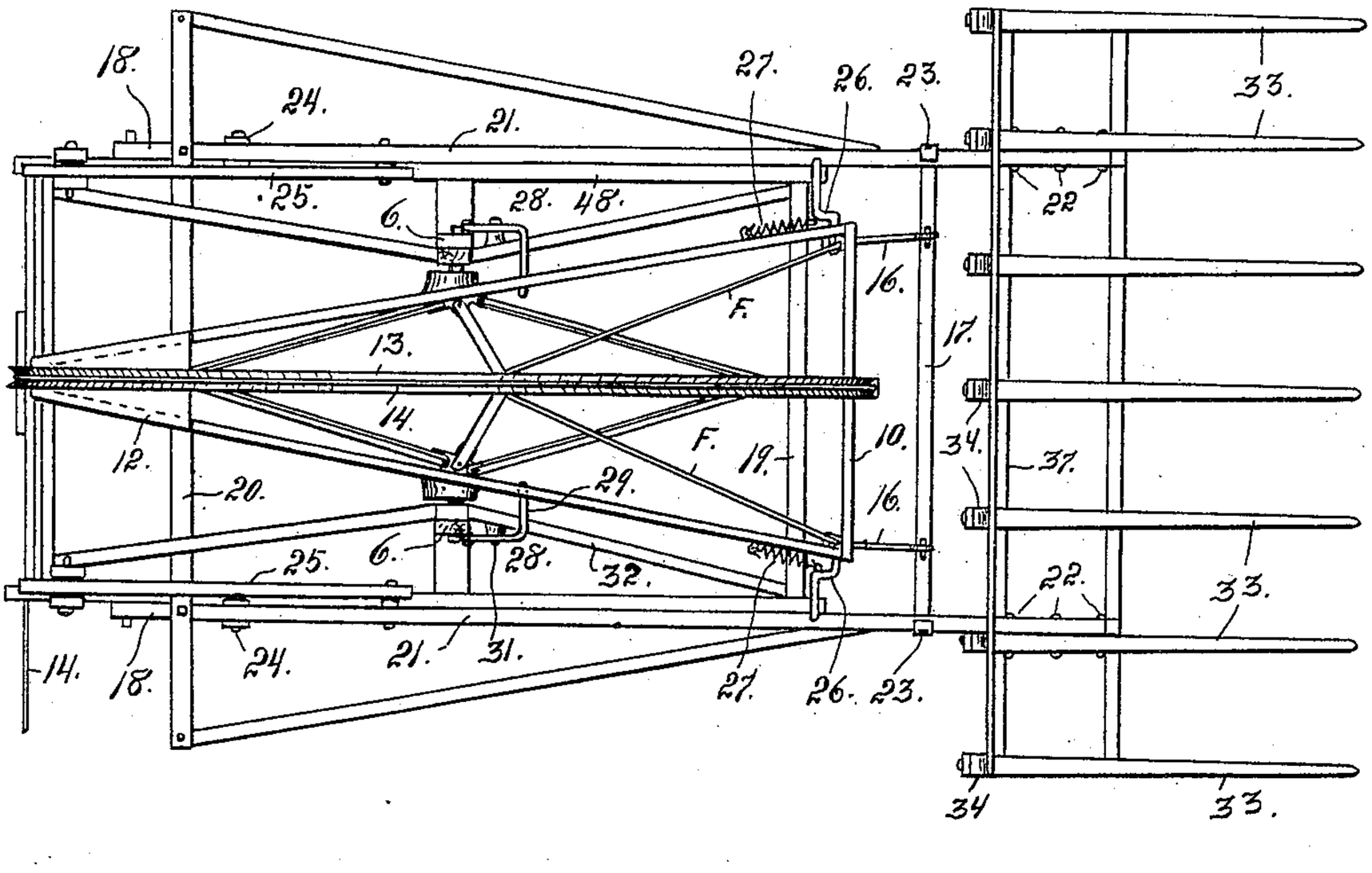

Fig. 3.

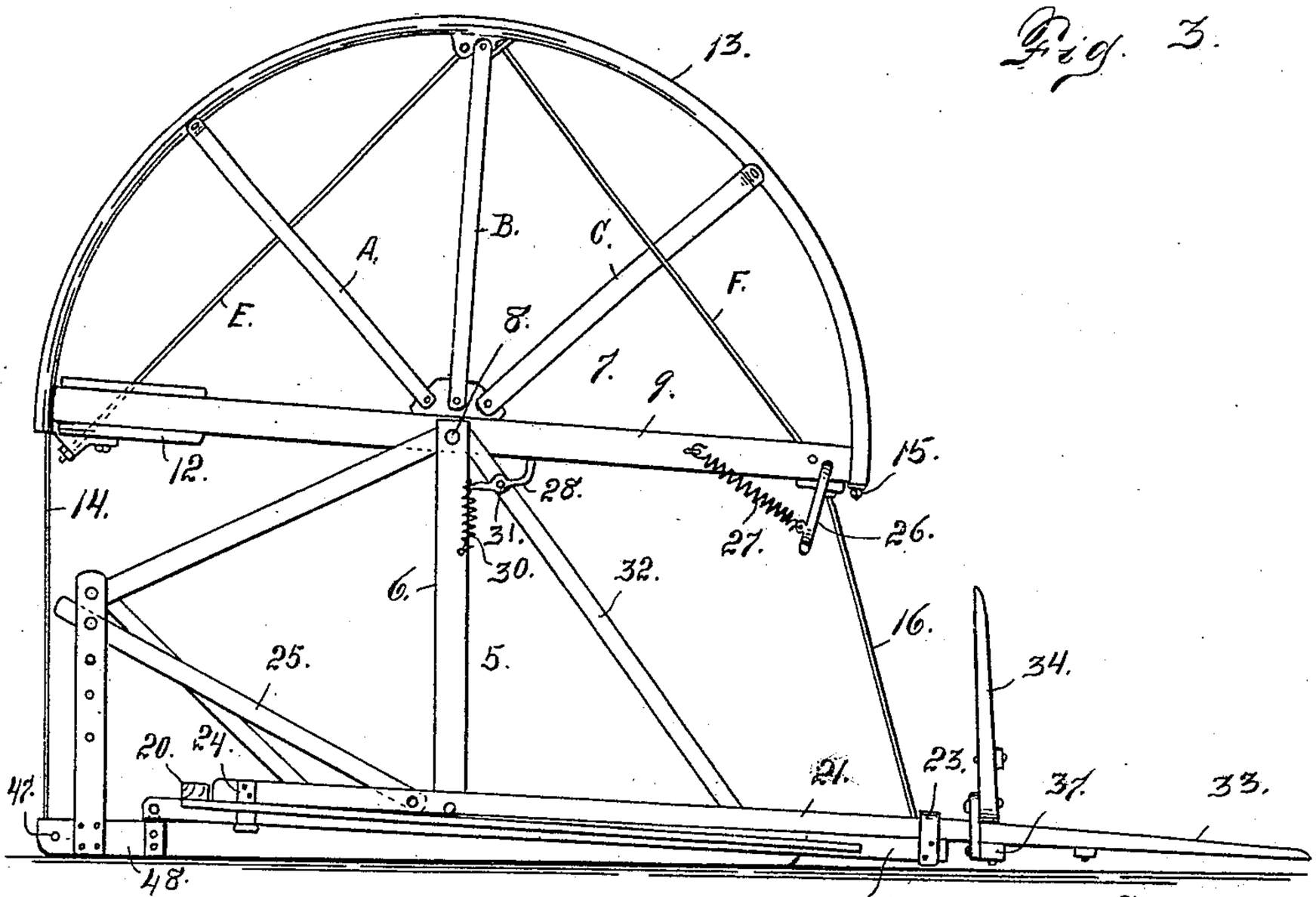

Fig. 4.

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5 SHEETS—SHEET 4.

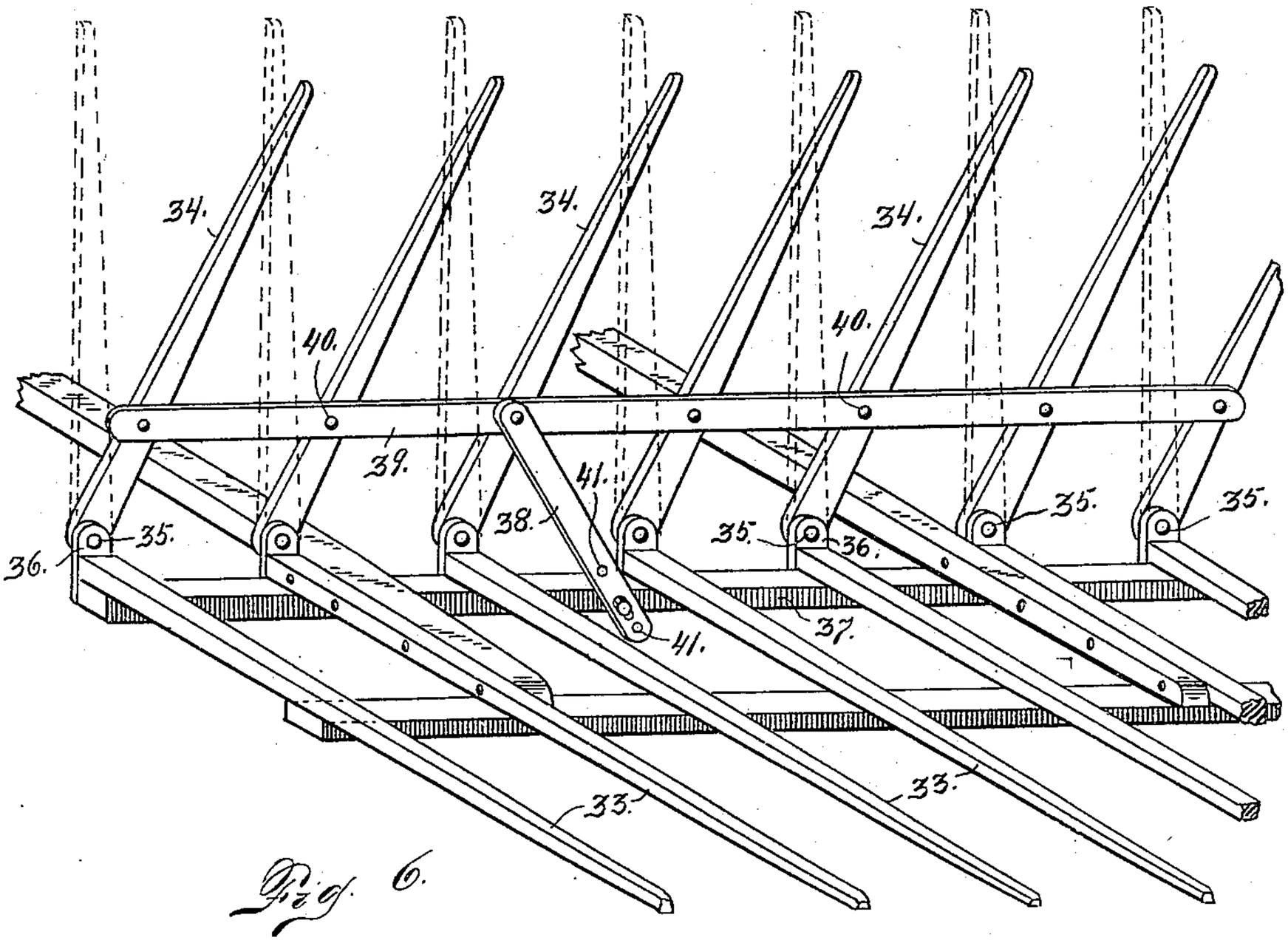

Fig. 6.

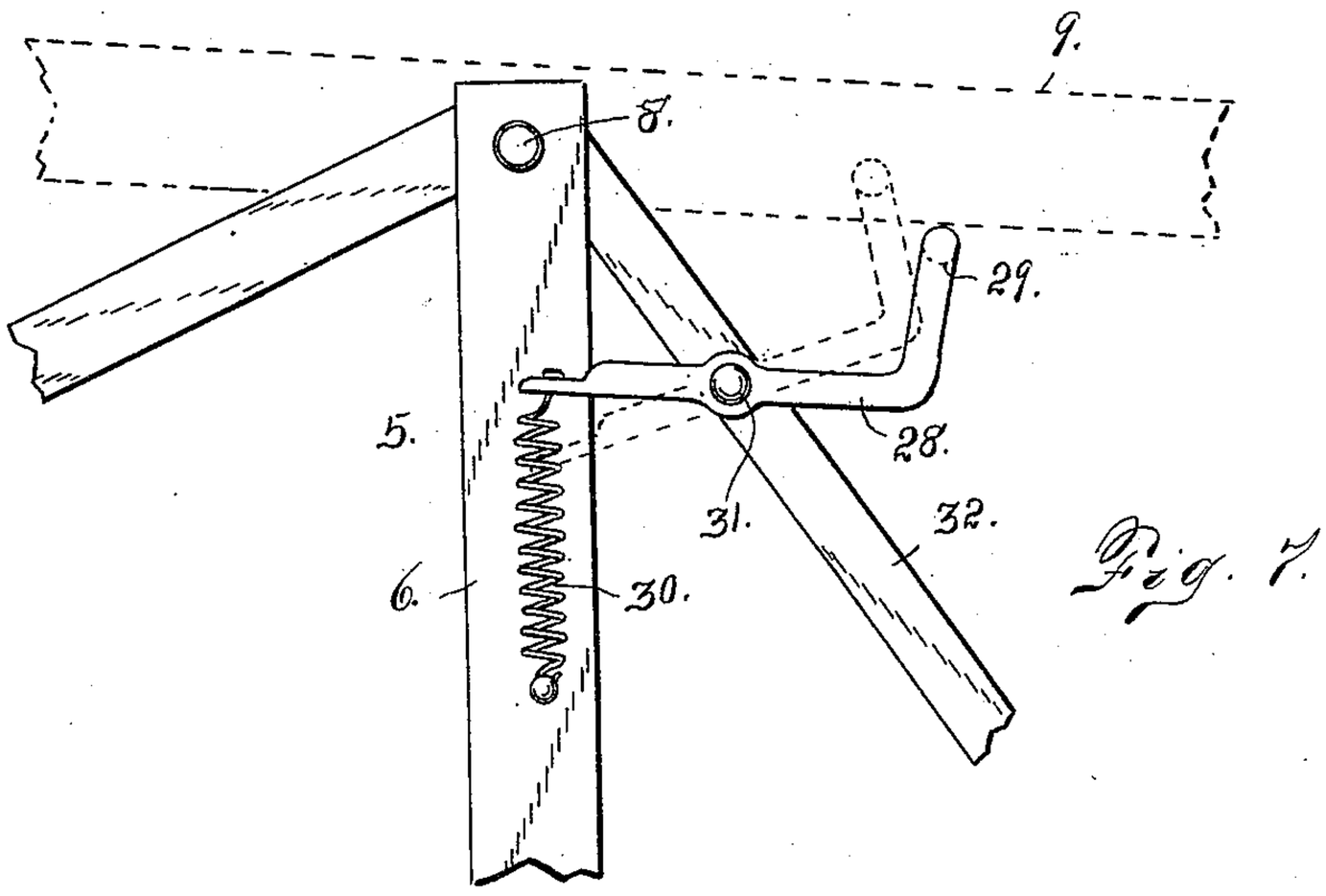

Fig. 7.

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5 SHEETS—SHEET 5.

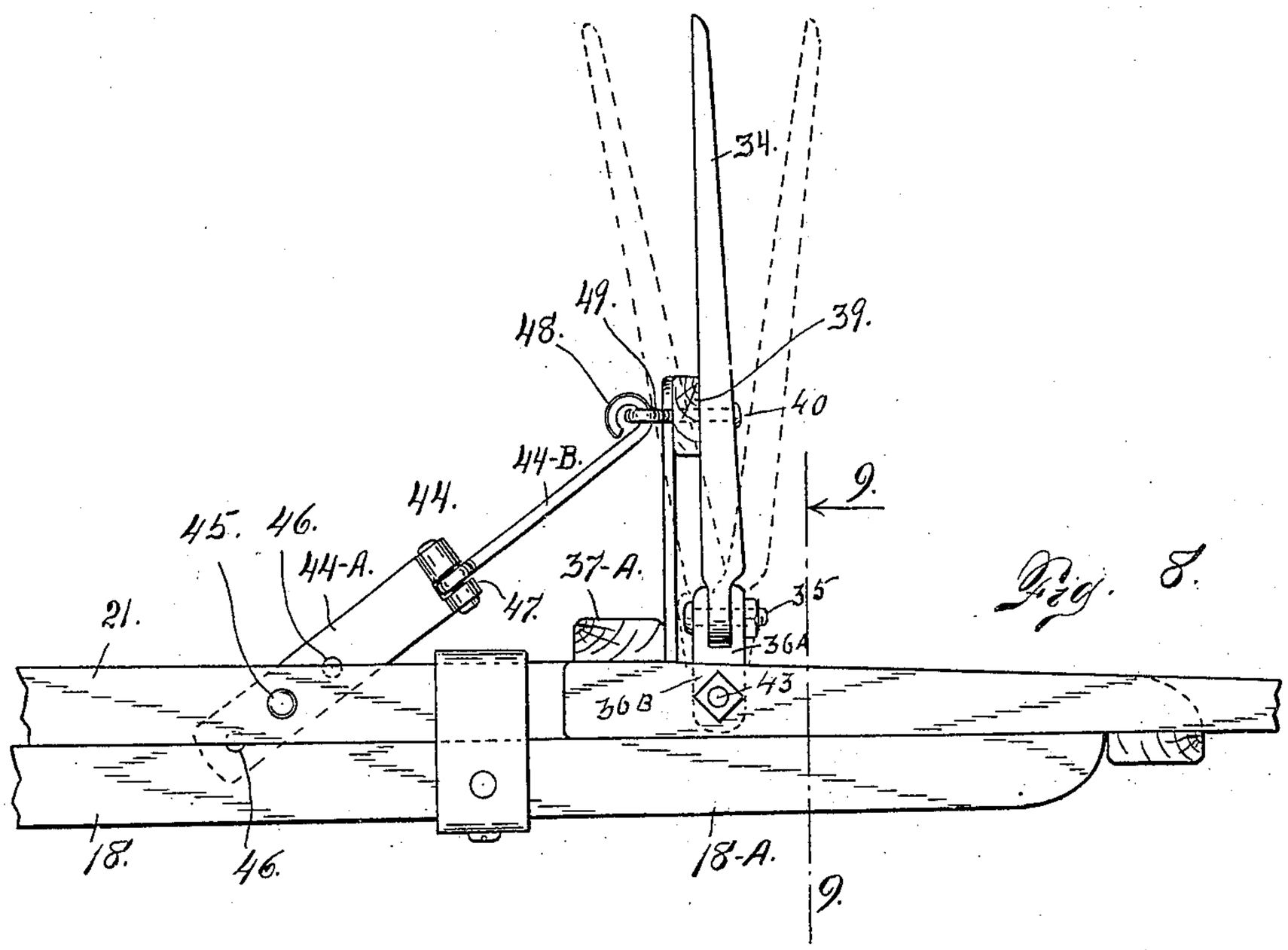

Fig. 8.

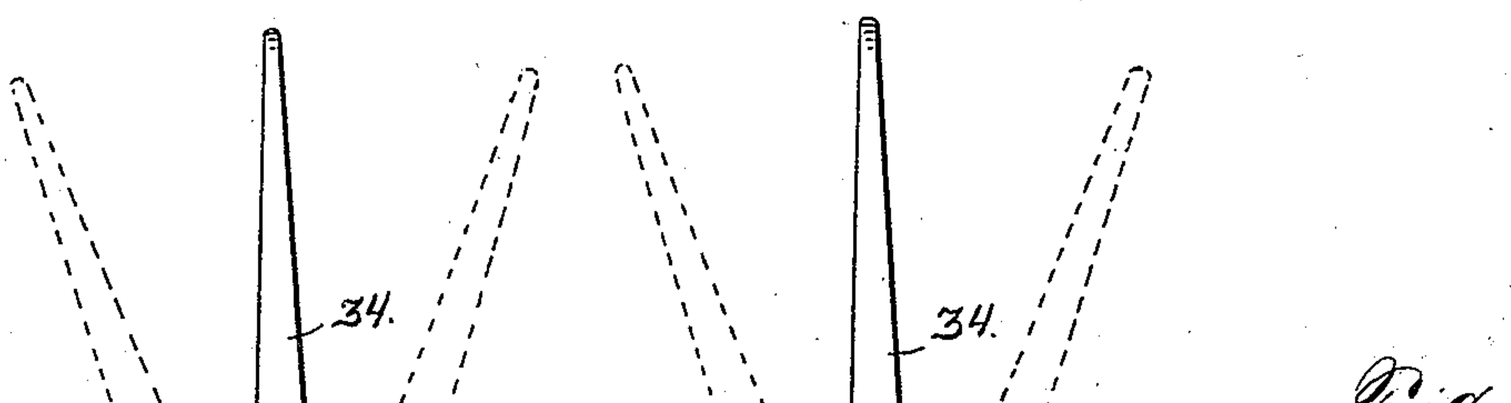

Fig. 9.

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UNITED STATES PATENT OFFICE.

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HAY-STACKER.

No. 841,376. Specification of Letters Patent. Patented Jan. 15, 1907.

Application filed May 1, 1906. Serial No. 314,708.

To all whom it may concern:

Be it known that I, JOSEPH H. COPE, a citizen of the United States, residing at Windsor, in the county of Weld and State of Colorado, have invented certain new and useful Improvements in Hay-Stackers; 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 letters and figures of reference marked thereon, which form a part of this specification.

My invention relates to improvements in hay-stackers; and it consists of certain novel features of construction and arrangement of parts, all of which will be fully understood by reference to the accompanying drawings, in which is illustrated an embodiment thereof.

In the drawings, Figure 1 is a rear end view of my invention with the stacker-head raised. Fig. 2 is a side elevation of the same. Fig. 3 is a top plan view of the stacker-head in the lowermost position. Fig. 4 is a side elevation of the same. Fig. 5 is a perspective view of the revolving frame. Fig. 6 is an enlarged fragmentary view of the rake-head, illustrating the adjustment of the fingers or pitcher-teeth forming a part of the rake-head. Fig. 7 is a detail view illustrating a yielding device adapted to be engaged by the revolving frame as it returns to the position corresponding with the lowermost of the stacker-head. Fig. 8 is a side elevation illustrating a modified form of construction. Fig. 9 is a view taken on the line 9 9, Fig. 8, looking in the direction of the arrow.

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

Let the numeral 5 designate the stationary frame of the stacker, provided with upright members 6, upon which is pivotally mounted the revolving frame 7, which is provided with journals or trunnions 8, engaging bearings with which the upright members 6 are provided. This revolving frame consists, as shown in the drawings, of an approximately triangular body composed of bars 9, connected at one extremity by a cross-piece 10, their opposite extremities being connected as shown at 12. The revolving frame is weighted at the extremity designated 12 in any suitable manner. To this triangular body portion is centrally attached a semicircular member 13, which is grooved to receive the hoisting-cable 14, which is connected with a cross-piece 10, as shown at 15. The semicircular member 13 is connected with a triangular body member on opposite sides by braces A, B, and C. These two members are further connected by brace-rods E, F, and F, the rod E extending from the weighted end of the body member to the central part of the semicircular member, while the rods F extend from the corners corresponding with the opposite extremities of the cross-piece 10 to the central portion of the semicircular member. The semicircular member of this revolving frame is located in a plane passed longitudinally through the central portion of the machine or midway of the stationary frame and stacker-head and forms a bearing for the hoisting-cable whereby the cable is held at all times equally distant from the axis of the revolving frame, thus maintaining a uniform leverage at the point of pull or where the draft or hoisting force is applied.

The extremity of the revolving frame which is foremost or toward the right when the machine is in its normal position, or that corresponding with the lowermost position of the stacker-head, is connected, by means of rods 16, with a cross-bar 17 of the pivoted frame. This pivoted frame is provided with side bars 18, connected in front by a cross-bar 19 and in the rear by a cross-bar 20. Slidably connected with the bars 18 on opposite sides are bars 21, which are rigidly connected with the stacker-head, as shown at 22. The bars 18 are provided with metal straps 23, forming guides for the bars 21, while the bars 21 are provided with guides 24, which engage the bars 18. As the pivoted frame is hoisted the stacker-head is gradually extended by virtue of the extension-arms 25, the construction and operation of which are set forth in my previous patent, No. 702,257, dated May 27, 1902, and therefore will not be described in detail herein.

The revolving frame is provided at its forward extremity with cranks 26, with which are connected coil-springs 27. These cranks 26 form a yielding device against which the extension-arm members 25 strike when the pivoted frame is in the upright position or just as it discharges its load upon the stack. This construction is protected by my previous patent, No. 769,590, dated September 6, 1904, though the arrangement of the yielding device is arranged slightly different from that shown herein.

Pivotally mounted on the stationary frame are lever-like devices 28, one on each side, each having an arm 29 at one extremity, while the other extremity is connected with a coil-spring 30, one extremity of the spring being fast to the adjacent upright part 6. Each device 28 is pivoted to a brace 32, as shown at 31. The device 28 forms a yielding support whereby the pivoted frame is prevented from injury or unnecessary concussion or jar as it reaches its lowermost position.

The stacker-head is provided with stacker-teeth 33 and the pitcher teeth or fingers 34. In my improved construction these pitcher-teeth are capable of lateral adjustment, as indicated by full lines in Fig. 6 and by dotted lines in Fig. 9. For this purpose they are pivotally connected, as shown at 35, with metal members 36, attached to a bar 37, to which the stacker-teeth 33 are rigidly secured. In order to hold the teeth in any desired position of lateral inclination, a link 38 is pivotally connected at its upper extremity with a strip 39, to which all of the pitcher-teeth are pivotally connected above their lower extremities at points 40. The opposite extremity of the link 38 is provided with a number of openings 41, through any one of which a pin 42 may be passed, depending upon whether it is desired to have the teeth inclined either more or less than shown by full lines in Fig. 6 or in the vertical position as shown by dotted lines in the same figure.

The object of this lateral adjustment of the pitcher-teeth is to direct the material in the one direction or the other from a straight rearward throw after the stacker-head has reached its upward limit of movement. It will be understood that these pitcher-teeth occupy a horizontal or approximately horizontal position when the stacker-head is elevated or in the position shown in Fig. 1. If the pitcher-teeth are in the position shown by dotted lines in Fig. 6, the material, as hay, will be thrown directly rearwardly upon the stack. Now when it is desired to throw it in either direction from the straight rearward throw the pitcher-teeth may be adjusted to cause them to incline in either direction, as shown by dotted lines in Fig. 9, and since the hay protrudes between the teeth 34 when the head is in this position the material in passing from the pitcher-teeth is guided in the direction toward which the teeth point.

In the form of construction shown in Figs. 8 and 9 provision is made for the forward and backward adjustment of the pitcher-teeth when the latter are arranged for the lateral adjustment just explained. This construction and arrangement require some modifications which will now be explained. In this construction the bars 18 project forwardly, as shown at 18^A, and thus give additional strength to the apparatus. In this case the bar which corresponds with the bar 37 in the other form of construction is placed above the stacker-teeth and is designated 37^A in Fig. 8, and the metal parts corresponding with the parts 36 in the other form of construction are designated 36^A, and their lower extremities 36^B are pivotally connected with the stacker-teeth by means of bolts 43, which pass through the stacker-teeth and also through the bars 21, where they project forwardly and occupy positions parallel and in the same plane with the stacker-teeth.

It will be observed that the plane of the part 36^B of each metal member 36^A extends at right angles to the plane of its upper portion. In other words, the upper and lower portions of these metal members are flattened to occupy planes at right angles to each other. In this case the adjusting-link 38 and its connections are substantially the same as shown in Fig. 6. Now in order to permit the forward and rearward adjustment of the teeth on the bolts 43 I employ a jointed link 44, composed of members 44^A and 44^B. The member 44^A is connected with the bar 21 by means of a pin 45, adapted to pass through any one of a number of openings 46. The member 44^B is jointed to the member 44^A, as shown at 47, in such a manner as to permit a lateral swing, its opposite extremity being formed into an eye 48, passing through a staple 49, attached to the strip 39. By virtue of this construction the pitcher-teeth are allowed to swing laterally, as indicated in Fig. 9, and are capable of forward and rearward adjustment, as indicated in Fig. 8. The jointed extremities of the member 44^B of the link 44 are sufficiently loose to compensate for the difference in distance between the upper extremity of the link member 44^A and the point of the strip 39, where the staple 49 is attached, incident to the lateral swing of the strip 39, when the pitcher-teeth are inclined in either direction, the latter being accomplished by passing the pin 45 through a different opening 46, the link being adjusted to bring this opening into register with the opening in the bar 21.

From the foregoing description the use and operation of my improved construction will be readily understood.

Assuming that the parts of the apparatus are in the position shown in Fig. 3 and that the load of material is placed upon the stacker-head, power is applied to the cable 14 in the direction indicated by the arrow in Fig. 1, and as the cable is moved outwardly in the said direction it is guided by a pulley 45 and an orifice 47, formed in a bottom bar 48 of the stationary frame. As the cable is moved as stated, it engages the grooved semicircular member 13 of the revolving frame and is thereby held at all points equally distant from the axis of revolution,

thus permitting the power to be applied with a constant leverage, since the point of its application is at all times equally distant from the center of motion. When the stacker-head reaches its upward limit of movement, as shown in Fig. 1, the extension-links 25 engage yielding cranks 26 and relieve the structure from the concussion or jar incident to a sudden stop. As the pivoted structure reaches its upward limit of movement the material upon the stacker-head is thrown upon a stack (not shown) either directly in the rear of the machine or laterally in either direction from the straight rearward throw, according to the position of the pitcher-teeth, as heretofore explained.

After the material has been discharged from the stacker-head the recoil of the pivoted frame incident to the action of the yielding cranks 26 has a tendency to cause the pivoted frame to move in the opposite direction, or downwardly, and as the pull upon the cable is released the pivoted structure together with the revolving frame return to their normal position, the revolving frame engaging the yielding lever-like devices 28 and preventing the stacker-head and its connections from striking the ground or the stationary frame with sufficient force to injure the structure.

The weighted extremity 17 of the revolving frame is located at the rear extremity of the device when the stacker-head is in the lowermost position, as shown in Fig. 4, and at the opposite or forward extremity when the stacker-head is in the elevated position, as shown in Fig. 2. By virtue of this arrangement the weight acts to aid in starting the upward movement of the stacker-head and also aids in continuing this movement until the stacker-head has been considerably elevated or to an angle of about forty-five degrees. After the stacker-head has reached this position the upward movement is comparatively easy. Furthermore, the weighted end of the revolving frame serves to start the stacker-head on its downward movement after it has reached the elevated position shown in Fig. 2, and after the stacker-head and pivoted frame have moved downwardly some distance the weighted end of the revolving frame serves to retard the downward movement of the stacker-head and prevent it from moving too rapidly.

Having thus described my invention, what I claim is—

1. In a stacker, the combination with a stationary frame, and a stacker-head frame pivoted directly to the stationary frame, a revolving frame connected in operative relation with the stacker-head frame and having a centrally-located arc-shaped grooved member forming a bearing for the hoisting-cable during the operation of the machine, the curve of the arc-shaped member being struck from the center of motion of the revolving frame.

2. In a stacker, the combination with a stationary frame, and a stacker-head frame pivoted directly thereto, of a frame mounted to revolve on the stationary frame and connected in operative relation with the stacker-head frame, the revolving frame having a curved member forming a bearing for the hoisting-cable, the curve of the said member lying in the arc of a circle struck from the center of motion of the revolving frame.

3. The combination with a stationary frame, a stacker-head frame pivoted directly to the stationary frame, a frame mounted to revolve on the stationary frame and connected in operative relation with the stacker-head frame, the revolving frame being composed of a body member and a member curved to conform to an arc struck from its center of motion and forming a bearing for the hoisting-cable, the curved member and the body member being connected and firmly braced, substantially as described.

4. In a stacker, the combination with a stationary frame, of a frame provided with a stacker-head and pivotally connected with the stationary frame, a frame mounted to revolve on the stationary frame and connected to operate the pivoted frame, the revolving frame having an arc-shaped member, and a hoisting rope or cable connected with the revolving frame and engaging the arc-shaped member thereof, the curve of the arc-shaped member being struck from the center of motion of the revolving frame.

5. In a stacker, the combination with a stationary frame, of a stacker-head frame pivotally connected with the stationary frame, a third frame mounted to revolve on the stationary frame and connected in operative relation with the stacker-head frame, and yielding means mounted on the stationary frame and adapted to engage the revolving frame as the latter approaches the position corresponding with the lowermost position of the stacker-head frame, for the purpose set forth.

6. A stacker-head provided with pitcher teeth or fingers, means for inclining the same laterally in either direction from a central position, and means for adjusting the same to cause them to incline either forwardly or rearwardly from a vertical position.

7. In a stacker, the combination with a stationary frame, of a frame carrying a stacker-head, said stacker-head-carrying frame being pivoted directly to the stationary frame of a revolving frame connected with the pivoted frame and having an arc-shaped member, whose curve is struck from the center of motion of the revolving frame a hoisting-cable connected with the pivoted frame and bearing upon the arc-shaped member thereof, one extremity of the pivot-

ed frame being weighted for the purpose set forth.

8. In a stacker, the combination with a stationary frame, and a stacker-head frame pivoted directly to the stationary frame, of a revolving frame connected in operative relation with the stacker-head frame and having a centrally-located arc-shaped member forming a bearing for the hoisting-cable during the operation of the machine.

9. In a stacker, the combination with a stationary frame, and a stacker-head frame pivoted directly thereto, of a frame mounted to revolve on the stationary frame and connected in operative relation with the stacker-head frame, the revolving frame having a curved member forming a bearing for the hoisting-cable.

10. The combination with a stationary frame, and a stacker-head frame pivoted directly to the stationary frame, of a frame mounted to revolve on the stationary frame and connected in operative relation with the stacker-head frame, the revolving frame being composed of a body member, and a centrally-located arc-shaped member forming a bearing for the hoisting-cable during the operation of the machine.

11. In a stacker, the combination with a stationary frame, and a stacker-head frame pivoted directly to the stationary frame, of a frame mounted to revolve on the stationary frame and connected with the stacker-head frame forward of the axes of both frames, the revolving frame being centrally located and having an arc-shaped member forming a bearing for the hoisting-cable during the operation of the machine.

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

JOSEPH H. COPE.

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