No. 849,403. PATENTED APR. 9, 1907.

A. V. KISER.

CRANE.

APPLICATION FILED MAR. 12, 1906.

3 SHEETS—SHEET 1.

Fig. 1.

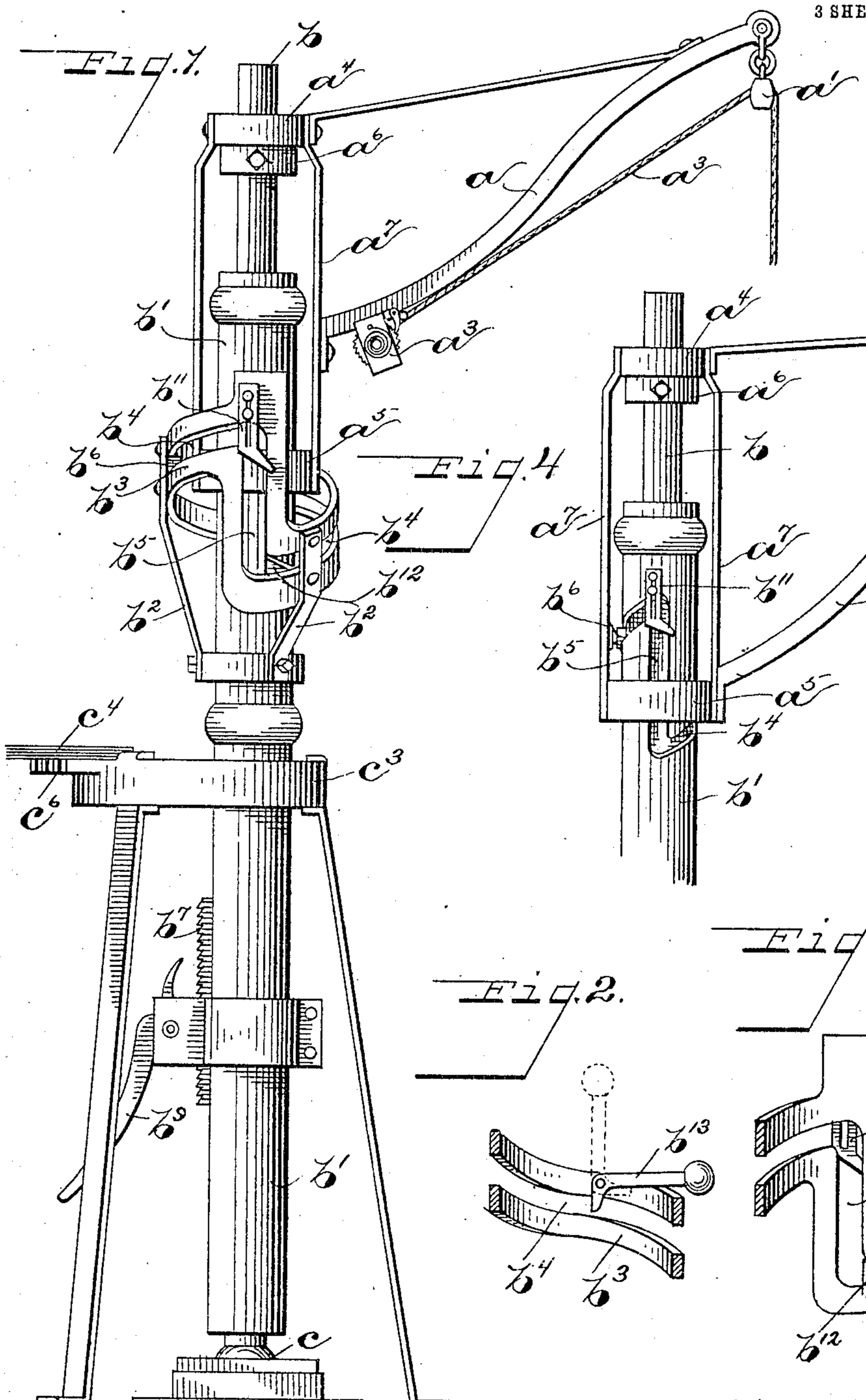
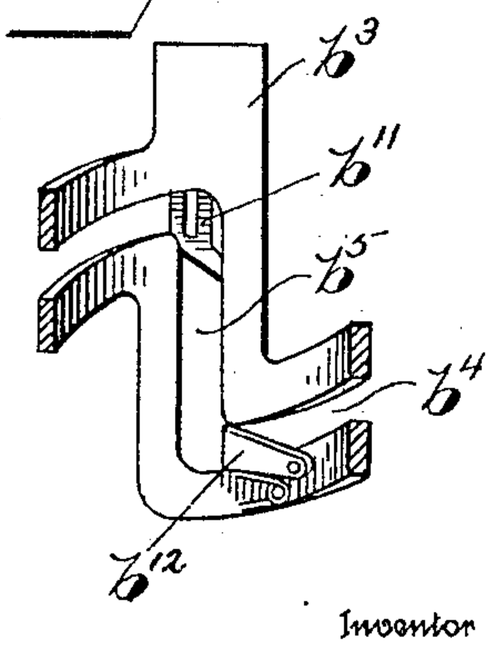


Fig. 4

Fig. 2.

Fig 3



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3 SHEETS—SHEET 2.

Fig. 5

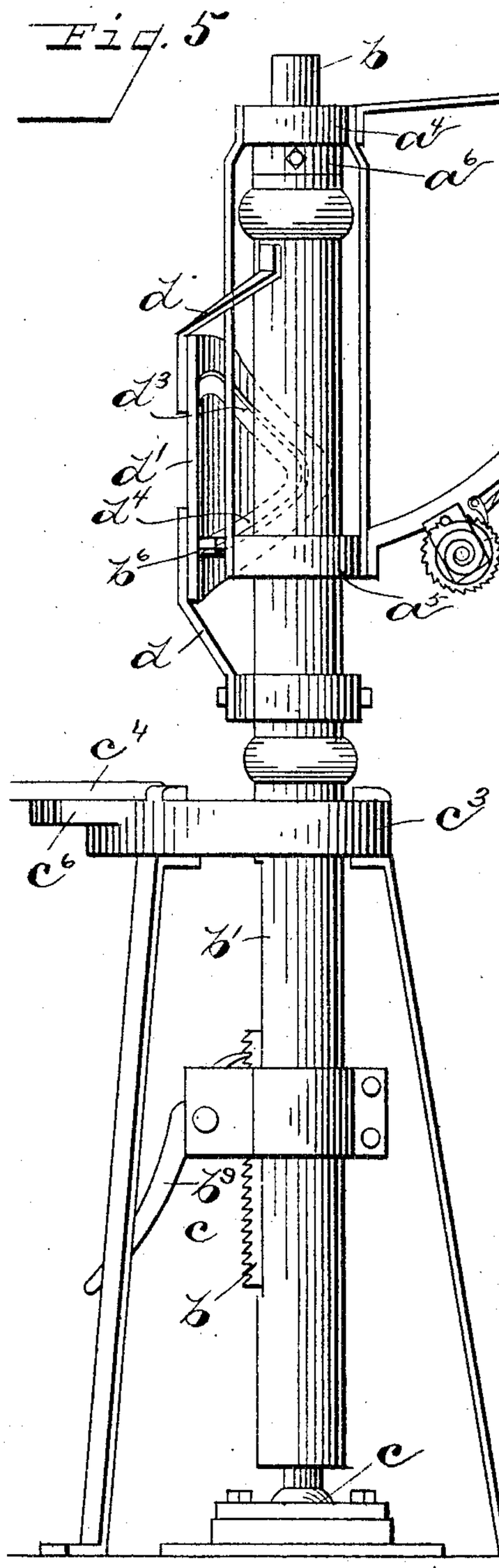
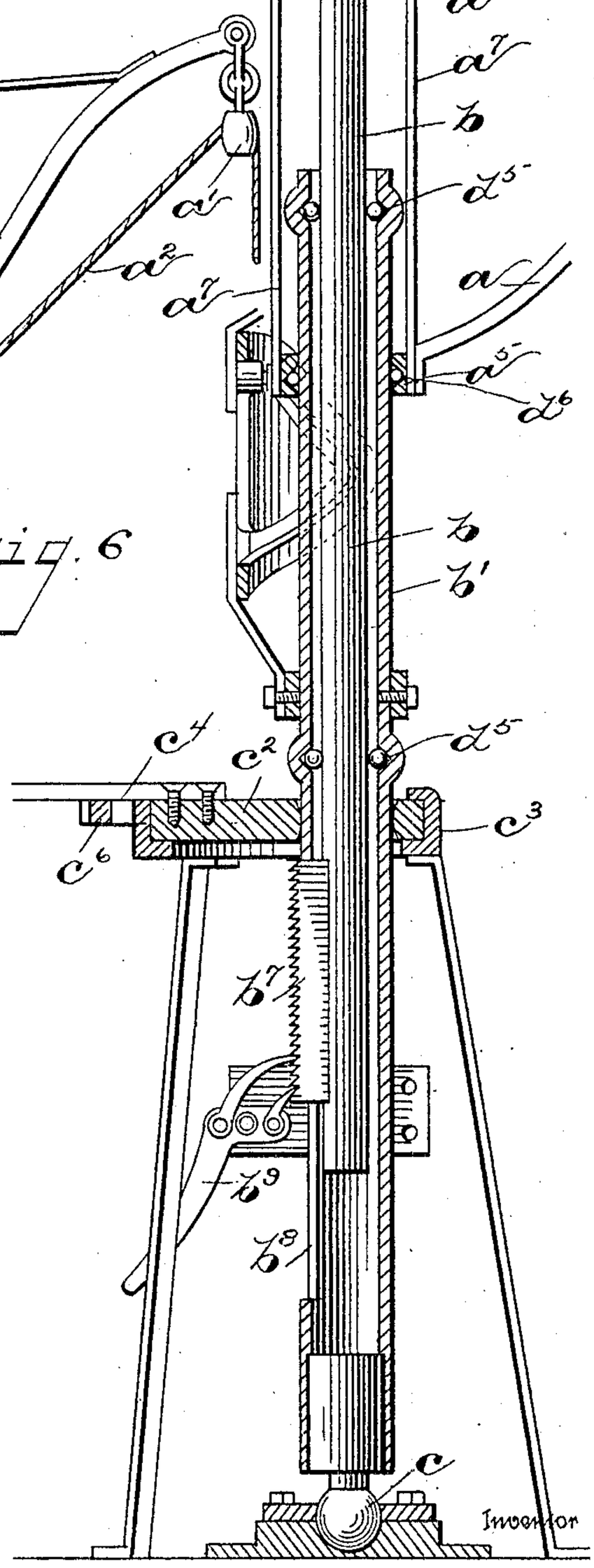


Fig. 6



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3 SHEETS—SHEET 3.

Fig. 7.

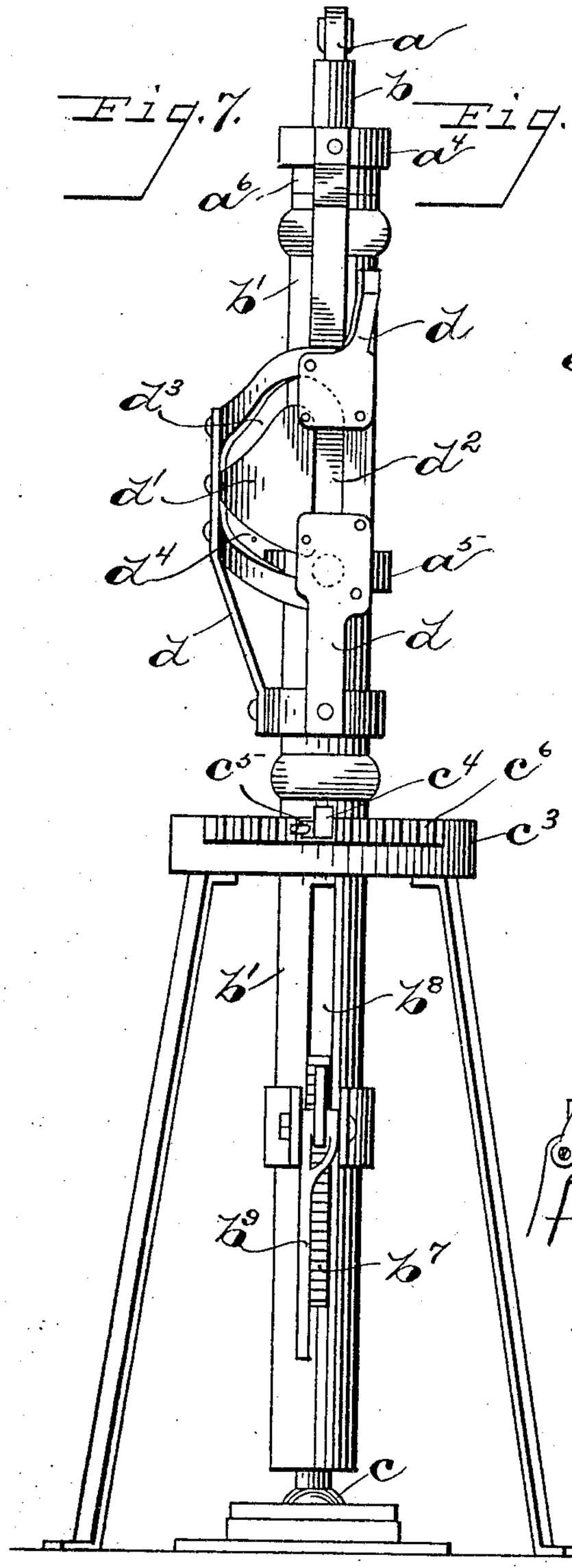

Fig. 9.

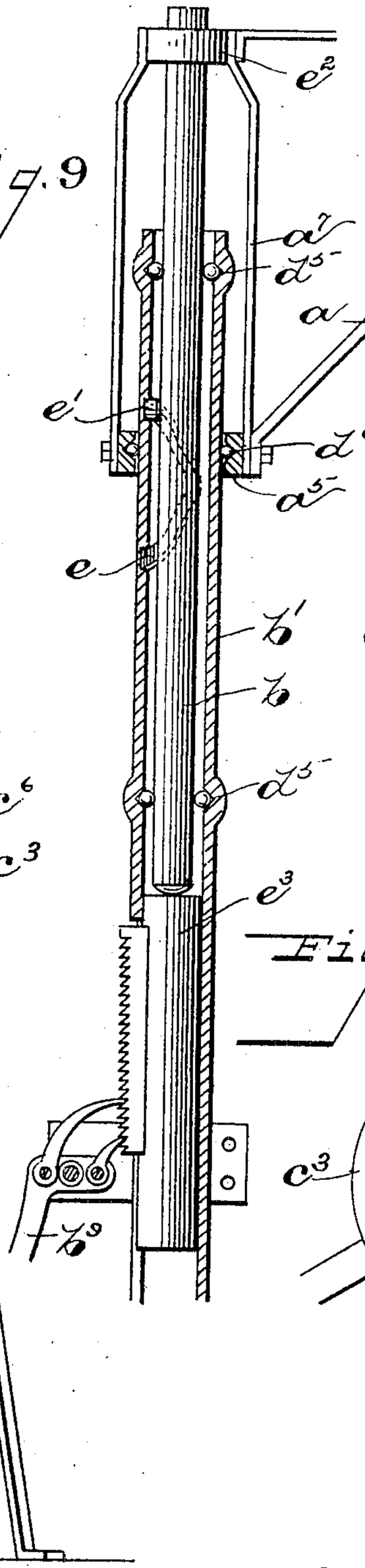

Fig. 10

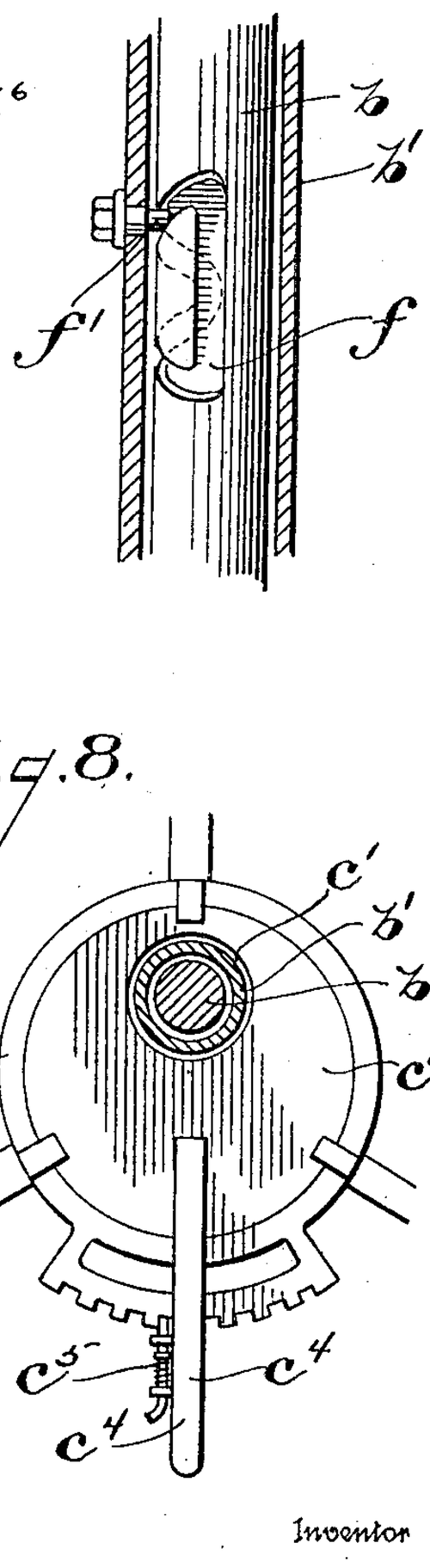

Fig. 8.

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UNITED STATES PATENT OFFICE.

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CRANE.

No. 849,403. Specification of Letters Patent. Patented April 9, 1907.

Application filed March 12, 1906. Serial No. 305,528.

To all whom it may concern:

Be it known that I, ALVIE V. KISER, a citizen of the United States, residing at Marion, in the county of Marion and State of Ohio, have invented certain new and useful Improvements in Cranes, of which the following is a specification.

My invention relates to cranes, and is particularly adapted for use with the shocking mechanism of corn-harvesters for the purpose of lifting the shock off the platform and setting it to one side the path of the machine. It is, however, adapted to other uses.

The object of the invention is to provide a simple, cheap, and efficient structure in which the crane-arm will swing to one side and then automatically return to its original position.

A further object is to provide means for varying the relation of the axis of the crane-arm with the machine or structure upon which it is mounted to compensate for any variation of the machine from the vertical incident to its use upon hilly or uneven ground.

With the above primary and other incidental objects in view, as will appear from the specification, the invention consists of the construction, parts, and combination thereof or their equivalents and the mode of operation hereinafter described, and set forth in the claims.

In the drawings, Figure 1 is an elevation showing the invention, wherein the crane-arm is adapted to make a complete revolution in returning to its original position independent of the vertical shaft by which said crane-arm is elevated. Figs. 2 and 3 are detail views relating to parts set forth in Fig. 1. Fig. 4 is a modified construction operating similar to that shown in Fig. 1. Fig. 5 is an elevation of a modified structure in which the crane-arm will swing to one side and then automatically swing back in a reverse direction. Fig. 6 is a vertical sectional view of the structure shown in Fig. 5 with the crane-arm in its elevated position. Fig. 7 is a view of the same structure at right angles to the view shown in Fig. 5. Fig. 8 is a detail view showing means for varying the axis of the swinging arm. Figs. 9 and 10 are modifications of the structure shown in Figs. 5, 6, and 7.

Like parts are indicated by similar characters of reference throughout the several views.

Referring by letter to the drawings, *a* represents the crane-arm, carrying at its outer extremity a pulley a', over which runs the cable a^2, secured to the shock-lifting mechanism. The other end of the cable a^2 is connected to a reel a^3, which in the drawings is shown to be spring-actuated and provided with a retaining-pawl, whereby upon the disengagement of the shock-lifting mechanism and the tripping of said retaining-pawl the lifting mechanism will be automatically pulled from the shock. The actuating-spring is rewound by pulling down the cable a^2. The crane-arm *a* is connected to a sleeve formed by a collar a^4 and a collar a^5, connected by vertical bars a^7. The collar a^4 is loosely journaled upon a shaft *b*. The collar a^5 is loosely mounted upon a hollow post b', within which the shaft *b* is longitudinally movable. Immediately below the collar a^4, on the shaft *b*, is secured a collar a^6, upon which the said sleeve rests. Surrounding the hollow post b' and secured thereto by suitable brackets b^2 is a member b^3, having thereon a spiral guideway or slot b^4, the extremities of which are connected by a vertical slot b^5. Projecting from the sleeve of the crane-arm is a roller b^6, engaging with said slot. Adjacent to the lower end of the shaft *b* there is provided a rack-bar b^7, which projects through a slot b^8 in the hollow post b'. The rack-bar b^7 is engaged by lifting and holding pawls upon an operating-lever b^9, pivotally mounted in a suitable collar on the hollow post b'.

It will be apparent upon reference to the drawings that upon the operation of the lever b^9 the shaft *b* will be elevated within the hollow post. Through the medium of the collar a^6, secured upon said shaft, the crane-arm *a* will be elevated, the roller b^6 traveling through the vertical slot b^5 of the member b^3. At the upper extremity of the slot b^5 the roller b^6 engages and lifts a pawl b^{11}, which immediately drops behind said roller and prevents the roller returning to its original position by way of the slot b^5. When the roller b^6 has reached the limit of its upward movement, the holding-pawl of the operating-lever b^9 is tripped and the shaft *b* is permitted to drop to its original position. The crane-arm *a* being in an elevated position will also tend to descend to its original position; but through the engagement of the roller b^6 with the spiral slot b^4 the crane-arm during its descending movement will be given a complete revolution and will return to its original position with the roller b^6 at the lower extremity of the slot b^5 preparatory to the next operation. Adja-

cent to the lower extremity of said slot b^5 there is provided a spring-pressed pawl b^{12}, which will be depressed by the roller b^6 in passing and by its spring will be immediately raised behind said roller to prevent a rebounding of the crane-arm as it comes to rest. The spring-pressed pawl b^{12} is best shown in detail view, Fig. 3.

In Fig. 2 is shown a weighted detent b^{13}, adapted to stop the movement of the crane-arm when it has completed a half-revolution in order that the shock of corn carried thereby may be deposited on the ground, after which the arm b^{13} is raised by hand to the position shown in dotted lines, which will then permit the roller b^6 to pass the said obstruction and the crane-arm a to complete its revolution. In Fig. 4 there is shown a modification of this construction which operates exactly as the construction shown in Fig. 1 and differs from said structure only in that the member b^3 is omitted and the spiral guideway b^4 and the vertical guideway or slot b^5 are formed in the hollow post b', the roller b^6, engaging therewith, being placed on the inner side of the connecting-bars a^7. The post b' is connected to the harvesting-machine or other supporting structure by a ball-and-socket joint c. The post b' extends through an eccentric opening c' in a revoluble disk c^2, mounted in a suitable frame c^3. The disk c^2 is provided with an operating-lever c^4, having therein a spring-detent c^5, engaging a notched segment c^6 on the frame c^3. By moving the operating-lever c^4 to the right or left the hollow post b' and parts carried thereby may be moved from the vertical or may be adjusted to maintain said post perpendicular when the machine is used on hilly or uneven ground.

In Figs. 5, 6, and 7 there is shown a structure in which the crane-arm will swing to a predetermined distance in one direction and then in the reverse direction to a certain point. This is accomplished by securing upon the post b' by suitable brackets d a member d', having therein a triangular guideway consisting of a vertical slot or guideway d^2, a downward-inclined slot d^3, extending from the upper end of said vertical slot d^2, and an upward-inclined slot d^4, extending from the lower extremity of the vertical slot d^2 and connecting with the guide-slot d^3. In the manner similar to that in the structure before described the shaft b is elevated by the operation of the operating-lever b^9, during which operation the roller b^6 travels through the vertical guide-slot d^2. Upon the tripping of the holding-pawls the shaft b' will drop to its original position and the roller b^6, descending through the guide-slot d^3 and then returning through the guide-slot d^4 to its original position, will cause the crane-arm to turn through a downward revolution in one direction and then swing in the opposite direction to a certain point. In order that the shaft b may be longitudinally moved within the hollow post b', there are preferably provided ball-bearings, as shown at d^5. Ball-bearings are also provided within the collar a^5, as shown at d^6.

In Fig. 9 there is shown a modification of the structure shown in Figs. 5, 6, and 7 wherein the triangular guide-slot is formed in the interior of the hollow post b', as shown at e. A roller e' is secured to the shaft b and engages the guideway e. The sleeve of the crane-arm is positively connected, through the collar e^2, to the shaft b. In this figure the rack-bar b^7 is shown as projecting from a part e^3, independent of the shaft b and upon which the shaft b rests. Fig. 9 shows the various parts in their elevated position. The structure is such that upon the withdrawal of the pawls from the rack-bar b^7 the member e^3 will drop to its original position. The shaft b during its descending movement through the engagement of the roller e' with the guideway e will be caused to revolve a partial revolution in one direction and then a similar movement in the opposite direction. The crane-arm a being positively connected with the shaft b through the integral collar e^2 will be given a corresponding movement.

In Fig. 10 there is shown a construction which is the reverse of that shown in Fig. 9. In this construction the triangular guideway f is formed in the shaft b, and a projection f' on the interior of the hollow post b' engages said guideway f and causes a movement similar to that described in connection with Fig. 9, the balance of the structure being similar to that illustrated in said Fig. 9. The operation of all the parts in this embodiment is the same as in Fig. 9, except that the projection f' normally rests at the top instead of at the bottom of the vertical portion of the guideway f.

In all the embodiments of the invention herein described there is provided a supporting post or member, and a crane-arm, one of which carries a guideway and the other of which carries means moving in said guideway to cause the crane-arm to automatically swing away from a certain radial position and to automatically return to the same radial position.

By the variation of the post b' from perpendicular through adjustment of the disk c^2 the crane-arm a will have a tendency to move laterally through force of gravity, and by manipulating the disk c^2 in such manner that the inclination of the post will be in the direction of the crane-arm the said arm may be caused to move laterally and return to normal position without the use of guides, as hereinbefore described.

Having thus described my invention, I claim—

1. In a structure as described, the combination of a crane-arm capable of both verti-

cal and revoluble movement, means for elevating said crane-arm perpendicularly, a guideway with which said crane-arm engages, a portion of said guideway being vertically disposed, and a portion of said guideway being inclined and connecting the opposite ends of said vertical portion, whereby said crane-arm will be returned to its original position through gravity, substantially as specified.

2. The combination with a swinging crane-arm, capable of vertical and revoluble movement, of means for elevating said crane-arm perpendicularly and means for moving said crane-arm radially about its axis, while it descends through gravity to its original position.

3. The combination with a swinging crane-arm, of means for elevating said crane-arm while maintaining same in a given radial position and means for automatically causing said crane-arm to swing from said certain radial position and to automatically return to the same radial position while descending.

4. The combination with a swinging crane-arm and a supporting-post, of a trackway on one of said parts, and means on the other part for causing the crane-arm to maintain a given radial position while ascending to automatically swing from said radial position and to automatically return to said position while descending, substantially as specified.

5. The combination with a swinging crane-arm and a supporting-post; of a trackway on one of said parts having a vertical section, a section leading downwardly and outwardly from the upper end of the vertical section, and a section leading upwardly and outwardly from the lower end of the vertical section and connected to the outer end of the other section; and means on the other of said parts for travel on the trackway and means for elevating said crane-arm while in engagement with said vertical section, substantially as specified.

6. The combination with a swinging crane-arm and a supporting-post, of a trackway on one of said parts having a vertical section, a section leading downwardly and outwardly from the upper end of the vertical section, and a section leading upwardly and outwardly from the lower end of the vertical section and connected to the outer end of the other section; means on the other of said parts for travel on the trackway; and means for elevating the crane-arm while in engagement with the vertical section of said trackway, substantially as specified.

7. The combination of a hollow post, a post movable vertically in said hollow post, a crane-arm movable vertically with the post, a trackway carried by one of said parts, and having a vertical section, a section leading downwardly and outwardly from the upper end of the vertical section, and a section leading upwardly and outwardly from the lower end of the vertical section and connected to the outer end of the other section, and a projection carried by another of said parts and movable on the vertical section of the trackway.

8. The combination of a hollow post, a post movable vertically in said hollow post, a crane-arm movable vertically with the post, a trackway carried by one of said parts, and having a vertical section, a section leading downwardly and outwardly from the upper end of the vertical section, and a section leading upwardly and outwardly from the lower end of the vertical section and connected to the outer end of the other section, a projection carried by another of said parts and movable on the vertical section of the trackway, and means for elevating the inner post to elevate the crane-arm.

9. The combination with the hollow post, of a post movable vertically within the hollow post, a crane-arm moved upwardly by the inner post, means for elevating the inner post to elevate the crane-arm, and means causing the crane-arm to automatically swing to one side from the elevated radial position and to automatically return to the same radial position in a lower plane.

10. The combination with a swinging crane-arm, means for elevating said crane-arm while maintaining same in a given radial position, means for automatically causing said crane-arm to swing from said certain radial position and to automatically return to the same radial position while descending, and means to arrest the said crane-arm at a given point in its descending movement, substantially as specified.

11. In a structure as described, a crane-post having universal connections with its supporting-base, a rotary disk located intermediate said supporting-base and the free end of said post, and having an eccentric opening through which said post extends, and means for adjusting said disk and maintaining it in its adjusted position, substantially as specified.

12. In a structure as described, a supporting-post, a crane-arm, means for causing said arm to swing laterally and return to normal position, a cable carried by said crane-arm, a spring-actuated reel for said cable, a detent for holding said reel when the actuating-spring is under tension, substantially as specified.

13. In a structure as described, a supporting-post, a crane-arm, means for causing said arm to swing laterally and return to normal position, a cable carried by said crane-arm, a spring-actuated reel for said cable, the actuating-spring of which is placed under tension by the unwinding of the cable, substantially as specified.

14. In a structure as described, a support-

ing-post, a universal connection for said post with a stationary supporting-base, a crane-arm free to swing about said post as a center, means for varying the inclination of said post from the vertical whereby said arm will be given a tendency to move through force of gravity, substantially as specified.

15. In a structure as described, a supporting-post, capable of being inclined in any direction, a crane-arm pivoted on said post, a member having an opening eccentrically located therein, through which said post extends, means to oscillate said member whereby the inclination of the post will be varied, substantially as specified.

In testimony whereof I have hereunto set my hand this 8th day of March, A. D. 1906.

ALVIE V. KISER.

Witnesses:
S. E. ZERKLE,
ERNEST THOMPSON.