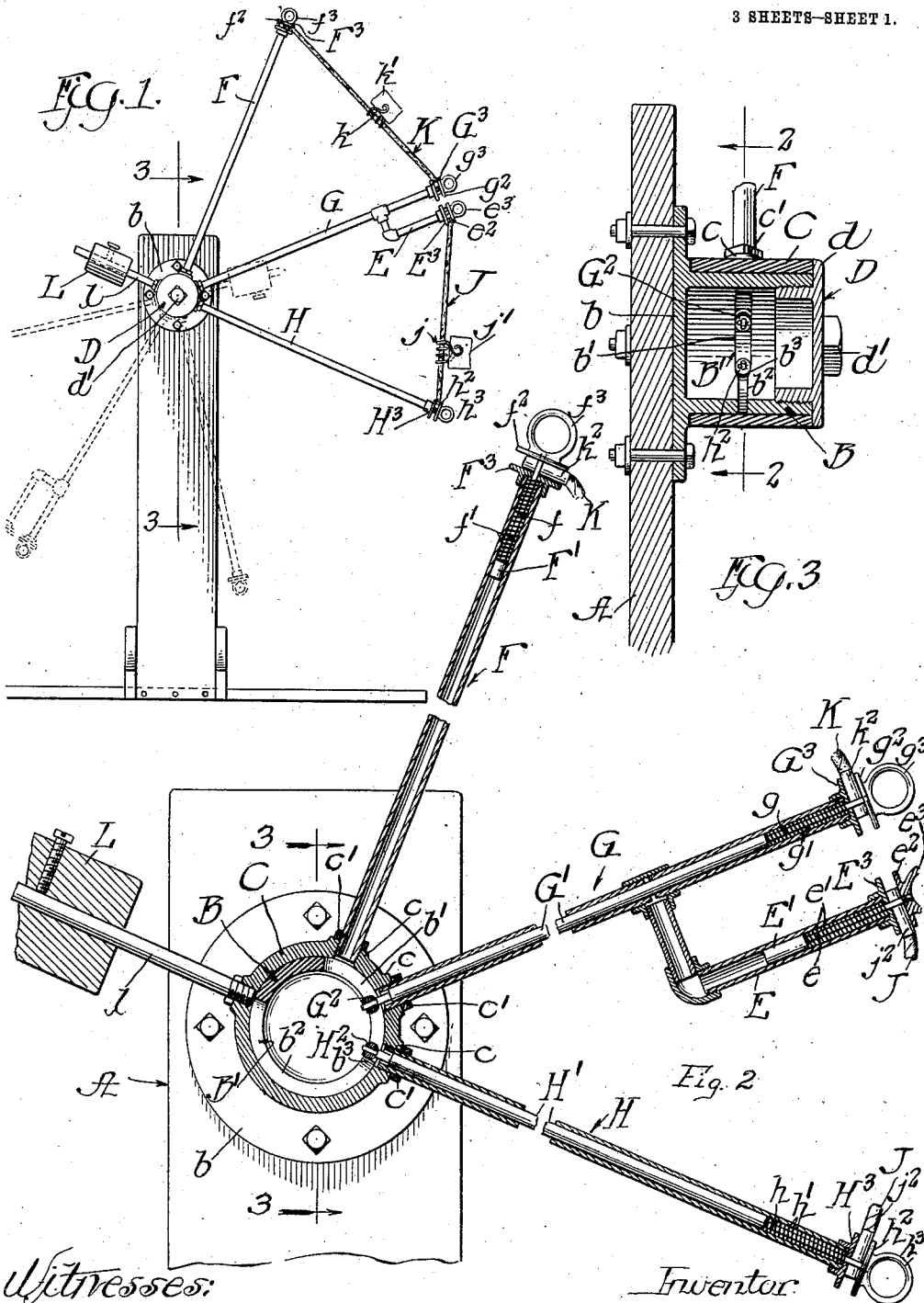


F. HACHMANN.
 TRAIN ORDER CRANE.
 APPLICATION FILED APR. 8, 1910.

985,163.

Patented Feb. 28, 1911.

3 SHEETS-SHEET 1.



Witnesses:
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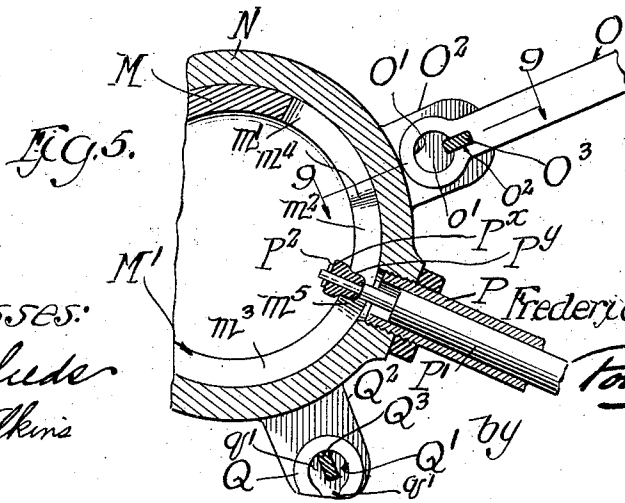
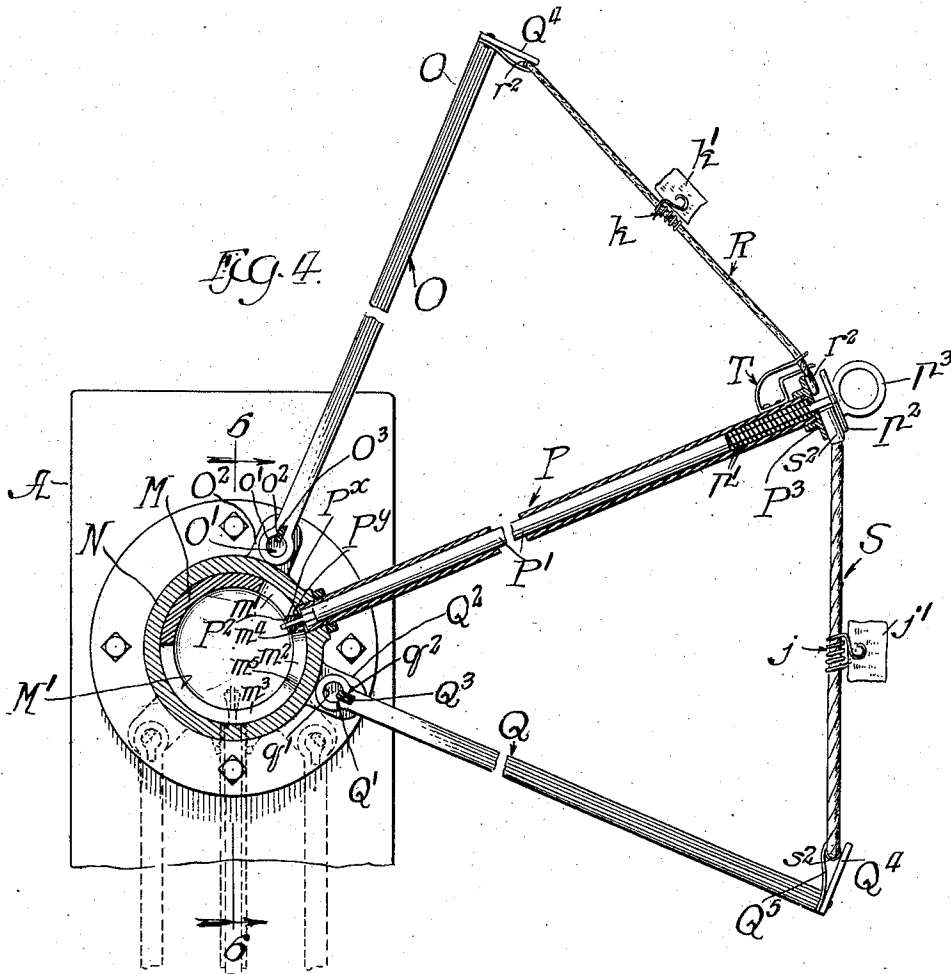
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3 SHEETS—SHEET 2.



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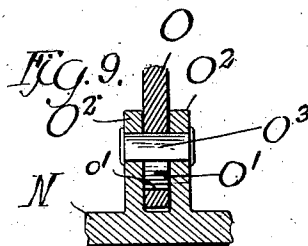
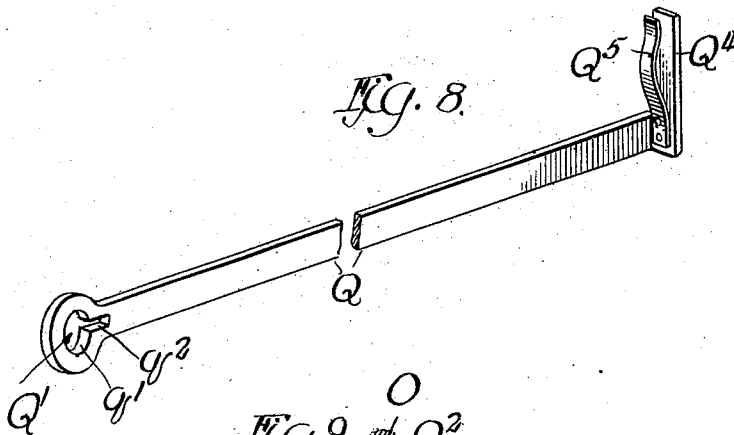
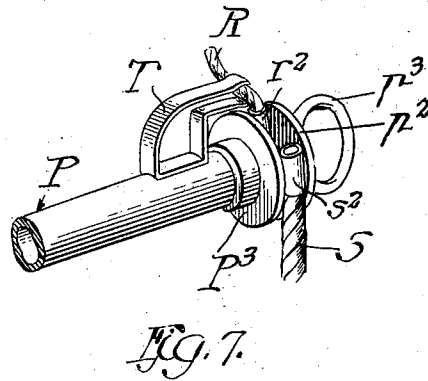
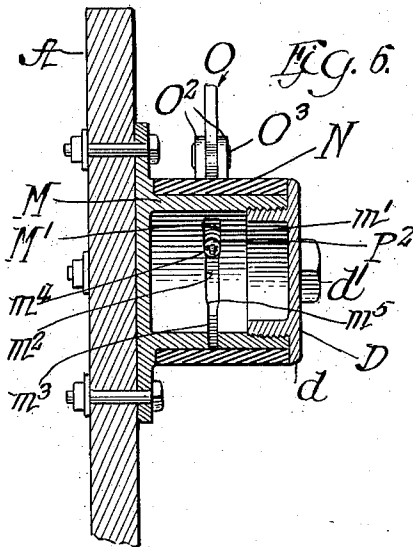
Atty

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3 SHEETS—SHEET 3.



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UNITED STATES PATENT OFFICE.

FREDERICK HACHMANN, OF CHICAGO, ILLINOIS, ASSIGNOR OF ONE-FOURTH TO GEORGE N. WOODLEY, OF EVANSTON, ILLINOIS, AND ONE-HALF TO ELNATHAN C. COOK AND ONE-EIGHTH TO THOS. GHON RIX, OF CHICAGO, ILLINOIS.

TRAIN-ORDER CRANE.

985,163.

Specification of Letters Patent.

Patented Feb. 28, 1911.

Application filed April 6, 1910. Serial No. 553,311.

To all whom it may concern:

Be it known that I, FREDERICK HACHMANN, a citizen of the United States, and a resident of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Train-Order Cranes; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to improvements in train order cranes and consists in the matters hereinafter described and more particularly pointed out in the appended claims.

My improved train order crane belongs to that kind of apparatus which is intended to deliver train orders to rapidly moving trains, one to the engineer and one to the conductor of the train. It embraces a post or standard which is located to one side of the track over which the train passes; a trunnion secured to the upper end of said post or standard at about the level of the usual engine cab; a hub mounted on said trunnion and adapted to rotate in a plane extending transverse of the track; arms carried by said hub between the outer ends of which the train order carriers in the form of the usual ropes or other similar devices are removably supported; and mechanism intermediate the hub and the trunnion which locks said hub first in one position to deliver the engineer's order and then in a second position to deliver the conductor's order, which locking mechanism is released by the removal of the carriers.

In the drawings:—Figure 1 is a vertical elevation of my improved train order crane. Fig. 2 is a section of the same on an enlarged scale taken through the longitudinal axes of the crane arms. Fig. 3 is a vertical section through Fig. 2 on the line 3—3 of Fig. 2. Fig. 4 is a section similar to Fig. 2 showing a slightly modified form of the device. Fig. 5 is a sectional view on an enlarged scale of the crane arm holder as used in the modified form of the device. Fig. 6 is a vertical section through Fig. 4 on the line 6—6 thereof. Fig. 7 is a detail perspective view of the end of the middle arm shown in Fig. 4. Fig. 8 is a perspective view of the lower arm shown in Fig. 4. Fig. 9 is a

partial section through Fig. 5 on the line 55 9—9 thereof.

In that embodiment of my invention as illustrated in Figs. 1 to 3, inclusive, A indicates a vertical post or standard which is securely anchored to the ground or to the station platform in any convenient manner adjacent the track. B is a hollow trunnion provided with a base *b* which is securely bolted to the standard. Upon said trunnion is rotatably mounted a hub C which is retained in place thereon by means of a threaded cap D having an annular shoulder *d* adapted to abut against the outer end of the hub. A squared head *d*¹ is formed on the outer surface of the cap D for convenience in removing or attaching the same by means of a wrench. F, G and H indicate radially extending arms which are rigidly secured in any convenient manner to the hub C in equal, angularly spaced relation. As illustrated herein, the hub is provided with threaded nipples *c* into which the threaded ends of said arms F, G and H are screwed. Locking nuts *c*¹ are provided for locking said arms in their respective nipples. Said arms are in the form of hollow tubes and are each provided with a spring controlled plunger which projects beyond the outer end of the tube and is there provided with a disk which is adapted to lock one end of the order carrier rope against the outer end of the tube. F¹, G¹, H¹ indicate the spring controlled plungers. The plungers H¹ and G¹ of the arms H and G project beyond the inner ends of the tubes comprising said arms and are there provided with rollers H², G² of larger diameter than the diameter of the rods themselves. In the hub B is formed an annular slot B¹ which, throughout part of its length, is of a width equal to the diameter of the rollers H², G², as indicated at *b*¹, while, for the balance of its length, it is less than this width, as indicated at *b*²,—the two parts of the slot being separated by a shoulder *b*³. Each of the arms H, G and F are provided at their outer ends with flanged caps, respectively, H³, G³, F³, through which project the reduced ends *h*, *g*, *f* of the plungers H¹, G¹, F¹. Helical springs *h*¹, *g*¹, *f*¹ bear between the caps H³, G³, F³ and the larger parts of said plungers so as to normally push said plungers longitudinally toward the center of the

hub. At the outer ends of said plungers are secured disks h^2 , g^2 , f^2 which are adapted to engage the ends of the order carriers J, K, and lock them against the caps H^3 , G^3 , F^3 , respectively. Finger rings h^3 , g^3 , f^3 are secured to the ends of said plungers for conveniently withdrawing them. An auxiliary arm E is secured to the middle arm G in the plane of the other arms and spaced from the outer end of the arm G. Said auxiliary arm E is tubular and is provided with a short spring-controlled plunger E^1 and other parts similar to those of the other arms. The order carriers consist of the usual ropes J, K provided with coiled wire or other message holders j , k . Said ropes are provided at each end with ferrules j^2 , k^2 of diameters substantially equal to the thickness of the metal of the cylindric hollow hub C. j^1 indicates the engineer's order or message and k^1 that for the conductor.

The operation of the device is as follows:—The arms normally hang downward when the apparatus is not in use in the position indicated by dotted lines in Fig. 1. When it is desired to set the apparatus for delivery of the orders or messages, the plunger F^1 is withdrawn by means of its ring f^3 and one ferrule k^2 on the end of the rope carrier K is inserted between the cap F^3 and the disk f^2 . The hub C is then rotated on its trunnion until the roller F^2 passes the shoulder b^3 of the slot in the trunnions, when the plunger G^1 may be withdrawn and the opposite ferrule h^2 of the rope carrier K inserted between the cap G^3 and the disk g^2 . The plunger E^1 of the auxiliary arm E is then withdrawn and the ferrule j^2 at one end of the rope carrier J is inserted between the cap E^3 and the disk e^2 . The hub is then rotated upon its axis until the roller H^2 passes the shoulder b^3 whereupon the plunger H^1 of the arm H may be withdrawn and the ferrule j^2 at the opposite end of said rope carrier is engaged between the cap H^3 and the disk h^2 . The parts are now in the position indicated in Fig. 1. As the rapidly moving train passes the crane, the rope J carrying the engineer's message is caught and forced from its respective arms which releases the plunger H^1 and permits the spring h^1 to move said plunger longitudinally inward, and with it the roller H^2 , inward beyond the slot B^1 . This releases the hub C and the weight of the arms causes the said hub to rotate on its trunnion until the roller G^2 strikes the shoulder b^3 in the slot. The carrier rope K is then caught and removed by means located at the rear end of the passing train and this releases the plunger G^1 whereupon the spring g^1 moves said plunger longitudinally inward and forces the roller G^2 inwardly beyond the slot B^1 whereupon the weight of the arm causes

the hub to swing to its first or initial position. A counterweight L mounted on a rod l which is secured to the hub D serves to balance the weight of the arm and thus diminish the effort necessary to raise said arms. Said counterweight, when the arms swing to their initial position, swings slightly toward the track side of the central vertical axis of the trunnion so as to hold the arms away from the track, as indicated in dotted lines.

In that modification of my invention shown in Figs. 4 to 9, inclusive, a slightly different mechanism for locking the hub to its trunnion is illustrated. In said construction instead of using two rollers which are adapted to successively lock against the same shoulder, as in the former construction, I use one roller having two parts of different diameter and provide a slot in the hub which is provided with two shoulders separating the slot into three parts of different widths:—one wide enough to permit the passage of the larger part of the roller, the next succeeding one wide enough to permit the passage of the smaller part of the roller, and the next only wide enough to permit the passage of the plunger upon which the roller is mounted. In said figures, A is the post or standard; M is the trunnion; N, the hub; O, P, Q, the arms; R, S, the carrier ropes; and r^2 , r^2 , s^2 , s^2 , the ferrules at the ends of said carrier ropes. M^1 indicates the annular slot in the hub, in this case provided with three parts m^1 , m^2 , m^3 of successively smaller widths separated by shoulders m^4 , m^5 . The middle arm P only is provided with a spring controlled plunger P^1 ; retracting spring p^1 ; cap P^3 ; disk p^2 and ring p^3 . At the inner end of the plunger C^1 is mounted a roller P^2 having parts P^x , P^y of different diameters, the innermost part P^x being adapted to fit the part m^1 of the slot and the outer part P^y being adapted to fit the part m^2 of the slot M^1 . The part m^3 of the slot is adapted to fit the reduced inner end of the plunger P^1 upon which the roller P^2 is journaled. The arms O, Q are of the same construction and are in the form of flat bars provided at their inner ends, respectively, with key-ways O^1 , Q^1 . Said key-ways are in the form of circular openings o^1 , q^1 provided on their outer sides with radially extending rectangular slots o^2 , q^2 . To the hub N are secured bifurcated ears O^2 , P^2 adapted to embrace, respectively, the inner ends of the arms O and Q and provided with keys O^3 , Q^3 which extend through the key-ways O^1 , Q^1 . To the outer ends of the arms O and Q are secured short flat bars O^4 , Q^4 which extend toward the middle arm P. Flat retaining springs O^5 , Q^5 are secured to the inner faces of said bars O^4 , Q^4 , which with said springs are adapted to engage and hold the ferrules r^2 and s^2 at the

ends of the rope carriers R and S. The rope S is of larger diameter than the rope R as are also the ferrules s^2 larger than the ferrules r^2 , the difference in diameters being about equal to the width of the outer, smaller part P^v of the roller P^2 . To the outer end of the middle arm P is secured an auxiliary spring-controlled catch T which is adapted to hold temporarily the lower end of the rope R with the ferrule r^2 thereof between the cap P^3 and the disk p^2 ready to be engaged therebetween when the larger ferrule s^2 on the lower rope S has been removed. When the arms O and Q are pushed longitudinally inward, the keys O^3 and Q^3 engage in the rectangular parts o^2 , q^2 of the key-ways so as to lock said arms to the hub N, but when withdrawn longitudinally away from the center of said hub, as occurs when said arms hang downwardly, as indicated in Fig. 4, the keys engage within the circular parts o^1 , q^1 of the key-ways and are free to swing with reference to the hub. By this construction, after the messages have been delivered and the hub has rotated to its first position, said arms hang vertically out of the way.

In order to set the modified apparatus above described for passing trains, the ferrule r^2 on the rope R is engaged between the bar O^4 and the spring O^5 at the end of the arm O and said arm is pushed longitudinally inward to bring the key O^3 into the rectangular part o^2 of its key-way, thereby locking the arm in radial position with reference to the hub. The opposite end of the rope R is then engaged by the auxiliary spring catch T, the disk p^2 withdrawn from the cap P^3 of the arm P, the ferrule s^2 of the rope carrier S engaged between said disk and cap, and the ferrule r^2 inserted between said cap and disk in position to be engaged thereby when the ferrule s^2 is withdrawn. The arms O and P are swung upward, the arm Q locked in radial relation to the hub, in the same way as the arm O, and the ferrule s^2 at the lower end of the rope carrier S engaged between the bar Q^4 and the spring Q^5 at the end of the arm Q. The arms are then swung into the position indicated in the full lines in Fig. 4, with the larger, inner part P^x of the roller in engagement with the shoulder m^4 of the slot M^1 . As the train passes the crane, the carrier S is removed, thus permitting the disk p^2 to move inward and engage the ferrule r^2 . The corresponding movement of the rod P^1 forces the larger part P^x of the roller inwardly beyond the slot M^1 so that the smaller part P^v of said roller may engage within the part m^2 of the slot. The arms then swing downward until the middle arm P assumes the former position of the arm Q indicated in full lines in Fig. 5. The rope R is then removed by the passing train which permits the plunger P^1 ,

by the action of the spring d^1 , to push the smaller part P^v of the roller inward beyond the slot M^1 , whereupon the hub swings on its trunnion until the middle arm P assumes a vertical position, and the arms O and Q assume the position indicated in dotted lines in Fig. 4.

The construction illustrated in Figs. 4 to 9, inclusive, is the preferred form of the apparatus, for the reason that all of the arms, when in inoperative position, hang vertically in front of the post or standard of the crane so as to be entirely out of the way.

While I have shown herein, in the two modifications of my invention illustrated and described, certain details of mechanical construction and arrangement, it is apparent that these may be variously modified without departing from the spirit of my invention, and I do not wish to be limited thereby except as pointed out in the appended claims.

I claim as my invention:—

1. A train order crane embracing a trunnion, a standard to which said trunnion is secured, a hub rotatably mounted on said trunnion, mechanism adapted to lock said hub in successive angular positions upon said trunnion, carrying arms mounted on said hub, carriers adapted to be removably secured to the outer ends of said arms, grippers located at the outer ends of said arms adapted to yieldingly grip said carriers, and means operated by the release of said grippers adapted to release said locking mechanism.

2. A train order crane embracing a standard, a hollow trunnion secured to said standard, a hub rotatably mounted on said trunnion adapted to be locked in successive angular positions thereon, an annular slot having parts of different widths formed in the cylindric surface of said trunnion, arms mounted on said hub, carriers adapted to be removably secured to the outer ends of said arms, rotatable parts of different diameters carried by said hub adapted to co-act with the parts of different widths of said slot to lock said hub in successive angular positions, spring controlled grippers located at the outer ends of said arms adapted to grip said carriers, and means automatically operated upon the release of said grippers to cause said rotatable parts in succession to co-act with successive parts of said slot.

3. A train order crane embracing a standard, a hollow trunnion secured thereto, a hub journaled on said trunnion adapted to be locked in successive angular positions thereon, an annular slot formed in said hollow trunnion having parts of different widths, rotatable parts of different diameters carried by said hub adapted to co-act with the parts of different widths of said slot to lock said hub in successive angular positions on

said trunnion, a radially extending arm rigidly secured to said hub, a spring controlled plunger carried by said arm adapted to control the positions of said rotatable parts, 5 a gripper operated by said plunger, an auxiliary spring controlled gripper carried by said arm adjacent said plunger controlled gripper, angularly spaced arms located at each side of said first named arm, said latter 10 arms being hinged to said hub, means for locking said latter arms in radial positions with reference to said hub, spring-controlled grippers carried at the outer ends of said hinged arms, and carriers having engaging 15 parts of different diameters adapted to be held by said grippers.

4. A train order crane embracing a standard, a hollow trunnion secured to said standard, a hub rotatably mounted on said trunnion adapted to be locked in successive angular positions thereon, an annular slot 20 having parts of different widths formed in

the cylindric surface of said trunnion, arms mounted on said hub, carriers adapted to be removably secured to the outer ends of said 25 arms, slot engaging members of different diameters carried by said hub adapted to co-act with the parts of different widths of said slot to lock said hub in successive angular positions, spring controlled grippers located 30 at the outer ends of said arms adapted to grip said carriers and means automatically operated upon the release of said grippers to cause said slot engaging members in succession to co-act with successive parts of said 35 slot.

In testimony, that I, claim the foregoing as my invention I affix my signature in the presence of two witnesses, this 2nd day of April A. D. 1910.

FREDERICK HACHMANN.

Witnesses:

T. H. ALFREDS,
G. R. WILKINS.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."