

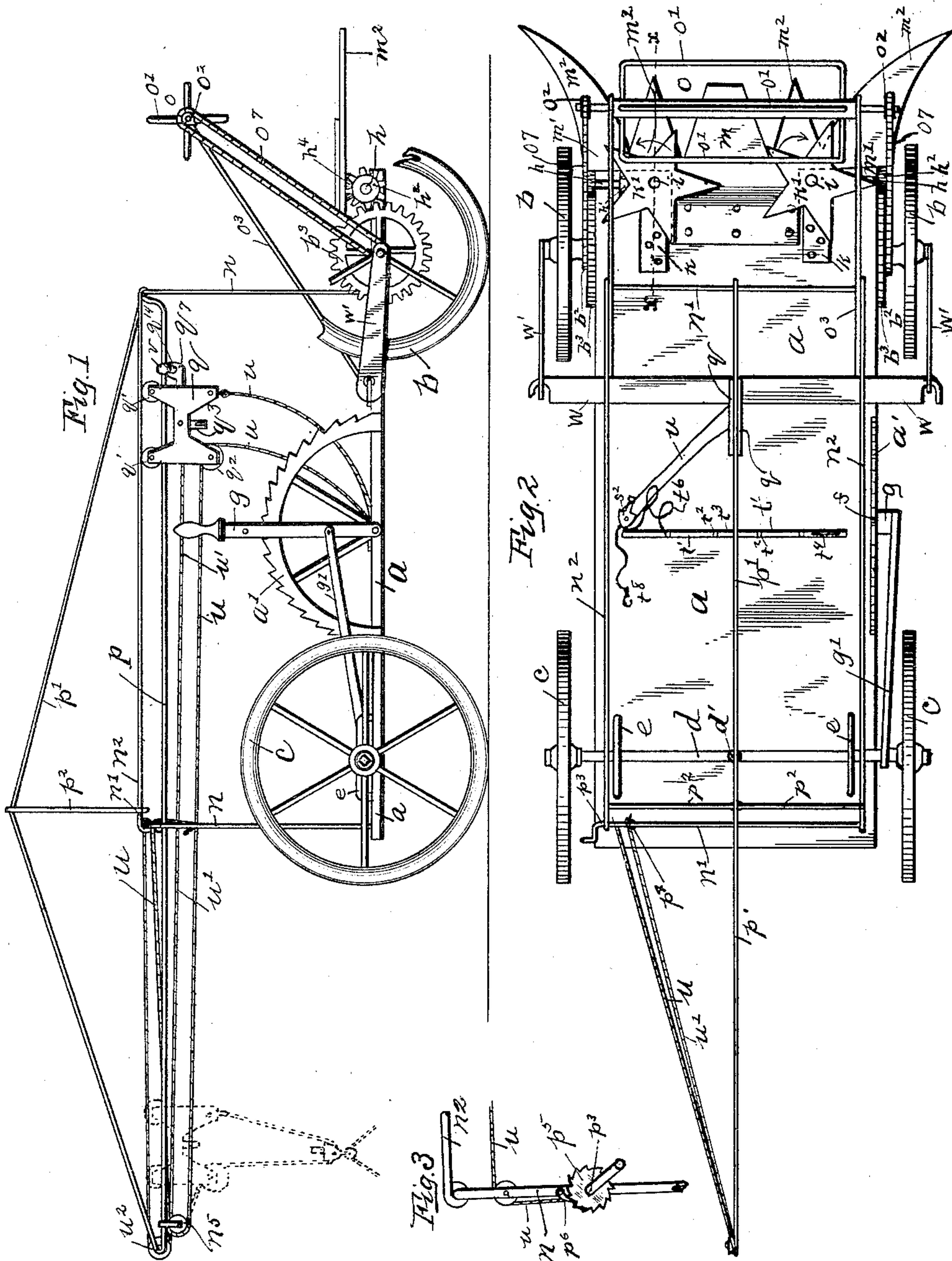
(No Model.)

3 Sheets—Sheet 1.

N. C. BADER.
CORN HARVESTER.

No. 462,230.

Patented Nov. 3, 1891.



WITNESSES

J. H. Fravel.
L. Donaldson Jr.

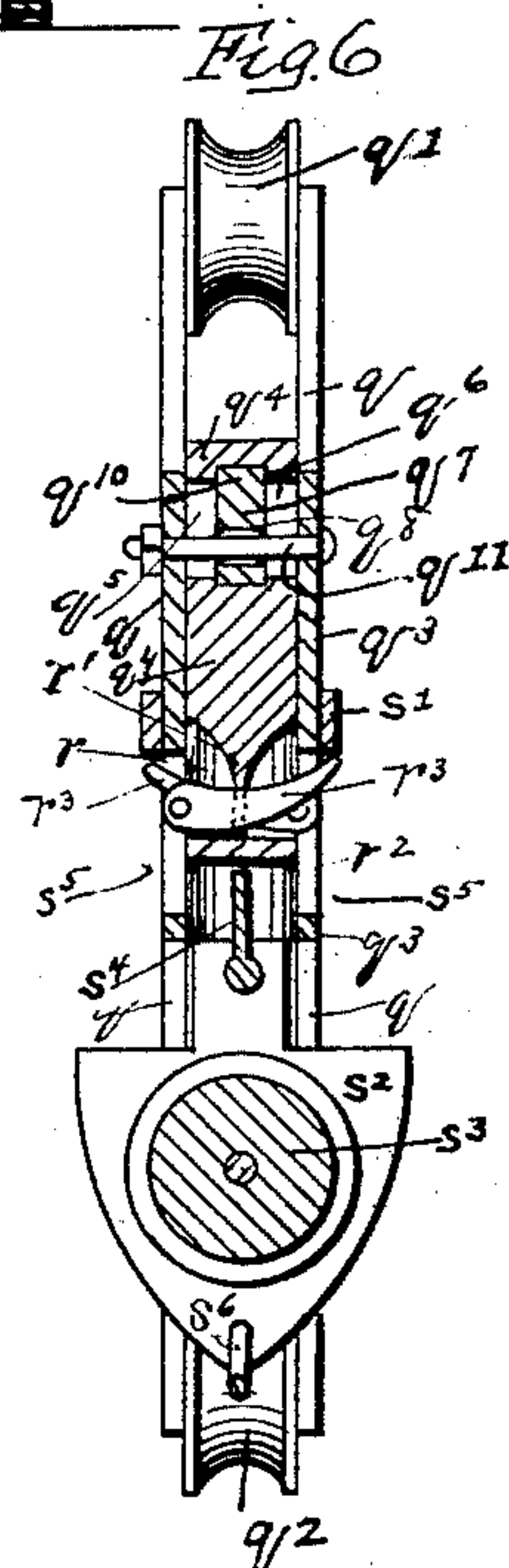
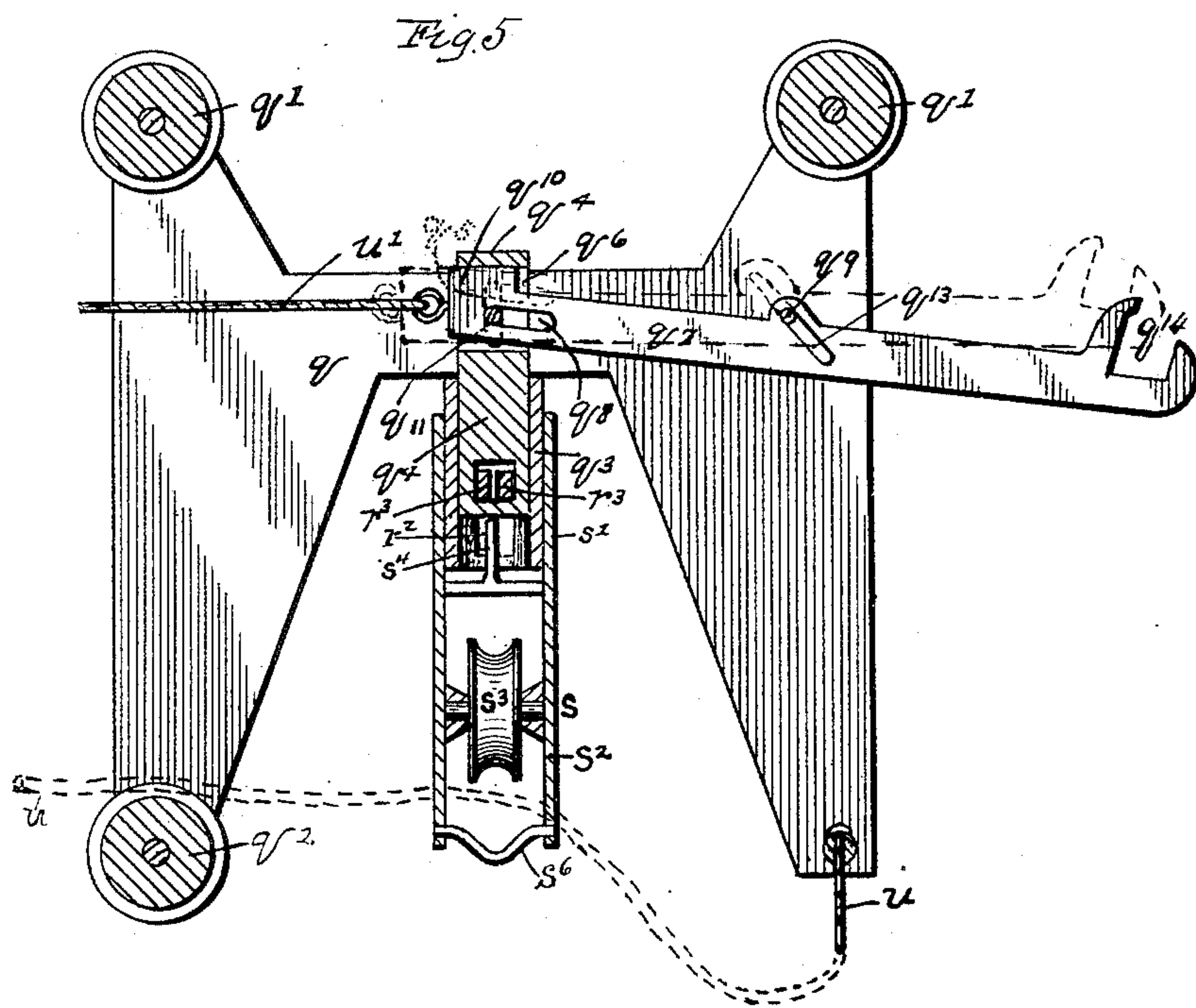
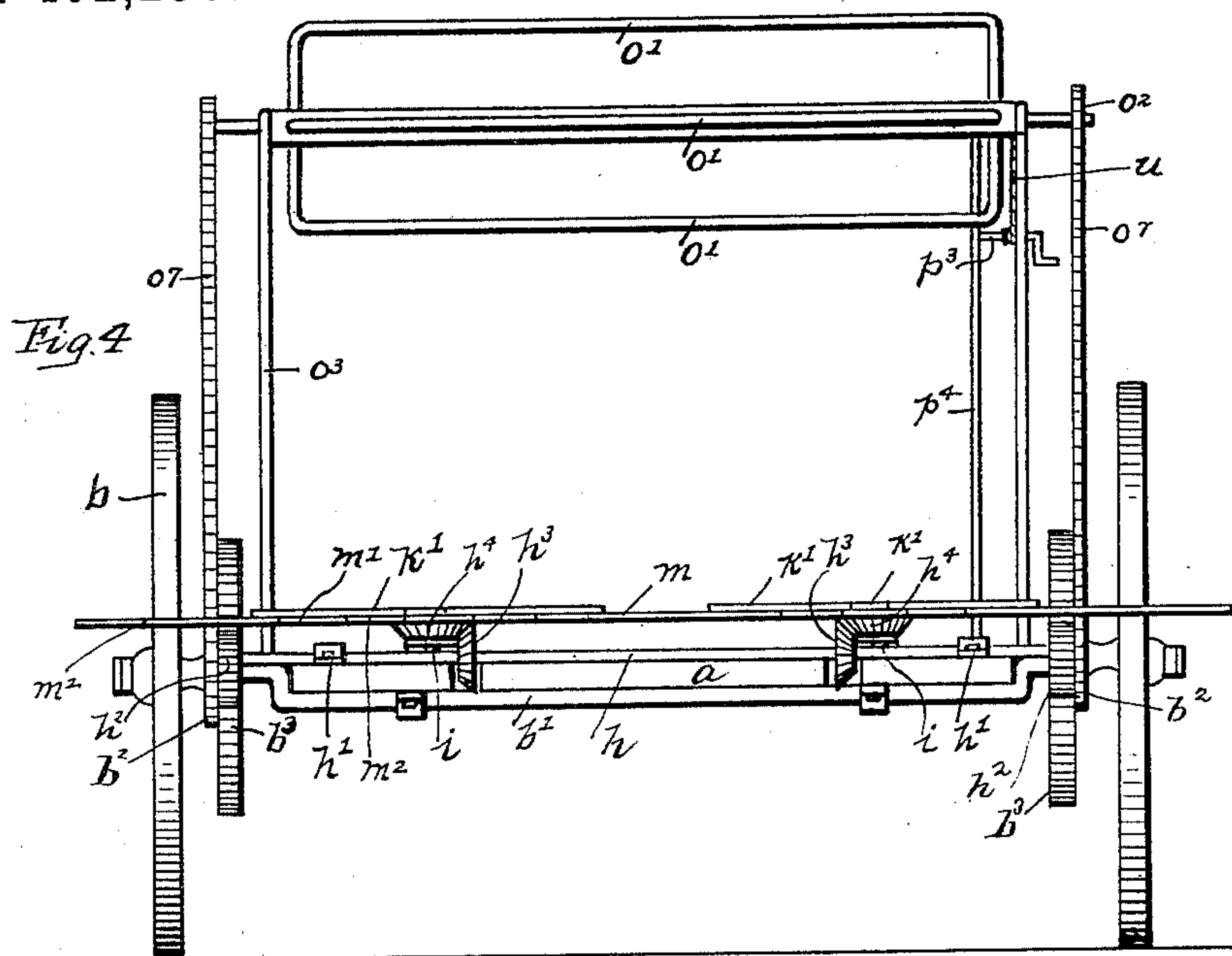
INVENTOR

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3 Sheets—Sheet 2.

No. 462,230.

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3 Sheets—Sheet 3.

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Fig. 7

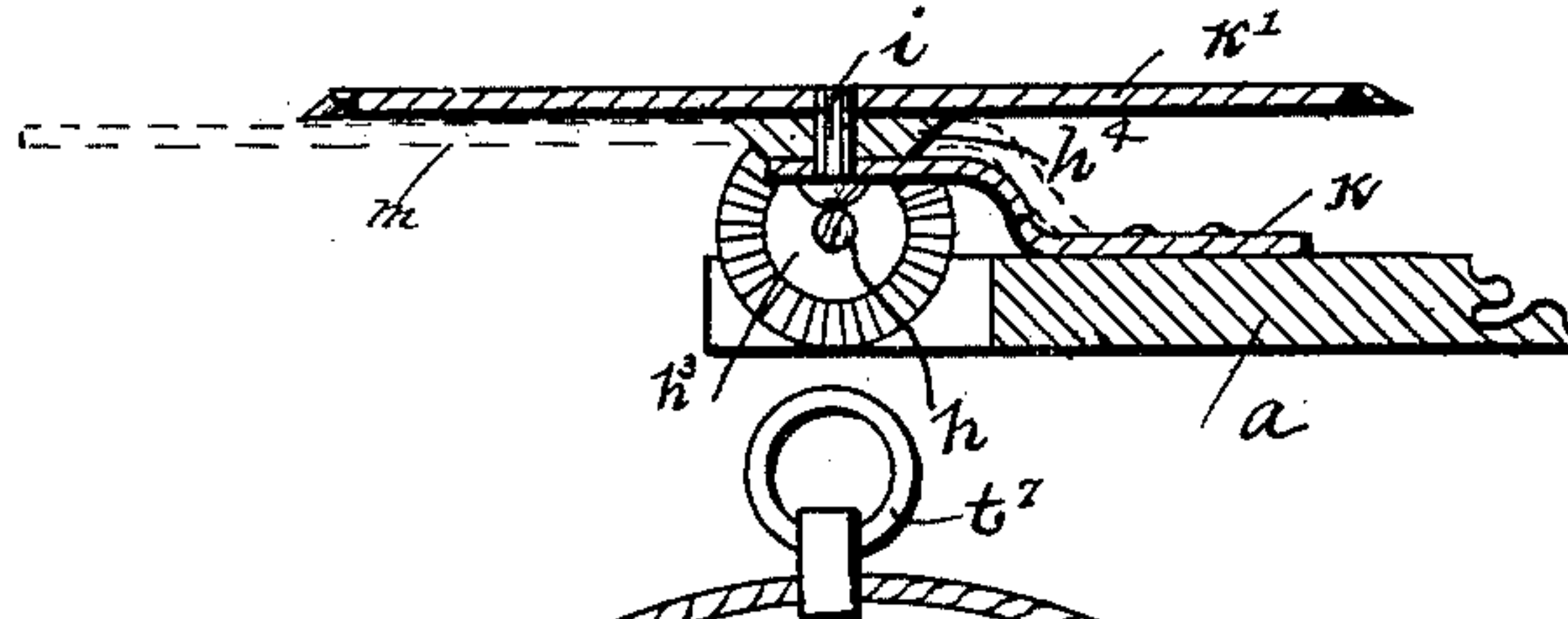


Fig. 8

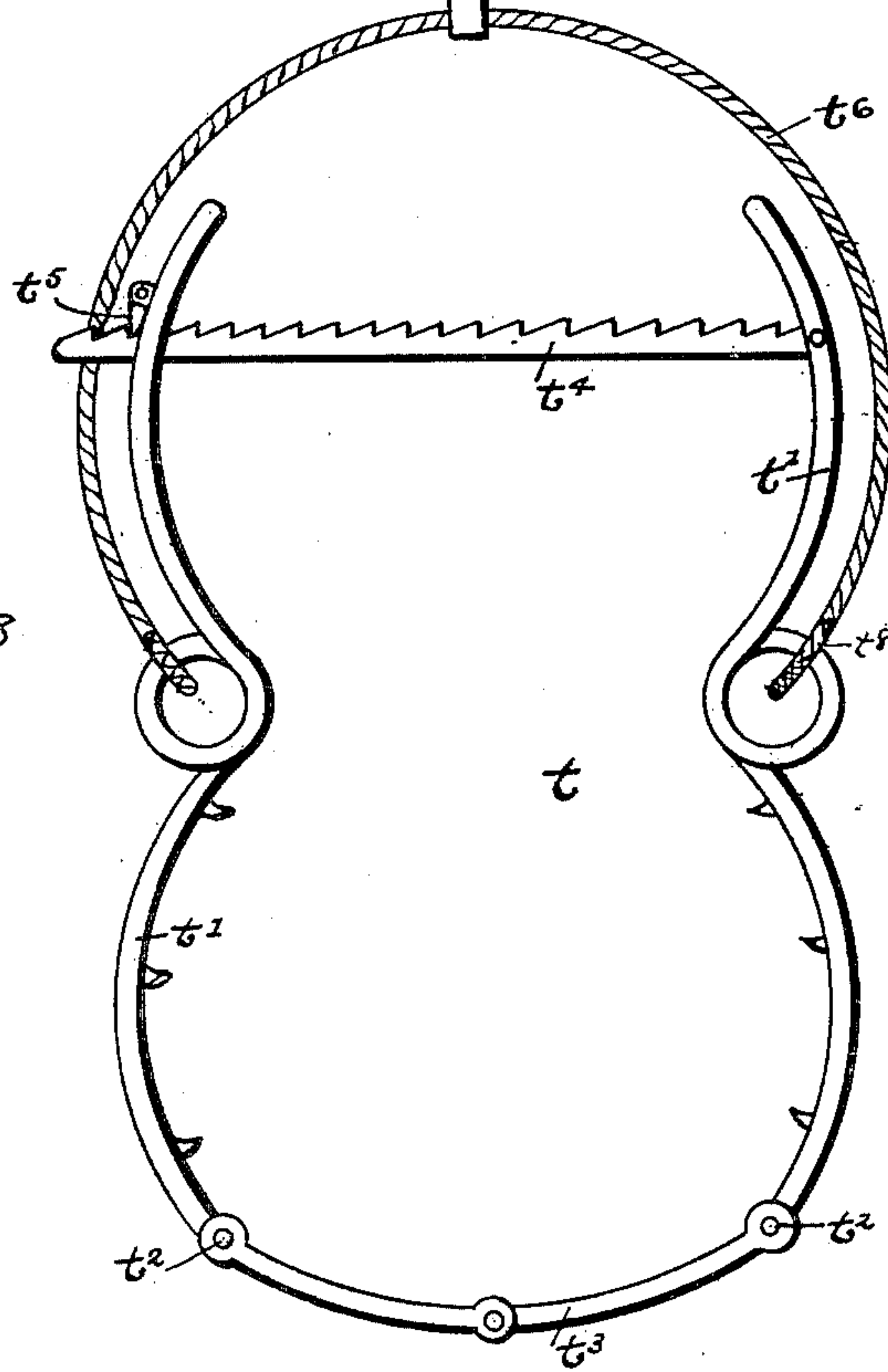
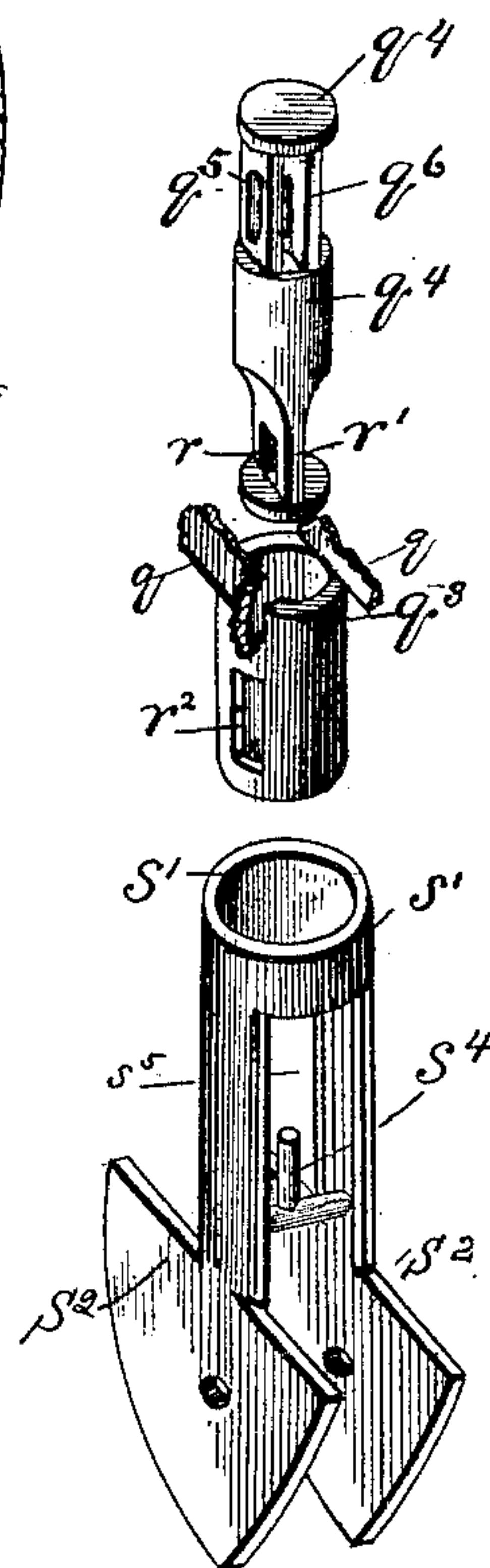


Fig. 9.



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NICHOLAS C. BADER, OF MARITS, OHIO.

CORN-HARVESTER.

SPECIFICATION forming part of Letters Patent No. 462,230, dated November 3, 1891.

Application filed May 21, 1890. Serial No. 352,575. (No model.)

To all whom it may concern:

Be it known that I, NICHOLAS C. BADER, a citizen of the United States, residing at Marits, in the county of Morrow and State of Ohio, have invented a certain new and useful Improvement in Corn-Harvesters, of which the following is a specification.

My invention relates to the improvement of machines for harvesting corn; and the objects of my invention are to provide a device of superior construction by means of which growing corn may be cut and shocked with rapidity and ease, to provide in connection therewith improved cutters, and to produce other minor improvements, which will be more fully set forth hereinafter. These objects I accomplish in the manner illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of my improved device. Fig. 2 is a plan view. Fig. 3 is a detail view showing the car-rope winding-reel and its location. Fig. 4 is a front end view of the harvester. Fig. 5 is a central vertical section of the shock-carrying car. Fig. 6 is a view taken at right angles with Fig. 5. Fig. 7 is a detail sectional view taken on line xx of Fig. 2. Fig. 8 is a view in elevation of the shock binder or clutch, showing its position when the shock is inclosed therein; and Fig. 9 is a view of several of the parts separated.

Similar letters refer to similar parts throughout the several views.

The body of my machine is in the form of a wagon having a low flat bed a and having forward ground-wheels b and rear wheels c . As shown in the drawings, the rear wheels c are fixed upon the ends of an axle d , which is pivotally secured at its center to the bed, as shown at d' , and extends transversely across the top of the wagon-bed and passes loosely through elongated staples or keepers e , which project from the top of the bed, one near each side thereof.

Secured to one of the long sides of the bed a and extending upwardly therefrom is a rack-bar a' , curved, as shown, in the arc of a circle. With the upwardly-projecting teeth of this rack-bar is made to engage a pawl f , the latter being made to slide vertically in suitable guides formed on the inner sides of the upper portion of a lever-arm g , the lower

end of which is pivotally connected with the side of the wagon and the body of which is in close proximity to the outer side of the rack a' . The lever g has pivotally connected with its lower portion the forward end of an arm g' , which extends rearwardly and connects with the axle d , as shown. By operating this lever g the axle is swung upon its pivot at the center of the bed and the wagon is guided to the right or left. The forward ground-wheels b are journaled upon the outwardly-projecting ends of an axle b' , which is secured to the under side of the forward portion of the bed, the outer ends being slightly bent up, so that the center of the wheels comes on a line with the bed. Each of the forward wheels b is provided with a short inwardly-extending hub, which carries a small sprocket-wheel b^2 and a large gear-wheel b^3 . A cross-piece W is secured to the top of the bed to the rear of the knives, and braces W' extend from its ends, which project beyond the sides of the bed to the ends of the axles outside of the wheels.

h represents a horizontal shaft which is supported transversely in suitable bearings h' , which project from the upper side of the bed in front of the forward axle. The ends of this shaft project outwardly in front of the gear-wheels b^3 , each of said projecting shaft ends carrying a pinion-wheel h^2 , which gears with wheel b^3 . The shaft h is also provided at a point on each side of the center of its length and near the outer side of the bed with a beveled gear-wheel h^3 . Each of the beveled wheels h^3 meshes with a beveled gear-wheel h^4 , mounted upon a short vertical shaft i , which is pivotally supported above the shaft h in a suitable bearing-piece k , which extends forwardly and upwardly from the bed a .

Fixed upon each of the shafts i , above the beveled wheel h^4 , is a star-shaped knife-plate k' .

m represents a stationary knife-plate, which consists of a flat metallic strip or plate having its rear portion secured to the upper side of the bed a and having its forward portion bent upwardly at the forward end of the bed and thence forwardly. The body of this forwardly-projecting portion of the knife-plate passes between the beveled gear-wheels h^4 and is provided with lateral projecting wings

m' , which are in front of and slightly below the projecting points of the star cutters, as shown. These wings m' are provided with forwardly-projecting teeth or points m^2 , the outer tooth of each wing being of the greatest length and curved outward toward its point. The tooth-wings m' are of such height as to come into close proximity to the under side of the star cutters. One edge of each of the star points or cutting-blades of the knife k' and that edge of each of the stationary points or teeth m^2 toward which said star cutters rotate, as hereinafter described, is sharpened.

Supported upon the upper side of the bed a is an oblong frame consisting of four vertical standards n , two of said standards being located a short distance in rear of star cutters and in close proximity to the sides of the bed and two at the rear corners of the bed, as shown. Each pair of these standards is connected by a suitable top cross-piece n' . Side rods n^2 are also made to connect the standards of each side, as shown.

o represents a reel consisting of a cross-rod or shaft, which has projecting therefrom arms o' , of the ordinary form, and which carries on each of its ends a small sprocket-wheel o^2 . This reel is supported at about the height of the standards n and above the knife-plate and cutters by inclined arms o^3 , which extend upwardly and forwardly from the bed a , the reel-shaft being journaled in the outer end of said arms o^3 . The reel sprocket-wheels o^2 and the axle sprocket-wheels b^2 are connected by an endless chain belt o^7 .

Secured to the center of the forward frame cross-piece n' is the forward end of a track-rod p . This track-rod is bent downward slightly from said frame cross-piece, from which point it extends horizontally rearward and terminates at a point in rear of the rear cross-piece n' , as shown. The track-rod is supported in this position by means of a truss-rod p' , which has one of its ends connected with the forward cross-piece n' , its remaining end connected with the outer or rear end of the track-rod, and its central and upwardly-inclined portion supported upon a cross-truss p^2 , which extends between the frame side rods n^2 .

p^3 represents a short horizontal reel-rod, which is journaled in suitable bearings formed in the upper portion of one of the rear standards n and a second vertical standard p^4 , which connects the bed and rear cross-rod n' a short distance from and parallel with the said rod n' . This reel-rod is provided, as shown, with a small ratchet-wheel p^5 on its outer projecting end portion, the teeth of which are adapted to be made to engage with a pawl p^6 , which is pivoted to the outer side of the standard n .

q represents a car the frame of which is approximately H-shaped. The upper ends of the upwardly-extending arms of this car-frame each carry a grooved track-wheel q' .

Said track-wheels bear and run upon the track-rod p , from which said car is suspended. As shown in the drawings, the H-shaped car-frame q is preferably formed of two duplicate plates, and the wheels q' are pivoted between said plates. Pivotal support in the lower end of the rear arm of the frame q is a pulley q^2 .

The double connecting or central cross-arms of the frame q are provided on their under side with a downwardly-extending tubular arm q^3 , into the upper end of which and between the frame cross-arm sections is inserted loosely a bolt or sliding pin q^4 , which is provided in its upper portion with a vertical slot q^5 and a cross-slot q^6 . The sliding pin is held in connection with the car-frame by means of a trigger-bar q^7 , which has its rear or inner end provided with a short longitudinal slot q^8 and an upwardly-projecting shoulder or hook q^{10} , said slotted inner end entering and projecting through the slotted opening q^6 of the bolt, as shown. A connection is formed between the bolt q^4 , bar q^7 , and frame q by a bolt q^{11} , which passes through said frame and the slots q^5 and q^8 . From the bolt q^4 the trigger-bar extends forwardly between the forward portions of the frame q , and terminates beyond the forward end of the frame in a U-shaped hook or clutch end q^{14} , as shown. The trigger-arm is further connected with the frame q by a transverse bolt q^9 in the forward end portion of said frame, said bolt passing through an upwardly and rearwardly inclined slot q^{13} , formed in said trigger-bar. The lower portion of the bolt q^4 is provided with a vertical slot r , the body of the bolt being so formed as to produce a wedge-shaped tongue r' , which projects downward therefrom into said slot r . The tubular arm q^3 is provided in its lower portion with two oppositely-located vertical slots r^2 , within each of which is pivoted the one end of an inwardly-extending and upwardly-curved pawl or tooth r^3 . These pawls are of such length that when in a horizontal position their free ends project through the opposite slots r^2 .

s represents a key or shock-supporter, which consists of a short tubular stem s' , which is provided with a flat shank or lower end s^2 , said shank being preferably formed of two duplicate plates, between which is pivoted a pulley s^3 . Projecting upwardly from the center of a cross-piece in the tubular stem s' is a pin s^4 . With the exception of its upper portion the tubular stem is cut away on two opposite sides, as shown at s^5 .

t represents the shock clutch or binder, of which t' t' represent two clamping-arms or spring-rods of equal length, which have their inner ends jointedly connected at t^2 t^2 with a short intermediate bar or rod t^3 . As shown in the drawings, these rods or arms t' are preferably looped at their centers to increase their spring-power. One of the arms t' near its upper end has pivoted thereto one end of a rack-bar t^4 , the free end of which is adapted

to be made to enter and pass through a slot in the remaining arm t' , in which position it may be held by a pawl t^5 , pivoted on the outer side of the slotted arm, and allowed to drop into engagement with the teeth of the rack-bar.

Secured to the central loop of one of the bars t' is a cord t^6 , the remaining end of which may be provided with a hook t^8 , as shown, by means of which it may be connected to the opposite arm-loop. The center of the cord-loop thus formed has attached thereto a suitable ring t^7 , by means of which it may be permanently connected to the key by passing the bar s^6 through it, or the ring may be dispensed with and the free end of the cord can be passed over the bar s^6 before it is hooked into the loop on the side of the clutch t .

Secured to the lower end of the forward arm of the H-shaped car-frame q is one end of a rope u . This rope passes under the pulley s^3 of the key-shank s^2 , from which it passes over the car-pulley q^2 , and thence rearwardly to and over a pulley n^5 , suspended by a block from the rear end portion of the track-rod p . From this pulley said cord extends to and is adapted to be wound upon the reel-shaft p^3 . Secured to the rear end of the trigger-bar q^7 is a cord u' , which extends rearwardly above the cord u , passes over a pulley u^2 in the extreme rear end of the track-rod p , from which point it extends and may be temporarily secured to the frame-work near the reel-shaft.

The herein-described shock-carrying car and its manner of operating is substantially the same as that employed in hay-carriers, and I do not, as will hereinafter be seen, claim as new this portion of the device.

The operation of the herein-described device is as follows: Before beginning the operation of cutting and shocking, the car q is supported, as shown, near the forward end of the track p and the outer clutch end q^{14} of the trigger-bar q^7 made to grasp or embrace a lug v , fixed on the track p . When in this position, the trigger-bar is substantially horizontal, as shown, and its shoulder q^{10} is engaging with the rear side of the sliding bolt q^4 above the slot q^6 of the latter. The above-mentioned parts being in the position described, it is obvious that the sliding bolt q^4 will have dropped down to its lowest position in the tube q^3 . It is further necessary that the shock binder or clutch t be opened out transversely on the bed a —that is, its rack-bar t^4 withdrawn from the slotted arm t^5 , the cord t^6 disconnected at one end from the arms t' , and the said arms t' turned on their pivots t^2 and laid crosswise on the wagon-bed, as shown in Fig. 2 of the drawings. In driving into the corn to be cut the horses are so driven as to cause one row of corn to come into contact with the blades of each of the wings m' of the stationary knife-plate, the horses traveling between the corn-rows. The turning of the ground-wheels b , caused by the forward motion of the device, will result in

transmitting motion to the gear-wheels b^3 , which, through their gearing connection with the pinions h^2 , will impart motion to the shaft h and the beveled gear-wheels h^3 thereon. Through the gearing of the wheels h^3 and h^4 rotary motion is communicated to the star-shaped knives k' through shafts i' . The rotating of the ground-wheel hubs will also, through the sprocket-wheels b^2 and drive-chain o^7 , communicate rotary motion to the reel o . The cornstalks, which enter the V-shaped spaces between the teeth m^2 , will be quickly and completely severed by the contact therewith of the sharpened blades or points of the rotating star knives k' . As the corn is cut in this manner the reel-arm o' will aid in forcing the stalks back onto the bed of the harvester, causing said stalks to fall upon the open clutch. When sufficient corn has thus been collected upon said clutch to produce the desired-size shock, the motion of the harvester is stopped, the outer ends of the clutch or binder arms t' drawn toward each other, thus clamping within them the corn, the rack-bar t^4 inserted through the slot of the binder-arm the desired distance or until the shock is firmly clasped by the binder, and the pawl t^5 allowed to drop into engagement with the rack t^4 , thus locking the latter against opening or withdrawal. The loose end of the rope t^6 is then hooked into engagement with the binder, as shown in Fig. 8. The shock thus closed by the binder is suspended from the car q by elevating the clutch. Now as the clutch is raised upward the tubular stem of the key s will surround the tubular arm q^3 of the car-frame, as shown in Figs. 5 and 6 of the drawings. As the arm q^3 is located at equal distances from the lower points of the frame and as the key is raised by the rope, its weight will keep it midway between said points or in a line with the arm, and as the stem s' is made large enough it will readily pass up around the arm q^3 . In this last operation the internal key-pin s^4 , by coming into contact with the lower end of the sliding bolt q^4 , drives the latter upward and presses the pointed ends of the pawls t^3 , which will cause them to engage with the outside of the upper solid wall portion of the key-stem, and thus support the said key in position as soon as the bolt is locked. The elevation of the bolt q^4 will operate to release the shoulder q^{10} of the trigger-bar q^7 from contact with the bolt q^4 , and the draft upon the rope u will cause the car to start to the rear of the harvester. This will cause the pin q^9 to slide up the inclined slot q^{13} of the trigger-bar, which will force the clutch end q^{14} down out of engagement with the catch v and will release the car, the enlarged end of the trigger-bar in the meantime being drawn in under the top of the bolt q^4 , which is thereby locked against downward movement, which, if permitted, would release the key. The car with the shock suspended therefrom, as above described, may then be drawn to the rear on the

track by turning the reel-shaft p^3 to wind thereon the cord u . This taking up of the cord u will operate to pull the car to the desired point in rear of the body of the harvester, in which point the shock may be lowered to the ground by pulling upon the cord u' , which will result in the rearward movement of the trigger-bar q^7 . This movement of said trigger-bar drives the enlarged rear end of said bar from its position in the slot q^6 and allows the head of the bolt q^4 to drop down and rest upon the main body of the trigger-bar. This downward movement of the bolt q^4 will release the pawls r^3 from the pressure of the lower end of the bolt q^4 and result in their points dropping inward sufficiently to disengage them from the key-tube and allow the latter to drop from the tube and allow the latter to drop from the car. The lowering of the shock may then be accomplished at the desired rate of speed by unwinding the reel-shaft p^3 until a sufficient portion of the rope u has been spent to allow the shock to reach the ground. The shock-binder may then be unclashed by disengaging the pawl t^5 and rack t^4 and the parts caused again to assume the positions seen in

Figs. 1 and 2 of the drawings. From the construction herein described it will be seen that the rapid rotation of the sharpened star-knived points or blades will cause, in connection with the stationary sharpened points m^2 , a rapid and complete severing of the stalks.

Having now fully described my invention, what I claim, and desire to secure by Letters Patent, is—

In a corn-harvester, the combination, with the running-gears, a corn-cutting mechanism supported from the forward portion of the bed, a rearwardly-extending track-rod p , supported above the harvester-bed, as described, a car q , running and supported on said track, and means for moving said car on said track, of a shock binder or clutch t , consisting, as described, of two hinged spring-arms $t' t''$, jointly connected with an intermediate arm t^3 , a rack-bar t^4 , pivoted at the end to one of the arms t' and passing through a slot in the other arm t'' , and means for supporting said binder from said car, substantially as set forth.

NICHOLAS C. BADER.

In presence of—

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W. J. EWERS.