

(No Model.)

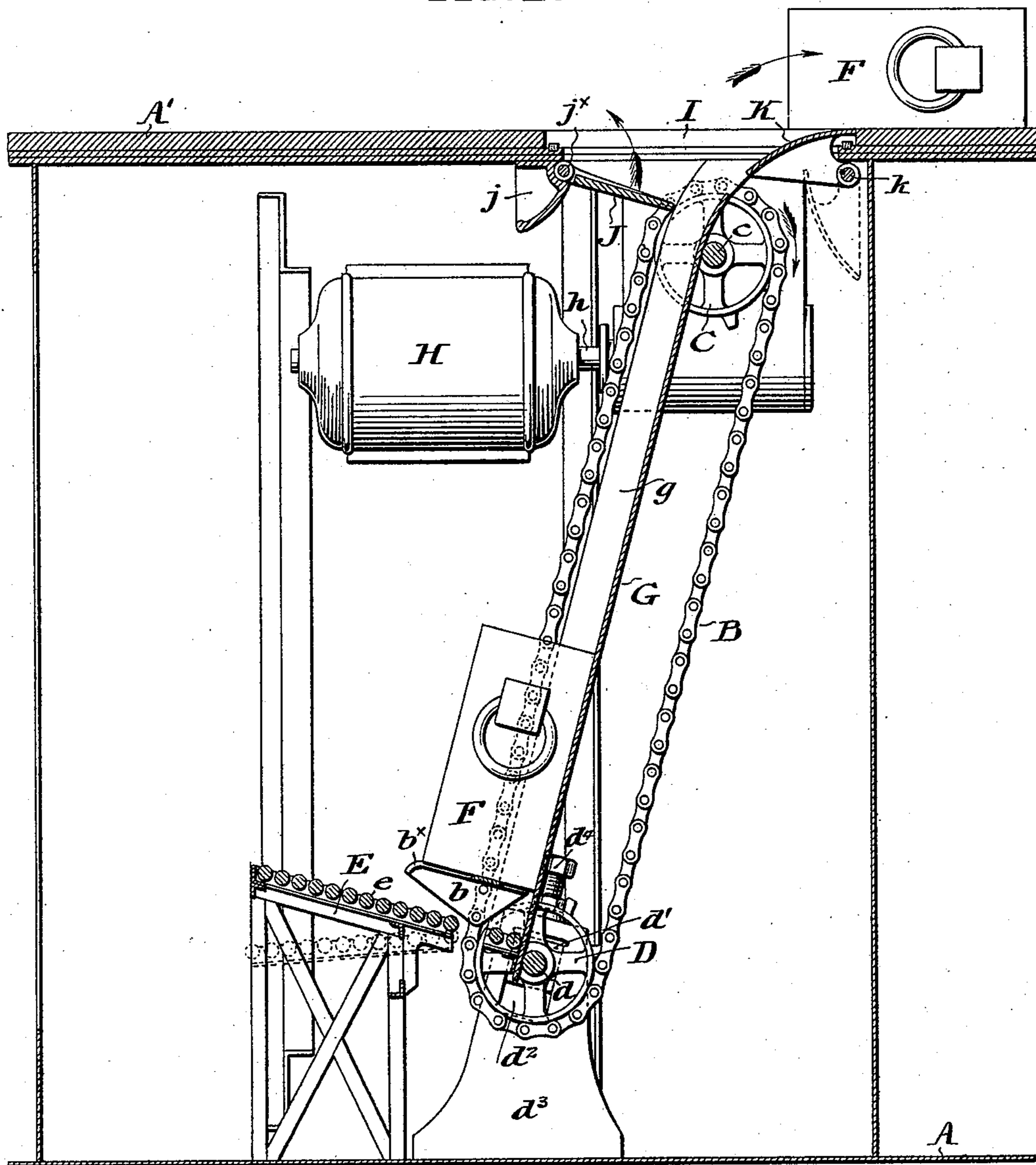
6 Sheets—Sheet 1.

W. RHODES.
AMMUNITION HOIST FOR SHIPS.

No. 587,330.

Patented Aug. 3, 1897.

FIG. 1.



Wesley Rhodes,

WITNESSES:

A. E. Paig
J. Norman Dixon

INVENTOR:

By his Attorney
Wm E. Strawbridge
Small Taylor

(No Model.)

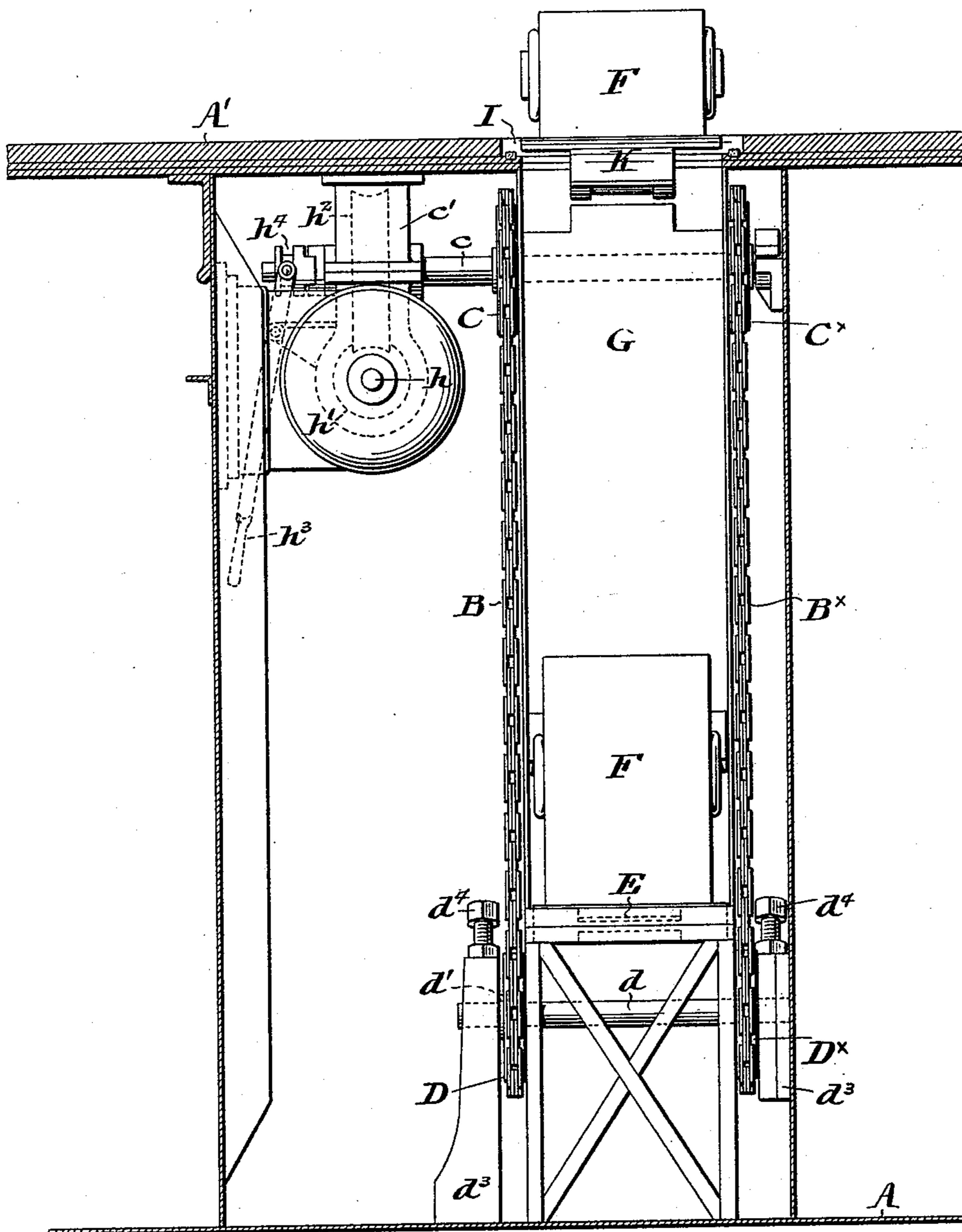
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FIG. 2.



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(No Model.)

6 Sheets—Sheet 3.

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FIG. 4.

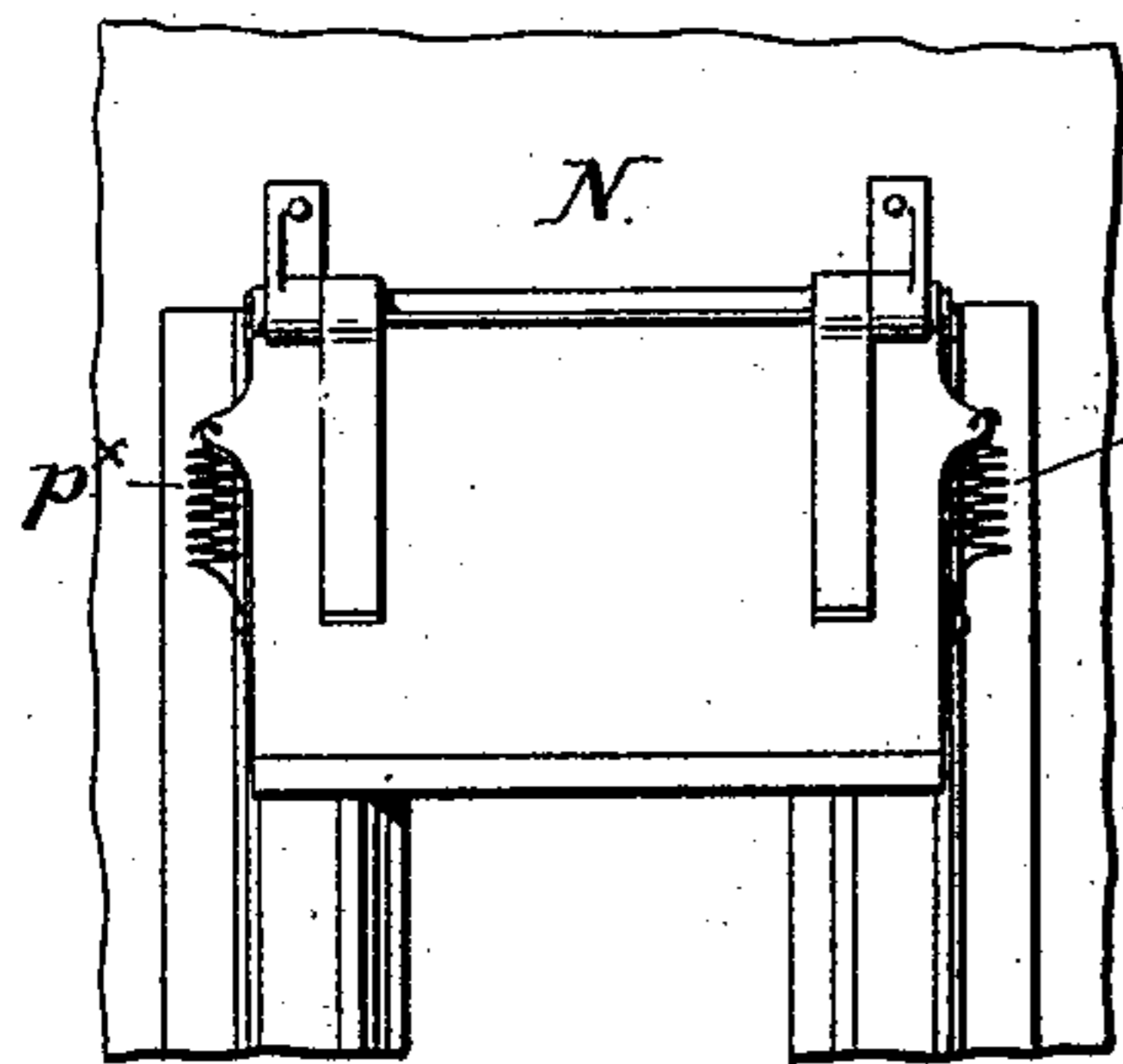
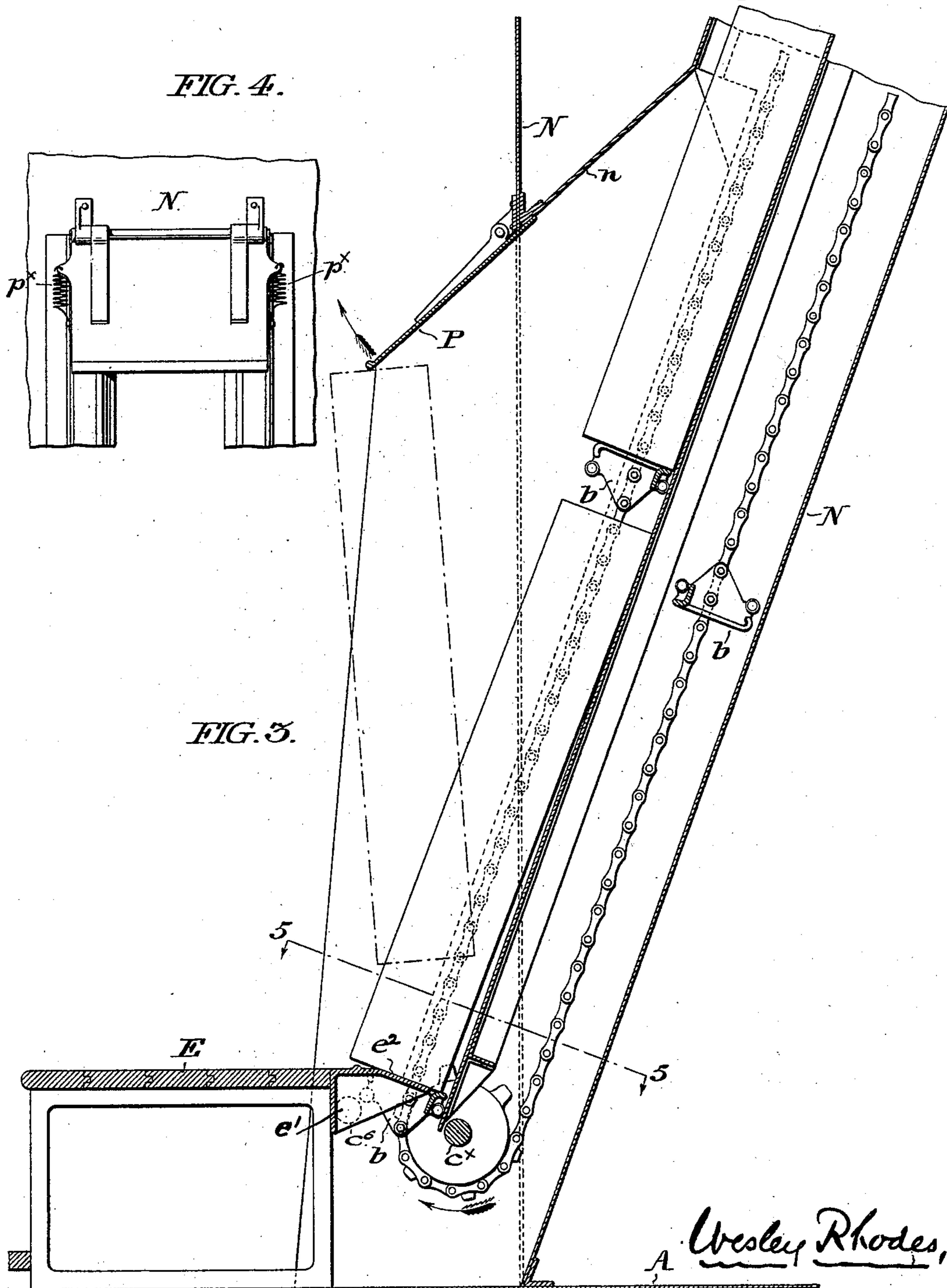


FIG. 3.



WITNESSES:

N. E. Paige
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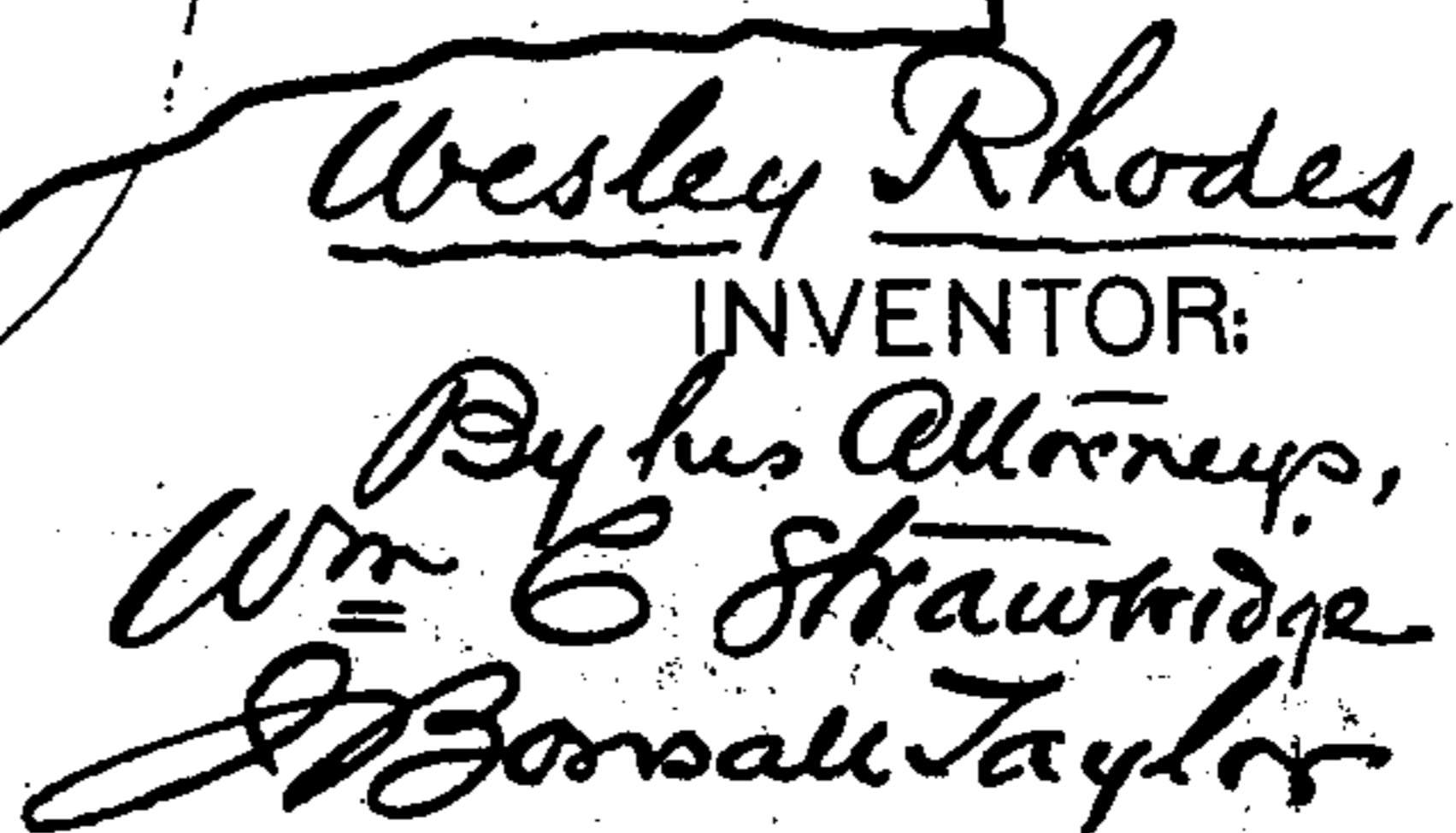
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& Norman Taylor

6 Sheets—Sheet 4.

No. 587,330.

Patented Aug. 3, 1897.



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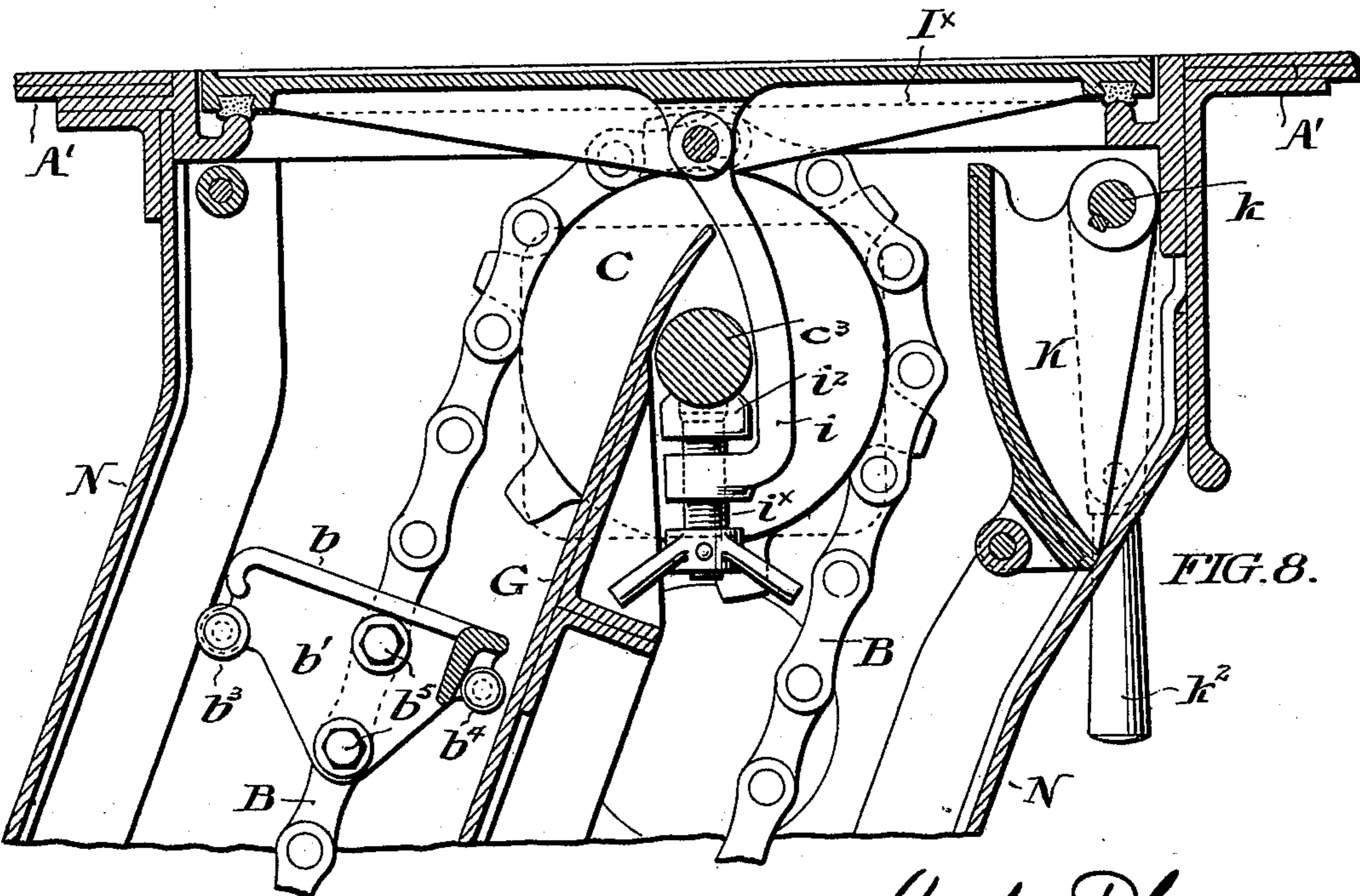
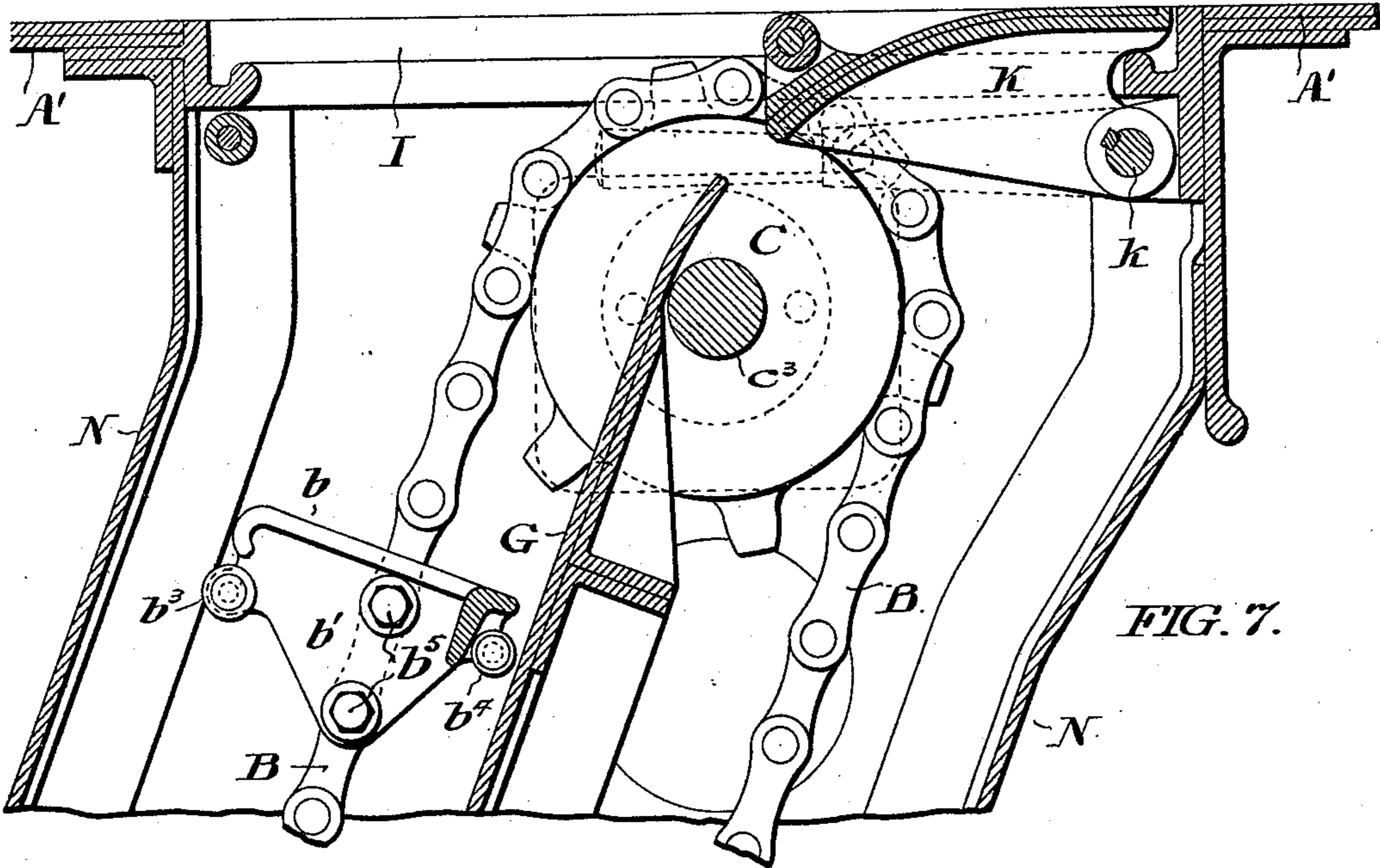
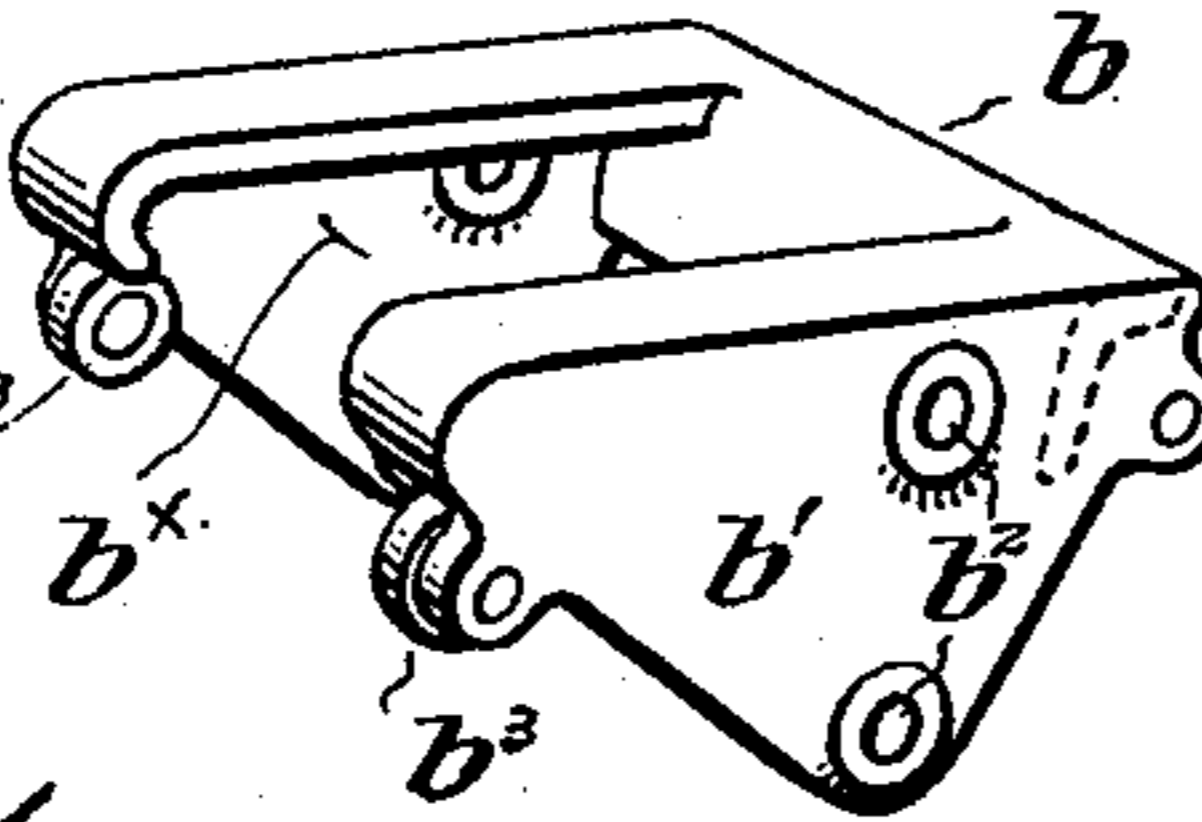


FIG. 11.

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6 Sheets—Sheet 6.

No. 587,330.

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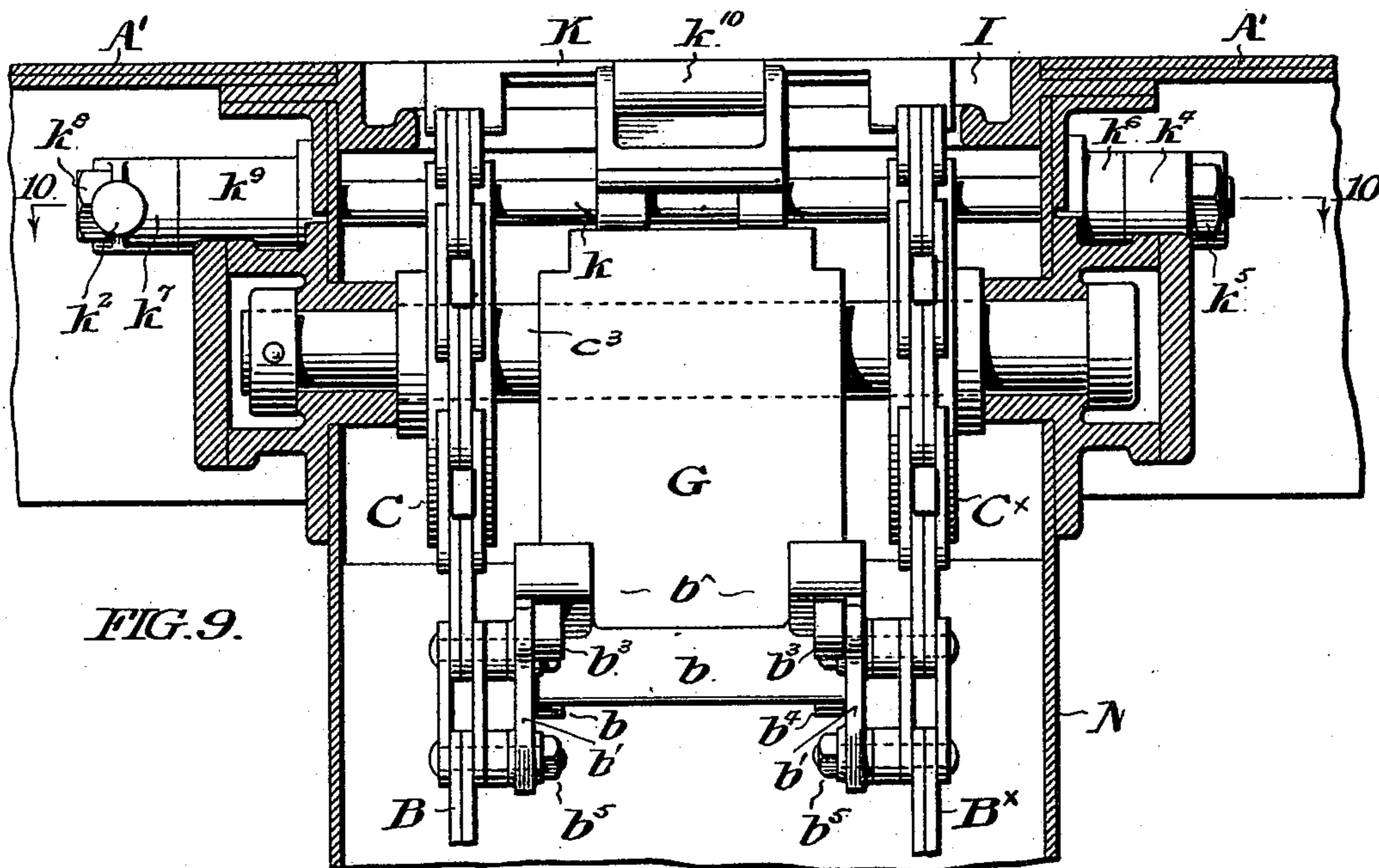


FIG. 9.

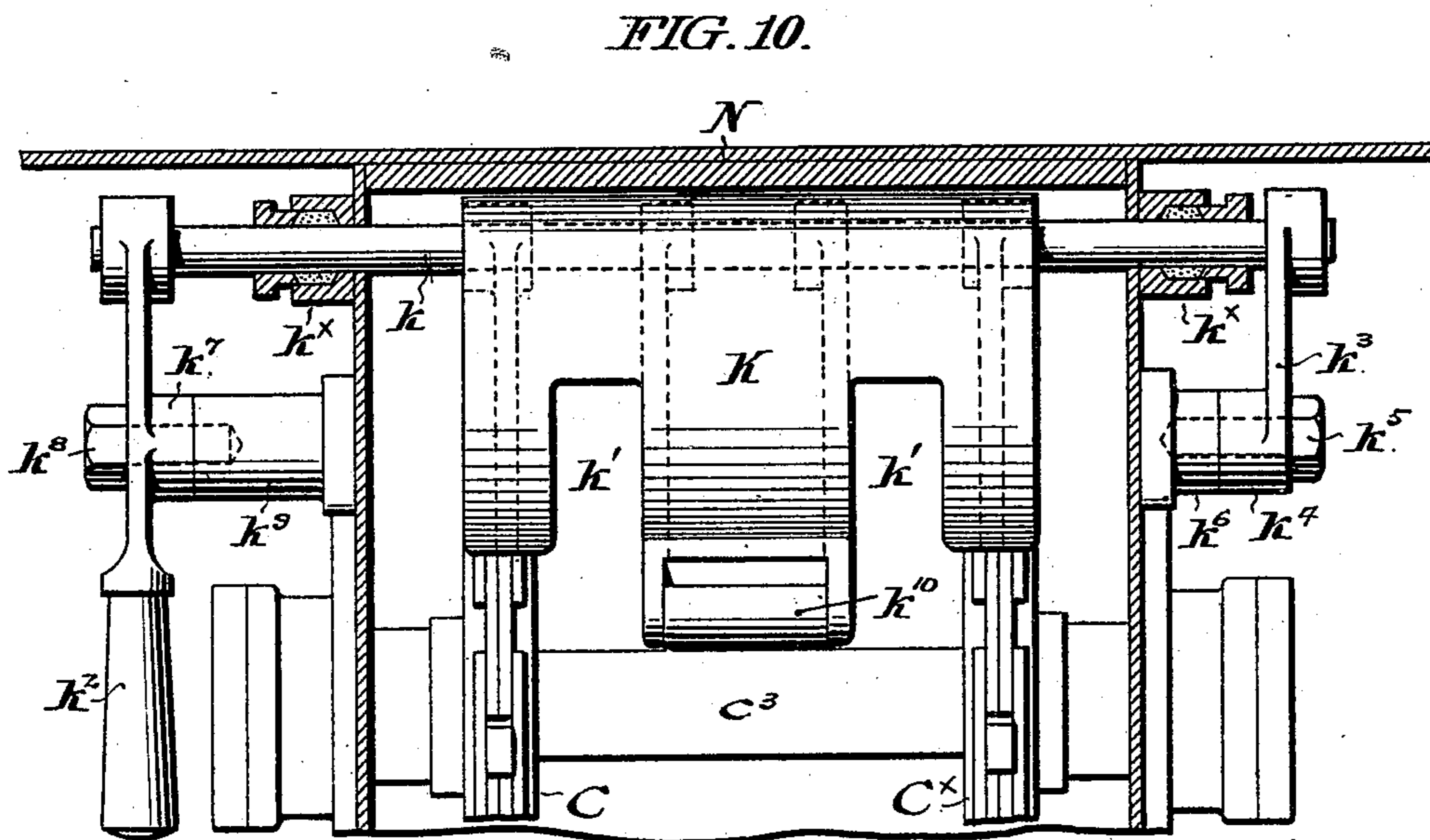


FIG. 10.

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UNITED STATES PATENT OFFICE.

WESLEY RHODES, OF PHILADELPHIA, PENNSYLVANIA.

AMMUNITION-HOIST FOR SHIPS.

SPECIFICATION forming part of Letters Patent No. 587,330, dated August 3, 1897.

Application filed March 26, 1897. Serial No. 629,316. (No model.)

To all whom it may concern:

Be it known that I, WESLEY RHODES, a subject of the Queen of Great Britain, residing in the city and county of Philadelphia, in the State of Pennsylvania, have invented certain new and useful Improvements in Ammunition-Hoists for Ships, of which the following is a specification.

My invention relates in general to hoists employed on ships to raise and lower merchandise, and other articles, between the various decks, or between the hold and any particular deck,—and relates, particularly, to the class of devices which are employed upon battle ships and known as ammunition hoists, and which are mechanisms operating by the aid of endless chains or equivalent carriers to raise ammunition from the magazine or handling room of a ship to any one of its decks.

The object of my invention is the construction of a ship's hoist,—particularly adapted for the handling of ammunition boxes and operative between the magazine or handling room and any particular deck,—which shall be so organized and arranged that when it is not in use, the discharging hatch of the discharge or delivery deck with which the hoist operates may be closed by a scuttle or cover which shall leave the deck flush and free from all obstruction;—in which, also, provision is made for maintaining the endless elevating chains tight, and for adjusting them when they become slackened, without interference with the motive or driving gearing;—in which, also, efficient provision is made against the liability of the boxes, in the movement of the ship, to fail to enter the tube or casing of the hoist, to fall from the hoist, or to become jammed with respect to the various hatch or other openings through which the hoist carrier may extend;—in which, also, special facility is afforded not only for elevating, but also for lowering, the boxes or shells from the deck to the magazine or handling room;—and, which, finally, while being light, simple, and inexpensive in construction, shall not only occupy less space than hoists heretofore used, and be adapted to be set up for working either “fore or aft” or “athwart-ships”, but shall also be

less liable to be damaged by the shot of an enemy.

A hoist embodying my improvements is represented in the accompanying drawings,—in Figures 1 and 2 as having its motive power applied to its upper end, and in the other figures to its lower end,—and is hereinafter described,—the particular subject-matter which I claim as novel being hereinafter definitely specified.

In the drawings,

Figure 1 is a side elevation, partly sectional, of a hoist embodying my improvements, and particularly adapted for application between two adjacent decks.

Figure 2 is an end elevational view of the same, sight being taken from the left hand side of Figure 1.

Figure 3 is a side elevational view of the lower portion of the hoist, illustrating the application to the hoist casing of the deflecting plate.

Figure 4 is a fragmentary end or face view of the deflecting plate represented in Figure 3.

Figure 5 is a sectional plan view of the basal portion of the devices represented in Figure 3, section being supposed in the plane of the dotted line 5—5 upon said Figure 3.

Figure 6 is a fragmentary side elevational view of the chain-adjusting devices represented in Figure 5, the section being supposed in the plane of the dotted line 6—6 upon said Figure 5.

Figure 7 is a fragmentary side sectional elevation of the upper portion of the hoist the lower portion of which is represented in Figure 3, the scuttle being removed and the discharge plate being in its elevated or working position.

Figure 8 is a view similar to Figure 7 of the same parts, with the scuttle in place within the hatch and the discharge plate dropped and out of operative position.

Figure 9 is a fragmentary end sectional elevational view of the parts represented in Figure 7, viewed from the left hand side of said figure, and section being supposed through the shaft-boxings of shaft c^3 , and through the casing N.

Figure 10 is a fragmentary top plan view, partly sectional, of a portion of the parts represented in Figures 7 and 9, section being supposed in the plane of the dotted lines 10—

5 10 upon said Figure 9.

Figure 11 is a view in perspective of one of the carrying or hoisting plates.

Similar letters of reference indicate corresponding parts.

10 In the drawings,

A represents the magazine deck and A' the delivery or discharge deck of a ship, between which my hoisting devices are shown applied.

Referring, for simpler explanation, first, 15 to the construction represented in Figures 1 and 2,—B B^x are a pair of parallel correspondent endless chains which together constitute the lifting carrier or elevating mechanism proper of the apparatus, and which are 20 adapted to be continuously operated to travel in one direction.

I prefer to employ chains of the sprocket type, but do not exclude other forms of chain, or endless ropes, belts, or kindred mechanical 25 elevating devices.

C C^x are a pair of parallel correspondent sprocket wheels, which I term the upper sprocket wheels, and which are mounted at a desired distance apart upon a shaft c, which 30 in the typical construction of Figures 1 and 2, now particularly under discussion, happens to be a driving shaft, suitably-housed, conveniently in fixed boxings c', immediately below the delivery deck.

35 D D^x are a pair of parallel correspondent sprocket wheels, which I term the lower sprocket wheels, preferably counterparts of the sprocket wheels C C^x, and which are mounted at a desired distance apart upon a 40 shaft d, which in the typical construction of Figures 1 and 2 happens to be a driven shaft suitably housed, conveniently in adjustable boxings d' mounted in box guide ways d², formed in standards d³, or other base frame- 45 work, erected from the magazine deck or otherwise as convenience of construction may dictate, so as to be easily adjustable by means of such a typical adjusting device as the bolts d⁴, to take up the slack of the endless 50 sprocket chains B B^x which are respectively bent upon and driven by the respective sets of sprocket wheels C D and C^x D^x.

In the construction represented in Figures 3 to 11 in which, as already mentioned, the 55 lower sprocket shaft, designated c^x, is the chain-driving shaft, and the upper sprocket shaft c³ the driven shaft,—the chain-adjusting devices are applied to the lower shaft, are particularly represented in Figures 5 and 6, 60 and are of such construction that the driving shaft c^x takes its power through a toothed spur wheel c⁴ mounted upon it and engaging with a counter spur wheel c⁵ on a counter shaft which I term the motor shaft c⁶.

65 In this arrangement the adjustable boxings

d' of the driving shaft are made of segmental form, and are mounted in corresponding segmentally-formed box guide ways d² formed in the base framework of the hoist as an entirety and struck upon a radius sprung from 70 the counter or motor shaft as an axis, and are adjustable by means of such typical adjusting devices as the bolts d⁴, all as represented in said Figures 5 and 6.

This arrangement permits of the adjusting 75 of the chain from the bottom without affecting the constant engagement of the toothed spur wheels c⁴ c⁵, which, as explained, impart the movement to the endless carrier from the counter or motor shaft c⁶. 80

Although I prefer to apply the driving and adjusting devices last above described to the lower end of the carrier, it is obvious that they may be applied to the upper end, and it is likewise manifestly true that the equivalent worm-driving gear represented in Figures 1 and 2 as applied to the upper end of the carrier, may, if desired, be applied to the 85 lower end.

E is a loading platform, of any preferred 90 character, disposed in adjacency to the lower portion or receiving end of the carrying chains, over the surface of which the ammunition boxes F are passed for delivery upon the carrying or hoisting plates b, which, in 95 any desired manner, are fixedly connected with the endless chains, and which, extending transversely of said chains, are employed in any desired number, after the manner of chain buckets, so to speak, to act as the elevating instrumentalities of the chain, for the 100 elevation of the ammunition boxes or other load.

Although the form of the carrying plate is immaterial, and the simplest possible typical 105 construction is that represented in Figures 1 and 2, I find it convenient to make these plates of the form particularly shown in Figures 3, 5, 7, 8, 9, and 11.

That is to say, I cut away the top or carrying 110 surface of the plate as an entirety in such manner as to form a central opening b^x, so as to cause the plate, in effect, to be constituted by two flat projecting parallel arms, or more strictly, ledges or top shelves, to which 115 the letters b are applied, and which are adapted in the movement of the chains to receive the boxes and pass through slots k', in Figure 10, in the discharge plate K, herein- 120 after referred to, and also to pass outside of the forwardly projecting delivery plate e² of the loading platform, as represented in Figure 5,—and in which side plates b' are provided and respectively formed with bolt apertures 125 b² through which chain bolts b⁵, to connect the device as a whole with corresponding opposite links of the chains, are passed.

The carrying plates are also provided with friction rolls b³ b⁴ to ease their contact with the guiding plate G or other portion of the 130

inclosing casing with respect to or by the aid of which the apparatus as an entirety is erected.

The construction of the loading platform E is not material, the platform which I have illustrated in Figure 1 being provided with an upper surface of carrying rolls e , while that which I have illustrated in Figure 3 is simply a solid-topped platform provided with a projecting bracket e' ,—both, however, are preferably provided with a forwardly projecting delivery plate or tongue portion e^2 , best shown in Figure 5, which the carrying plates in their travel overlap, or pass through, so to speak.

G is a guide plate located between both sets of sprocket wheels and chains, and formed as a flat plate, way, or kindred bearing surface suitably supported upon the front side of the driving and driven sprocket shafts, and extending from the loading platform to about the level of the tops of the upper chain wheels.

This plate is preferably formed with side flanges g , and it serves as a rest or guide for the ammunition boxes in their travel with the chains, and, in conjunction with the timber or other sides M, to form a hoist tube or casing for the hoist as an entirety.

In the construction represented in Figures 1 and 2, the upper sprocket wheel shaft being the driving shaft and the lower a driven shaft, suitable means are provided for the driving of the upper shaft.

The shaft-driving mechanism may be of any preferred character.

I have illustrated as such a mechanism an electric motor H suitably supported beneath the delivery deck, and the shaft h of which is provided with a worm h' adapted to engage with a worm wheel h^2 upon the driving chain shaft c , the entire device being under suitable control, and being conveniently provided with a hand lever h^3 and shaft clutch h^4 of any preferred character.

In the construction illustrated in Figures 3 to 11 inclusive, and already referred to, the upper sprocket shaft being the driven shaft, and the lower the driving shaft, the driving devices are applied to the lower shaft.

I is a hatchway through the delivery deck, through which the ammunition boxes pass as they are elevated by the carrier from the loading platform to said delivery deck.

The hatchway may be of any preferred character, and, if desired, provided with the usual covering, and is adapted when the apparatus is not in use to be closed water-tight by an armored or other scuttle illustrated in place in Figure 8, and conveniently adapted to be retained in place as illustrated in Figure 8, by being provided as to its under side with a swinging hook i , adapted to take under the sprocket shaft c^3 , and to be locked securely by the action of a locking thumb bolt i^x adapted to force a swiveled grooved bearing nut i^2 into contact with said shaft.

J is what I term a baffle plate, the same

being a hinged or pivoted plate or arm located within or slightly below the hatchway on the ascending side of the carrying chains opposite the discharge plate, and being conveniently supported by or hung upon the pivot or hinge pin j^x parallel with the driving shaft and mounted in the bracket bearing j applied to the hatchway.

Normally this baffle plate occupies the comparatively horizontal position represented in full lines in Figure 1, but in the ascent of the carrier is adapted to be encountered by each ammunition box in turn, and to be deflected about its pivot pin into an approximately vertical position in which it remains during the period of the passage through the hatchway of the ammunition box being elevated,—gravitating to its normal horizontal position after the box has completely passed it, and in such normal position serving as a guard to the hatchway to prevent the possible falling back through it of the elevated ammunition box.

K is what I term a discharge plate, the same being a preferably curved bearing or directing plate, which, when in the horizontal position which it occupies when the hoist is in operation, constitutes in effect a continuation of the guiding plate G, to the delivery deck, and serves to receive and direct onto said deck the ammunition box as the latter is delivered by the carrying or hoisting plate of the carrier through the hatchway.

This discharge plate may be of any preferred construction, a typically simple form being that depicted in Figure 1, and a preferred construction being that illustrated in Figures 5, 7, 8, 9, 10, and 11.

The plate in its preferred form of application is pivoted with respect to the hatchway upon the descending side of the chains, by means of a pivot or hinge pin k , which supports it either in the horizontal position which it occupies when the hoist is in use, and which is represented in full lines in Figures 1, 7, 9, and 10, or in the vertical or depending position which it occupies when the hoist is not in use and the scuttle is in place within the hatchway as represented in dotted lines in Figure 1, and in full lines in Figure 8.

The pivot pin k is keyed upon the discharge plate and extended through boxings k^x in the hoist casing. At one of its projecting extremities it is fixedly provided with a hand lever k^2 by means of which it is rotated and the plate raised or lowered, and at the other extremity is conveniently provided with a locking arm k^3 rigidly keyed to it and at its outer end provided with a tubular bolt bearing k^4 through which a retaining bolt k^5 is adapted to be passed and entered within a threaded suitably formed bolt seat k^6 in the framework.

In order to equalize the locking of the pivot pin and avoid the possibility of torsion, the hand lever is also conveniently provided with

a tubular bolt bearing k^7 through which a retaining bolt k^8 is adapted to be passed and entered within a threaded bolt seat k^9 , also formed in the framework.

5 When the scuttle is removed and the discharge plate elevated into its operative position, both retaining bolts are inserted and screwed into their seats, and the pivot pin of the plate and the plate thereby securely
10 locked in position.

Obviously, the foregoing devices for securing the discharge plate in its horizontal position are simply devices of convenience and may be replaced by other contrivances operative to the same effect.

The upper surface of the discharge plate, as already mentioned and as will be understood by reference to Figure 10, is formed with two longitudinal parallel slots or openings k' , through which, in the travel of the
20 chains, the side members b' , Figures 5, 9, and 11, of the carrying plate b , pass.

The discharge plate is also at its outer top portion provided with a guard roller k^{10} upon
25 which the ammunition box, in the operation of the hoist, is deposited by the carrying plate, and over which it rolls as it is forced by said lifting plate laterally forward on to the main carrying surface of the discharge
30 plate and thence on to the delivery deck.

This roller is not essential but simply serves a useful purpose.

In Figure 3 I have illustrated the application to the throat portion n at the foot of the
35 hoist casing N , of a hinged deflecting and release plate P , as I term it, which,—being pivoted upon the hinge pin p and normally controlled by springs p^x to occupy the position represented in Figure 3,—is adapted to
40 normally serve as a directing or guide plate to cause the ammunition box to enter the throat portion n of the casing, should the box, in the movement of the ship, happen to lean or tilt off from the carrier;—and which
45 is, moreover, adapted, should the tilting out of the box occur to such an extent as to cause its upper end to encounter said plate, to yield or turn about its pivot and fold upward, so to speak,—an action which the yielding of
50 the springs render possible,—so as to permit of the passage of the box upward to the outside of the casing, and avoid the possibility of injury to either the casing or the carrier proper.

55 The form or special mode of application of this deflecting plate is not essential, but the arrangement represented in Figures 3 and 4 is a good one.

While I have represented the carrier as an
60 entirety at a slightly inclined position it is obvious that it would be operative in a vertical position or at a different angle from that represented.

Having thus described my invention, I
65 claim—

1. In an ammunition hoist for ships, the following elements in combination:—an end-

less carrier continuously operated in one direction and provided with carrying or hoisting plates fixedly applied to it and traveling
70 continuously with it;—means for actuating the carrier and its applied plates to continuous travel in one direction;—means located near the bottom of the carrier for supplying
75 to its upwardly-moving carrying plates articles to be hoisted;—a hatchway at the upper end of said carrier;—and a movable discharge plate applied to said hatchway and operating when maintained in its raised position to receive the articles elevated by the carrier;—
80 substantially as and for the purpose specified.

2. In an ammunition hoist for ships, the following elements in combination:—an endless carrier provided with carrying or hoisting
85 plates;—means for actuating the carrier;—means located near the bottom of the carrier for supplying to its carrying plates articles to be hoisted;—a hatchway at the upper end of said carrier;—a discharge plate applied to said hatchway and operating to receive the
90 articles elevated by the carrier;—and a baffle plate applied to said hatchway opposite to said discharge plate,—substantially as and for the purpose specified.

3. In an ammunition hoist for ships, the
95 following elements in combination:—an endless carrier provided with hoisting or carrying plates;—a casing for said carrier provided with a deflecting and release plate;—means for actuating the carrier;—means located
100 near the bottom of the carrier for supplying to its carrying plates articles to be hoisted;—a hatchway at the upper end of said carrier;—and a discharge plate applied to said hatchway and operating to receive the articles elevated
105 by the carrier;—substantially as and for the purpose specified.

4. In an ammunition hoist for ships, the following elements in combination:—an endless carrier provided with hoisting or carrying
110 plates;—a casing for said carrier provided with a deflecting and release plate;—means for actuating the carrier;—means located near the bottom of the carrier for supplying to its carrying plates articles to be hoisted;—
115 a hatchway at the upper end of said carrier;—a discharge plate applied to said hatchway and operating to receive the articles elevated by the carrier;—and a baffle plate applied to said hatchway opposite to said discharge
120 plate;—substantially as and for the purpose specified.

5. In an ammunition hoist for ships, the following elements in combination:—an endless carrier provided with carrying or hoisting
125 plates;—means for actuating the carrier;—a loading platform at the base of the carrier, which coöperates with the carrying or hoisting plates to supply them with articles to be hoisted;—a hatchway at the upper
130 end of said carrier;—a discharge plate applied to said hatchway upon the delivery side of the carrier, which operates to receive the articles lifted by the carrier;—and a baffle

plate applied to said hatchway opposite to said discharge plate;—substantially as set forth.

6. In an ammunition hoist for ships, the following elements in combination:—an endless chain carrier composed of a pair of parallel chains provided with transversely-extending carrying or hoisting plates;—means for actuating the carrier;—means located near the bottom of the carrier for supplying to its carrying plates articles to be hoisted;—a transversely-disposed guiding plate extending longitudinally of the carrier between its edges;—a hatchway at the upper end of said carrier;—and a discharge plate applied to said hatchway, forming a continuation of said guide plate, and operating to receive the articles lifted by the carrier;—substantially as and for the purpose specified.

7. In an ammunition hoist for ships, the following elements in combination:—an endless carrier provided with carrying or hoisting plates;—means for actuating the carrier;—means located near the bottom of the carrier for supplying to its carrying plates articles to be hoisted;—a hatchway at the upper end of said carrier;—a discharge plate applied to said hatchway which is adapted to be, at will, removed for the application of a scuttle to close the hatchway;—and a removable scuttle adapted to close said hatchway when the discharge plate is dropped;—substantially as and for the purpose specified.

8. In an ammunition hoist for ships, the following elements in combination:—an endless carrier provided with carrying or hoisting plates;—means for actuating the car-

rier;—means located near the bottom of the carrier for supplying to its carrying plates articles to be hoisted;—a hatchway at the upper end of said carrier;—a pivoted discharge plate applied to said hatchway which is adapted to be, at will, dropped for the application of a scuttle to close the hatchway;—means for maintaining the discharge plate in its elevated position;—and a removable scuttle adapted to close said hatchway when the discharge plate is dropped;—substantially as and for the purpose specified.

9. In an ammunition hoist for ships, the following elements in combination:—a pair of parallel counterpart endless chains constituting an endless carrier;—counterpart pairs of driving and driven chain wheels for supporting and driving said chains;—means for driving the chain wheels;—a hatchway at the upper end of the chain carrier;—a discharge plate applied to said hatchway;—and a transversely-disposed carrying or hoisting plate connected with corresponding opposite portions of said chains;—the arrangement being such that one of said plates embodies an opening and the other is provided with a bearing surface substantially corresponding in plan with said opening;—substantially as and for the purpose set forth.

In testimony that I claim the foregoing as my invention I have hereunto signed my name this 24th day of March, A. D. 1897.

WESLEY RHODES.

In presence of—

J. BONSALE TAYLOR,
F. NORMAN DIXON.