

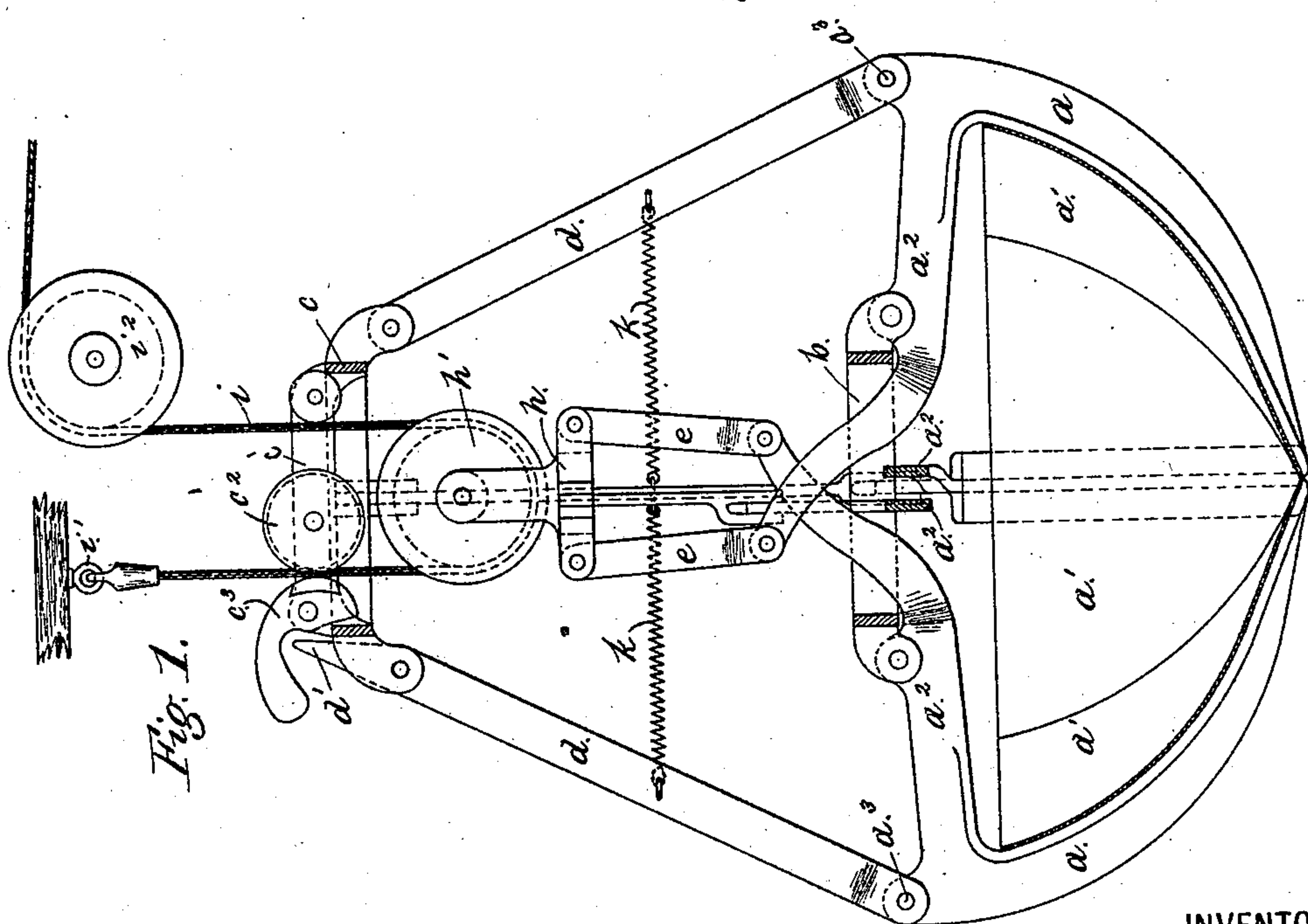
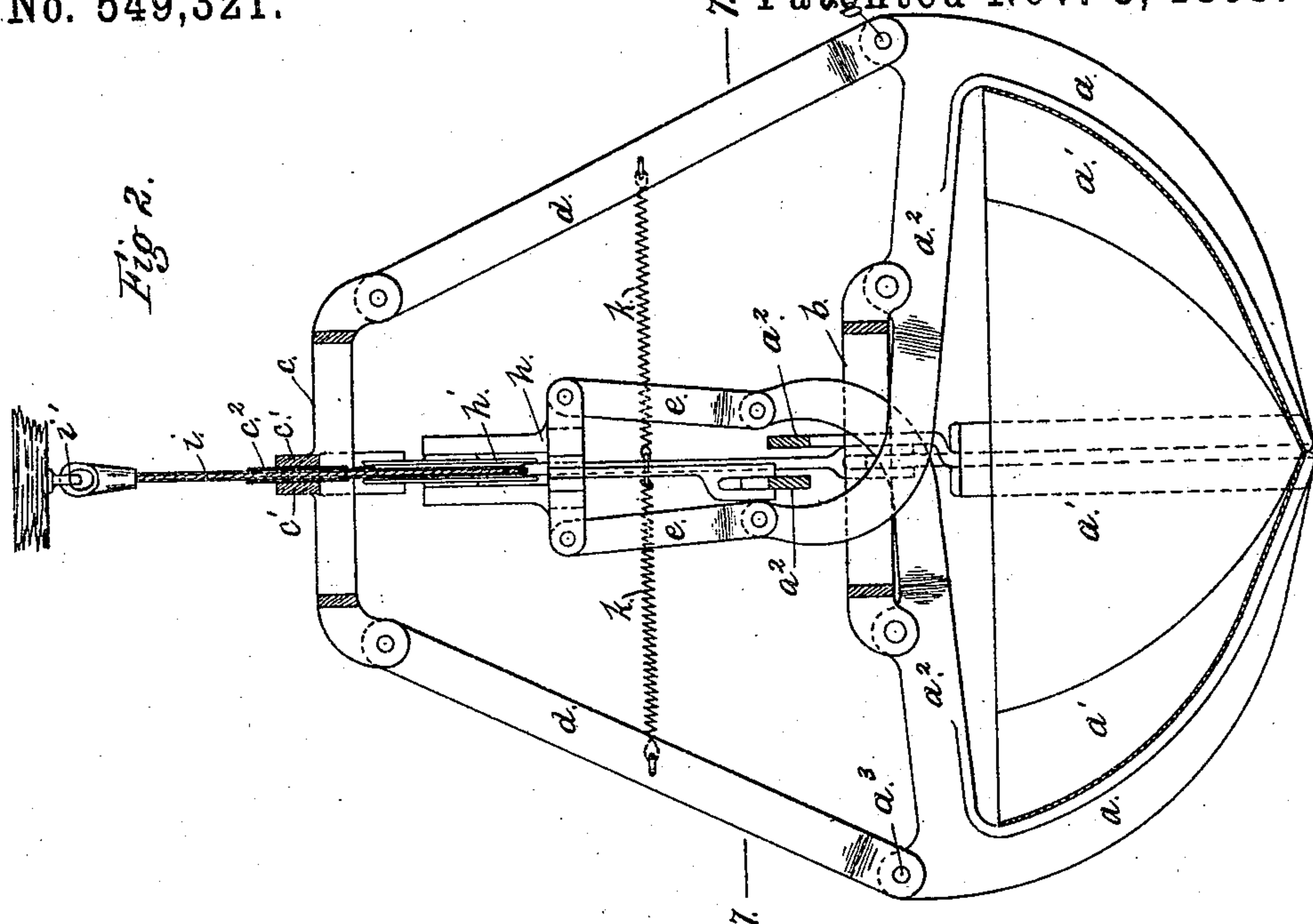
(No Model.)

3 Sheets—Sheet 1.

L. E. LAURENT.
GRAPPLING OR DREDGING MACHINE.

No. 549,321.

Patented Nov. 5, 1895.



WITNESSES:

A. L. Hayes
Fred W. Dunn

INVENTOR

Louis E. Laurent

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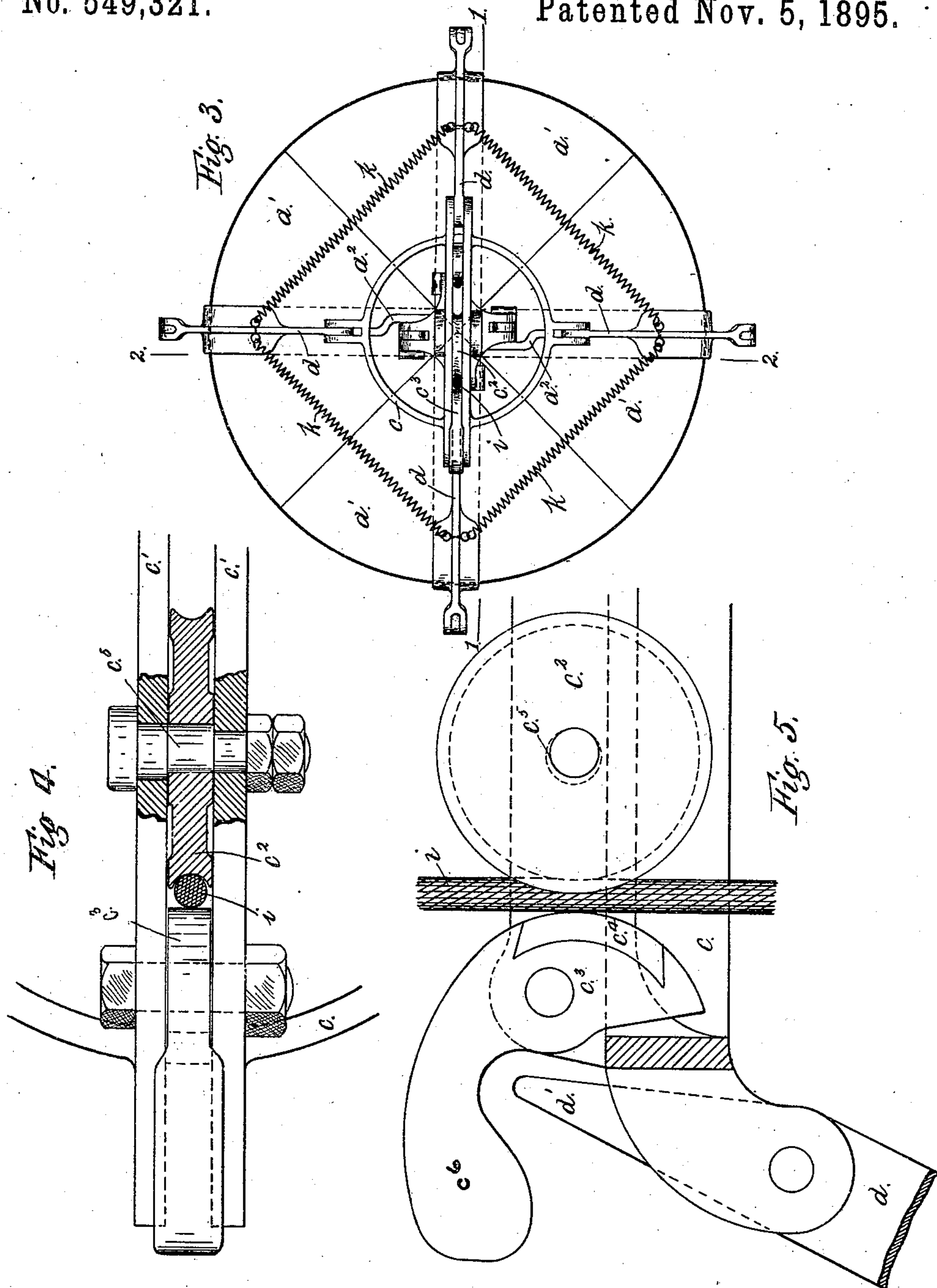
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(No Model.)

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Fig. 7.

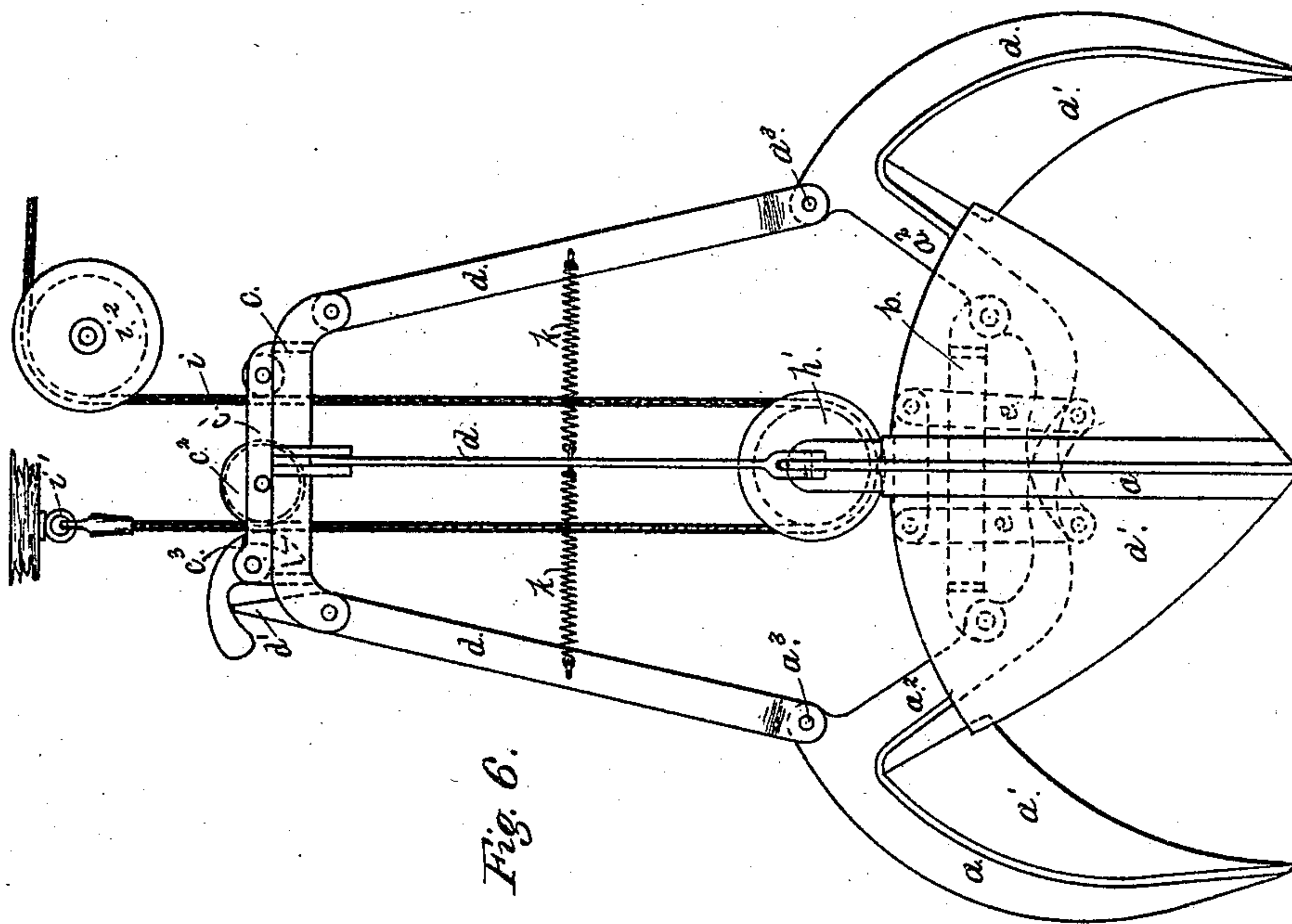
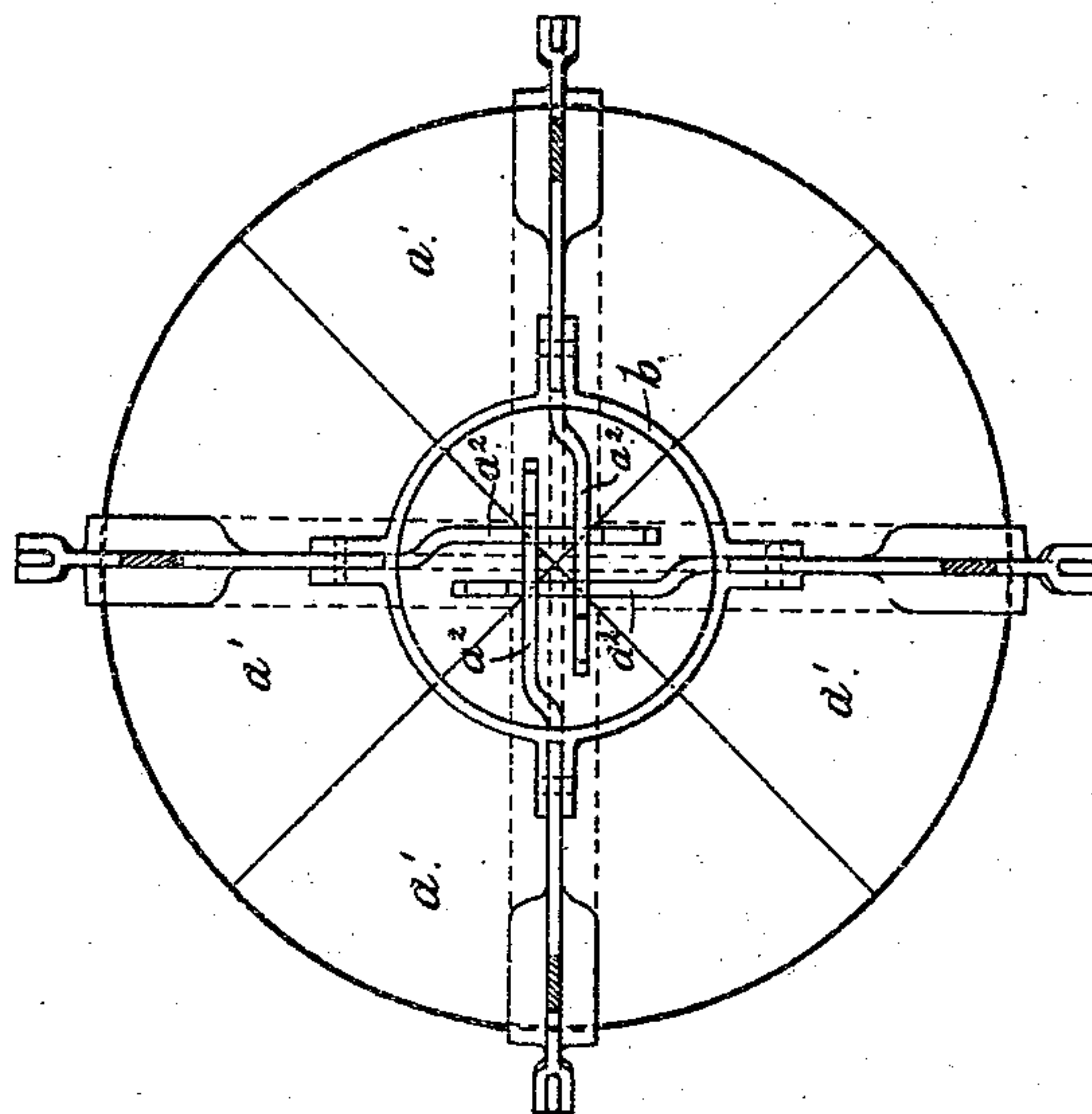


Fig. 6.

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UNITED STATES PATENT OFFICE.

LOUIS E. LAURENT, OF TRENTON, NEW JERSEY.

GRAPPLING OR DREDGING MACHINE.

SPECIFICATION forming part of Letters Patent No. 549,321, dated November 5, 1895.

Application filed March 19, 1895. Serial No. 542,305. (No model.)

To all whom it may concern:

Be it known that I, LOUIS E. LAURENT, a citizen of the United States, and a resident of Trenton, Mercer county, State of New Jersey, have invented new and useful Improvements in Grappling or Dredging Machines, of which the following description, taken in connection with the drawings herewith accompanying, is a specification.

My invention relates to that class of grappling devices or machines comprising suitable grappling-jaws which are supported and operated in a manner to be automatically opened when the device is lowered to receive the load, and closed when the device is raised, in the usual and well-known manner. It has been customary heretofore in devices of this class to employ two or more ropes, chains, or similar flexible connections to operate and control the movements of the device during the course of its several operations; and it has been the object of my present invention to simplify both the construction and the operation of such devices by adapting or constructing the same in a manner whereby they may be operated and controlled during its several required operations by the employment of a single rope or chain. This object I secure by means of the construction and combination of the several parts hereinafter set forth in detail and pointed out in the claims.

Referring to the accompanying drawings, Figure 1 represents a side elevation of my improved device in a closed position, taken in section through line 1 1 of Fig. 3, also showing the operating-rope and the connections on which it operates and is attached. Fig. 2 is a side elevation through line 2 2 of Fig. 3, being at right angles to the view shown in Fig. 1. Fig. 3 is a plan view of the device. Figs. 4 and 5 show an enlarged plan and side view, respectively, partly in section, of certain parts to be hereinafter referred to. Fig. 6 is a side elevation of the device shown in Fig. 1 with the jaws in an open position, and Fig. 7 is a plan view taken through line 7 7 of Fig. 2.

To explain in detail, a represent the arms or jaws to which, in the present instance shown, the scoop-blades a' are detachably se-

cured. These arms are each provided with an inwardly-projecting extension a^2 , which are pivotally supported at a point between their ends upon a circular frame or ring b , upon which the arms fulcrum when being operated, as will hereinafter be described.

The arms a are connected at their point of angle a^3 with a second ring or frame c , arranged immediately above the former ring b , through the medium of connecting-rods d , which are pivotally connected at their opposite ends to the said rings, as shown.

The inner ends of the extensions a^2 project upward and through the ring b and are pivotally connected, through the medium of links e , with a sheave block or frame h , which latter, when lowered or raised with relation to the upper ring c by means and in a manner to be described, causes the arms a^2 to operate on their fulcrum-support b and the blades a' to be either opened or closed. The inner ends of the extensions a^2 are so formed and arranged with relation to each other as to freely operate within the fulcrum-ring b .

The upper ring c is provided with two ribs c' , between which is supported a guide-sheave c^2 and a pivoted cam-lever c , the latter being pivoted or supported in such manner as to cause its working-face to be movably held toward the guide-sheave, as shown, in order to act upon the operating-rope which passes between the same in a manner as will be described. This cam-lever is provided with an arm c^6 , which extends over the end of one of the rods d in a position to be engaged by an extension or nose d' on the end of the latter during a certain movement of the same, whereby the cam is operated, as will be described.

The rope or chain represented at i , by which the device is operated or raised and lowered, is adapted, as shown in Fig. 1, to be attached at one end to a stationary support, as at i' , and pass between the guide-sheave c^2 and cam c^3 , under the sheave h' , and from thence up and over a stationary sheave i^2 to the engine or other means (not shown) employed for operating the device.

The operation of the device when arranged and constructed as above set forth is as follows: When the device is started in its

descent by paying out the rope over the sheave i^2 , the cam c^3 is caused to bind or jam the rope between it and the guide-sheave at such point, to lock or hold the ring c from further movement and thus allow the sheave h' and connecting parts, by reason of the continued paying out of the rope, to be lowered with relation to the retarded ring c and cause the jaws of the device or grapple to open, as shown in Fig. 6. As the jaws are being thus opened and the connecting-rods d thereby moved toward a vertical position, the extension or nose d' on one of said rods is caused to engage with the under side of the cam-lever c^3 , as shown in Fig. 6, and raise the same to release its hold upon the rope. The jaws now being opened and the device freed from its locked connection with the rope, and being otherwise in operative position for descending to take its load, said jaws are held in such open position and prevented from closing during the descent of the device partly by means of the friction produced on the rope by the guide-sheave and cam on the upper ring c , which said parts act as friction devices on the rope during the descent of the grapple, and partly by means of the springs k k , which connect the rods d at a point between their ends, and serve only as a supplemental means in addition to the friction device referred to for holding the jaws open, in order that the tension of the same may be readily overcome when the rope is drawn to close the jaws and raise the device. When the device has reached the point to receive its load, the operating-rope is drawn in the opposite direction, thereby raising the sheave h' and the connecting end of the jaw extensions a^2 , which movement of the latter, by reason of their hinged connection with the fulcrum-ring b , causes the jaws or scoop-blades to penetrate and close upon the substance to be received, the tension of the springs k being readily overcome during such operation. The jaws now being closed and filled the device is raised, the rope passing freely between the guide-sheave and cam during such upward movement. When the device has been raised to the desired point, the engine is reversed, as in the operation of lowering the same, and the cam thereby caused to jam the rope and thus allow the jaws to open and discharge its load.

Referring more particularly to Figs. 4 and 5, I have shown the cam-lever c^3 provided with a removable shoe c^4 , seated therein to form its working face, which is adapted and provided for the purpose of allowing for wear caused by the engaging-rope i . The guide-sheave c^2 is shown as mounted on an eccentric-bearing c^5 , which is also adapted for the purpose of adjusting said guide-sheave to allow for the wear occasioned by the engaging-rope i .

Having thus illustrated and described my invention as embodied in one practical form,

it will be obvious that the same may be modified more or less in the several details of construction or other parts or devices of somewhat-different form or construction but substantially the same in operation and function as those above set forth be employed without departing from the spirit of my invention.

What I claim, and desire to secure by Letters Patent of the United States, is—

1. A grappling device, comprising pivotally supported jaws, a ring or frame having connection with said jaws through the medium of suitable connections, an operating rope or its equivalent adapted to be attached at one end to a stationary support and having a loose or sliding connection with the inner ends or arms of said jaws, and a means or device supported by said ring or frame, constructed and operated to automatically lock with said operating rope whereby the jaws may be opened, and be automatically released from such locking engagement upon the opening of the jaws, substantially as described and for the purpose set forth.

2. A grappling device, comprising jaws, a ring or frame on which said jaws are hinged and fulcrumed, a second ring or frame connecting with said jaws through the medium of pivoted connecting rods, an operating rope or its equivalent having connection with means attached to the inner end of said jaws, and a device having connection with said second ring or collar, constructed to impinge said operating rope for the purpose set forth, and be automatically moved from such contact by one of said connecting rods, substantially as described.

3. A grappling device, comprising jaws, a ring or frame on which said jaws are hinged and fulcrumed, a second ring or frame connecting with said jaws through the medium of pivoted connecting rods, a sheave or pulley connecting with the inner arm of said jaws, an operating rope engaging with said sheave, a cam lever supported by said second ring for engaging with and clamping said operating rope, and springs for acting upon said connecting rods, substantially as described and for the purpose set forth.

4. A grappling device, comprising a fulcrum ring or frame, jaws hinged upon said ring and provided with arms extending and operating through the same, a sheave or pulley block connecting with said arms, a second ring having connection with said jaws through the medium of pivoted connecting rods, an operating rope, a friction device carried by said second ring, comprising a guide-sheave and a cam lever, and springs for acting in combination with said friction device, substantially as described and for the purpose set forth.

5. A grappling device, comprising jaws, a ring or frame on which said jaws are hinged and fulcrumed, a second ring having connec-

tion with said jaws through the medium of connecting rods, a device connecting with the inner arms of said jaws, an operating rope engaging with said device, and an automatically acting clamping or locking device supported on said second ring for engaging the operating rope, comprising a cam lever and a guide-sheave, the latter being supported on an eccentric bearing, substantially as described and for the purpose set forth.

LOUIS E. LAURENT.

Witnesses:

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JOHN C. DISBROW.