

No. 665,683.

Patented Jan. 8, 1901.

O. HETLESAETER.  
CRANE.

(Application filed Feb. 8, 1900.)

(No Model.)

3 Sheets—Sheet 1.

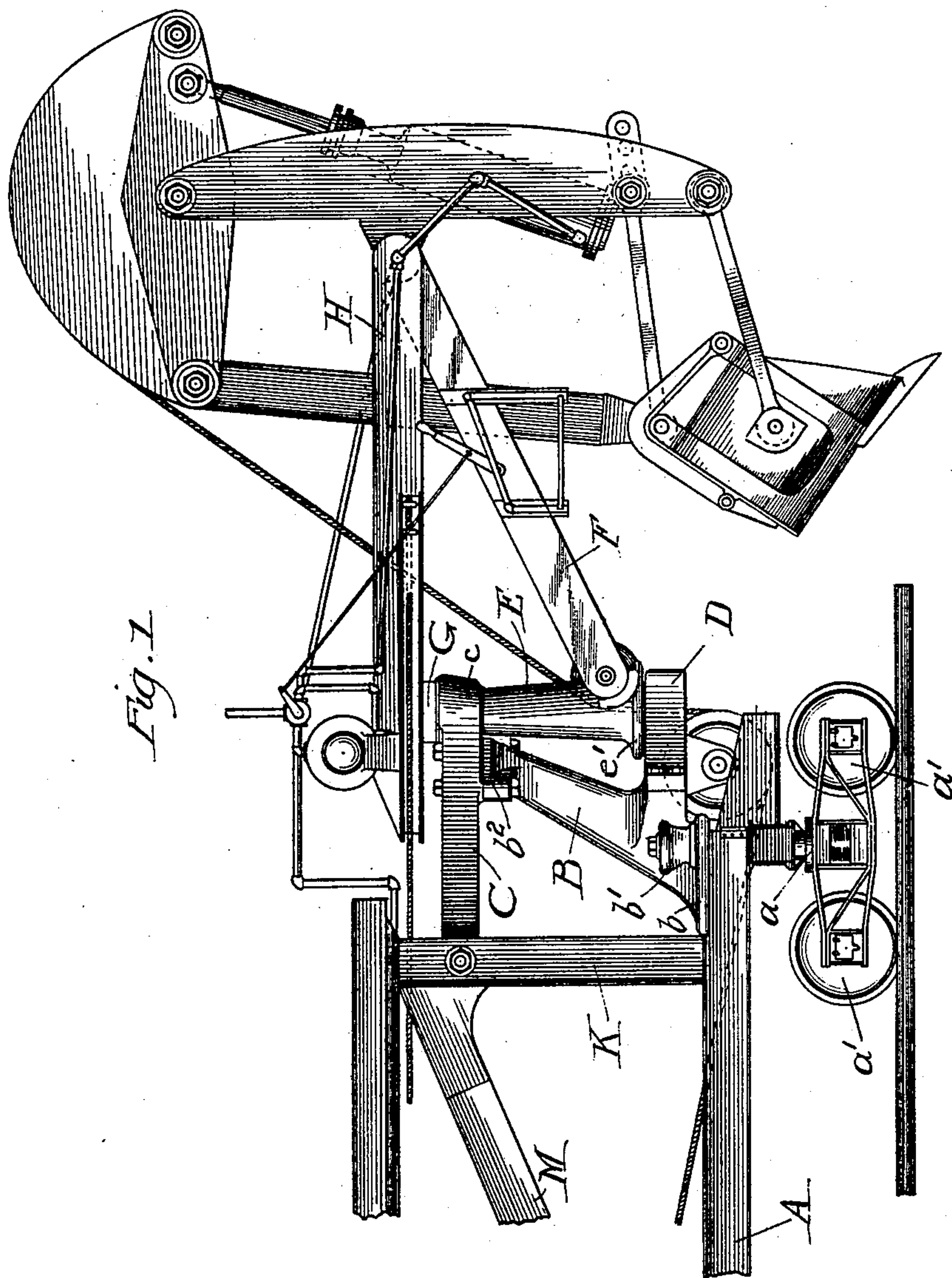


Fig. 1

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Fig. 5.

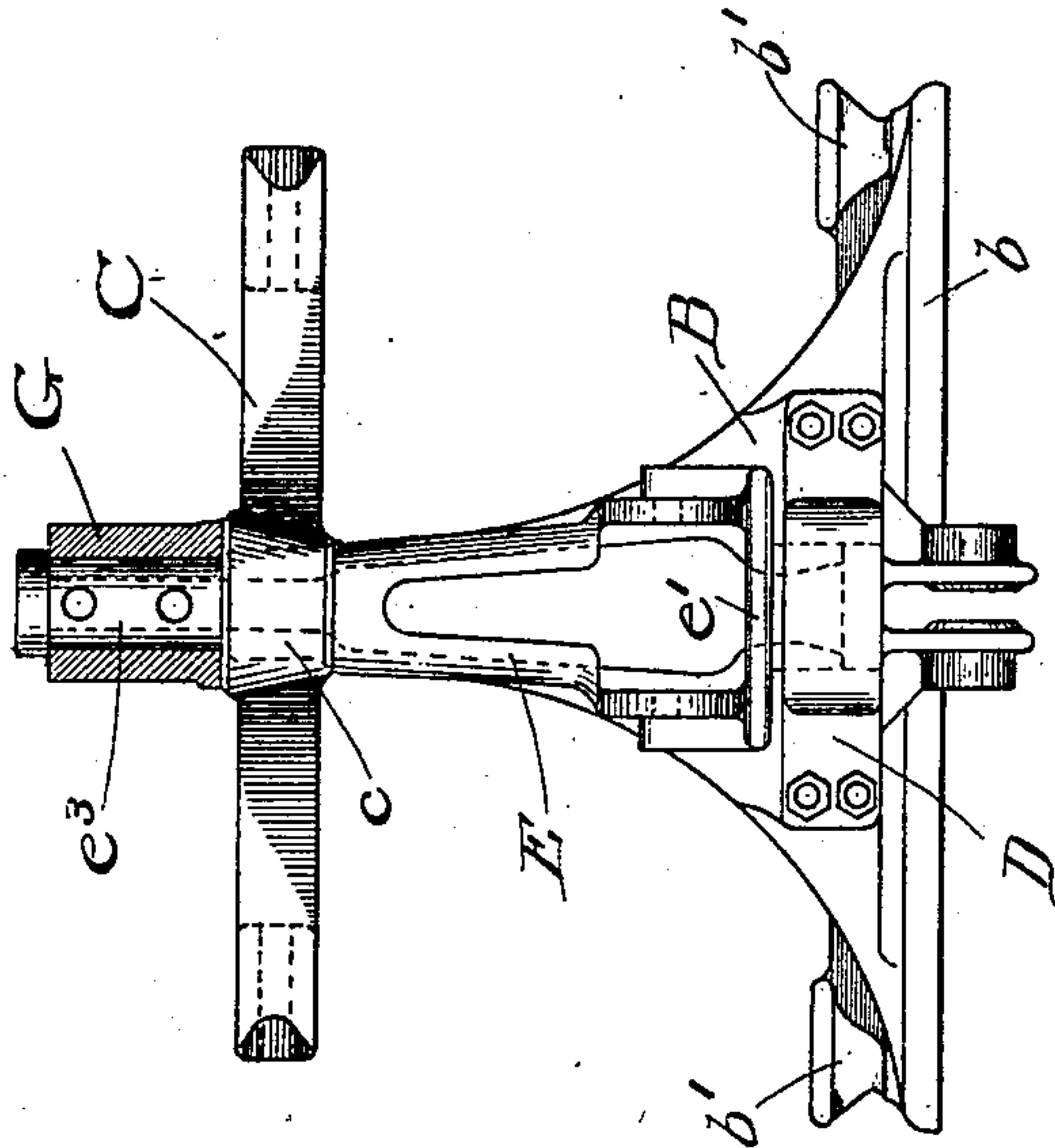
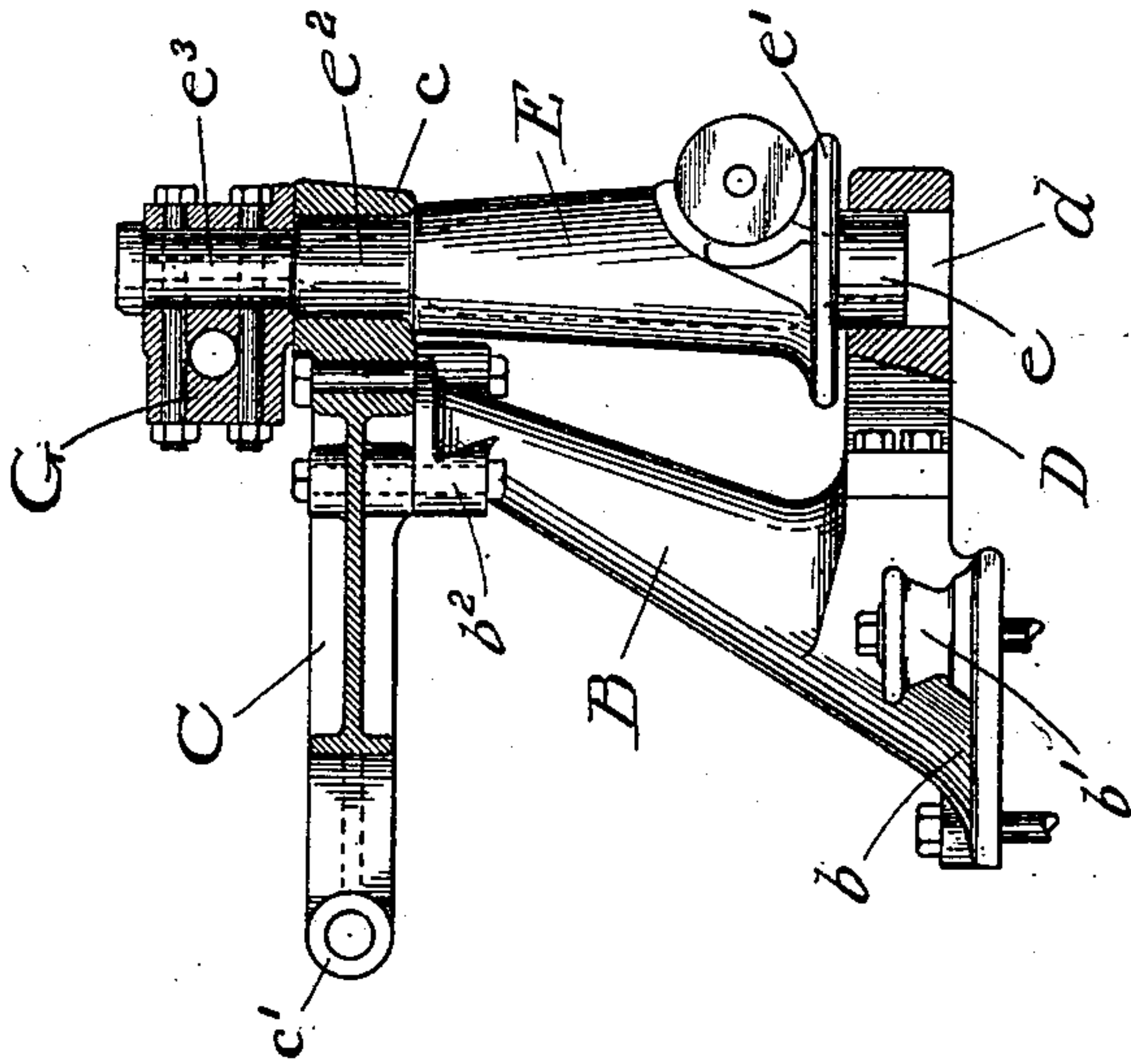


Fig. 2.



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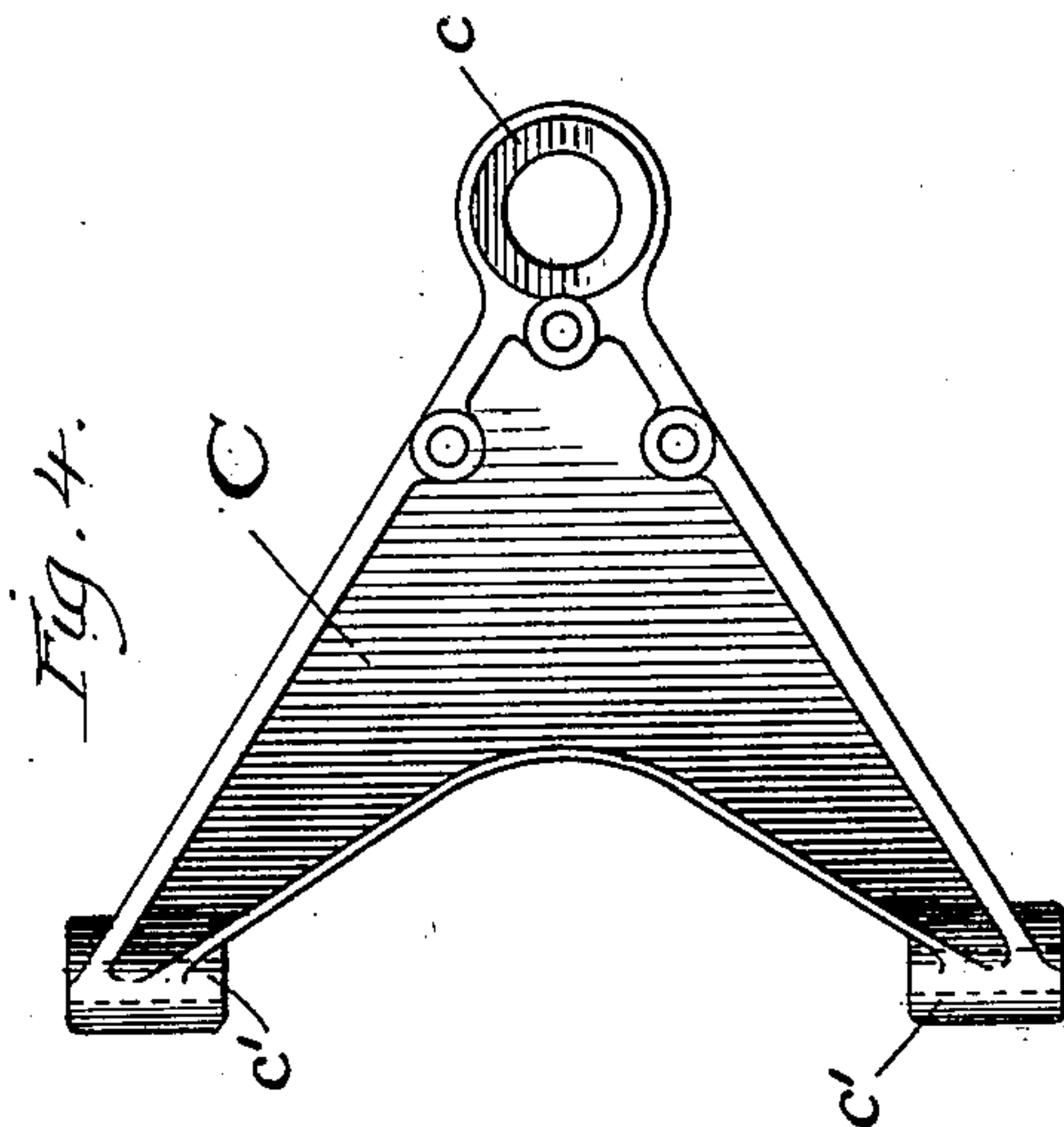
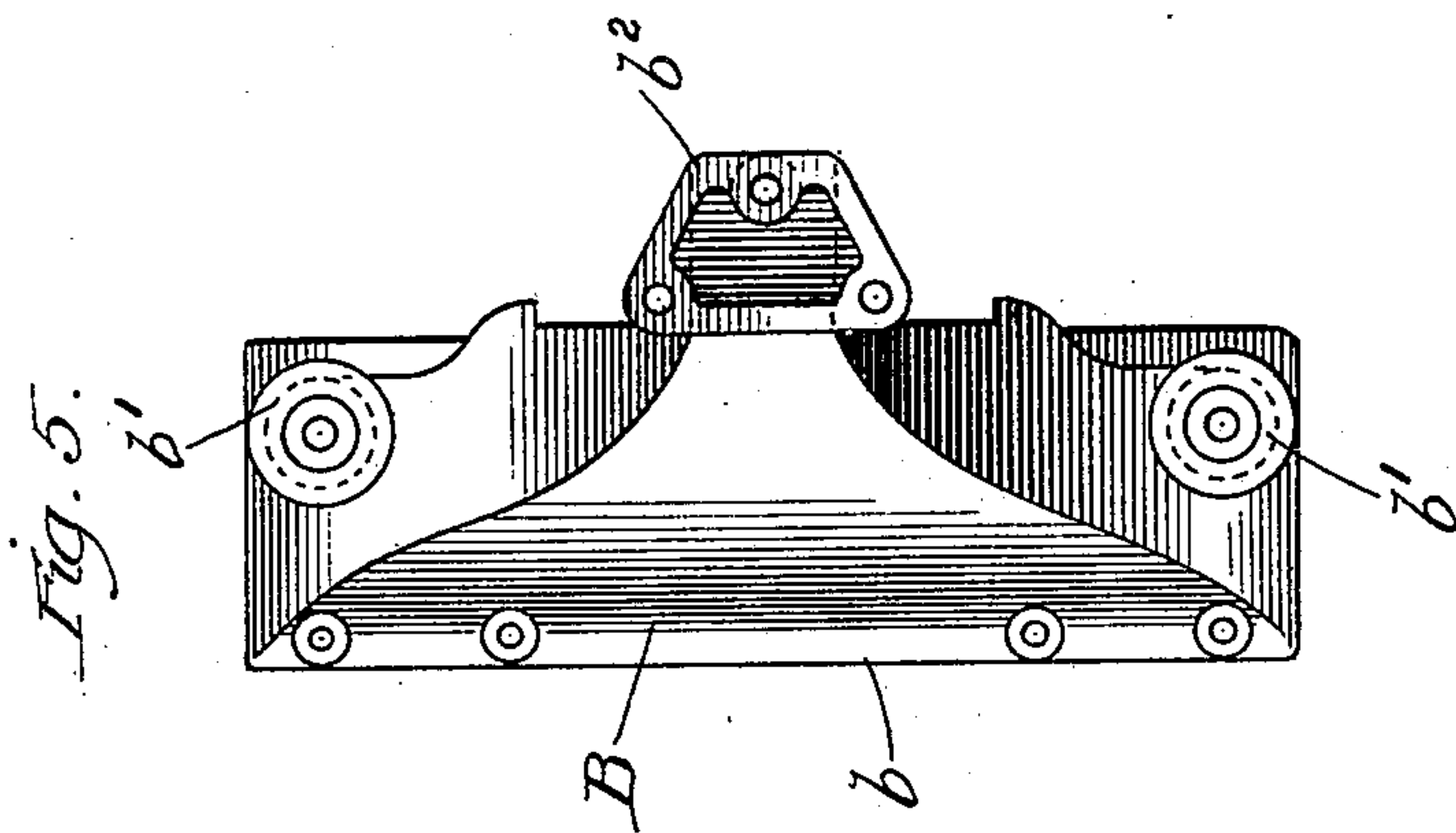
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# UNITED STATES PATENT OFFICE.

OLAF HETLESAETER, OF CHICAGO, ILLINOIS.

## CRANE.

SPECIFICATION forming part of Letters Patent No. 665,683, dated January 8, 1901.

Application filed February 8, 1900. Serial No. 4,506. (No model.)

*To all whom it may concern:*

Be it known that I, OLAF HETLESAETER, a citizen of the United States, residing in the city of Chicago, county of Cook, and State of Illinois, have invented a new and useful Improvement in Cranes, of which the following is a specification.

My invention relates to cranes, especially of the portable type, such as are employed as railway-excavators, wrecking-machines, and the like.

The objects of my invention are, first, to provide a crane-support wherein the vertical axis of the mast or pivot is projected and lies beyond the point where the weight of the crane is borne by the car or other supporting structure; second, to provide a construction whereby the use of A-frames and similar stays rising to a considerable height above the car-platform is obviated, and, third, to provide the other details hereinafter set forth. I attain these objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a side view of a crane embodying my invention and adapted to support a cable-operated linkwork excavator of the type shown and described in my application for Letters Patent filed October 2, 1899, Serial No. 732, 332. Fig. 2 is a view in side elevation, partly in section, of the mast, mast-frame, back guy, and the top frame, whereby the jib-stay is secured to the mast. Fig. 3 is a view in front elevation of the mast, mast-frame, and back guy and shows also the top frame in section. Fig. 4 is a plan view of the back guy. Fig. 5 is a plan view of the mast-frame.

Similar letters refer to similar parts throughout the several views.

The crane is here shown mounted upon a railway-car, wherein the platform A is supported by the bolster *a*, carried upon the truck *a'*. Said bolster carries substantially the entire weight of the crane and the supports thereof, and in order to minimize bending strains in said platform and also to do away with all unnecessary parts which might interfere with the operation of the hoisting or excavating mechanism said bolster is placed under the forward extremity of said platform A.

The mast-frame B is mounted upon the platform A at the forward extremity thereof and is securely bolted in place. Said frame is preferably a steel casting and has a broad base *b*, provided at the lateral extremities thereof with the lugs *b' b'*. Said lugs consist, preferably, of knobs or raised portions forming an integral part of said frame and are adapted to receive and retain abutting extremities of a beam, shore, jack-arm, or other type of brace, (not shown,) whereby said frame and the car or other supporting structure may be laterally braced and be prevented from overturning during the operation of the machine. From said base *b* said mast-frame extends forward and obliquely upward, tapering off as it ascends and presenting an outline of bold and sweeping curves when viewed from the front or rear. The cap *b<sup>2</sup>*, which constitutes the upper extremity of said frame B, affords a bearing for the forward portion of the back guy C and is so formed that said back guy may be bolted thereto. The foot D is secured to and projects in a forward direction from the lower portion of said frame B. Near the forward extremity of said foot is the cylindrical aperture *d*, which receives the pintle *e* of the mast E in such a manner as to brace the lower extremity of said mast and permit the same to rotate upon its axis. Said mast E is columnar in form and has at its lower extremity the pintle *e* above mentioned. The base or flange *e'* is formed on said mast E immediately above the said pintle *e* and serves to prevent dust and other foreign matter from gaining access to the bearing of said pintle. The lower forward portion of said mast is adapted to receive and retain the abutting lower extremity of the jib F of the crane. At the upper portion of said mast is a cylindrical part *e<sup>2</sup>*, which is inclosed within the collar *c* of the back guy C, so as to rotate therein. Above said cylindrical part *e<sup>2</sup>* and near the upper extremity of the mast E is formed the part *e<sup>3</sup>*, preferably cylindrical also and of a diameter smaller than the diameter of the said part *e<sup>2</sup>*. The top frame G is bolted to said part *e<sup>3</sup>* of said mast, so as to be rigid and immovable thereon and rotate therewith. Said top frame has a bearing upon the upper surface of the collar *c* of the back guy C and forms the anchor



or rear attachment for the jib-stay H of the crane. Said jib F and jib-stay H are fastened together at their forward extremities, and said jib and stay therefor swing in a horizontal plane simultaneously with the mast E and top frame G.

The back guy C extends substantially horizontally, is approximately triangular in outline, and consists, preferably, of cast steel. At its forward extremity is the collar *c* above mentioned, which is cylindrically apertured to receive the part *e*<sup>2</sup> of the mast E. Immediately behind said collar *c* said guy rests upon the cap *b*<sup>2</sup> of the mast-frame B and is securely bolted thereto. The apertured lugs *c'* *c'* are formed at the rear lateral extremities of said guy C and afford means whereby said guy may be bolted to the stanchions K upon the platform A. As the back guy C is fixed at its rear extremity and also at a point lying between its forward and rear extremities and as the top frame G and mast E are supported at the forward extremity of said guy, said guy constitutes a cantaliver and is under bending strain at the said mast-frame B. By this construction the mast, which forms the axis about which the crane swings, is thrown forward beyond all the other parts of the crane-supports and beyond all parts of the structure whereon the mechanism is mounted. This is an important advantage, especially in grading-machines, for the excavator-bucket is enabled to work almost directly beneath the axis of the crane without interference with any portions of the car-platform or upper works. The mast E is of such length that the base *e'* thereof is raised from the foot D sufficiently to relieve said foot from any vertical pressure. The weight of said mast and its adjuncts is therefore borne by the top frame G, bearing upon the collar *c* of the back guy C, and said mast is suspended from said frame. The point of suspension being thus near the mast-frame B the weight of said mast is transmitted almost directly onto said frame. As the foot D receives no weight, but merely the horizontal thrust of the pintle *e*, said foot is lightly constructed, and consequently occupies no great space at the forward lower portion of the mechanism. The stanchions K above mentioned are columns mounted upon the platform A at the lateral extremities of said back guy C and are braced by means of the tension-bars M. Said bars M are secured to a rear portion of the structure whereon the mechanism is mounted.

In operation the weight of the load acts upon the crane in such a manner as to put the jib F under a compressive and the jib-stay H under a tensional strain. The thrust of said jib F is transmitted to the platform A through the mast E, foot D, and mast-frame B. The strain of the jib-stay H is transmitted through the top frame G, mast E, and back guy C to the stanchions K and bars M. The lateral bracing of the mast E is effected by means of the mast-frame B and back guy

C. The foot D so braces the pintle *e* that the mast E is prevented from becoming cramped or bound within the collar *c* of the back guy. 70

By my construction the great height usually required in this class of machines to give the necessary strength and rigidity to the pivoted mast is obviated. Moreover, the strains are to a great extent carried to a point far to the rear on the supporting structure, thus leaving the space at the front of the platform free, which is an important consideration, especially in machines employed as railway wrecking-cars and graders. 80

An advantageous feature of my device lies in the fact that the broad base *b* of the mast-frame B forms a reinforcing member for strengthening the forward part of the car or other supporting structure, and, moreover, as the lugs *b'* *b'* constitute an integral part of said frame the whole structure is rigidly braced when said lugs are suitably supported. On account of the broad base of said frame B no separate lateral braces are required. 90

What I claim as new, and desire to secure by Letters Patent, is—

1. A metallic frame having a spreading base and an upwardly-projecting stem forming a support for the supporting-bearing of the mast of a crane, said frame having also near its lower portion a forwardly-projecting foot forming a lateral brace for the lower part of said mast. 95

2. A metallic frame having a spreading base and an upwardly-projecting stem forming a support for the supporting-bearing of the mast of a crane, said frame having also near its lower portion a forwardly-projecting foot forming a lateral brace for the lower part of said mast; in combination with a mast suspended in said bearing. 100

3. In a crane, the combination of laterally-swinging parts forming the crane-arm; a mast pivotally suspended and carrying said swinging parts; a back guy wherein said mast is suspended; a mast-frame whereon said back guy bears, said frame having means for laterally bracing the lower extremity of said mast; and means for bracing said back guy. 110

4. In a crane, the combination of a swinging crane-arm, a mast for supporting said frame, a back guy for bracing said mast, a mast-frame supporting said back guy and adapted to be mounted upon the forward extremity of a supporting structure, a foot extending in a forward direction from said mast-frame for laterally bracing the lower extremity of said mast, and braces for said back guy. 115

5. In a crane, the combination of a mast, a mast-frame whereby said mast is supported at a point beyond the structure whereon said frame is mounted, and lugs upon said frame whereby the crane may be laterally braced. 120

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Witnesses:

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