No. 667,866. Patented Feb. 12, 1901.

A. CALLESON.

DRAWING PRESS.

(Application filed Mar. 28, 1900.)

(No Model.) 3 Sheets—Sheet 1.

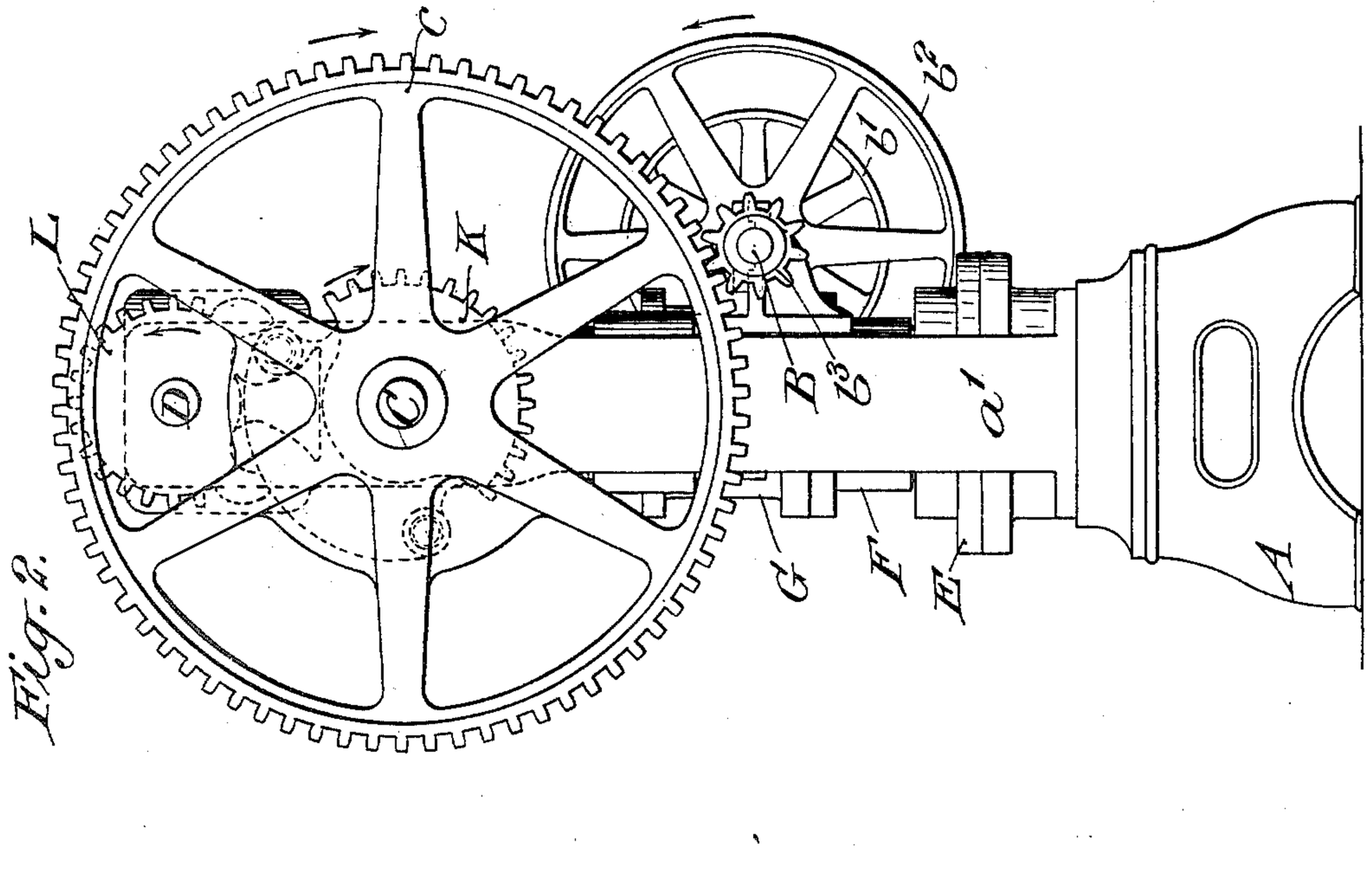

Fig. 2.

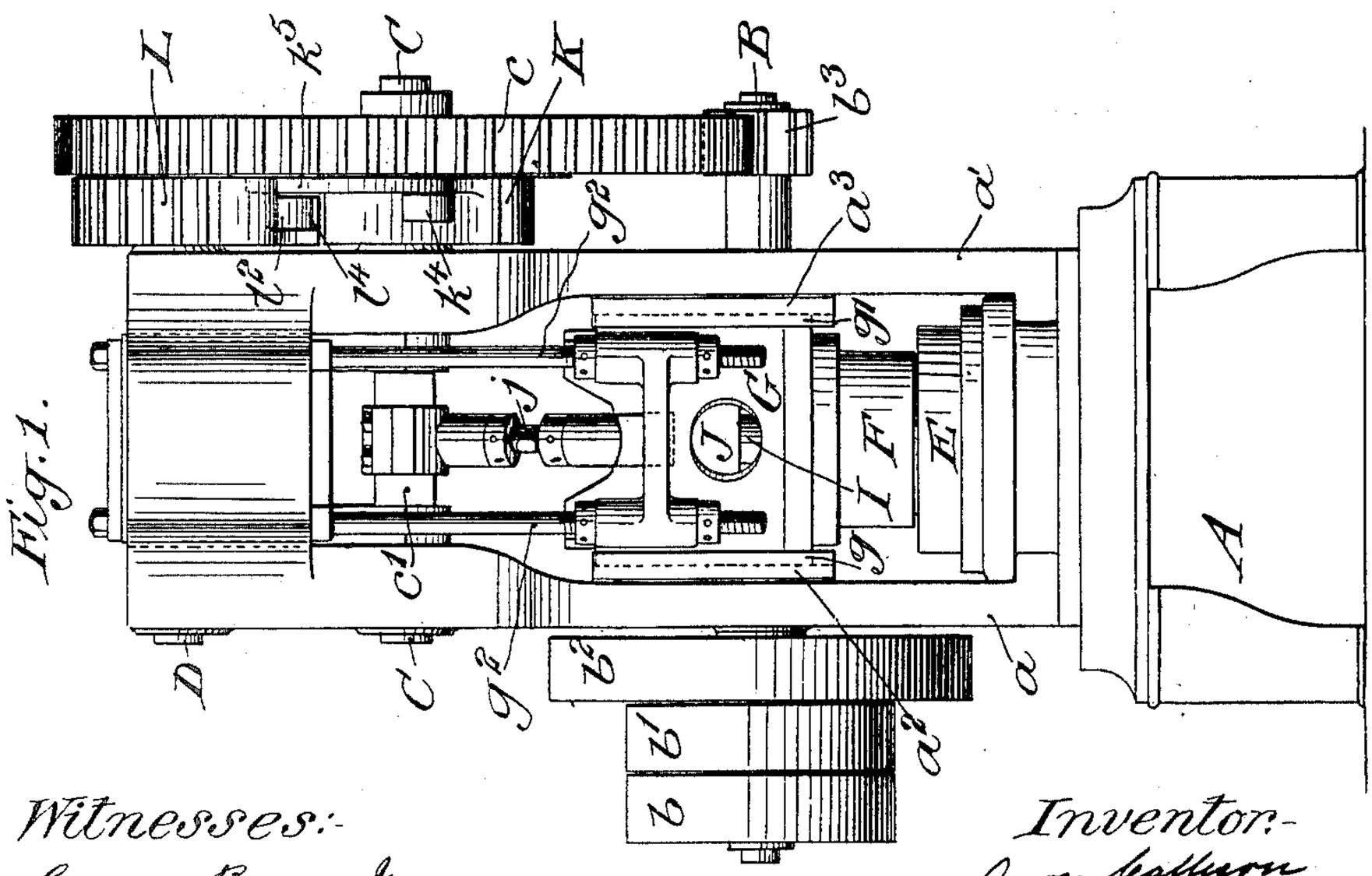

Fig. 1.

Witnesses:-
George Barry Jr.
Edward Vieser

Inventor:-
Anna Calleson
by attorneys
Bonnell & Brand

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A. CALLESON.

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(No Model.) 3 Sheets—Sheet 2.

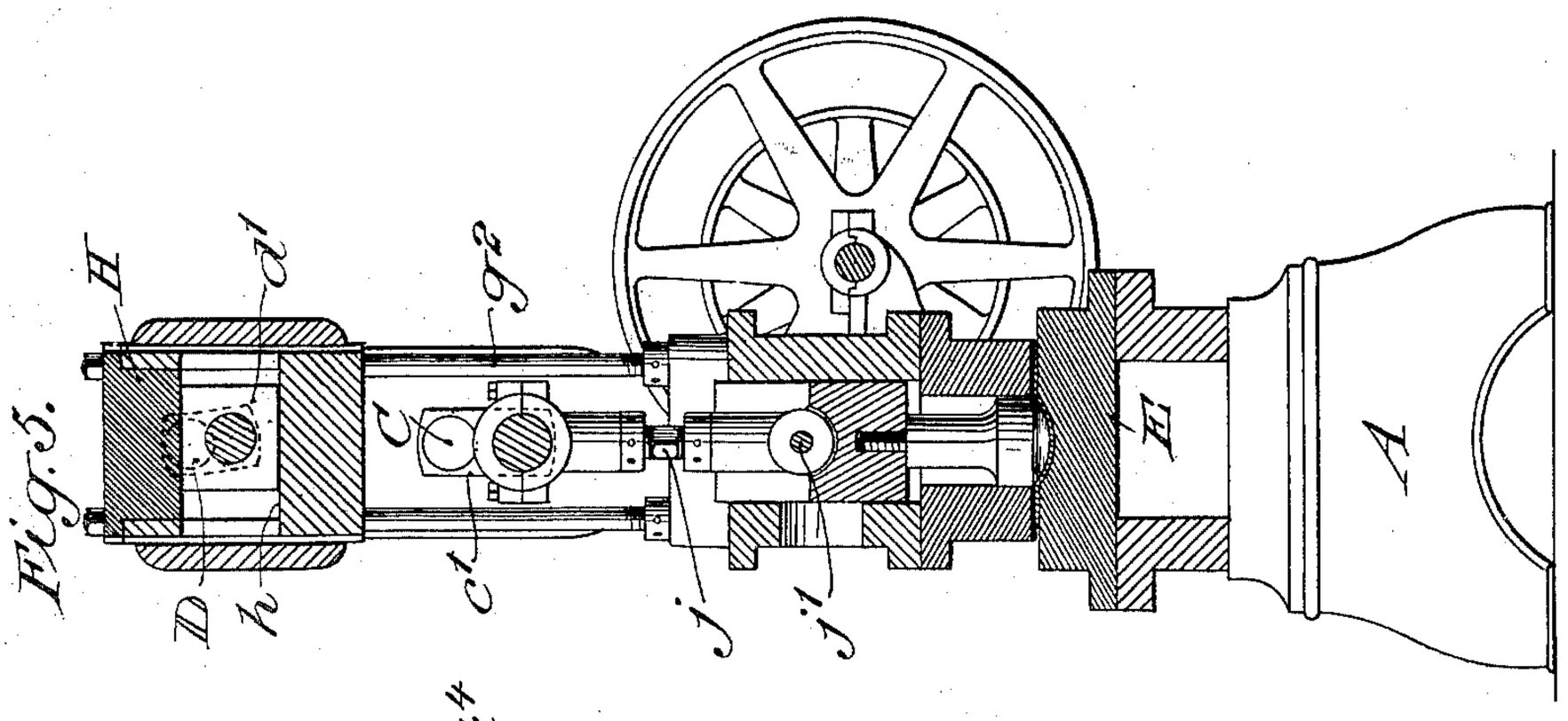

Fig. 5.

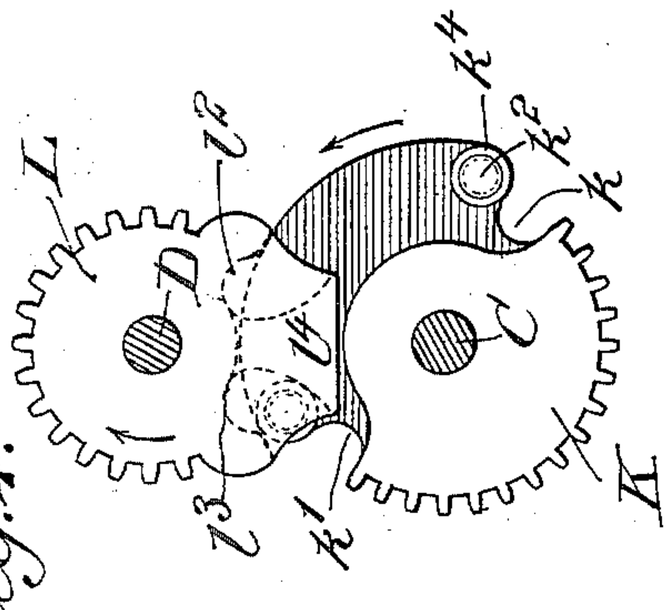

Fig. 4.

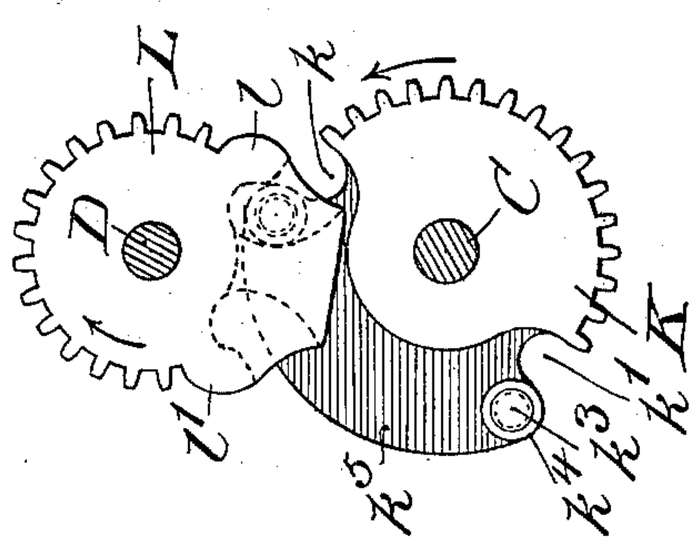

Fig. 6.

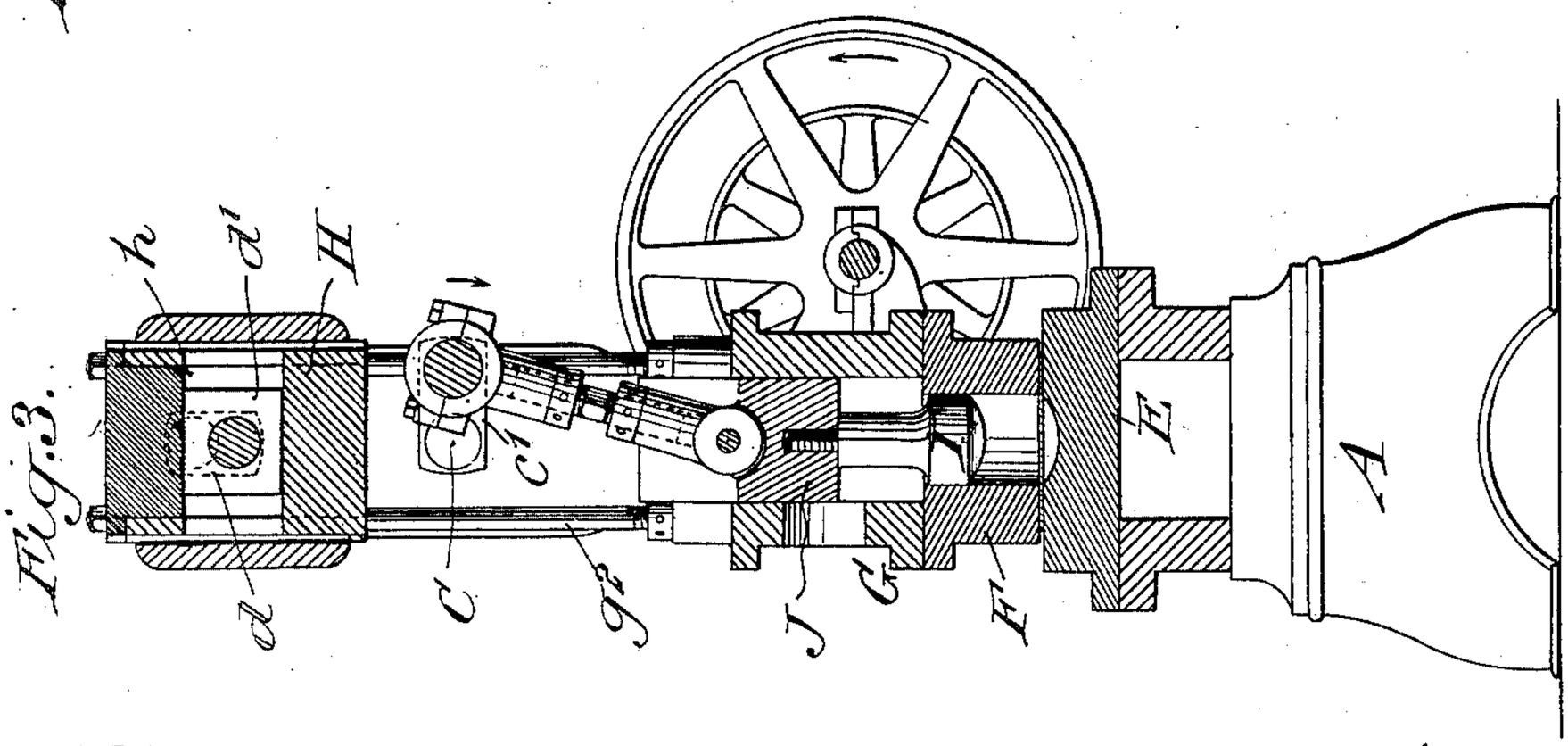

Fig. 3.

Witnesses:-
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No. 667,866. Patented Feb. 12, 1901.

A. CALLESON.

DRAWING PRESS.

(Application filed Mar. 28, 1900.)

(No Model.) 3 Sheets—Sheet 3.

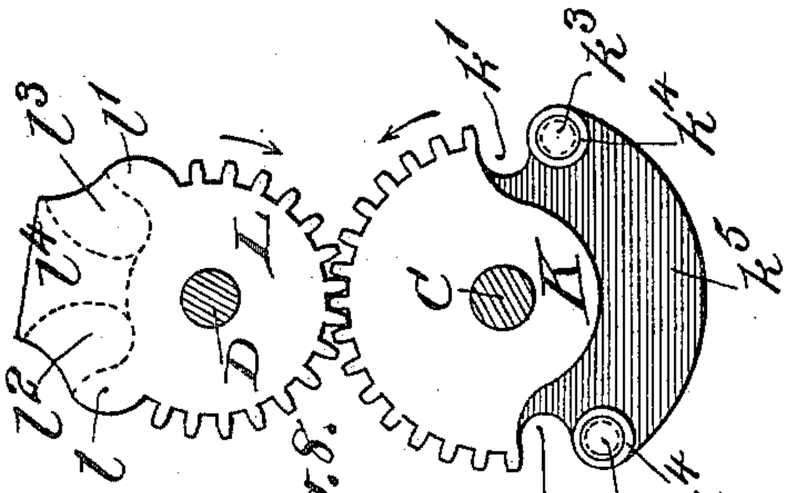

Fig. 8.

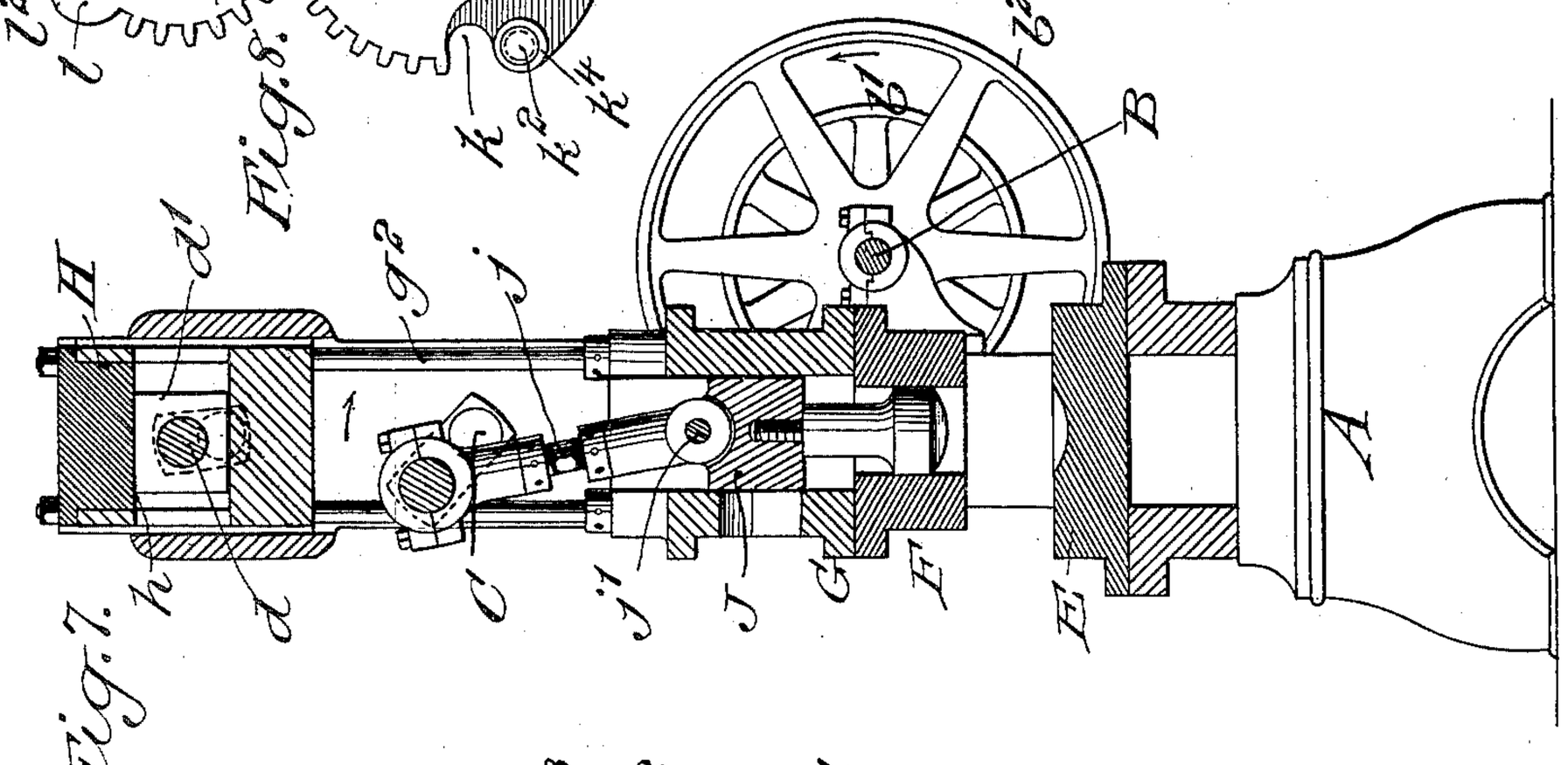

Fig. 7.

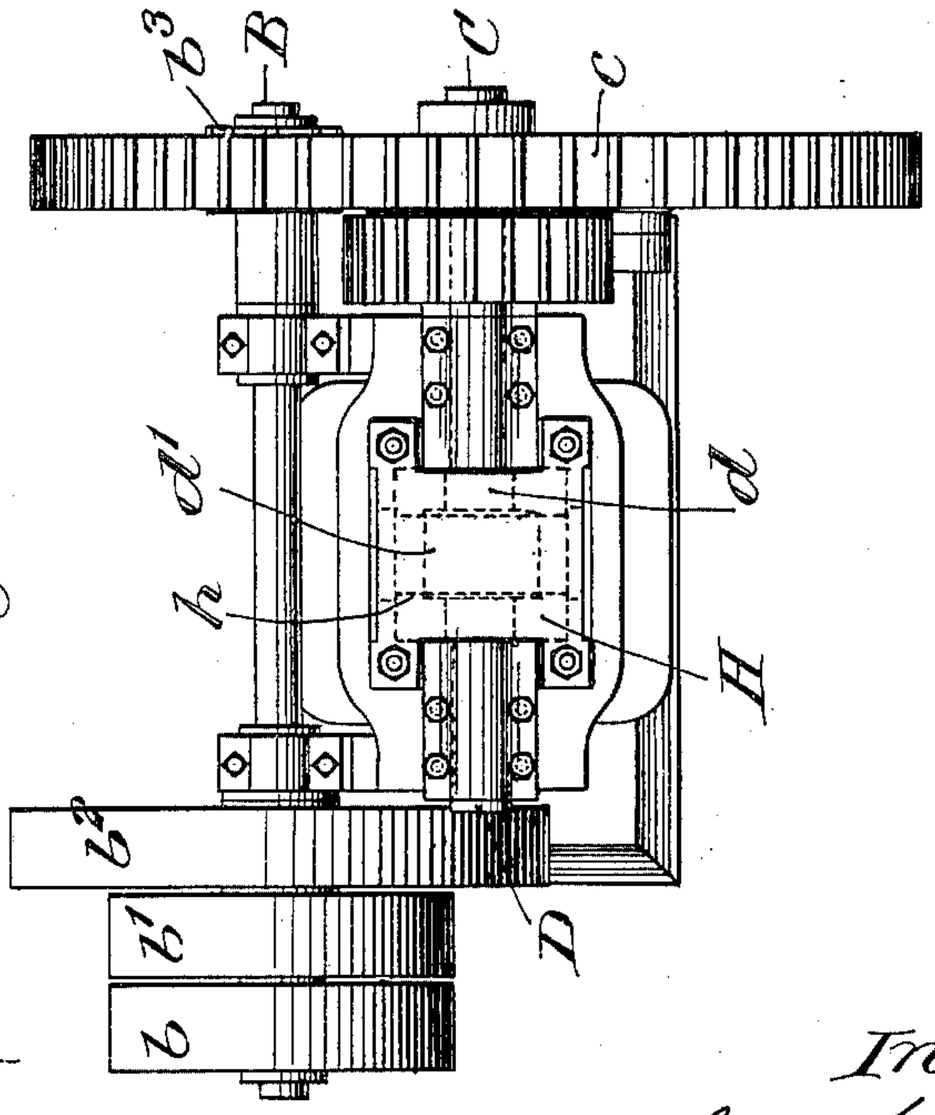

Fig. 9.

Witnesses:-
George Barry Jr
Edward Viesel

Inventor:-
Amos Calleson
by attorneys
Brown & Seward

UNITED STATES PATENT OFFICE.

AMOS CALLESON, OF NEW YORK, N. Y.

DRAWING-PRESS.

SPECIFICATION forming part of Letters Patent No. 667,866, dated February 12, 1901.

Application filed March 28, 1900. Serial No. 10,473. (No model.)

To all whom it may concern:

Be it known that I, AMOS CALLESON, a citizen of the United States, and a resident of the borough of Brooklyn, in the city and State of New York, have invented new and useful Improvements in Drawing-Presses, of which the following is a specification.

My invention relates to certain improvements in drawing-presses, with the objects in view of providing a powerful drawing or stamping press which will be very simple, the number of working parts being very few and direct in action, and in which the continuous rotary movement of the plunger-operating shaft imparts an intermittent rotary movement to the blank-holder-operating shaft with a minimum strain to the several operating parts.

A further object is to provide a drawing-press of the above character in which the connection between the plunger-operating shaft and blank-holder-operating shaft is located at the same side of the machine as the main drive-gear, thereby leaving the other side of the machine free for the extra attachments so often utilized with machines of this character.

A still further object is to provide a new and improved connection between the blank-holder and the blank-holder-operating shaft.

A practical embodiment of my invention is represented in the accompanying drawings, in which—

Figure 1 is a front view of the machine, the blank-holder being shown in its lowered position for clamping the blank to the die, the plunger being shown half-way between its raised and lowered position. Fig. 2 is a view in elevation of the side of the machine which carries the driving connection between the main drive-shaft and the plunger-operating shaft and the connection between the plunger-operating shaft and blank-holder-operating shaft. Fig. 3 is a vertical central section from front to rear with the parts in the positions in which they are represented in Figs. 1 and 2. Fig. 4 is a detail view in reverse of the geared connection between the plunger-operating shaft and blank-holder-operating shaft, showing the relative positions of the two gears when the plunger and blank-holder are in the positions in which they are represented in Fig. 3. Fig. 5 is a sectional view similar to Fig. 3, showing the plunger depressed for shaping the blank. Fig. 6 is a detail view in reverse of the geared connection between the plunger-operating shaft and the blank-holder-operating shaft, showing the relative positions of the two gears when the plunger and blank-holder are in the positions shown in Fig. 5. Fig. 7 is a sectional view similar to Fig. 3, showing the plunger and the blank-holder released. Fig. 8 is is a detail view in reverse of the geared connection between the plunger-operating shaft and the blank-holder-operating shaft, showing the relative positions of the two gears with respect to each other when the plunger and blank-holder are in the positions shown in Fig. 7; and Fig. 9 is a top plan view of the machine.

The base A of the press and the side frames *a a'* may be made of any suitable shape and size to suit different requirements. The main drive-shaft is denoted by B, and it is suitably mounted in the side frames *a a'* at the rear of the machine.

The drive-shaft B may be driven from any source of power (not shown) either by gearing or by belt. In the present instance I have shown the shaft as being provided at one side of the machine with fast and loose pulleys *b b'* and a balance-wheel b^2.

A rotary crank-shaft C is mounted in the side frames *a a'* of the machine, which crank-shaft has fixed thereto a large gear-wheel *c*, which meshes with a pinion b^3 on the end of the drive-shaft B opposite to the end which carries the drive-pulley *b* and the balance-wheel b^2.

A short distance above the rotary crank-shaft C, I mount a second or auxiliary rotary crank-shaft D, which is geared directly to the crank-shaft C in such a manner that the continuous rotary movement of the crank-shaft C in either direction will impart an intermittent rotary movement to the crank-shaft D in the reverse direction, which geared connection will be hereinafter more particularly described.

A die E, bearing any desired impression, is mounted upon the base A of the machine, between the side frames *a a'*, which die is adapted to receive thereon a blank of sheet metal

or other material of the required size upon which it is intended to operate.

A blank-holder F is mounted to reciprocate vertically toward and away from the die E for clamping the blank thereto and releasing it therefrom, which blank-holder in the present instance is firmly secured to a lower slide G, which is provided with feathers g g' along its opposite sides, which are adapted to travel within guides a^2 a^3, carried by the side frames a a'. This lower slide G is connected by four spacing-rods g^2 with an upper slide H, which is mounted to reciprocate vertically in the top of the machine. This upper slide H embraces the crank d of the upper crank-shaft D, and a reciprocating movement is imparted to the said slide by providing the crank d with a horizontally-sliding block d', which is adapted to travel forwardly and rearwardly within a suitable groove h in the slide H as the shaft D is rotated. The reciprocating movement of the slide H is imparted through the spacing-rods g^2 to the lower slide G, and thus to the blank-holder F, carried thereby.

The plunger or movable member of the die is denoted by I, and it is secured to a vertically-reciprocating slide J, fitted to reciprocate vertically within the lower slide G of the blank-holder. This slide J is connected to the crank c' of the crank-shaft C by an adjustable connecting-rod j, which is hinged at j' to the slide J and is suitably secured at its other end to the said crank c'.

The mutilated geared connection between the plunger-operating shaft and blank-holder-operating shaft is as follows: A mutilated gear K is fixed to the shaft C, in the present instance between the gear-wheel c and the side frame a'. A mutilated gear L is fixed to the shaft D at a point above the gear K. The gear K is provided with teeth for about one-half of its circumference, and beyond the last tooth on each side of the gear I provide recesses k k' and just beyond the recesses a pair of studs k^2 k^3, preferably provided with anti-friction rollers k^4 thereon. The gear K is reduced in thickness to a considerable extent, as shown at k^5, at that portion which is not provided with teeth, and the roller-bearing studs k^2 k^3 project a slight distance above the face of the cut-away portion k^5. The periphery of the cut-away portion k^5 of the gear is concentric to the shaft C from the roller k^2 to the roller k^3 on a radius greater than the radius to the periphery of the toothed portion of the said gear.

The mutilated gear L is provided with a number of teeth one less than the number on the gear K, and at the end of these regular teeth it is provided with two large teeth l l', which are fitted to enter recesses k k' in the gear K. The gear L is further provided with recesses l^2 l^3, open at their ends at the periphery of the gear and open at one side for receiving successively therein the roller-studs k^2 k^3 on the gear K. The outer ends of the large teeth l l' are such a distance from the center of the gear that they will be caused to travel along the curved periphery of the reduced portion k^5 of the gear K as the gear K is being rotated, thus holding the gear L immovable from the time one of its recesses l^2 l^3 leaves one of the roller-studs k^2 k^3 until the other recess is entered by the other stud. The web portion l^4 of the gear L is reduced in thickness corresponding to the thickness of the cut-away portion k^5 of the gear K. The recesses l^2 l^3 of the gear L are so made that when the gear is in position to cause one of the recesses—l^2, for instance—to receive one of the studs on the gear K—for instance, the stud k^2—the walls of the recess are at substantially right angles to a radial line from the center of the gear K through the said stud k^2, so as to prevent absolutely any pounding or hammering of the two gears with respect to each other when they are being operated at a high speed. In the present instance I have shown the cut-away portion k^5 as being reduced to about one-third of the total thickness of the gear K, the roller-studs k^2 k^3 as projecting upwardly therefrom another third of the thickness of the said gear, and have shown the web l^4 as being about two-thirds the thickness of the gear L.

The geared connection as described above insures the easy and positive action of the gear K in either direction and permits it to alternately rotate the gear L and lock it against rotation during a portion of the movement of the gear K without any danger of the cutting or breaking of the teeth or of slipping a tooth, thus insuring absolute accuracy in the manipulation of the plunger and blank-holder.

It will be seen from the above description that by the use of the improved direct gear connection between the plunger-operating shaft and the blank-holder-operating shaft the shock or hammering due to a usual intermittent motion of the blank-holder-operating shaft is obviated, the working of the two shafts being practically noiseless. Furthermore, the relation of the mutilated gear is such that the gear-teeth simply act to carry the blank-holder to and from its working position, which requires very little power; but the severe strain of clamping the blank which is being operated upon is transmitted through the studs k^2 k^3 of the gear K and the recesses l^2 l^3 of the gear L, thus preventing any tendency on the part of the teeth to break or crush.

It is evident that slight changes might be resorted to in the form and arrangement of the several parts without departing from the spirit and scope of my invention. Hence I do not wish to limit myself strictly to the structure herein set forth; but

What I claim is—

1. In a drawing-press, a plunger and its operating-shaft, a blank-holder and its operating-shaft, and a direct geared connection between the two shafts comprising intermeshing mutilated gears fixed to the said shafts,

of such construction that the continuous rotary movement of the plunger-operating shaft will impart an intermittent rotary movement to the blank-holder-operating shaft, substantially as set forth.

2. In a drawing-press, a plunger and its operating-shaft, a blank-holder and its operating-shaft, a main drive-shaft, and direct geared connections at the same side of the machine between the drive-shaft and the plunger-operating shaft and between the plunger-operating shaft and the blank-holder-operating shaft, the last-named geared connection being of such construction that the continuous rotary movement of the plunger-operating shaft will impart an intermittent rotary movement to the blank-holder-operating shaft, substantially as set forth.

3. In combination, two shafts, a mutilated gear fixed to each shaft and in mesh with the gear on the other shaft, the structure of the gears being such that the continuous rotary movement of one of the shafts will impart an intermittent rotary movement to the other shaft without hammering or pounding, substantially as set forth.

4. In a drawing-press, a plunger and its operating crank-shaft, a blank-holder, its operating crank-shaft mounted above the plunger-operating shaft, an upper slide fitted to be reciprocated vertically by the blank-holder-operating shaft and rigid connections between the blank-holder and the said upper slide, substantially as set forth.

5. In a drawing-press, a plunger and its operating-shaft, a blank-holder and its operating-shaft, and a direct geared connection between the two shafts so constructed that the continuous rotary movement of the plunger-operating shaft will impart an intermittent rotary movement to the blank-holder-operating shaft, the connection between the blank-holder and its shaft comprising an upper slide adapted to be reciprocated vertically by the said shaft and a lower slide carrying the blank-holder and connected rigidly to the upper slide, substantially as set forth.

6. The combination with two shafts, of means for converting the rotary movement of one shaft to an intermittent rotary movement for the other shaft comprising two intermeshing mutilated gears, the one being provided with a pair of recesses beyond the ends of its toothed portion and a pair of large teeth between the said recesses and the ends of the toothed portion and the other being provided with a pair of studs arranged to enter the recesses and a pair of recesses arranged to receive the large teeth in the first-named gear, the said second-named gear being further provided with a curved portion arranged to travel along the outer ends of the large teeth on the first-named gear for locking the first-named gear temporarily against rotary movement, while the second-named gear is being rotated, substantially as set forth.

7. The combination with two shafts, of a geared connection between the two shafts comprising mutilated gears fixed to the said shafts and intermeshing with each other, the structure of the gears being such that the rotary movement of one gear will alternately rotate the other gear and then lock it against movement for a predetermined time, without hammering or pounding when the intermittently-rotating gear is started and stopped, substantially as set forth.

In testimony that I claim the foregoing as my invention I have signed my name, in presence of two witnesses, this 19th day of March, 1900.

AMOS CALLESON.

Witnesses:
FREDK. HAYNES,
C. S. SUNDGREN.