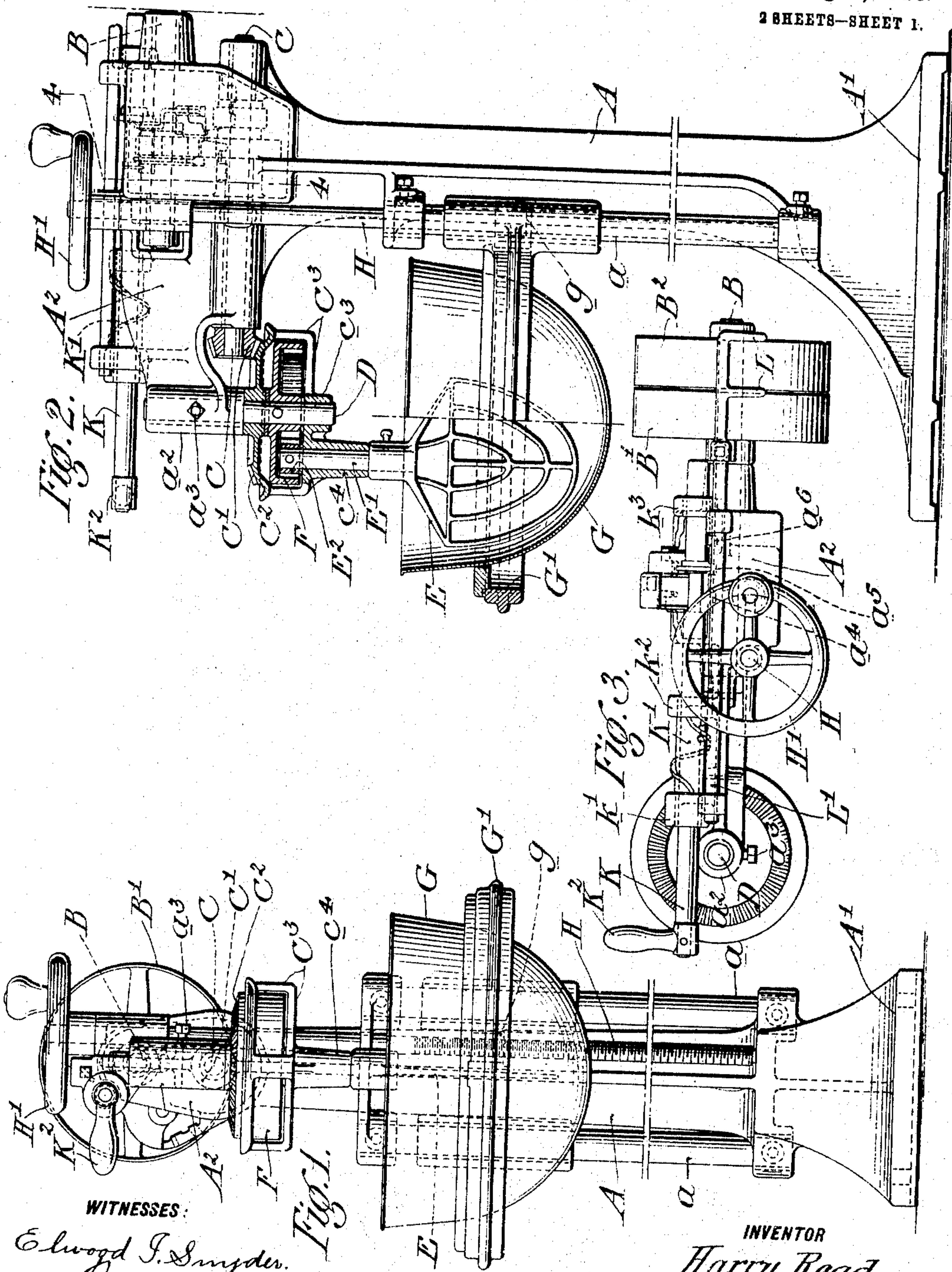


966,765.

Patented Aug. 9, 1910.

2 SHEETS—SHEET 1.



WITNESSES:

Edwood J. Snyder.  
Stewart

INVENTOR

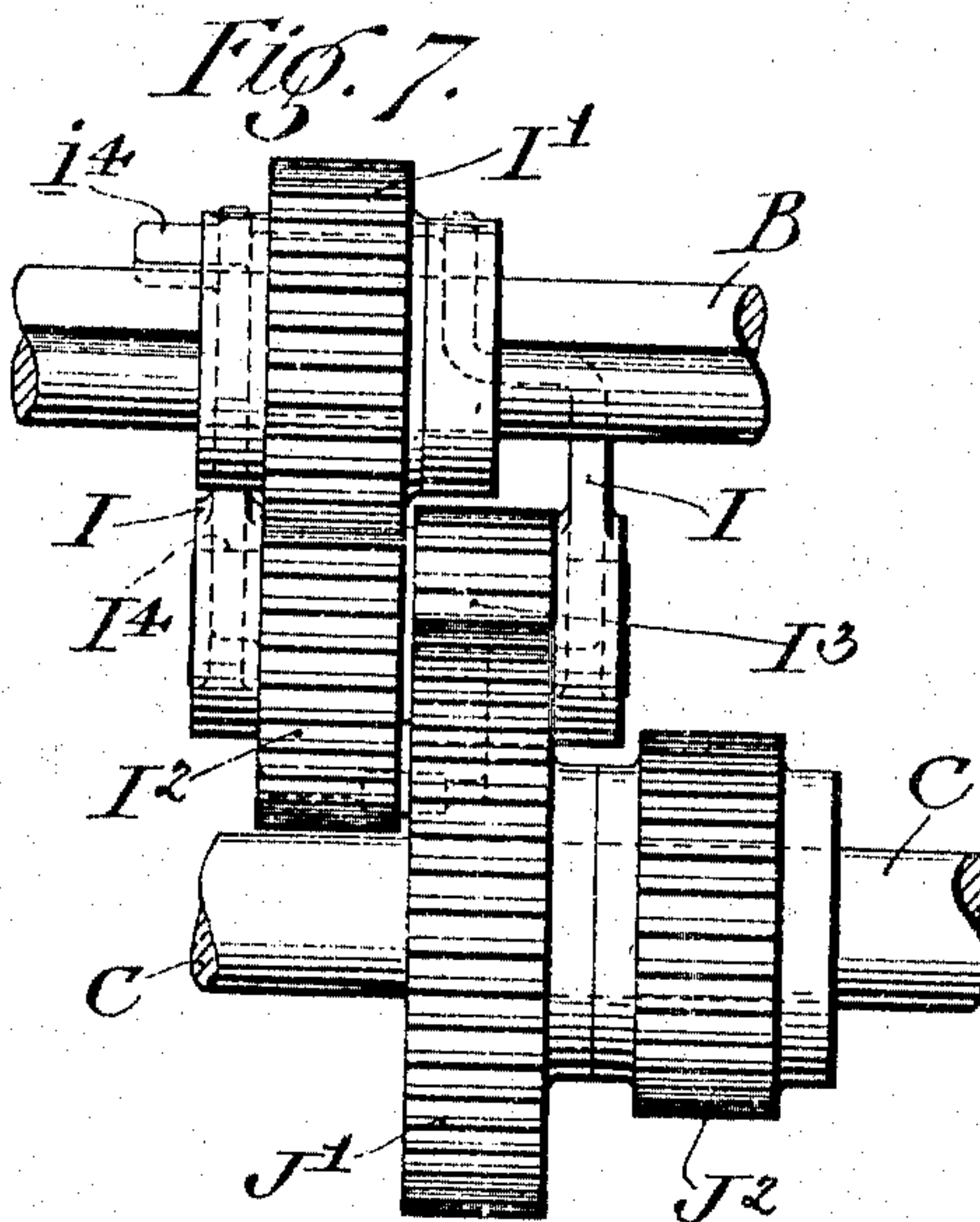
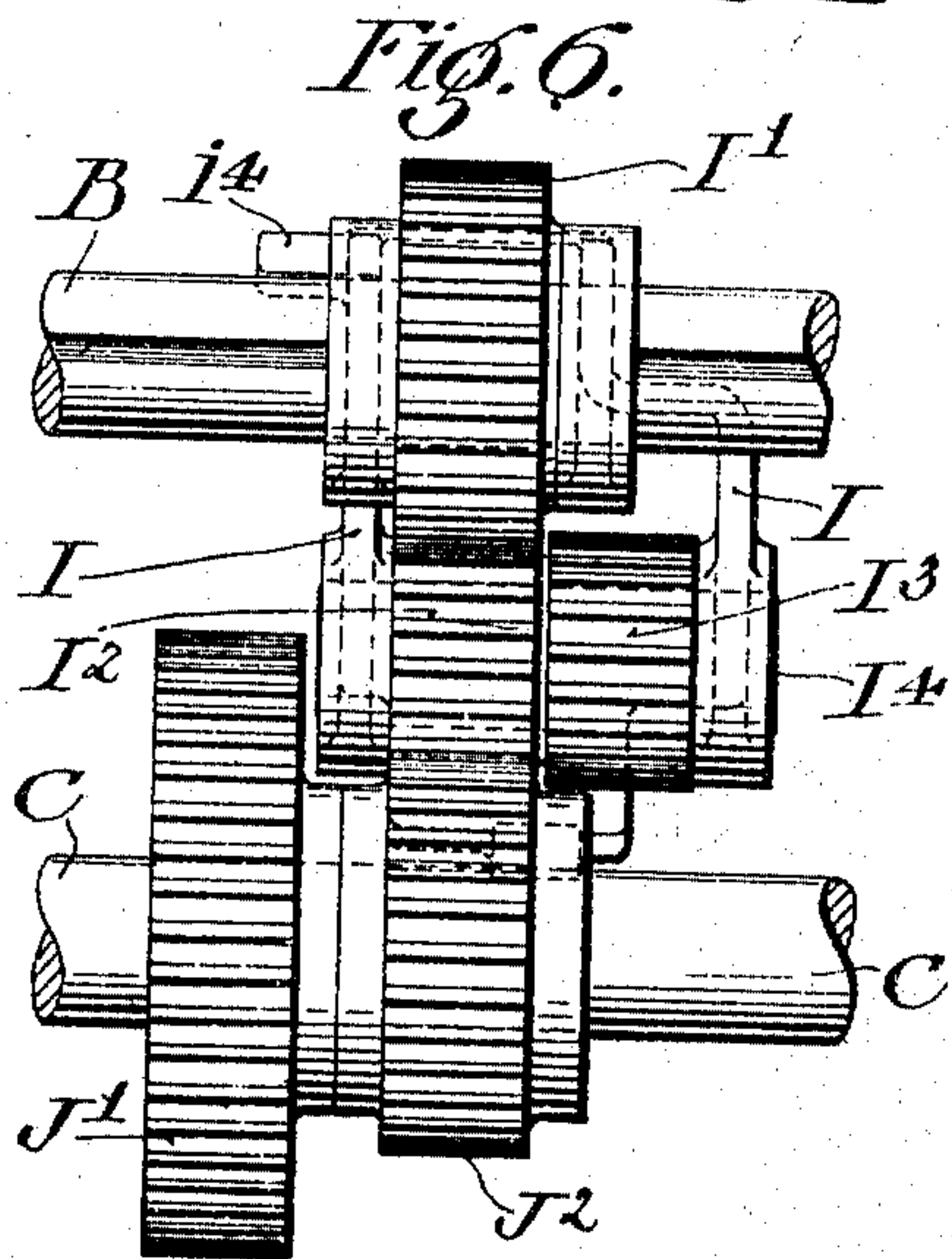
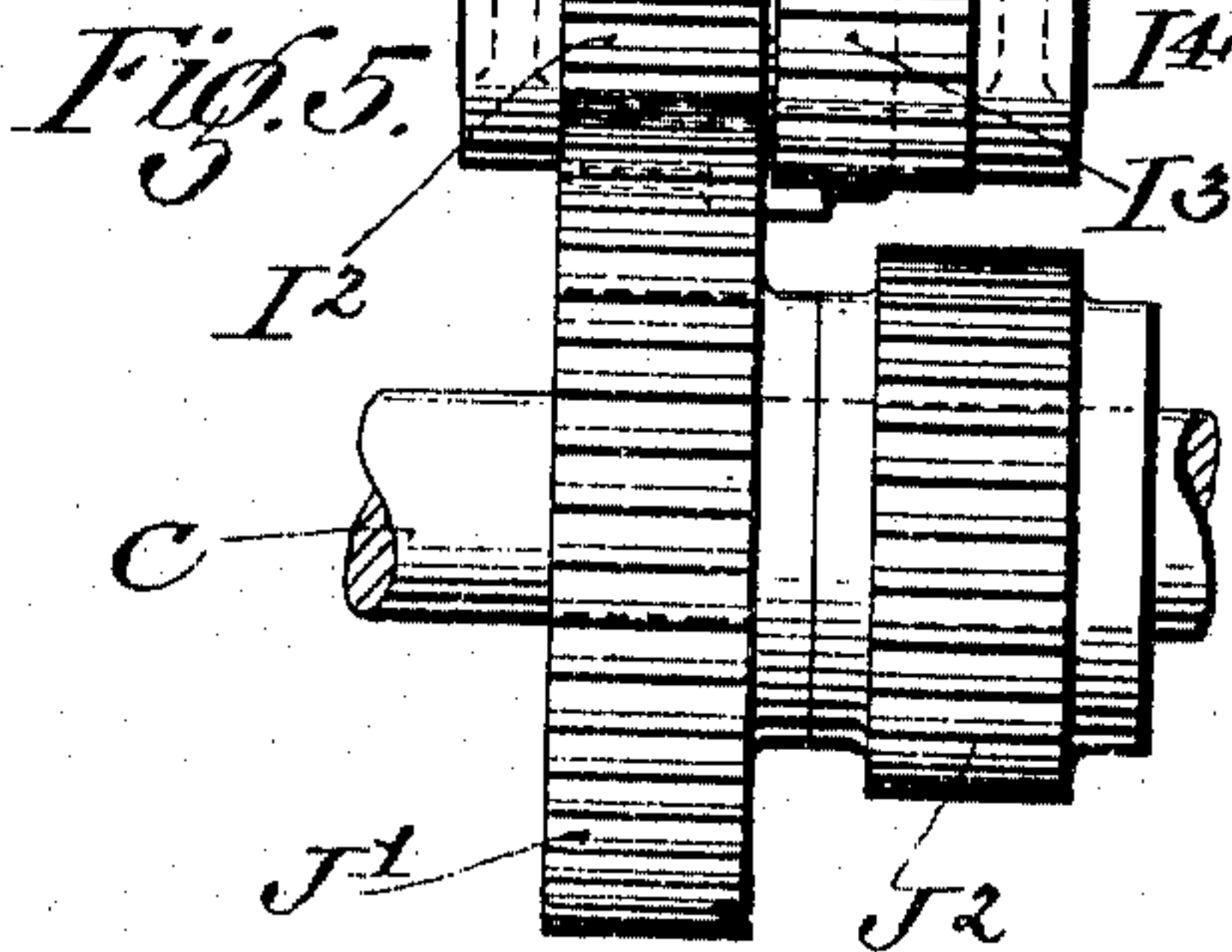
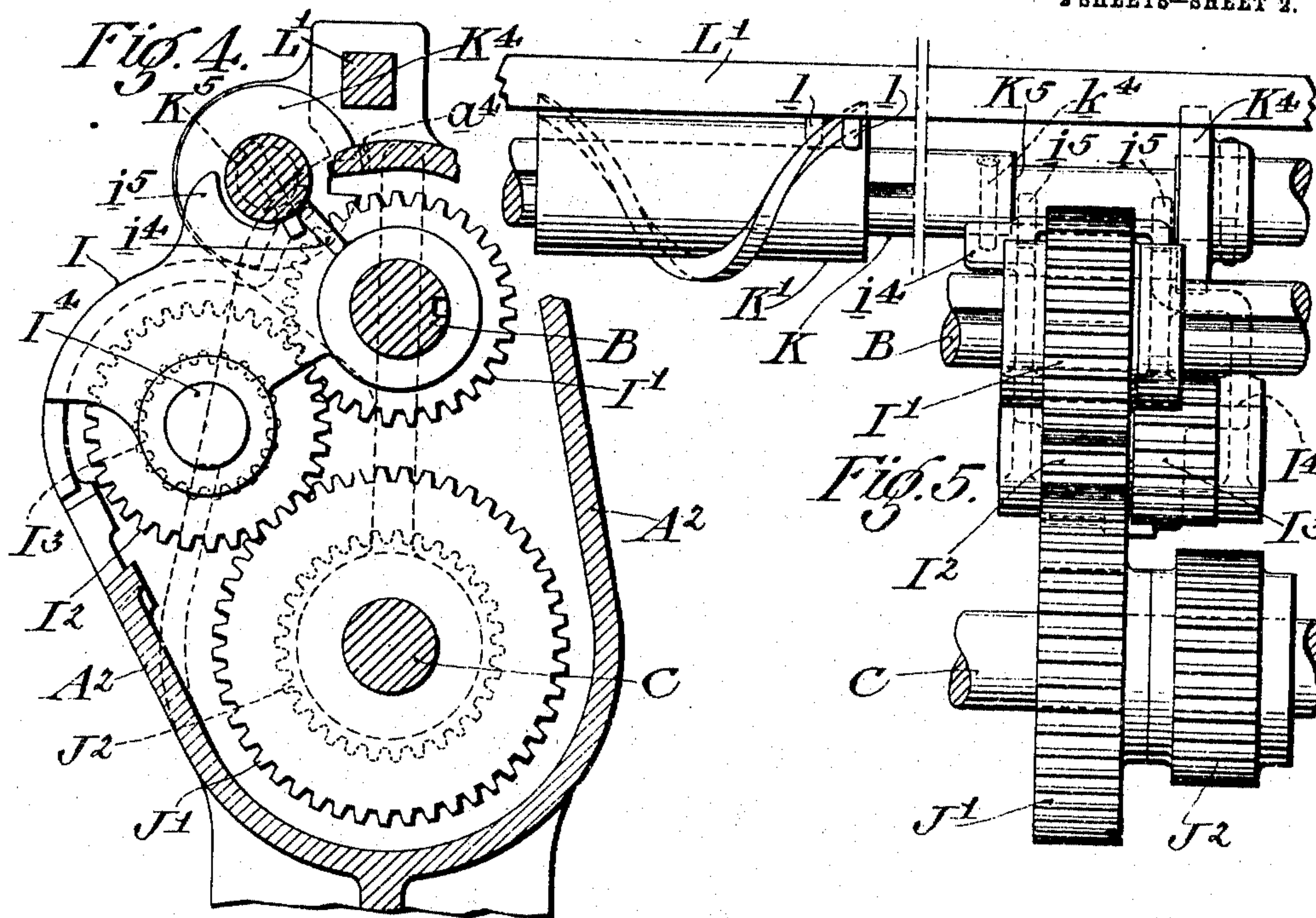
Harry Read  
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966,765.

Patented Aug. 9, 1910.

2 SHEETS—SHEET 2.



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# UNITED STATES PATENT OFFICE.

HARRY READ, OF YORK, PENNSYLVANIA.

## MIXING-MACHINE.

966,765.

Specification of Letters Patent.

Patented Aug. 9, 1910.

Application filed January 14, 1909. Serial No. 472,290.

*To all whom it may concern:*

Be it known that I, HARRY READ, a citizen of the United States, residing at York, in the county of York and State of Pennsylvania, have invented certain new and useful Improvements in Mixing-Machines, of which the following is a specification.

The present invention relates to a cake mixing machine, and particularly to cake mixing machines of relatively large size and of that type adapted to be operated by power.

The object of the present invention is to improve the mechanical construction of such cake mixing machines, and in particular to provide an efficient and effectively disposed mechanism for operating the beater, a mechanism for changing the speed of rotation of the beater in mixing batches of material of varying consistency, a mechanism whereby the machine is stopped when it is desired to change the speed, and in means for moving the bowl into and out of engagement with the beater.

The various features of novelty which characterize my invention are pointed out with particularity in the claims annexed to and forming a part of this specification. For a better understanding of my invention, however, reference may be had to the accompanying drawings and descriptive matter in which I have illustrated and described one of the forms in which my invention may be embodied.

Referring to the accompanying drawings: Figure 1 shows a front elevation of the cake mixer. Fig. 2 a side elevation with the pulleys to the right broken away. Fig. 3 represents a plan view of the head or upper part of the machine, the lower portion being omitted. Fig. 4 illustrates an enlarged vertical section on the line of 4—4 of Fig. 2 of a portion of the head, showing the arrangement of the speed-gears. Fig. 5 represents a detached diagrammatic view of the speed-gears when adjusted to an intermediate position and working at a moderate speed, as also the connection between the gear shifting mechanism and the belt shifter. Fig. 6 shows a similar view with the gears shifted to operate the machine at its highest speed, and Fig. 7 another similar view showing the gears adjusted to operate the machine at its lowest speed.

A, denotes a vertical frame or standard having a base  $A^1$ , and an upper extension or

head  $A^2$ . The head  $A^2$ , is provided with bearings supporting a main shaft B, the same having the conventional fast and loose pulleys  $B^1$  and  $B^2$ . Below the shaft B is an auxiliary shaft C, suitably journaled in the head  $A^2$  and driven from the shaft B by means of interposing gears which may be readily interchanged for the purpose of varying the speed of the mixer in a manner hereinafter described. The forward end of the head  $A^2$ , is provided with a boss  $a^2$  provided with socket to receive a fixed shaft D, secured against turning by means of a set screw  $a^3$ . The shaft C has secured to its forward end a bevel-pinion  $C^1$  which meshes with a corresponding bevel-wheel  $C^2$ , loosely mounted upon the fixed shaft D. The bevel-wheel  $C^2$  is provided with a depending bracket  $C^3$ , having a central bearing  $c^3$ , inclosing the fixed shaft D, and an eccentric bearing  $c^4$  of considerable length adapted to hold a beater-shaft  $E^1$ . Between the bevel wheel  $C^2$  and the bearing  $c^3$  of the bracket is an internal gear F, which is stationary by reason of the fact that it is secured to the fixed shaft D.

The upper end of the mixer shaft  $E^1$ , is provided with a pinion  $E^2$ , meshing with the internal gear F, and the lower end of the mixer shaft is furnished with a detachable beater E. By this arrangement the beater which is arranged within a bowl will be caused to traverse a circular path on the inside circumference of the bowl, the axis of which is the fixed shaft D, while the beater is given an independent rotary movement within the bowl in an opposite direction and upon its shaft  $E^1$ .

The frame A of the machine is provided with vertical guides,  $a$ ,  $a$ , which, carry an annular ring or bowl support  $G^1$  in which is suspended the bowl G. The bowl support together with the bowl is raised and lowered to bring the bowl into and out of engagement with the beater E, by means of a vertical screw H, adapted to an internally threaded boss  $g$ , on the bowl-support and guided in the upper and lower portions of the frame A. The upper end of the screw H, is provided with a hand wheel  $H^1$ , by which means the screw may be turned.

Referring to the driving mechanism and particularly to the means employed for changing the speed of the beater, the gears interposed between the upper or main shaft B, and the lower or auxiliary shaft C are



arranged in the following manner. Upon the shaft B, is journaled a movable gear-box I, carrying gear wheels I<sup>1</sup>, I<sup>2</sup> and I<sup>3</sup>. The gear wheel I<sup>1</sup> is splined to the shaft B, and is therefore free to move forward or backward upon said shaft while the gear-wheels I<sup>2</sup> and I<sup>3</sup>, are connected together and mounted upon a shaft I<sup>4</sup>, also carried by the gear-box I. Securely fastened to the shaft C, are gear wheels J<sup>1</sup> and J<sup>2</sup> either of which is adapted to engage one or the other of the gear-wheels I<sup>2</sup> and I<sup>3</sup>, when said gear wheels are moved under the influence of a worm-shaft K. The worm shaft K, is supported in bearings k<sup>1</sup>, k<sup>2</sup> and k<sup>3</sup>, and is provided with a worm K<sup>1</sup> which is splined to the worm shaft so as to turn with it but is confined against lateral movement by the bearings k<sup>1</sup> and k<sup>2</sup>. The function of the worm K<sup>1</sup> is to operate a belt shifter L, to move a belt from the fast pulley B<sup>1</sup> to the loose pulley B<sup>2</sup> and vice versa and to this end the square rod L<sup>1</sup> of the belt-shifter is provided with pins l, l, which engage the said worm. As the worm shaft K is turned in its bearings by means of the handle K<sup>2</sup>, its first effect as before stated is to operate the belt shifter and move the belt from one to the other of the pulleys, which requires about two-thirds of a revolution. The worm shaft K is provided with a pin k<sup>4</sup>, adapted to engage a lug i<sup>4</sup> on the gear-box I, and said worm-shaft is also fitted with a split ring or locking-collar K<sup>4</sup>, adapted to notches a<sup>4</sup>, a<sup>5</sup> and a<sup>6</sup>, in the head A<sup>2</sup>, as shown by dotted lines in Fig. 3. As the worm shaft is further turned after having moved the belt shifter, the pin k<sup>4</sup> will be brought into engagement with the lug i<sup>4</sup>, and will lift or turn the gear-box on the shaft B. This will disengage either of the gears on the shaft I<sup>4</sup>, from those of the shaft C, the movement requiring about one-sixth of a revolution of the worm shaft. The entire movement including the movement of the belt-shifter being about five-sixths of a revolution. When a complete movement of worm shaft has been thus made, the slot in the locking-collar K<sup>4</sup>, (see Fig. 4) will be in line with one of the notches a<sup>4</sup>, a<sup>5</sup> and a<sup>6</sup>, of the upper part of the frame of the machine, and the horns i<sup>5</sup>, i<sup>6</sup> of the gear-box I, will have closed in on the reduced portion of said worm-shaft indicated at K<sup>5</sup>. In this position the gear-box and its gears may be shifted to either of the positions shown in Figs. 5, 6 and 7 by a lateral movement of the worm-shaft. The position indicated in Fig. 5 shows the gear wheel I<sup>2</sup> on the shaft I<sup>4</sup>, in mesh with the large gear J<sup>1</sup> on the shaft C, in which case the machine would operate at a moderate speed. As indicated in Fig. 6 the gear wheel I<sup>2</sup> on the shaft I<sup>4</sup> is in mesh with the small gear J<sup>2</sup> on the shaft C, in which position the machine is geared to

operate at its highest speed. In the remaining position indicated in Fig. 7 the machine is geared to operate at its slowest speed in which case the gear I<sup>3</sup> on the shaft I<sup>4</sup> is shown in mesh with the large gear J<sup>1</sup> on the shaft C.

The construction illustrated and described possesses advantageous features. Among these may be mentioned the ease with which the parts may be constructed and assembled and thereafter adjusted, and the compactness and simplicity of the cake mixer as a whole. In a cake mixer of this type it is desirable not only that the speed should vary in order to facilitate the working of batches of goods of greater or less consistency, but also as a means of gradually furthering the process of aeration of certain kinds of goods required to be exceedingly light and spongy.

Having described my invention what I claim is:—

1. A mixing machine comprising a standard, a bowl support guided in the standard and provided with a bowl-ring, a removable bowl adapted to be supported by the bowl-ring, a vertically disposed beater adapted to enter the bowl, means controlled by a screw for adjusting the position of the bowl to and from the beater and means for revolving the beater upon a vertical axis and moving the same in a circle in said bowl.

2. A mixer, comprising a bowl, a beater adapted to rotate within the bowl, a horizontally disposed main shaft, an auxiliary shaft parallel with the main shaft, intermediate speed changing gears hung to the main shaft, gears mounted upon the auxiliary shaft, and means whereby the intermediate gears may be lifted and afterward moved laterally to engage one or the other of the gears of the auxiliary shaft.

3. A mixer comprising a bowl, a beater adapted to rotate within the bowl, upper and lower shafts, gears mounted on the lower shaft, a gear box provided with gears adapted to turn with the upper shaft and to slide laterally upon the same and means for shifting the gear box and its gears into and out of engagement with the gears of the lower shaft.

4. A mixer comprising a bowl, a beater, upper and lower shafts, gears fixedly secured to the lower shaft, a gear box having gears which are adapted to turn with the upper shaft and free to slide laterally upon the same, a belt shifter, a worm shaft having a worm adapted to rotate to operate the belt shifter and by a further movement to raise the gear box and its gears out of engagement with the gears of the lower shaft, said worm-shaft being free to move laterally to shift the upper gears into and out of engagement with the several gears of the lower shaft.

5. A mixer comprising a bowl, a vertical



frame having a member forming a support for the bowl, a fixed vertical shaft depending from the frame, a bevel gear adapted to turn upon the fixed vertical shaft and having a depending eccentric bearing for a beater shaft, a driving shaft and a bevel pinion thereon the latter engaging the aforesaid bevel-gear, an internal gear secured to the fixed vertical shaft, a beater having a shaft adapted to the eccentric bearing and a pinion on said shaft engaging the internal gear.

6. A cake dough mixing machine, comprising a standard, a bowl, a bowl support movably mounted thereon, a vertical screw engaging said bowl support for adjusting the position thereof, a beater, a main shaft, an auxiliary shaft parallel with the main shaft, speed changing gears interposed between the main shaft and the auxiliary shaft and a mechanism whereby the gears of one shaft may be shifted and brought into and out of engagement with the gears of the other shaft to alter the speed of the beater.

7. A mixer comprising a vertical frame provided with a bowl support, and a detachable bowl, a main shaft journaled in said vertical frame, an auxiliary shaft arranged parallel to the main shaft, a beater geared to be driven by the auxiliary shaft, gears interposed between the main and the auxiliary shaft, the gears of the main shaft being adapted to move longitudinally while those of the auxiliary shaft are fixed in position and a mechanism whereby one set of gears may be brought into and out of engagement with the other.

8. A mixer comprising a bowl, a vertical frame provided with an annular bowl support, a power shaft journaled in the frame,

a vertical shaft fixedly secured to the frame, a bracket geared to the power shaft and free to turn upon the fixed shaft, said bracket being provided with a journal and a beater shaft adapted thereto, a beater detachably secured to the lower end of the beater shaft, a pinion secured to the upper end of the beater shaft, and an internal gear secured to the fixed vertical shaft and in mesh with the pinion of the beater shaft.

9. In a cake dough mixer, a standard, a bowl, a bowl support connected with said standard and guided thereby, means for reciprocating said bowl support for adjusting the position thereof, a beater mounted in said bowl, means for adjusting the position of said beater, means for revolving the beater upon its axis and moving the same in a circle in said bowl, and means for moving said last mentioned means.

10. In a dough mixer, a standard, a bowl, a bowl support movably mounted thereon, a vertical screw engaging said bowl support for adjusting the position thereof, a beater adapted to operate within the bowl, means for rotating the beater upon its axis and moving the same in a circular path in said bowl, a main drive shaft, an auxiliary shaft arranged parallel to the main shaft, complementary speed change gears mounted on the main and auxiliary shafts, and means for selectively combining said gears in operative relation.

In testimony whereof I affix my signature in presence of two witnesses.

HARRY READ.

Witnesses:

CHARLES A. MAY,  
MARGIE SHANABROUGH.