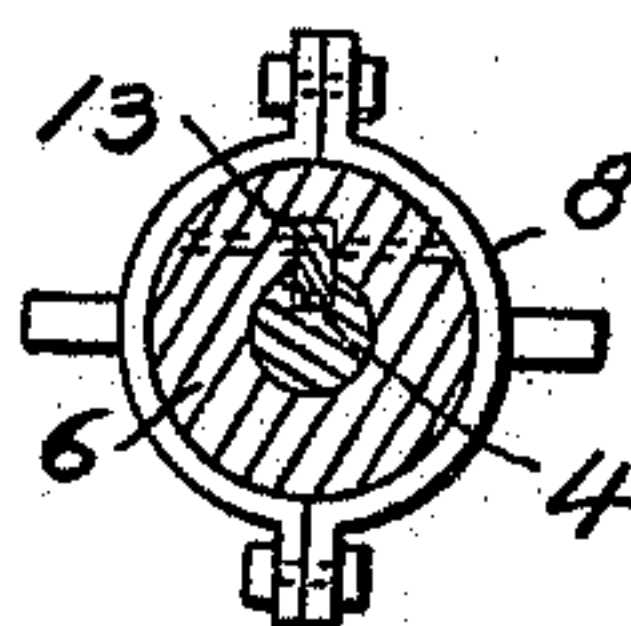
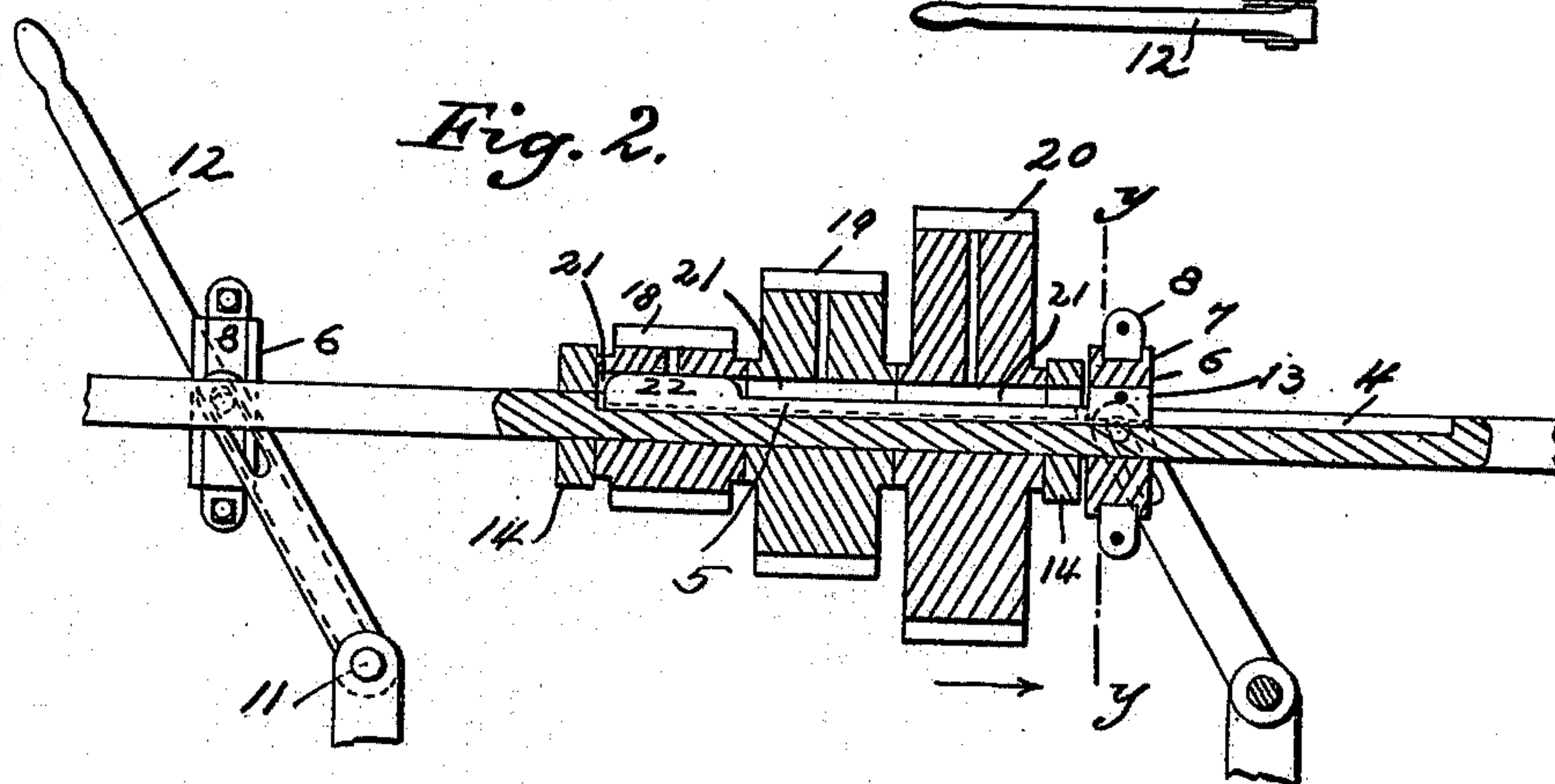
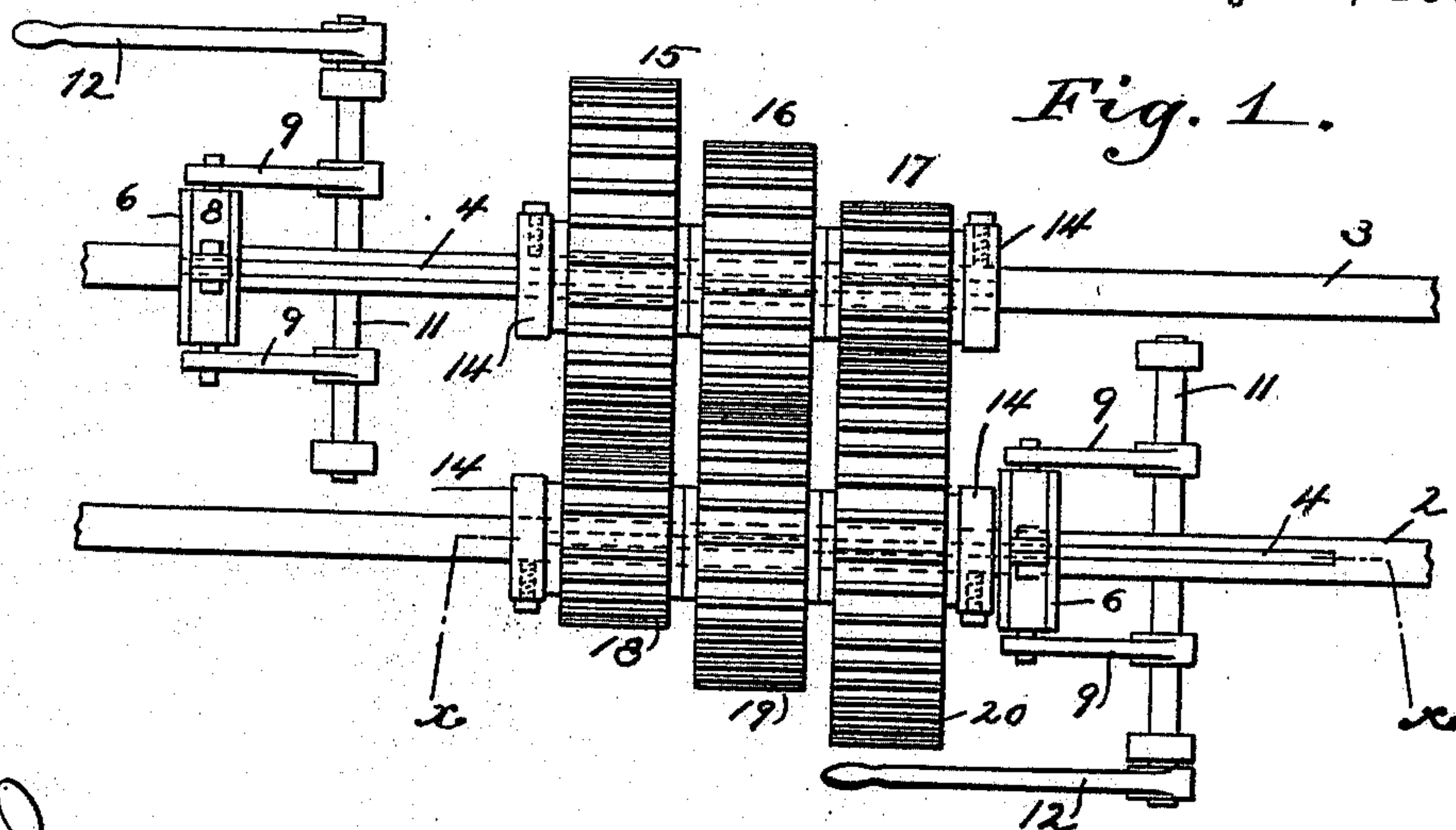


1.)

J. H. BUCKLEY.
CONE GEARING.

No. 560,774.

Patented May 26, 1896.



WITNESSES:

John H. Deerner
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ATTORNEYS

UNITED STATES PATENT OFFICE.

JOHN HENRY BUCKLEY, OF MILLTOWN, NEW JERSEY.

CONE-GEARING.

SPECIFICATION forming part of Letters Patent No. 560,774, dated May 26, 1896.

Application filed February 25, 1895. Serial No. 539,542. (No model.)

To all whom it may concern:

Be it known that I, JOHN HENRY BUCKLEY, a citizen of the United States, and a resident of Milltown, county of Middlesex, and State of New Jersey, have invented certain new and useful Improvements in Cone-Gearings, of which the following is a specification, reference being had to the accompanying drawings, forming a part thereof, in which similar
10 numerals of reference indicate corresponding parts in all the figures.

The object of my invention is to provide an improved gearing for the transmission of power from an engine to a power-shaft or
15 from a shaft directly geared or connected with an engine to a secondary shaft, from which the power is transmitted to the machinery in the usual manner, whereby I may increase or diminish the speed of the secondary or power
20 shaft at will; and the invention consists of what is generally denominated a "cone-gearing," and in the construction shown and described the desired result is produced by a series of gear-wheels of different sizes arranged on adjacent shafts, the series of wheels
25 on each shaft being so arranged as to present the appearance of a cone, the bases of which are in opposite directions, and means for locking the corresponding wheels on each shaft
30 when desired and allowing the shaft to revolve within the others, all of which will appear in the following specification.

In the drawings forming part of this specification, Figure 1 represents a plan view of
35 my improved gearing; Fig. 2, a vertical section on the line *xx* of Fig. 1; and Fig. 3, a vertical section on the line *yy* of Fig. 2, looking in the direction of the arrow.

Referring to the drawings, the numeral 2
40 designates a shaft in connection with an engine or other power-generator, (not shown,) and 3 a secondary or power shaft, from which power may be transmitted to machinery in the usual manner. In each of these shafts is
45 formed a longitudinal groove or slot 4, in which is placed a lock or key 5, which is connected at one end with a collar 6, movably mounted on each of said shafts. Each of said collars is provided with an annular peripheral
50 groove 7, in which is placed a divided clamping ring 8, to which are pivotally connected on op-

posite sides thereof arms or levers 9, secured at their other ends to a crank-shaft 11, pivotally supported in any desired manner and provided with a crank or operating arm 12. 55
The bores of the collars 6 are provided with a groove 13, (shown in Figs. 2 and 3,) which aligns with the corresponding groove in the shaft 3 to receive the end of the key 5, which is secured therein, and two collars or rings 14 60
are secured to each shaft at a predetermined distance from the center, one on each side thereof, which are designed to prevent the lateral movement of the gear-wheels, which are placed between them. 65

A series of gear-wheels 15, 16, and 17 are arranged on the secondary or power shaft 3, as shown, decreasing in size in the order named and presenting the general appearance of a cone, and a corresponding series of gear-
70 wheels 18, 19, and 20 are arranged on the main or engine shaft, and which increase in size in the order named, and also present the appearance of a cone, the base of which is in a direction opposite to that of the cone first 75
named. As shown in Fig. 2, the bore of each of these gear-wheels is provided with a groove 21, which corresponds with the groove 13 in the collar 6, and each of which aligns with the groove 4 in said shafts when the gear-
80 wheels are in a position to admit of it.

The key 5, the body of which is so formed as not to project above the groove 4 when the key is in position therein, is provided with a head 22, which projects above said groove 85
and above the body of the shaft in which the groove is located, so as to project into the corresponding groove formed in the bore of the gear-wheels, as shown in Fig. 2. It will be seen from this construction that by simply 90
moving either of the collars 6 back or forth upon the rods 3 or 4 either of the gear-wheels located on said rods may be locked in its position and compelled to revolve with the respective shafts. It will also be seen that 95
when one of said gear-wheels is locked to the shaft and compelled to revolve therewith by means of said key each of the other wheels will be independent of the lock and will revolve thereon. The key and its operating de- 100
vices connected with the secondary or power shaft 3 are precisely the same as that con-

nected with shaft 2 and operate in the same manner, and the illustration thereof in section has not been deemed necessary.

The operation of this device is as follows:

5 The engine or motor being in operation and it being desired to revolve the secondary or power shaft slowly, the collar 6 on shaft 2 is drawn backward until the head 22 of the key
10 5 enters the groove 21 in the gear-wheel 20, when said wheel will be locked to the shaft and revolve therewith. At the same time the key connected with shaft 3 is forced forward in the same manner by means of the collar 6 and its operative connections until
15 the head on said key enters or meshes with the groove formed in the bore of the gear-wheel 17. In this position of the lock the gear-wheels 17 and 20 are in operative connection with the shafts, and a comparatively
20 slow motion will be transmitted to the power-shaft 3. If now it is desired to increase the motion of the power-shaft 3, each of said keys will be drawn back until the heads thereof operate in connection with the grooves
25 formed in the bores of the gear-wheels 16 and 19 to hold these gears in operative connection with the shafts. In this position and with these two wheels in operation the speed of the shafts would be substantially the same
30 and the speed of the power-shaft greater than in the first instance. If now it is desired to still further increase the speed of the power-shaft, the keys 5 are so operated as to secure the gear-wheels 15 and 18 in operative con-
35 nection with the shafts in the manner hereinbefore described, when the speed of the power-shaft 3 will be highly increased, and much greater, in fact, than with either of the former connections.

40 Though I have shown and described the key and its operative mechanism as connected with each of the shafts, it is evident that I may produce the same result by securing the wheels on one shaft rigidly thereto and
45 have the key and its operative connections connected with the other shaft, the wheels on said shaft being revolubly mounted thereon. As an illustration, the gear-wheels on the shaft 3 might be rigidly secured thereto in
50 the usual manner, and those on shaft 2 revolubly mounted thereon, as shown, and provided with the key and its operative connections, as illustrated in Fig. 2. It is evident that with this arrangement exactly the same

result may be produced as that hereinbefore 55 described by simply operating the key 5 by means of the collar 6 and its connections, so as to secure alternately, or as desired, the gear-wheels 18, 19, and 20 in operative con-
60 nection with the shaft 2. With this form of gearing I may secure in the most simple and practical manner and with the least possible expense, and by an apparatus which is simple in construction and operation and not
65 liable to get out of order, means for increasing or decreasing the speed of the power-shaft at will, as the speed of said shaft may be controlled at all times by the number of gear-wheels employed and the differences in
70 the diameters thereof, this being a matter that can be arranged or adjusted to any desired extent and within any reasonable limits.

It is evident that many changes in and departures from the construction herein shown and described may be made without departing 75 from the scope of my invention, and I do not limit myself to the exact form thereof herein shown; but,

Having fully described the same, its construction and operation, I claim, and desire 80 to secure by Letters Patent, the following:

In a conical gearing, of the character described, the combination of the main shaft provided with a longitudinal slot, a second shaft also having a longitudinal slot, a num- 85 ber of different-sized gear-wheels carried by said shafts and constructed to engage in pairs, and being provided with grooves corresponding to the slots in said shafts, keys provided with heads to enter said grooves 90 and slots, a collar mounted upon each of said shafts to prevent the lateral movement of said gear-wheels, another collar upon each shaft having a central or peripheral groove 95 and a divided clamp-ring secured in said central groove, pivotal arms secured upon the opposite side of said ring, a crank-shaft connecting the ends of the arms, substantially as described.

In testimony that I claim the foregoing as 100 my invention I have signed my name, in presence of two witnesses, this 15th day of February, A. D. 1895.

JOHN HENRY BUCKLEY.

Witnesses:

WILLIAM G. EVANS,
NELSON POLLARD.