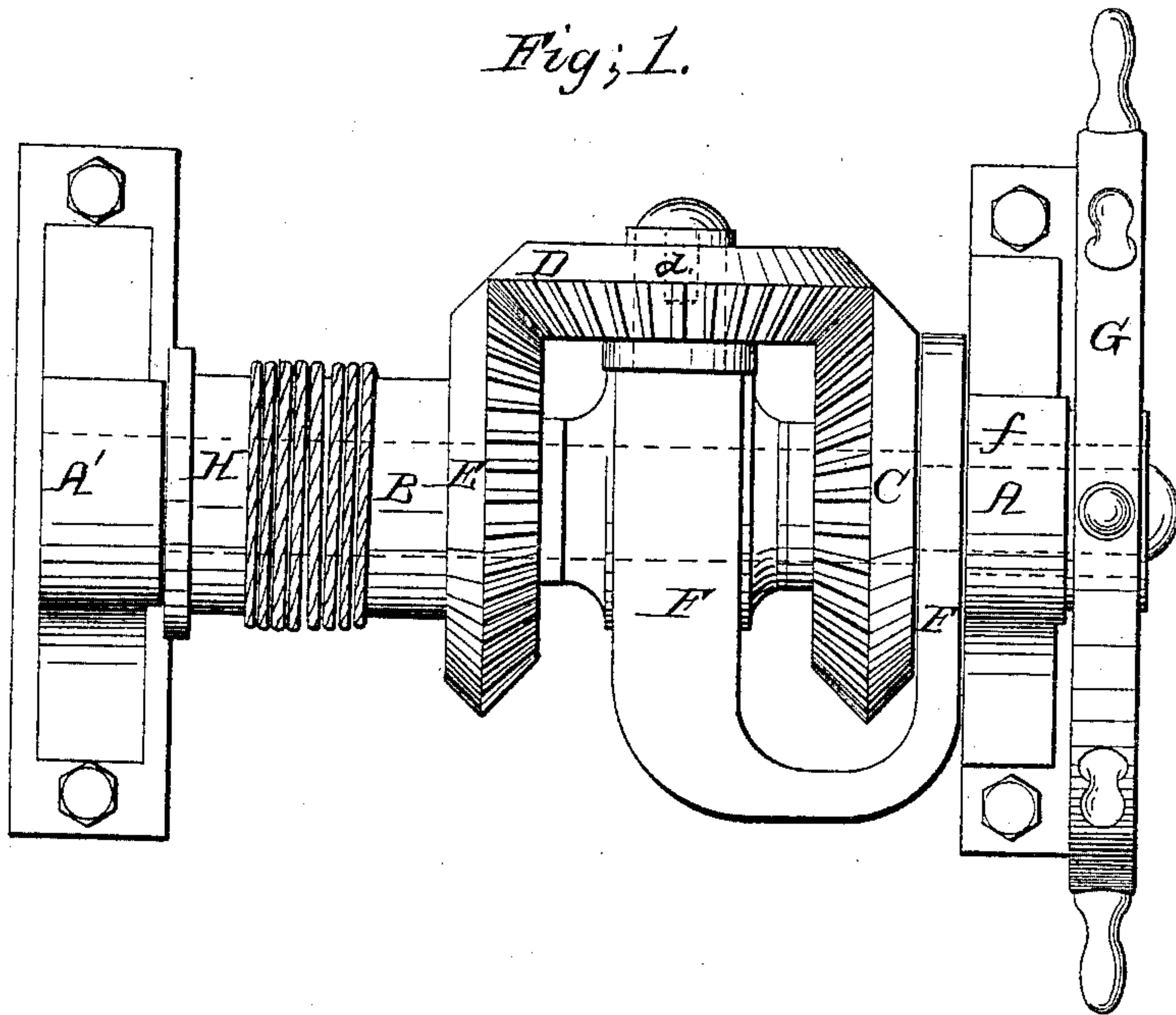
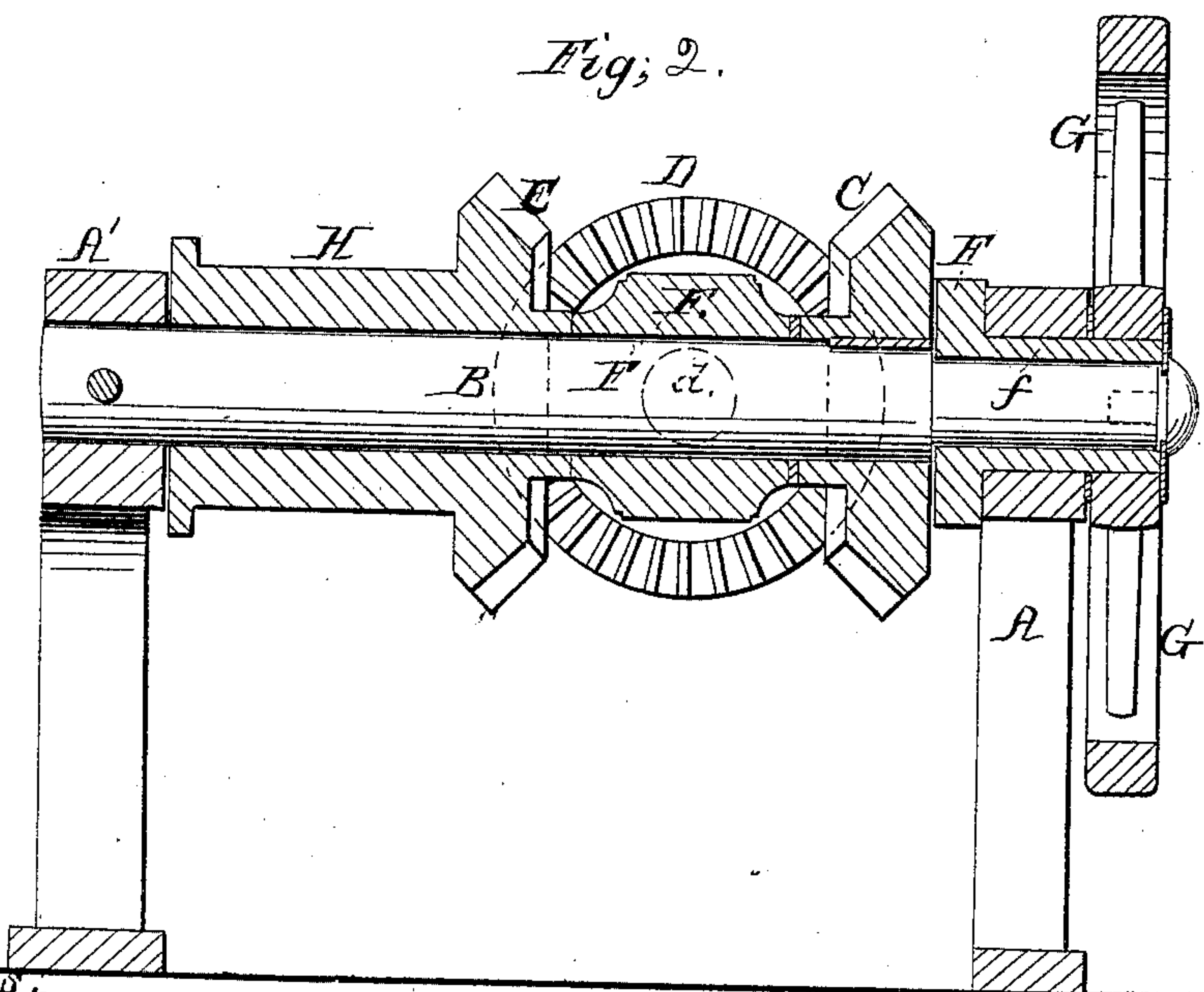


T. C. Entwistle,
Mechanical Movement.
N^o 57,693. Patented Sep. 4, 1866.

Fig; 1.



Fig; 2.



Witnesses,
J. W. Coombs
A. Keller

Inventor;
T. C. Entwistle

UNITED STATES PATENT OFFICE.

THOMAS C. ENTWISTLE, OF NEW YORK, N. Y.

IMPROVEMENT IN DEVICES FOR TRANSMITTING MOTION.

Specification forming part of Letters Patent No. 57,693, dated September 4, 1866.

To all whom it may concern:

Be it known that I, THOMAS C. ENTWISTLE, of 330 East Fourth street, in the city, county, and State of New York, have invented a new and useful Device for Transmitting Motion; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification, in which—

Figure 1 is a plan view of my invention as applied to a steering apparatus. Fig. 2 is a longitudinal section of the same.

Similar letters of reference indicate corresponding parts in both figures.

The object of my invention is to obtain a very compact arrangement of gearing for increasing or diminishing the speed of rotary motion; and to this end it consists in a novel combination and arrangement of three bevel-gears, two of which have a common axis, and the axis of the third is radial to and revolves around the first-named axis.

To enable others to construct and apply my invention, I will proceed to describe it with reference to the drawings.

A A' are two upright standards, such as are commonly used for supporting the wheel-shaft of a steering apparatus. B is a horizontal shaft, supported in the standards in the position commonly occupied by the wheel-shaft, and prevented from turning by being keyed or otherwise firmly secured in the standard A.

The drum H is fitted to turn freely on the shaft B, and the steering-wheel G is secured firmly to the hollow journal *f* of a revolving yoke, F, which is fitted to turn freely on the shaft B, the said journal *f* working in a bearing in the standard A.

C D E are the three bevel-gears. C is fast upon the shaft B, and consequently stationary. D is fitted to turn freely on an axle, *d*, secured to the revolving yoke, and occupying a position perpendicular and radial to the shaft. E is firmly secured to the drum H. D gears with both E and C.

The three gears are represented of uniform size, and operate as follows: When the wheel G is made to rotate on the shaft B it carries with it the yoke F and gear D, and as the latter revolves, engaged with the stationary gear C, it is caused to rotate upon the axle *d*, and thereby to give rotary motion to the gear E and the drum H at the rate of two

revolutions of the said gear and drum to one of the wheel G and yoke. This double revolution is produced owing to the gear D being made to operate as a lever of the third order, the fulcrum of which is at the pitch-line of the gear C, the power being applied at *d*, and the weight at E. The power being equidistant between the fulcrum and the weight, the weight moves twice as fast as the power moves.

The same combination and arrangement of gearing may be used for a great variety of purposes.

It is applicable with especial advantage, on account of its compactness, to driving screw-propellers at a higher speed than the engine, the yoke F and axle *d* of the gear D being in such case attached to the engine-shaft, and the gear E being secured on the propeller-shaft.

In applying the invention to the reduction of speed the power would be applied to the gear E, which, by its rotary motion, would cause the gear D both to rotate on its axle *d* and to creep around the stationary gear C, and thereby give rotary motion to the yoke F and any attached shaft at the rate of half a revolution for every revolution of E.

In this operation the gear D operates as a lever of the second order, the fulcrum of which is at the pitch-line of the gear C, the power being applied at the point of contact of the gear E, and the weight being at *d*.

The weight, being equidistant between the fulcrum and the power, only moves half as fast as the power.

It must not be understood that the sizes of the three gears are required to be uniform.

The sizes may be varied, and the movement transmitted will be increased or diminished in velocity according to the relative size of the gears C and E.

If the gears C and E are not of uniform size, the axle *d* will require to be set oblique to the shaft B instead of perpendicular, as represented.

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

The combination and arrangement of three bevel-gears, C D E, and a revolving yoke, F, or its equivalent, to operate substantially as herein specified.

T. C. ENTWISTLE.

Witnesses:

J. W. COOMBS,
A. LE CLERC.