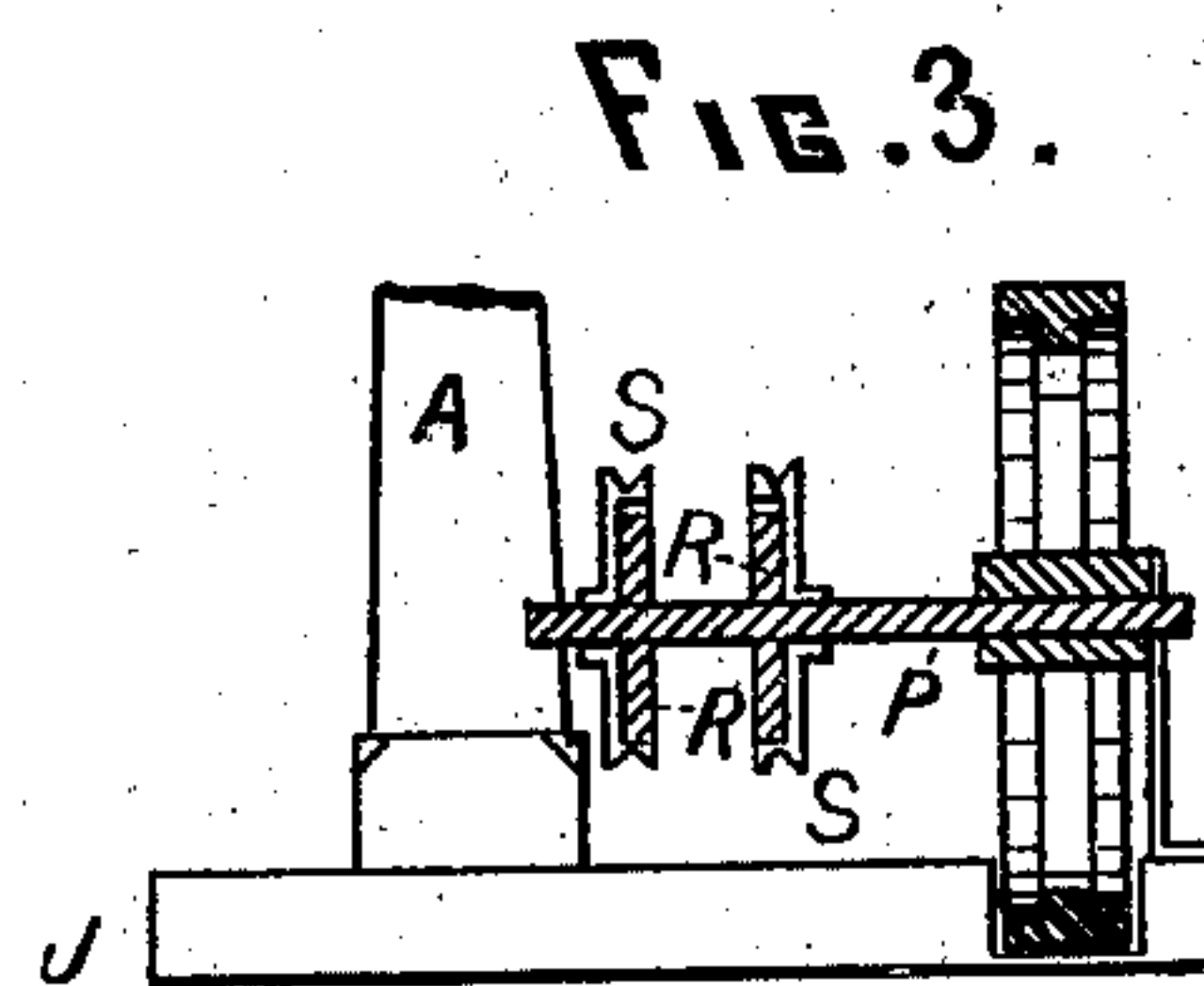
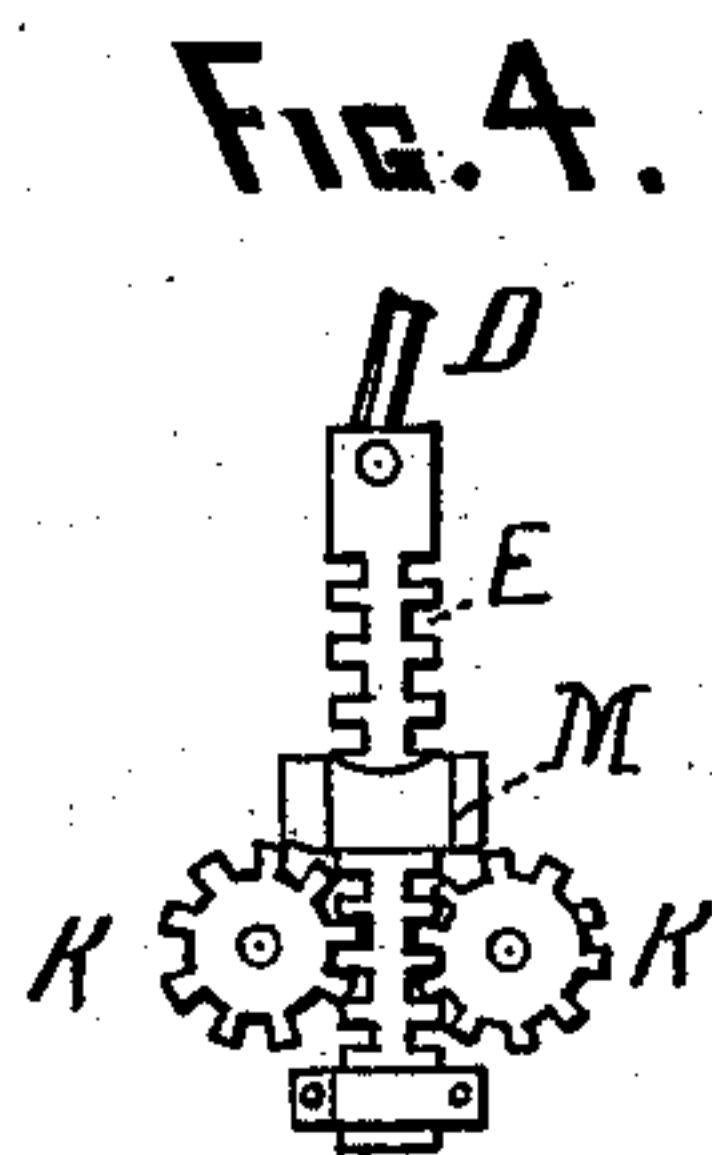
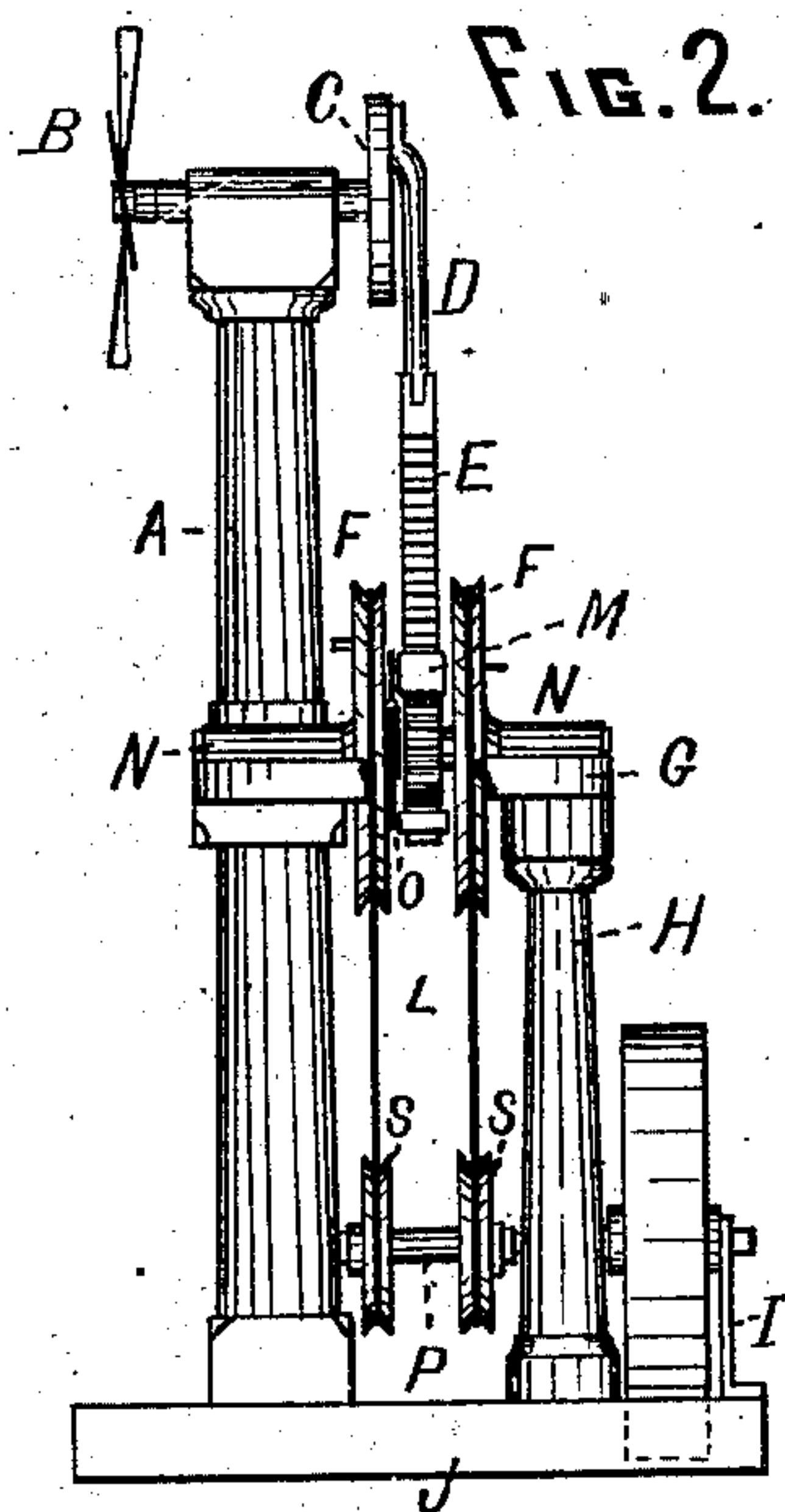
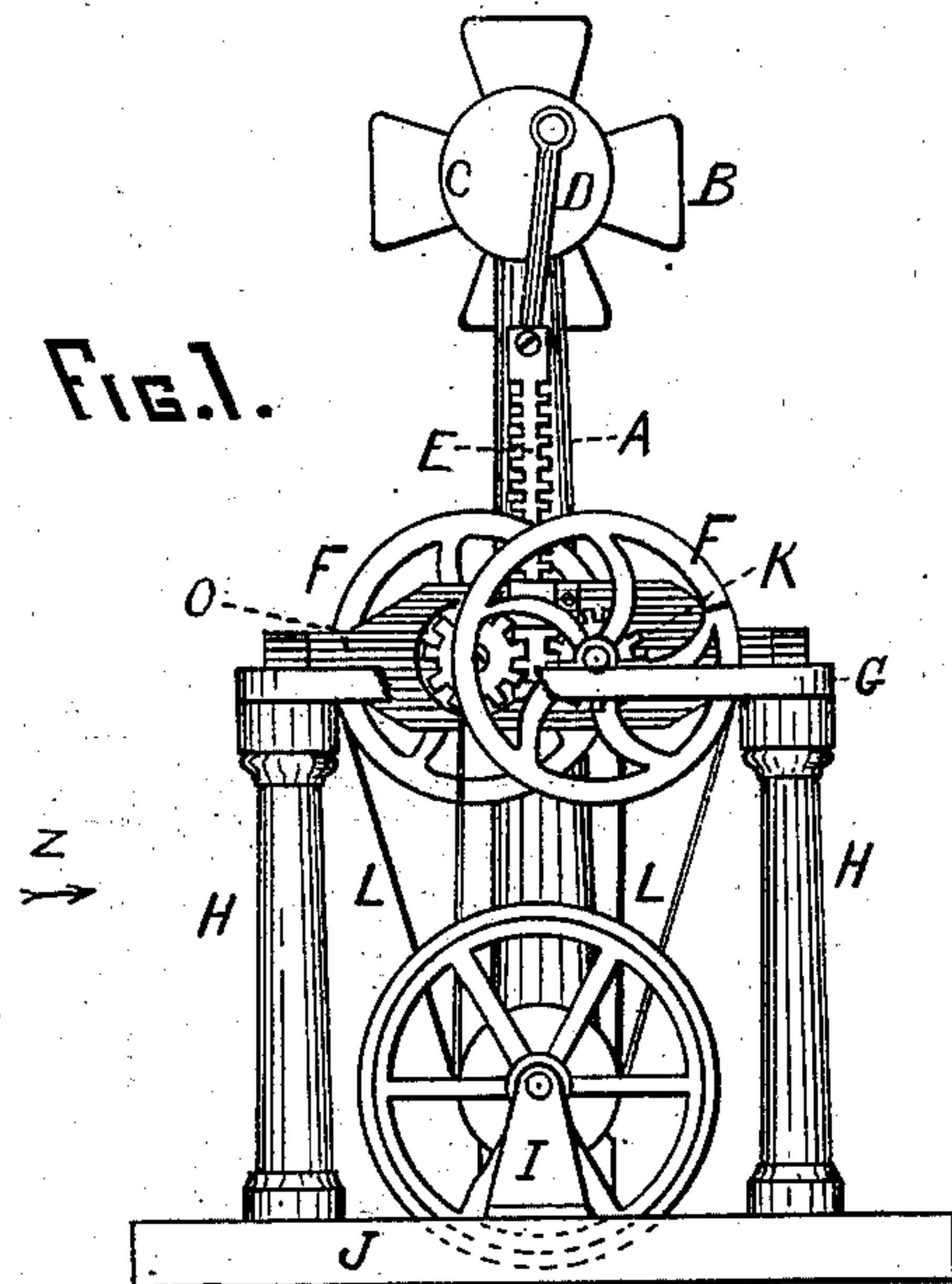


(No Model.)

W. S. MARSHALL.
Mechanical Movement.

No. 227,911.

Patented May 25, 1880.



WITNESSES.

Arthur G. Moorey.
William B. Maulore.

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UNITED STATES PATENT OFFICE.

WILLIAM S. MARSHALL, OF BATAVIA, ILLINOIS.

MECHANICAL MOVEMENT.

SPECIFICATION forming part of Letters Patent No. 227,911, dated May 25, 1880.

Application filed March 15, 1880. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM S. MARSHALL, of Batavia, in the county of Kane and State of Illinois, have invented a new and useful
5 Improvement in Mechanical Movements for Windmills, of which the following is a specification, reference being had to the accompanying drawings, illustrating the improvement, in which—

10 Figure 1 is an elevation of a wind-wheel and other mechanism, looking toward the rear face of said wheel, and embodying my improvements; Fig. 2, a side elevation of the same mechanism, looking at Fig. 1 in the direction
15 indicated by dart *x*, Fig. 1; Fig. 3, a sectional elevation of the ratchet-wheels on the lower shaft; Fig. 4, an elevation of the reciprocating rack and pinions, also pitman-connection, detached from the other parts; Fig. 5, an inside
20 face view of one of the ratchet-wheels on the shaft to be driven.

The object of the present invention is to attain a rotary motion from the reciprocating motion of the pitman of a windmill.

25 The nature of invention consists of a reciprocating rack placed between and operating two pinions which are attached to and drive two pulley-wheels in oscillating movements and in opposite directions. The pulley-wheels,
30 by means of cords or belts, drive loose pulleys on the shaft to be driven, and ratchet-wheels fixed to said shaft engage spring-pawls of ordinary construction on the loose pulleys, so that each loose pulley alternately gives a forward
35 movement to the shaft to be driven, as the whole is hereinafter fully described and shown.

40 A represents the tower which supports the wind-wheel B, and G H I J is the frame which supports the mechanism. O is the crank-wheel, and D the crank or pitman to the wind-wheel.

45 F F are pulley-wheels, whose shafts have single bearings, respectively, in long boxes N on the top of the frame part G. The pulley-wheels and their respective shafts are placed in such positions relative to each other that pinions K K, placed on the inner ends of

the shafts of wheels F, will lie in the same vertical plane and far enough apart for a
50 double cog-rack, E, to engage the cogs of the pinions and give to them an oscillating movement in reverse directions. The guide M is supported in a proper position to keep the rack E vertical in its movement by means of
55 a thin metallic frame, O, whose ends are attached to frame-work G, said frame being cut away, so as not to interfere with the movement of the pinions K, as shown in Fig. 1.

A lower shaft, P, is placed in any desired
60 position relative to the wheels F, but parallel with the shafts of said wheels, and to it are rigidly affixed two ratchet-wheels, R, and on the same shaft are placed two loose pulleys, S, which are countersunk or recessed out on
65 their inner faces to such depth as to correspond with the thickness of the wheels R, so that spring ratchet-pawls T, attached to the peripheries of the countersunk parts, will engage the ratchet-wheels R and turn them when
70 the loose pulleys are turned.

Ordinary springs are to be or may be employed to engage arms placed, respectively, on the wheels F to assist in reversing the motion of the wheels in the ordinary manner.

75 I am well aware that various devices and mechanism have been heretofore used to attain rotary motion from windmills. I therefore confine myself to the construction and combination shown.

80 I claim as new and desire to secure by Letters Patent of the United States—

1. The combination of the two wheels F, placed such a distance apart as to receive the pinions K between them, and the rack E between the pinions with the guide M and frame O, as specified, for giving oscillating motions to the wheels F in opposite directions.

2. The combination of the wheels F, pinions K, frame O, guide M, rack E, pulleys S, ratchets R, pawls T, and cords or bands L, as
90 and for the purpose specified.

WILLIAM S. MARSHALL.

Witnesses:

G. L. CHAPIN,
A. G. MOREY.