

(No Model.)

E. P. MORGAN & J. H. McMULLAN.
ROVING FRAME.

No. 483,573.

Patented Oct. 4, 1892.

FIG. 2

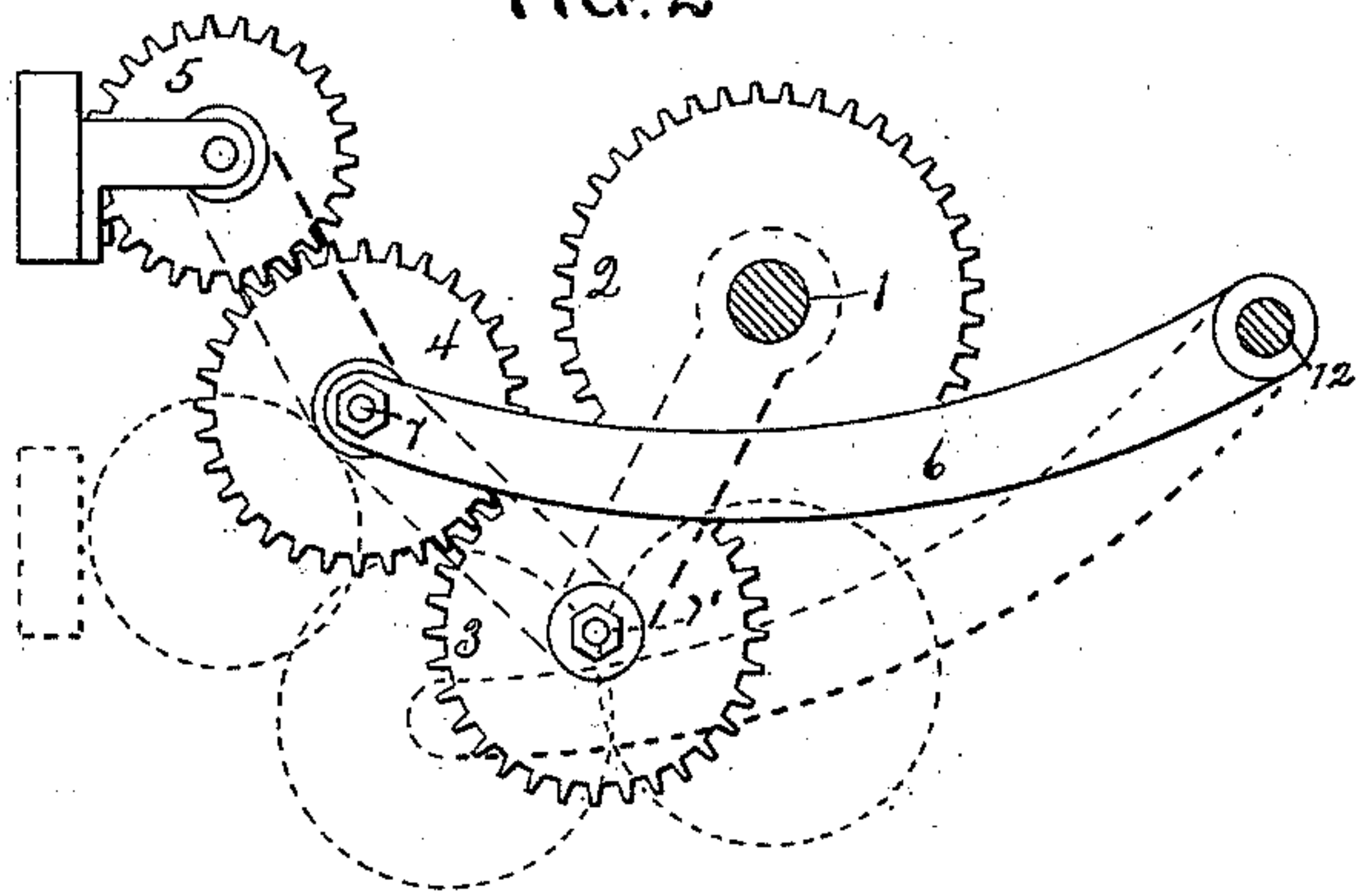


FIG. 3

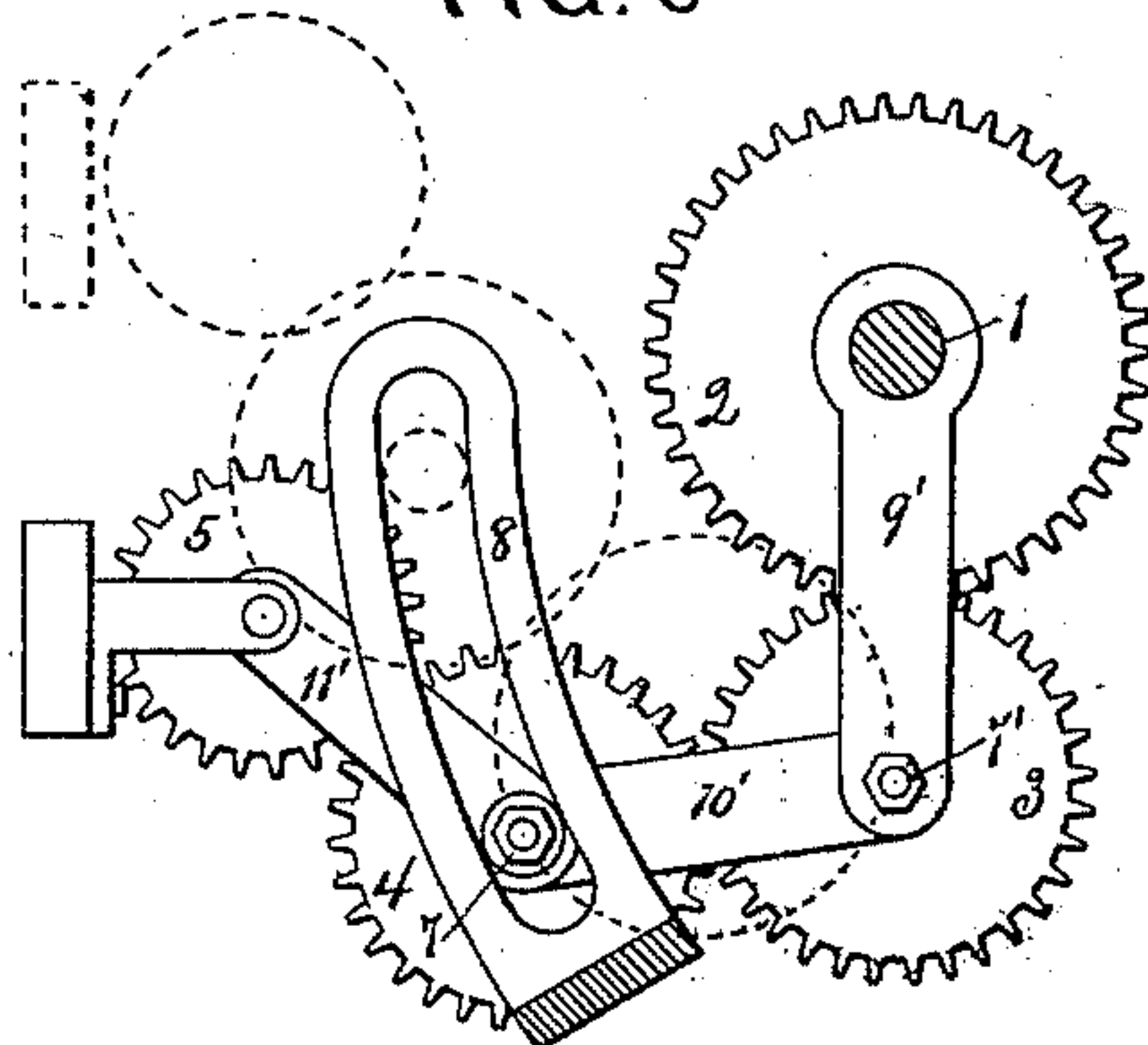


FIG. 1

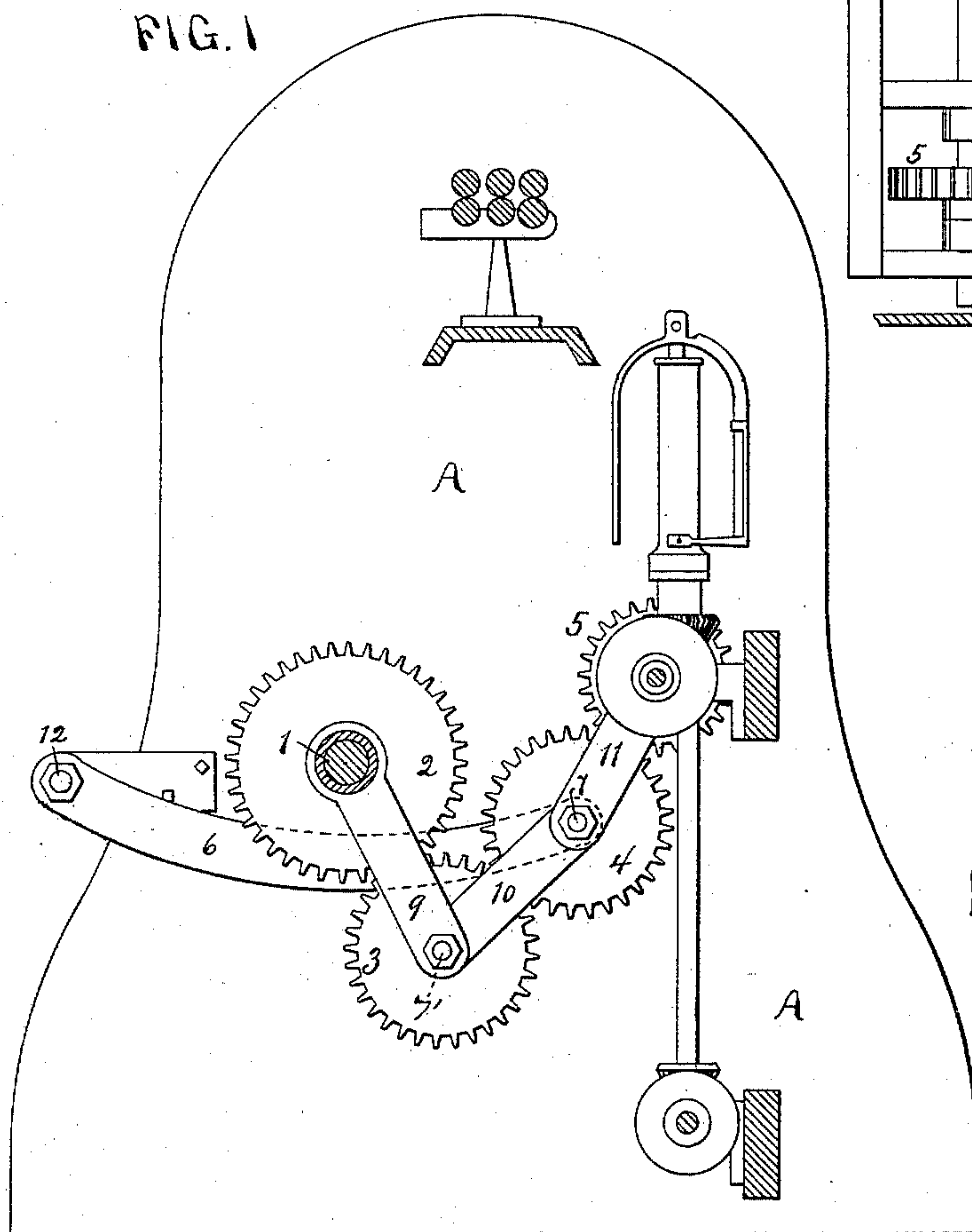
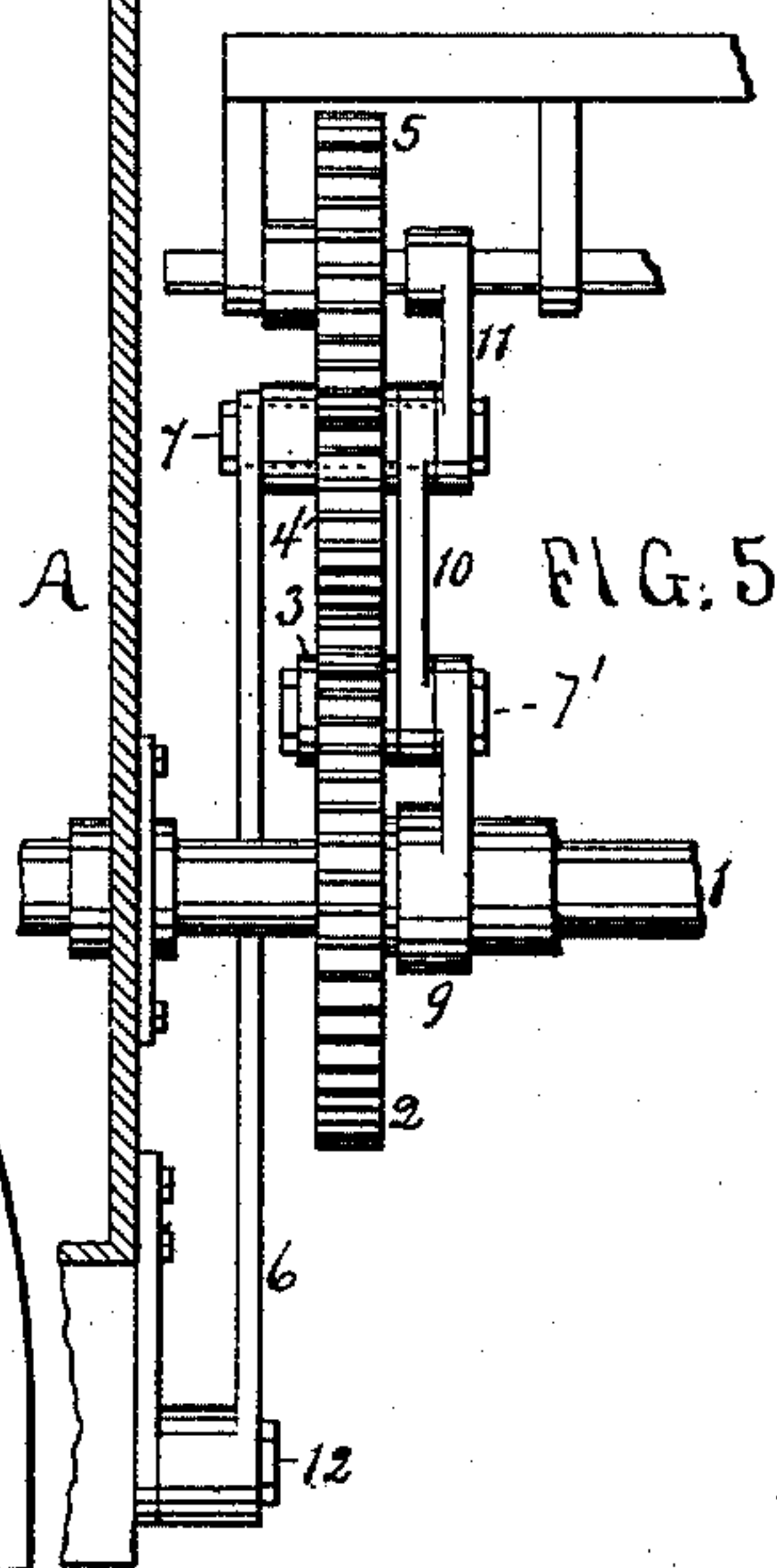
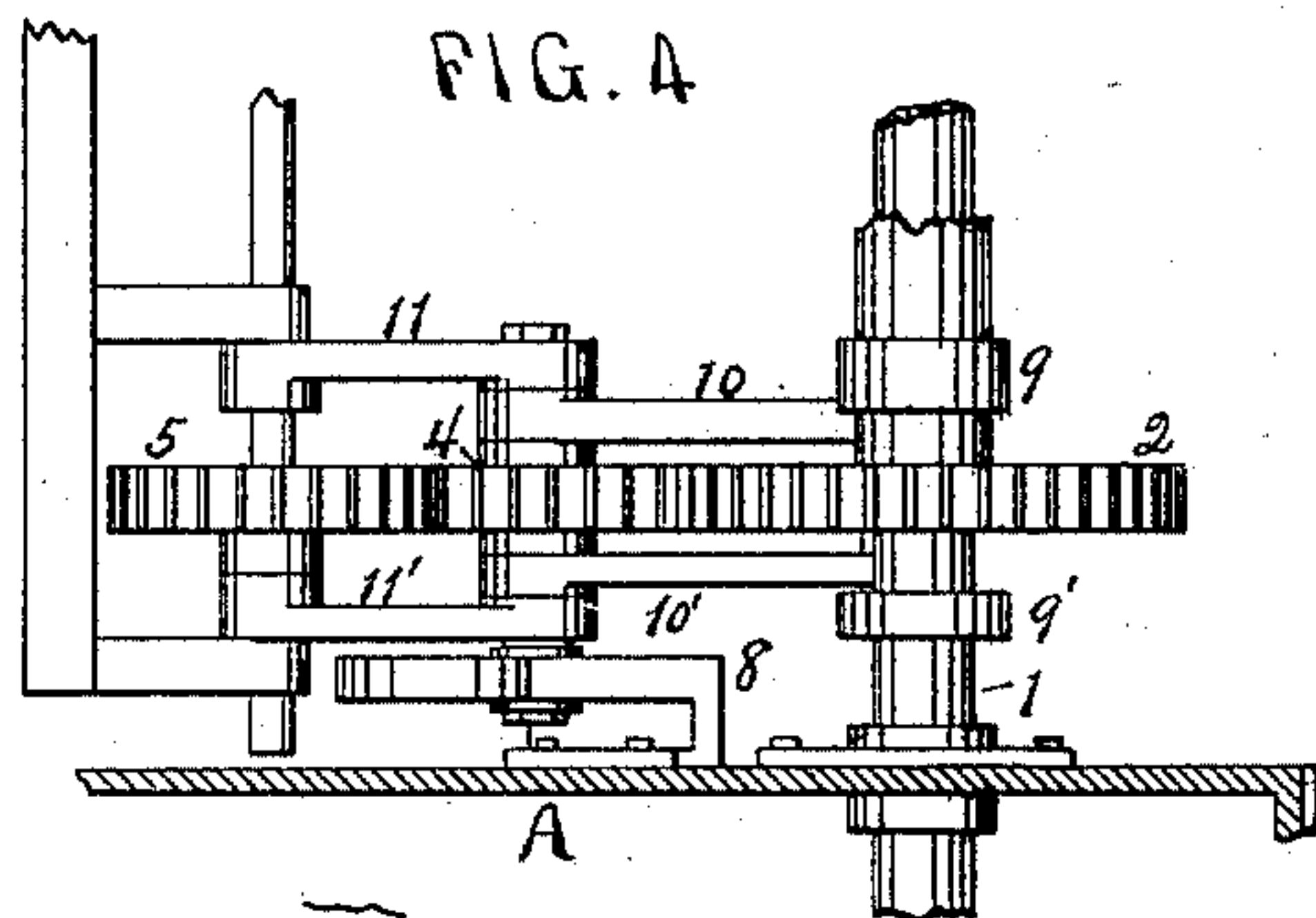


FIG. 4



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EUSTIS P. MORGAN, OF SACO, AND JAMES H. McMULLAN, OF PORTLAND,
MAINE.

ROVING-FRAME.

SPECIFICATION forming part of Letters Patent No. 483,573, dated October 4, 1892.

Application filed January 18, 1892. Serial No. 418,388. (No model.)

To all whom it may concern:

Be it known that we, EUSTIS P. MORGAN, of Saco, in the county of York, and JAMES H. McMULLAN, of Portland, in the county of Cumberland, in the State of Maine, citizens of the United States, have invented a certain new and useful Improvement in Roving-Frames, of which the following is a specification, reference being had to the drawings accompanying and forming a part thereof.

Our invention relates to machinery for making roving of cotton or other fibers, being designed to control the rotary movement of the bobbins and avoid a variable rotary movement of the same incident to the vertical traverse of the bobbin-rail. The variable movement of the bobbins above noted incident to the present mode of construction is such that during their traverse they do not take the roving as delivered from the rolls with a uniform tension, the result being a variable strain of and consequent injury to the roving. This control of the bobbin and more uniform winding of the roving thereon we accomplish by the methods and devices hereinafter set forth. Intermediate gears flexibly connected with each other and with the main driving-gear and bobbin-rail-shaft gear are selected and controlled in a fixed path by means of a directing arm or guide, so that no rotary movement of the rail-shaft gear shall result from the vertical traverse of the bobbin-rail, thus securing during each vertical traverse a uniform rotation of the bobbins and uniform tension of the roving thereon.

In the accompanying views, Figure 1 is a sectional elevation looking toward the frame-head, showing our improvement in position on a roving-frame. Fig. 2 is a sectional elevation of the same looking from the frame-head, showing the positions of the gears and directing-arm when the bobbin-rail is up, the dotted lines showing their positions when the bobbin-rail is down. Fig. 3 is a sectional elevation looking from the frame-head, showing a slotted guide as an equivalent for the directing-arm, with the gears in position when the bobbin-rail is down, the dotted lines showing their position when the bobbin-rail is up. Fig. 4 is a plan view of Fig. 3. Fig. 5 is a

plan view of the form shown in Figs. 1 and 2.

Similar characters indicate similar parts.

A is the frame-head.

1 is the main shaft.

2 is the main driving-gear loose on the main shaft and driven through other gearing, which varies its rotary movement for each vertical traverse of the bobbins.

3 and 4 are the intermediate gears, and 5 is the bobbin-rail-shaft gear.

6 is the directing-arm.

7 and 7' are pivoting-studs.

8 is a slotted guide or slotted directing arm or guide rigidly secured to the frame-head and carrying the pivoting-stud 7 and exercising the same function as the directing-arm 6.

9', 10', and 11' are supplementary connecting-arms not essential to the construction, but adding to the strength and symmetry of the machine.

12 is the directing-arm stud.

The construction and operation of our improvement are as follows: The selection of intermediate gears and adjunctive devices, as well as their relative positions in the train, is readily determined by mechanical methods, as follows: The traverse of the bobbin-rail being determined, the gears 2 and 5 are fixed so that they cannot revolve. The intermediate gears are selected and mounted upon the pivoting-studs 7 and 7' and held in contact with each other by an arm 10 or by arm 10'. These gears are also connected with the main-shaft gear and bobbin-rail-shaft gear by the arms 9 and 11 or by arms 9' and 11', to the end that when the bobbin-rail is traversed the intermediates shall roll upon each other as well as upon the fixed gears. Under the conditions set forth the path described by the intermediate gear 4 when the intermediate gears are properly selected and connected will be the arc of a circle or a close approximation thereto, the radius of which determines the construction of the directing-arm and the position of the stud 12.

When the construction of the frame or other obvious reasons render the use of the directing-arm as herein set forth inconvenient or undesirable, or if it is desirable that the path described by the intermediate gear 4 should

be other than the arc of a circle, the same end—namely, controlling and guiding the intermediate 4 in its determined path—may be secured by the device shown in Fig. 3, to wit:

- 5 A slotted guide 8, conforming to the determined path of the intermediate 4, is secured to the frame, the gear 4 being pivoted and guided therein or thereby, the form and position of said slotted guide controlling the intermediate in its determined path. The office of this slotted guide is the same as that of the directing-arm and is an equivalent therefor, the effect of either directing device being to secure the rolling of the gears upon each other, so that whatever rotary motion is given to the intermediate 4 by the traversing of the bobbin-rail shaft it shall expend itself by rolling upon the bobbin-rail-shaft gear 5 without communicating rotary motion thereto, thus leaving an undisturbed rotary motion for each traverse as communicated by the main driving-gear 2.

In the selection of intermediate gears and adjunctive devices herein set forth we do not limit our choice to any fixed dimensions or positions, as the same will vary with the construction of the frame and the determined vertical traverse of the bobbin-rail. When the selection and connection hereinbefore described are such that the gears form a flexible chain controlled in a determined path, as set forth, and no rotary movement of the bobbin-rail-shaft gear, or practically none, results from the vertical traverse of the bobbin-rail, our construction is complete.

The operation of our improvement is as follows: The rotary motion of the main driving-gear is imparted to the bobbin-rail-shaft gear through the intermediate gears and thence to the bobbins. This motion would be uniform were the bobbin-rail fixed, but as it has a vertical traverse the rotary motion of the bobbin-rail-shaft gear is variably accelerated or retarded as it moves upward or downward. This motion is communicated to the bobbins, causing a change in the tension of the roving as wound upon the bobbin. This variably accelerated or retarded speed and consequent change of tension we overcome by so controlling the position of the intermediate in contact with the bobbin-rail-shaft gear that the changed motion shall be expended by the rolling of this intermediate on the bobbin-shaft gear.

In a frame of the style and size shown in the accompanying drawings the proportions and relative positions of the several parts of our mechanism are such as conform to the requirements of construction and operation herein set forth.

In the construction of our improvement we do not confine our selection of a directing arm or guide to any set form or style other than that which shall to the best advantage (substantially as herein shown) secure the control of the intermediate 4 in a determined path.

We are aware that intermediate gears are in common use on roving-frames for the purpose of communicating motion from the main driving-gear to the bobbin-rail-shaft gear, and do not claim that as our invention.

What we claim as our invention, and desire to secure by Letters Patent, is—

1. In a machine for making roving of cotton or other fibers, the combination, with a main driving-gear and a bobbin-rail-shaft gear, of a flexible chain of gears flexibly connected with each other and with said driving and said bobbin-rail-shaft gear, as herein set forth, and for the purpose specified.

2. In a machine for making roving of cotton or other fibers, the combination of a main driving-gear 2, intermediate gears 3 and 4, bobbin-rail-shaft gear 5, connecting-arms 9, 10, and 11, pivoting-studs 7 and 7', directing-arm 6, and stud 12, said connecting-arms being pivoted on the main driving-gear shaft, bobbin-rail-gear shaft, and on the pivoting-studs 7 and 7' to secure the flexible connection of the several gears, said directing-arm being pivoted on the studs 7 and 12 to control the path of motion of the intermediate 4 conformably to the limit of the vertical traverse of the bobbin-rail shaft, substantially as and for the purpose specified.

3. In a machine for making roving of cotton or other fibers, the combination of a main driving-gear, a bobbin-rail-shaft gear, and intermediate gears, all flexibly connected with means for controlling the path of motion of said intermediates, in the manner described, to fill the conditions herein set forth.

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Witnesses:

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JERE. MURPHY.