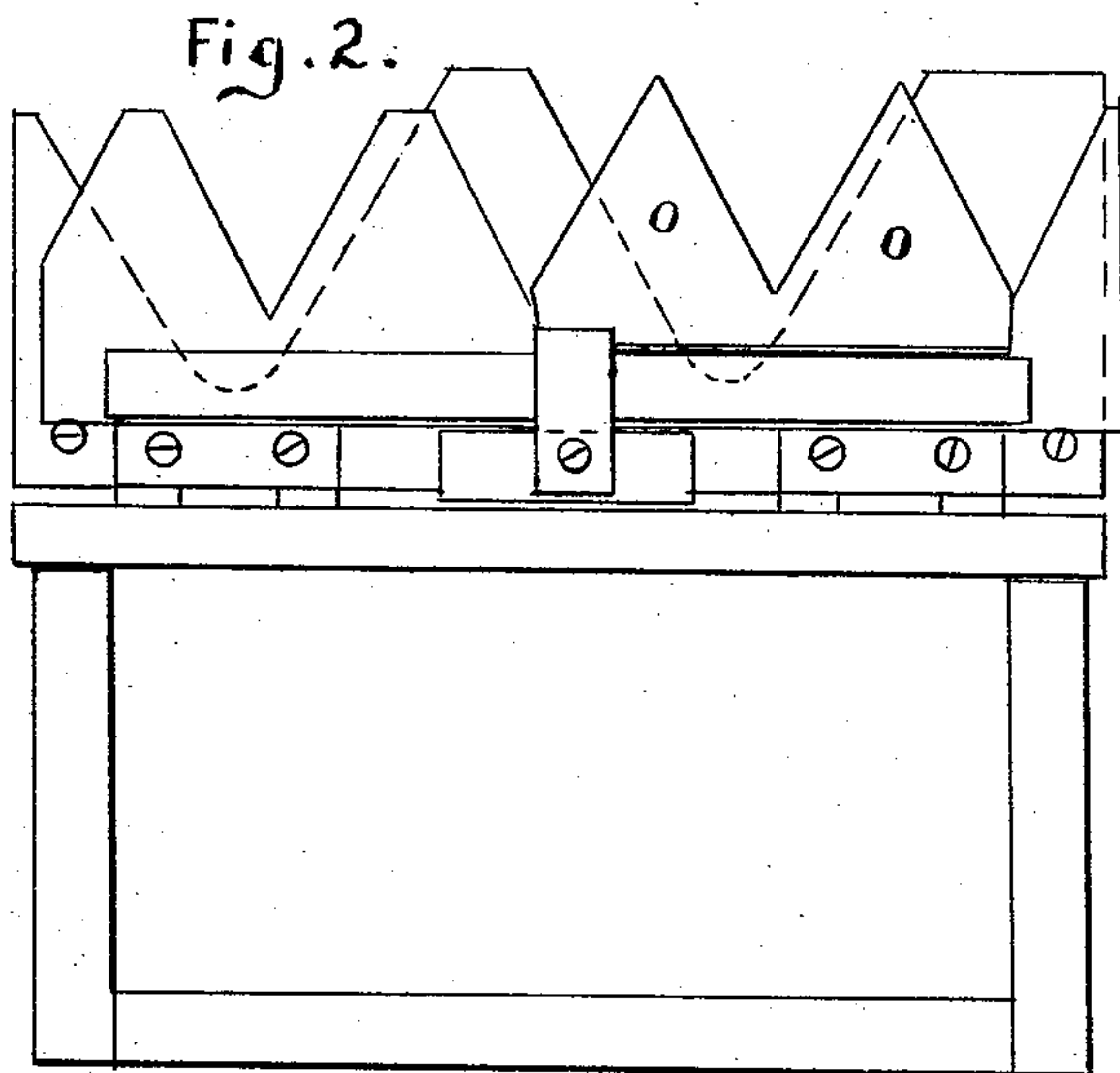
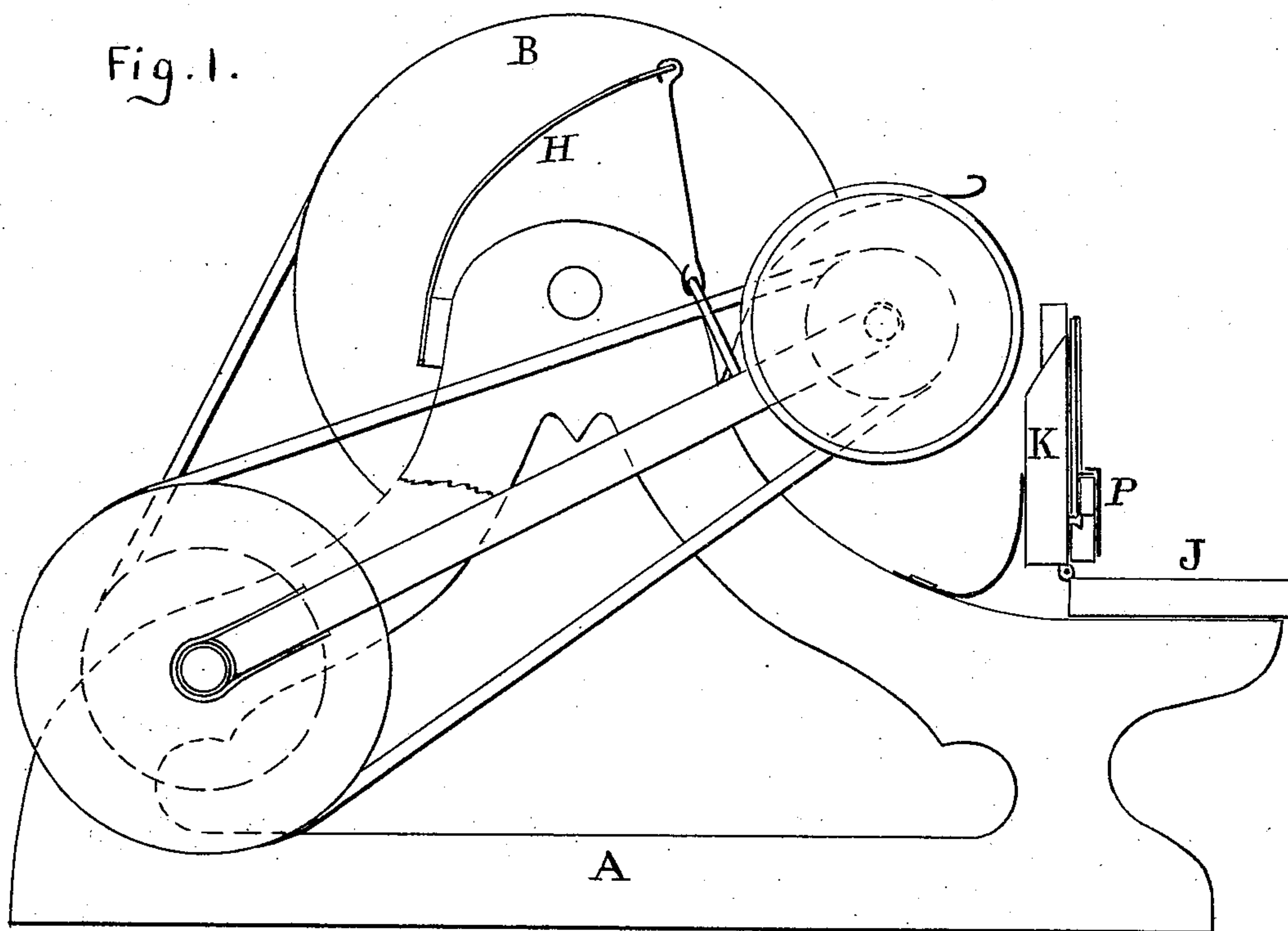


E. W. PHELPS.

Machines for Grinding Harvester-Knives.

No. 157,079.

Patented Nov. 24, 1874.



Witnesses :

As Harris
H. A. Daniels

Inventor :

Ebenezer W. Phelps
by C. S. Whitman
att'y

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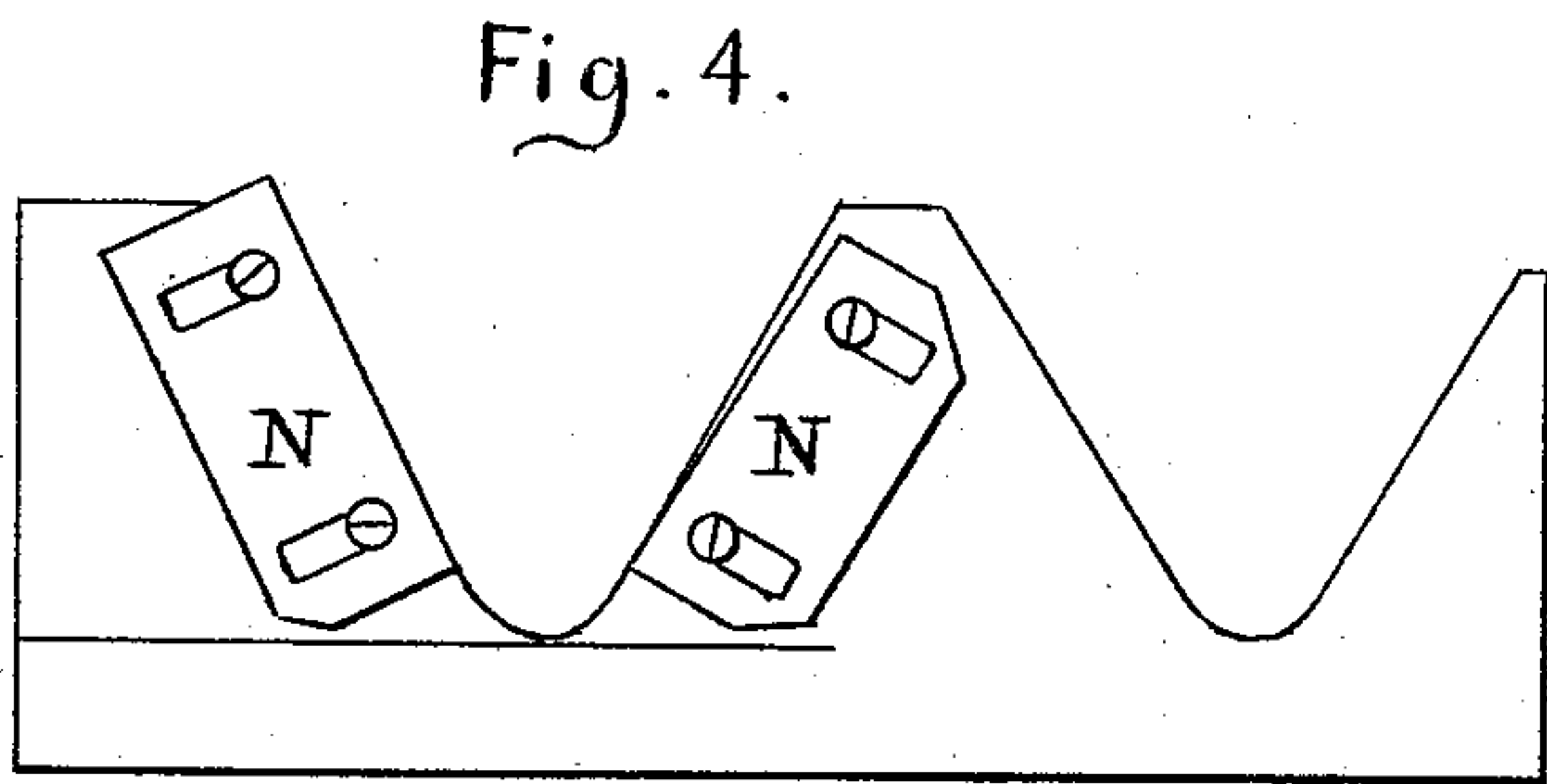
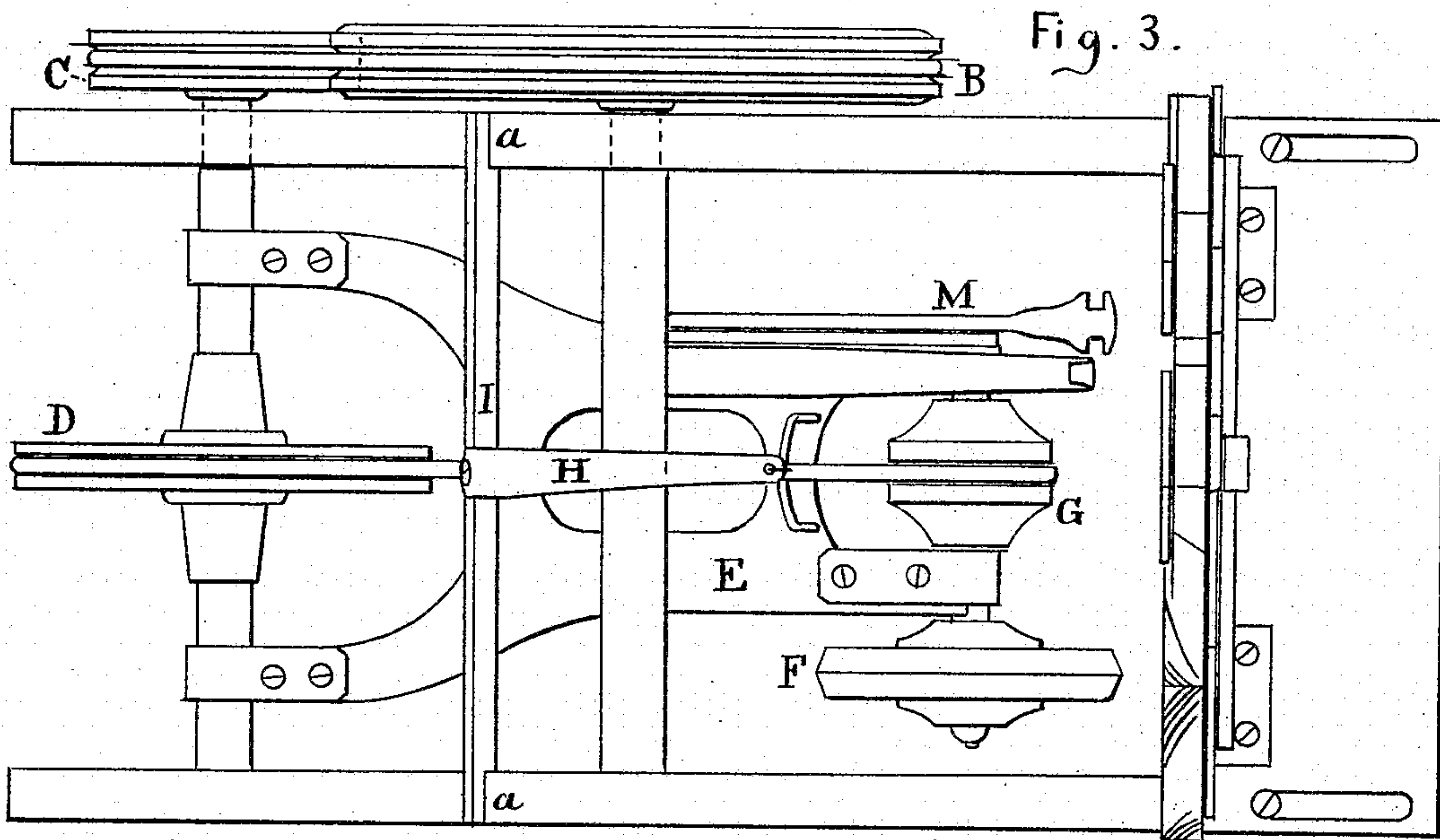
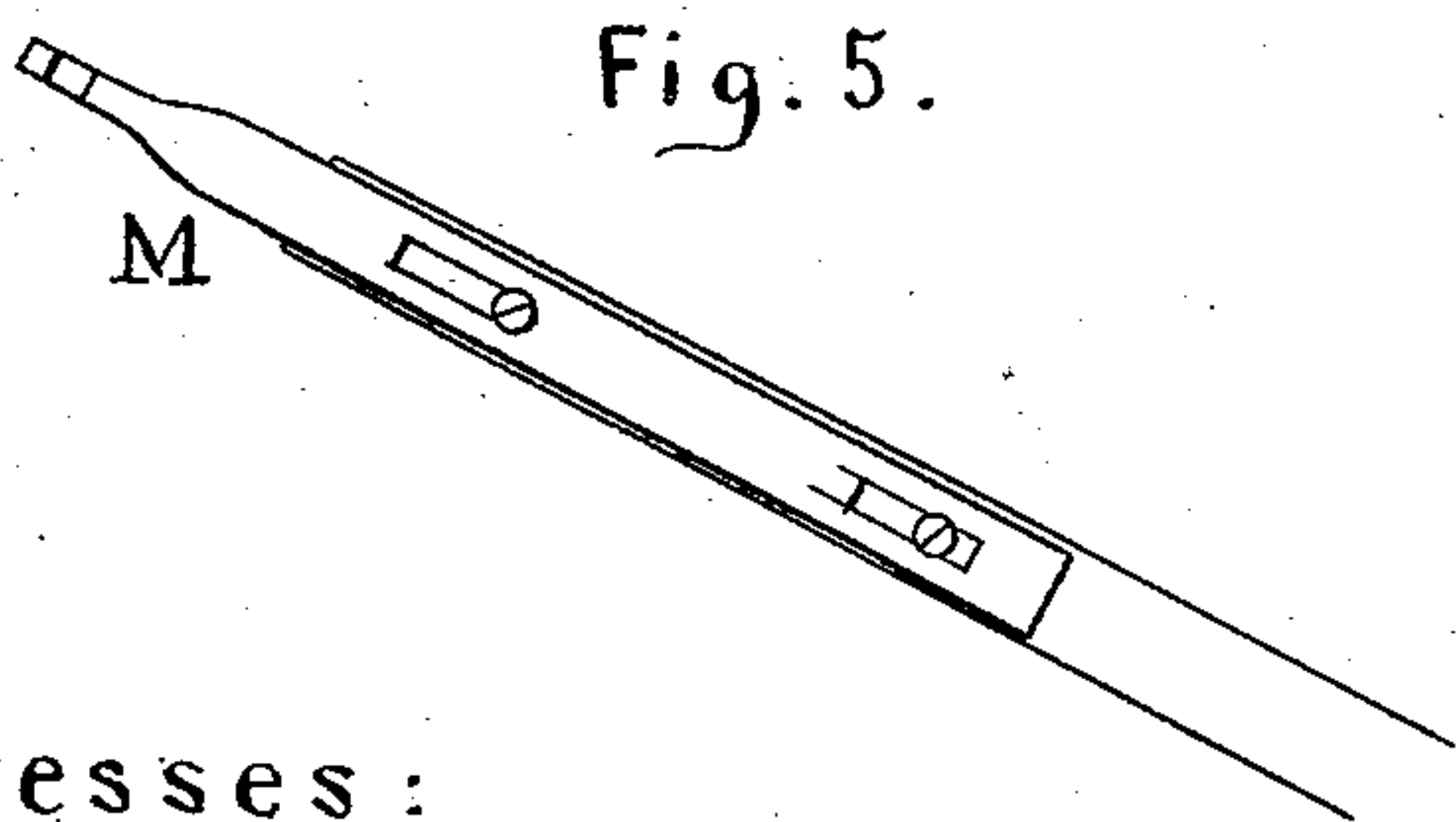


Fig. 6.



Witnesses:

W. A. Daniel

H. A. Daniel

Inventor:

Ebenezer W. Phelps
by *C. S. Whitman*
Atty

UNITED STATES PATENT OFFICE.

EBENEZER W. PHELPS, OF NEWARK, OHIO.

IMPROVEMENT IN MACHINES FOR GRINDING HARVESTER-KNIVES.

Specification forming part of Letters Patent No. **157,079**, dated November 24, 1874; application filed March 26, 1874.

To all whom it may concern:

Be it known that I, EBENEZER W. PHELPS, of Newark, in the county of Licking and State of Ohio, have invented a new and useful Machine for Grinding and Sharpening the Section-knives of Mowing and Reaping Machines.

The following description, taken in connection with the accompanying plate of drawings hereinafter referred to, forms a full and exact specification, wherein are set forth the nature and principles of the invention, by which the same may be distinguished from others of a similar class, together with such parts thereof as are claimed as new, and are desired to be secured by Letters Patent of the United States.

Figure 1 is a perspective view.

A represents the main frame of my machine, constructed in any suitable manner, to receive the other parts of the machine. To the main frame A is connected a driving cog-wheel or pulley, B, by means of a shaft passing across the frame and running in journal-bearings. This driving-wheel connects with and drives a small pinion, C, on another shaft, at the center of which is a pulley, D, some three times larger in diameter than the pinion C. On this counter-shaft a swinging frame is secured, on bearings extending the entire length of the shaft on either side of the pulley D, which admits of a lateral movement of the swinging frame, to provide for working the emery-wheel F laterally, simultaneously with an up-and-down motion when grinding, to follow the angle of the sections, as the wheel is worked back and forth on the bevel of the same. At the outer and free end of the swinging frame E, the emery-wheel arbor is secured. F, the emery-wheel, is made with a double beveled face, the angles of the bevels to correspond with the angles and bevels of the section-knives, and will work down and grind the sections to their vertex much more perfectly than by any other device heretofore known, and at the same time perfectly fit the beveled edges of the sections, when worked in combination with the guide-plates. G, the pulley on the arbor, which is driven by a belt from the pulley D. The outer end of the swinging frame is supported and held in an elevated position by a spring, H, to

which it is connected by a wire extending from the swinging frame to the free end of the spring. The other end of the spring is secured to the cross-piece I, which is secured to the main frame at *a a*, by bolts passing through slots. The main frame, being in circular form at the point where the cross-piece rests on it, provides means whereby the tension of the spring can be increased or diminished, as by raising the cross-piece on the bolts increases, and lowering reduces, the tension of the spring. At the opposite end of the main frame an adjustable table is attached, composed of two parts, J, the bed-piece being secured to the main frame by bolts passing through slots, which provide for adjusting the table to and from the emery-wheel; and K, the other part, which is hinged to the former, and admits of a vibrating movement to work the section bar to and from the emery-wheel, as may be necessary to grind as desired. This vibrating holder rests against a spring, *b*, which prevents the holder or section-knife from bearing too heavily on the emery-wheel while grinding, and yet will yield to a pressure, if desired, to grind a little deeper in some places than in others, to grind out niches or parts that have been broken out by coming in contact with stones or other hard substances. This spring having a slot through which the bolt passes, admits of its being moved back or forward, to conform to the position of the holder and emery-wheel. This vibrating holder has two V-shaped apertures through it on its upper edge, one for the emery-wheel to work through, the other for the guide-arm M to work through, to connect with the section or guide-plate O on the sections. The guide-arm M is secured to the swinging frame by screws or bolts passing through slots, to provide for lengthening or shortening it, as may be required to connect with the guide-plates on which it moves and rests, to guide the movements of the emery-wheel. This guide-arm M being attached to the swinging frame which carries the emery-wheel, perfectly controls its movements when the guide-arm is held and moved back and forth on the guides, retaining it in the desired and a uniform position on the bevel of the sections, while the emery-wheel is easily operated back and forth

on the sections, grinding a uniform bevel at all times, by merely sliding the guide-arm back and forth on the guides. The guide-plate O is made of tin-plate or any other metal, cut and bent over the edges of the sections to correspond with the angle of the same, affording protection to their edges, and also a guide for the guide-arm to move back and forth on while grinding another section. It being made of flexible material, and narrow at the base or vertex of the angle, can be made to yield and conform to the angles of the sections to be ground. This guide is easily transferred from one section to another, as required while grinding, and is held in place by the same clasp P that holds the section-bar in place. There are guide-plates N N also arranged and secured to the back or inner side of the adjustable holder, and on either side of the aperture M; through these are slots for the screws to pass, to fasten them to the holder. The slots provide for adjusting the guide-plates to correspond with the angle of

different sections having angles of different degrees. When these are used for guides, the guide-arm is run back on the screws and shortened to connect with and work on them, to guide the emery-wheel while grinding.

When the shafts and emery-wheel are in motion, the swinging frame and emery-wheel are easily operated and controlled with the thumb-and-finger hold of the lever L.

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

The guide-arm M, in combination with the swinging frame and guide-plates N and O, operating substantially as and for the purposes specified.

In testimony that I claim the foregoing I have hereunto set my hand this 4th day of March, 1874.

EBENEZER W. PHELPS.

Executed in presence of—

GEO. M. GROSSER.

ISAAC W. BIGELOW.