No. 644,447. Patented Feb. 27, 1900.

J. NORTH.

RAZOR GRINDING MACHINE.

(Application filed June 20, 1899.)

(No Model.) 2 Sheets—Sheet 1.

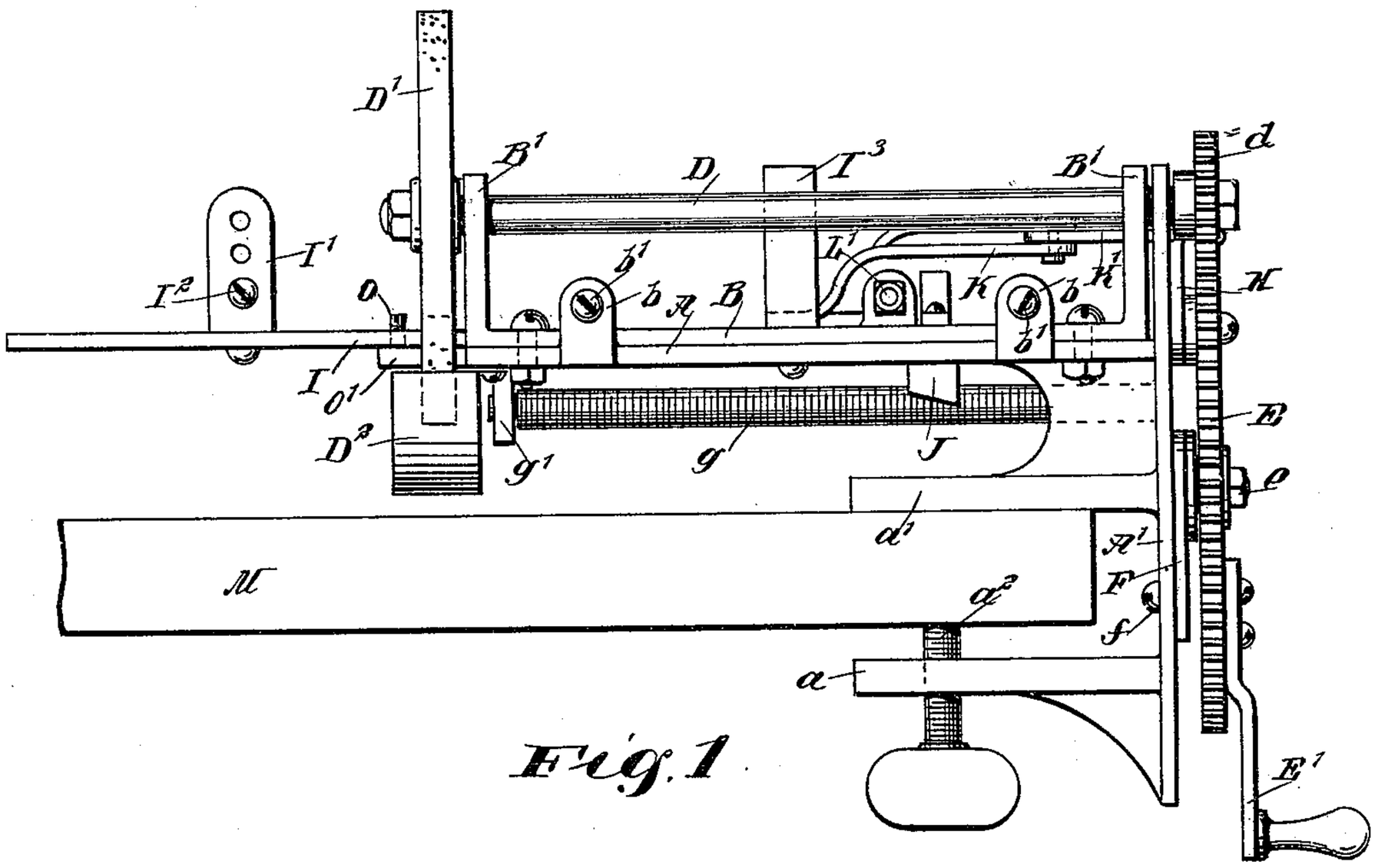

Fig. 1

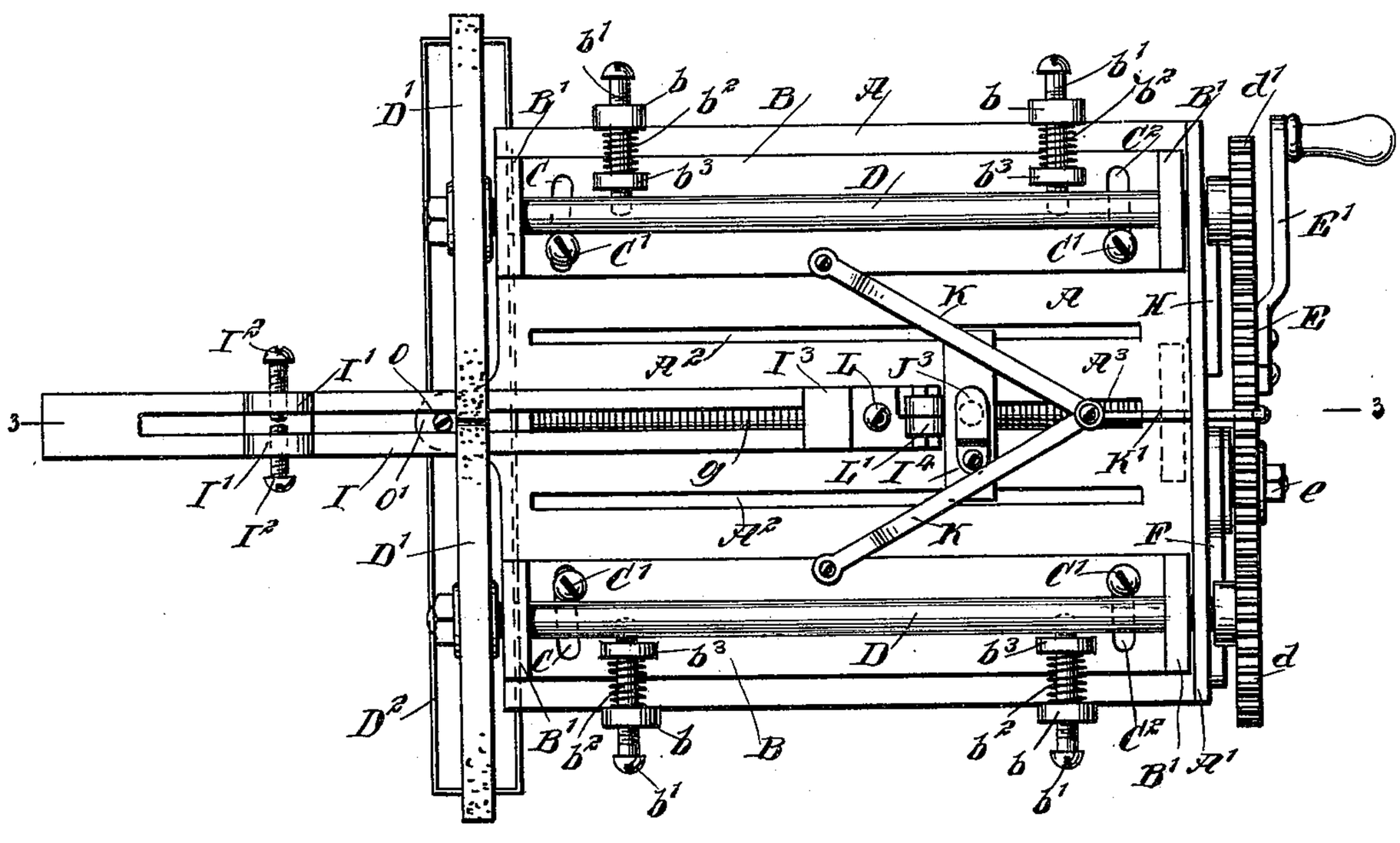

Fig. 2

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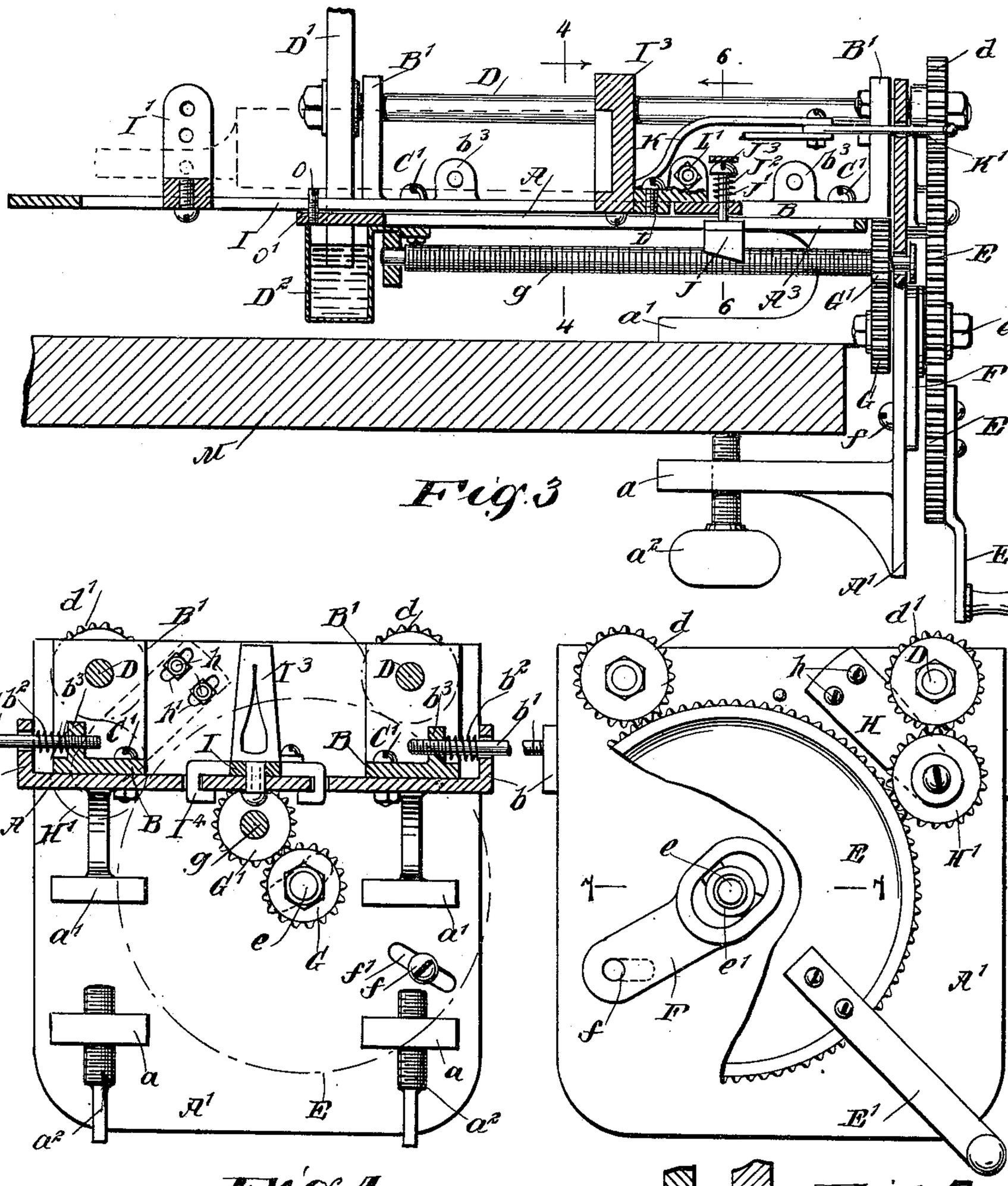

Fig. 3

Fig. 4

Fig. 5

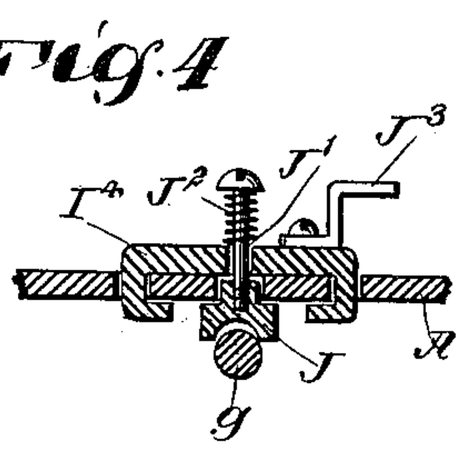

Fig. 6

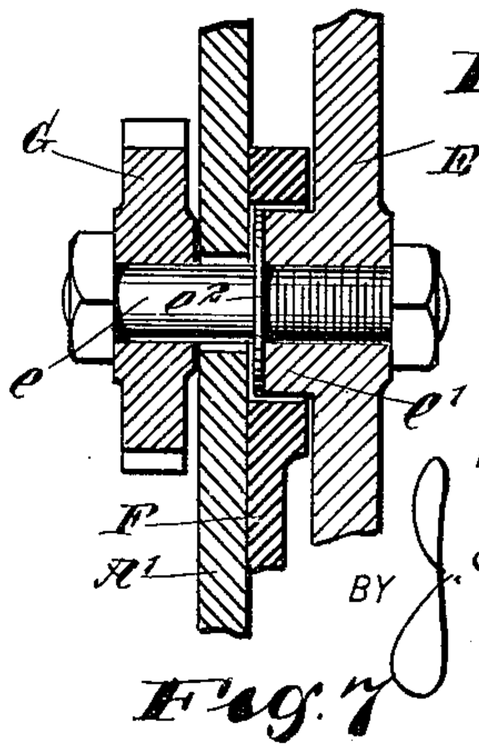

Fig. 7

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JOSEPH NORTH, OF HARRISON, NEW JERSEY.

RAZOR-GRINDING MACHINE.

SPECIFICATION forming part of Letters Patent No. 644,447, dated February 27, 1900.

Application filed June 20, 1899. Serial No. 721,221. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH NORTH, of Harrison, in the county of Hudson and State of New Jersey, have invented a new and Improved Razor-Grinding Machine, of which the following is a full, clear, and exact description.

My invention relates to an improvement in machines designed for grinding razors; and it comprises the novel features hereinafter described and claimed.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the views.

Figure 1 is a side elevation of the machine. Fig. 2 is a plan view thereof. Fig. 3 is a longitudinal sectional elevation upon the line 3 3 of Fig. 2. Fig. 4 is a cross-sectional elevation upon the line 4 4 of Fig. 3. Fig. 5 is an end view from the crank or operating end. Fig. 6 is a sectional elevation through the feeding mechanism, taken upon the line 6 6 of Fig. 3; and Fig. 7 is a section taken upon the line 7 7 of Fig. 5.

The object of my invention has been to produce a small machine which may be used for hollow-grinding razors and similar tools and which shall be of such size and cost that it may be obtained by the ordinary workman.

I have herein shown my device as provided with means by which it may be secured to a table or board M, the latter serving as a support. These means consist of four lugs or arms arranged in pairs, the lower arms a being provided with set-screws or clamping-bolts a^2, which engage the lower side of the table, while the upper arms a' engage the upper side of the table. One end of each of these arms is secured to a vertical plate A', which forms a support for the gears by which the parts are turned, and to said vertical plate and at a short distance below its upper edge is secured a horizontal plate A, which forms the framework upon which the grinding mechanism is placed.

Two bars or plates B are provided, each of which is provided at each end with vertical standards B', in which is journaled a shaft D. One of these plates and the shaft D, journaled therein, are placed upon each side of the frame, and at one end the shafts D are provided with wheels D', which are constructed of emery or any suitable grinding material, these wheels D' being placed opposite each other and being adapted to engage opposite sides of the razor or other tool to be ground. The plates B, which support the standards and the grinding-wheels, are provided with transversely-extending slots C and C^2, located near their ends, and the plates B are secured to the main plate A by means of screws C', which pass through said slots into the plate A. By this means the plates B and the grinding-wheels D, carried thereby, may be adjusted toward and from the center, so as to compensate for differences in diameter due to the gradual wear of the grinding-wheels.

For the purpose of temporarily freeing the grinding-wheels from the razor while the razor is being withdrawn the outer ends of the plates B are not rigidly secured to the plates A, but are free to be forced outward in order to separate the wheels. This transverse sliding movement is permitted by reason of the fact that the clamping bolt or screw C', which passes through the slot C, is not screwed down tightly. The plates or bars B have lugs b^3 extending upward therefrom near their outer edge and located opposite similar lugs b, which are secured to the lower plate A. Bolts b' screw in the lugs b^3 and pass through the lugs b upon the plate A. Between the lugs upon the two plates and surrounding the bolts b' are placed the spiral springs b^2, which act upon the plates B so as to force them toward the center of the device.

The ends of the shafts D opposite those to which the wheels D' are secured have pinions d and d' secured thereto. The pinion d meshes directly with the gear E, which is journaled upon the vertical plate A', and the pinion d' meshes with an adjustable idler-pinion H', said idler-pinion in turn meshing with the gear-wheel E. The idler-pinion H' is carried upon an arm H, which is adjustably secured to the plate A' by means of screws or bolts h, which pass through the arm H and through slots h' in the plate A'.

The gear E is mounted upon a short shaft e and is provided with a boss or shoulder e' surrounding said shaft upon one side of the wheel. This boss or shoulder enters and fits

snugly within an opening in one end of an arm F, said arm being adjustably secured to the plate A′ by means of a clamping-bolt *f*, said bolt passing through a slot *f′* in the plate A′. The object of these adjustments for the wheels is to compensate for the different distances between the shafts D, due to the varying sizes of the wheels D′. The shaft *e* of the gear-wheel E extends through the plate A′ and upon the opposite end carrries a pinion G, which meshes with a pinion G′, secured to a longitudinally-threaded shaft *g*, which is located centrally beneath the plate A. The plate A has a slot A^3, located just above this shaft and adapted to receive a half-nut J, which is mounted upon one end of a bar I, so that when the nut is in engagement with the threaded shaft the bar I will be given a forward feeding movement. This bar I is also provided with a central slot which embraces a combined guide and adjusting-pin O, which is threaded in an arm O′, secured to the frame. This pin or bolt O acts as a guide to hold the arm I in proper position horizontally and also bears upon the back of the razor to keep it at the proper elevation relative to the grinding-surfaces of the wheels D′. This pin will require vertical adjustment corresponding to the width of the razor-blade. The arm I, being hinged at L′ (see Fig. 2) and temporarily supported upon the pin O through the intervention of the razor, will rock upon the pin O as it is fed along, thus keeping the razor edge at the proper place whether it is curved or straight. The bar I is also provided with an upwardly-extending knee or arm I^3, which is recessed, as clearly shown in Fig. 3, to receive one end of the razor-blade and hold it firmly in position, and upon its opposite end the bar is provided with two parallel arms I′, extending upwardly and provided with clamping-screws I^2. Between these two arms the shank of the razor is placed and secured by the clamping screws or bolts I^2.

A razor in position is shown by dotted lines in Fig. 3. To the end of the bar I, which is next to the crank, is secured a cross-plate I^4, which has its ends extending downwardly through parallel slots A^2 in the plate A and then bent under said plate, so as to hold the arm securely in place. Through the plate A passes a vertical bolt or stem J′, to the lower end of which is secured the half-nut J, adapted to engage the threaded shaft *g*. The threaded bolt or stem J′ is normally held clear of the shaft *g* by means of a spiral spring J^2, which surrounds the upper end of the stem J′. Upon one end of the cross-plate I^4 is mounted a bent bar J^3, which may be swung about so as to engage the upper end of the stem J′ and hold the same depressed, so that the nut is in engagement with the threaded shaft *g*. The cross-plate I^4 is preferably secured to the arm I by a block or link having the two pivots L and L′, placed at right angles to each other, as clearly shown in Fig. 2. Beneath the two grinding-wheels D′ is placed a trough D^2, which is adapted to hold water or any other liquid by which the wheels are kept cool.

In using my device the razor is placed in position upon the bar I and secured thereon by the clamping screws or bolts I^2. While this is being done the bar should be in its outermost position. The nut J is then forced downward upon the threaded shaft *g* and held thereon. The gear-wheel E is then turned by means of the crank-arm E′, which is secured thereto, and by the mechanism described the wheels D′ are rotated. At the same time the shaft *g* is turned so as to gradually feed the razor between the grinding-wheels. When the razor has been passed entirely across the wheels, the nut J is released from the shaft *g* and the razor withdrawn. While the razor is being withdrawn it is desirable that the wheels D′ be slightly separated, so that the razor will not touch these wheels. I have herein shown a means for doing this, which consists of two links K, each of which is pivoted by one end to one of the plates B and by their other ends to each other, said ends being also pivotally connected to a rod K′, which passes through the end plate A′, and may be engaged and pressed inwardly, so as to separate the outer ends of the plates B. To pernit this action, the clamping-screws C′, which pass through the slots C^2 in the plates B, are firmly secured, while the clamping-screws C′, which pass through the slots C in the opposite ends of the plates B, are left a little loose. It is evident that the plates B may be adjusted toward the center as necessitated by the decreasing diameter of the wheels until the wheels become too small to be efficiently used.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. A razor-grinding machine, comprising two opposed grinding-wheels adapted to engage opposite sides of the razor, a bar mounted to slide between and beneath said wheels and having means for securing a razor thereto, a threaded shaft journaled beneath said razor-holder, a nut mounted upon the razor-holder and adapted to engage said threaded shaft, means for turning the grinding-wheels, and rotative connection between the grinding-wheels and the threaded shaft, substantially as described.

2. A razor-grinding machine, comprising two opposed grinding-wheels adapted to engage opposite sides of the razor, a bar mounted to slide between and beneath said wheels and having means for securing a razor thereto, a threaded shaft journaled beneath said razor-holder, a nut mounted upon the razor-holder and adapted to engage said threaded shaft, a spring acting on said nut to disengage it from the threaded shaft, a releasable catch adapted to hold the nut and shaft in engagement, means for turning the grinding-wheels, and rotative connections between the

grinding-wheels and the threaded shaft, substantially as described.

3. A razor-grinding machine, comprising two opposed grinding-wheels adapted to engage opposite sides of the razor, means for separating the grinding-wheels at will to clear the razor, a bar mounted to slide between and beneath said wheels and having means for securing a razor thereto, a threaded shaft journaled beneath said razor-holder, a nut mounted upon the razor-holder and adapted to engage said threaded shaft, means for turning the grinding-wheels, and rotative connection between the grinding-wheels and threaded shaft, substantially as described.

4. A razor-grinding machine, comprising a frame, two parallel plates or standards adjustably secured to the frame by cross slots and bolts, a grinding-wheel and its shaft journaled upon each plate or standard, the wheels being opposed, mechanism for turning said wheels, a razor-support adapted to slide beneath and between said wheels, and means for temporarily separating the wheel-carrying ends of the plates to clear the razor, while the ends remain fixed, substantially as described.

5. A razor-grinding machine, comprising a frame, two parallel plates or standards adjustably mounted on the frame to be moved toward and from each other, a grinding-wheel and its shaft journaled upon each plate or standard, the wheels being opposed, mechanism for turning said wheels, a razor-support adapted to slide beneath and between said wheels, links pivoted to the wheel carrying the ends of the said plates and to each other, and a rod connected to said links whereby the wheel-carrying ends of the plates may be separated to clear the razor, while the other ends remain fixed, substantially as described.

6. A razor-grinding device comprising a grinding-wheel, a slide having means thereon for holding the razor and presenting it to the wheel, an adjustable support for said slide adapted to engage the razor-back adjacent the wheel, and means for moving said slide.

7. A razor-grinding device, comprising a grinding-wheel, a slide-bar provided with means for holding the razor, a feeding means for said slide-bar having a flexible connection to one end thereof, guides for the slide-bar, and an adjustable support engaging the razor-back adjacent the grinding-wheel.

8. A razor-grinding device comprising grinding-wheels and means for turning them, a slide-bar having a longitudinal slot and provided with means for securing a razor thereto, a feed device connected with one end of the slide-bar, said end of the slide-bar having a hinge therein, and a vertically-adjustable pin passing through the slot in the slide-bar adjacent the wheels and engaging the back of the razor.

9. A razor-grinding machine, comprising a frame, two standards or plates adjustably mounted upon the frame to be moved toward and from each other, a shaft and grinding-wheel thereon mounted upon each plate or standard, a driving-pinion upon each shaft, a main driving-gear mounted upon the frame by an adjustable pivot and meshing with one of the said pinions, and an adjustable idler-pinion connecting said gear and the pinion upon the other shaft, substantially as described.

10. A razor-grinding machine, comprising a frame, two standards or plates adjustably mounted upon the frame to be moved toward and from each other, a shaft and grinding-wheel thereon mounted upon each plate or standard, a driving-pinion upon each shaft, a driving-gear meshing directly with one of said pinions, an adjustable idler-pinion connecting the driving-gear with the other pinion, and an arm adjustably secured to the frame and having bearings therein for the driving-gear, substantially as described.

11. A razor-grinding machine, comprising a frame, two standards or plates adjustably mounted upon the frame to be moved toward and from each other, a shaft and grinding-wheel thereon mounted upon each plate or standard, a driving-pinion upon each shaft, a main driving-gear mounted upon the frame by an adjustable pivot and meshing with one of the said pinions, an adjustable idler-pinion connecting said gear and the pinion upon the other shaft, a razor-supporting slide adapted to slide beneath and between the grinding-wheels, a threaded shaft journaled in the frame, a nut on the razor-holding slide adapted to engage said shaft, and rotative connection between said shaft and the wheel-turning mechanism.

JOSEPH NORTH.

Witnesses:
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