(No Model.) 2 Sheets—Sheet 1.

J. G. KINGSBURY.

ENGRAVING MACHINE.

No. 546,542. Patented Sept. 17, 1895.

Fig. 1.

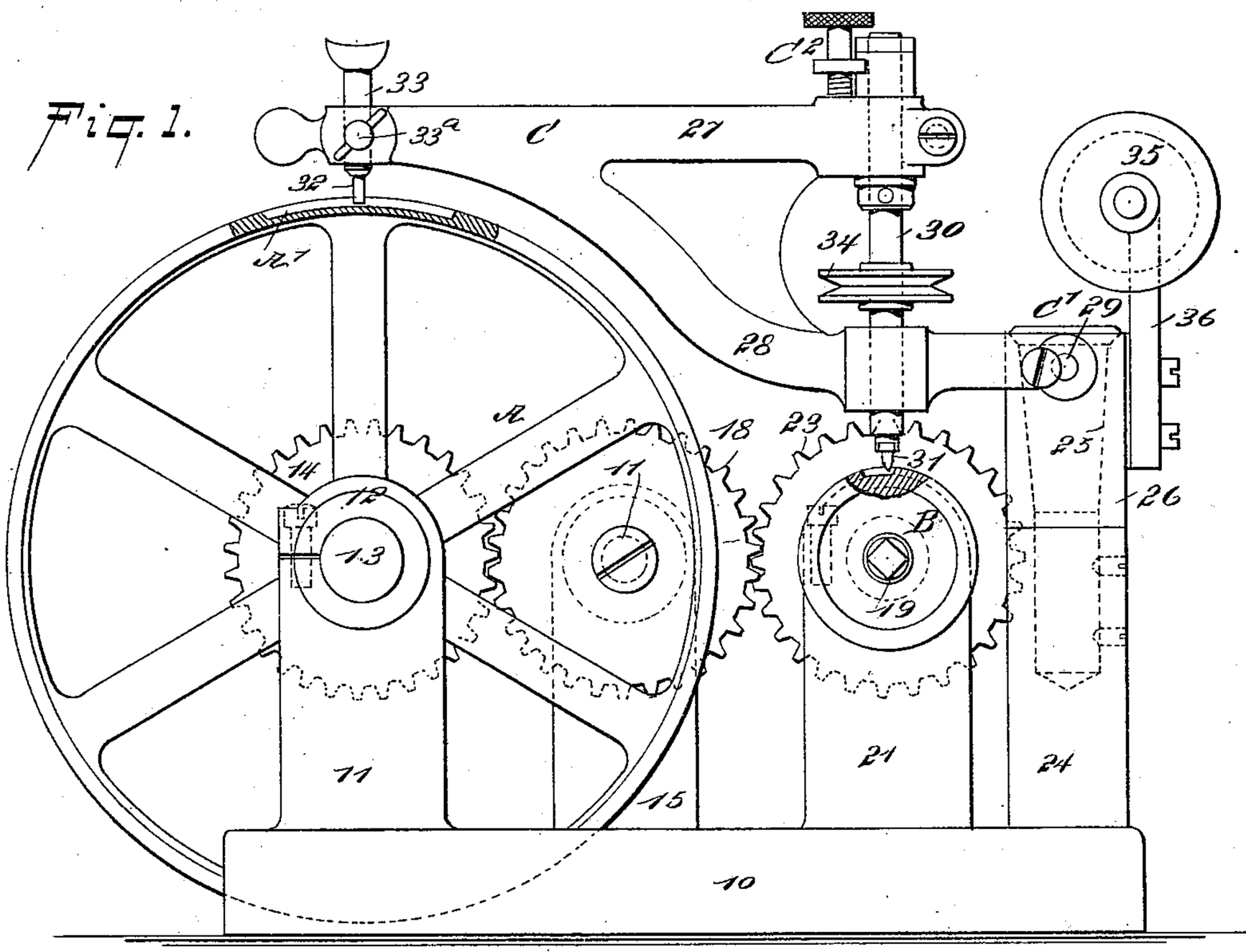
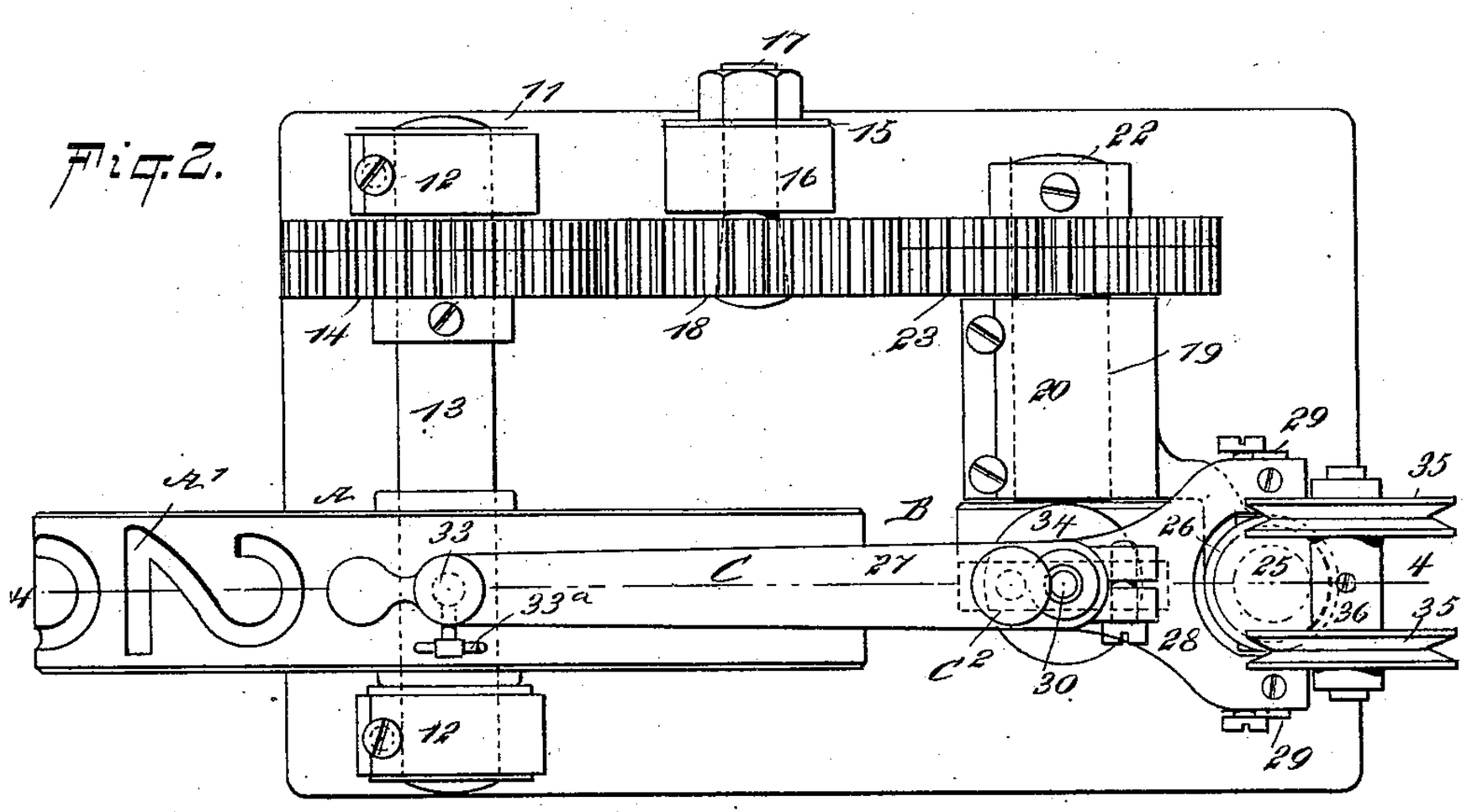


Fig. 2.



WITNESSES:

William Gaebel.

J. Frederick.

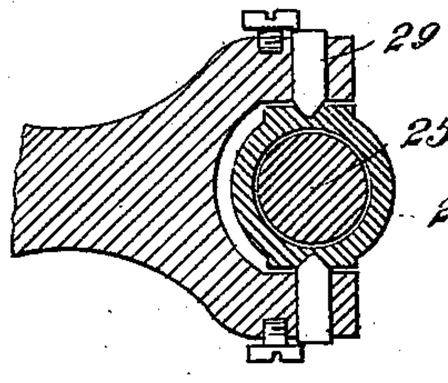


Fig. 3.

INVENTOR

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Fig. 4.

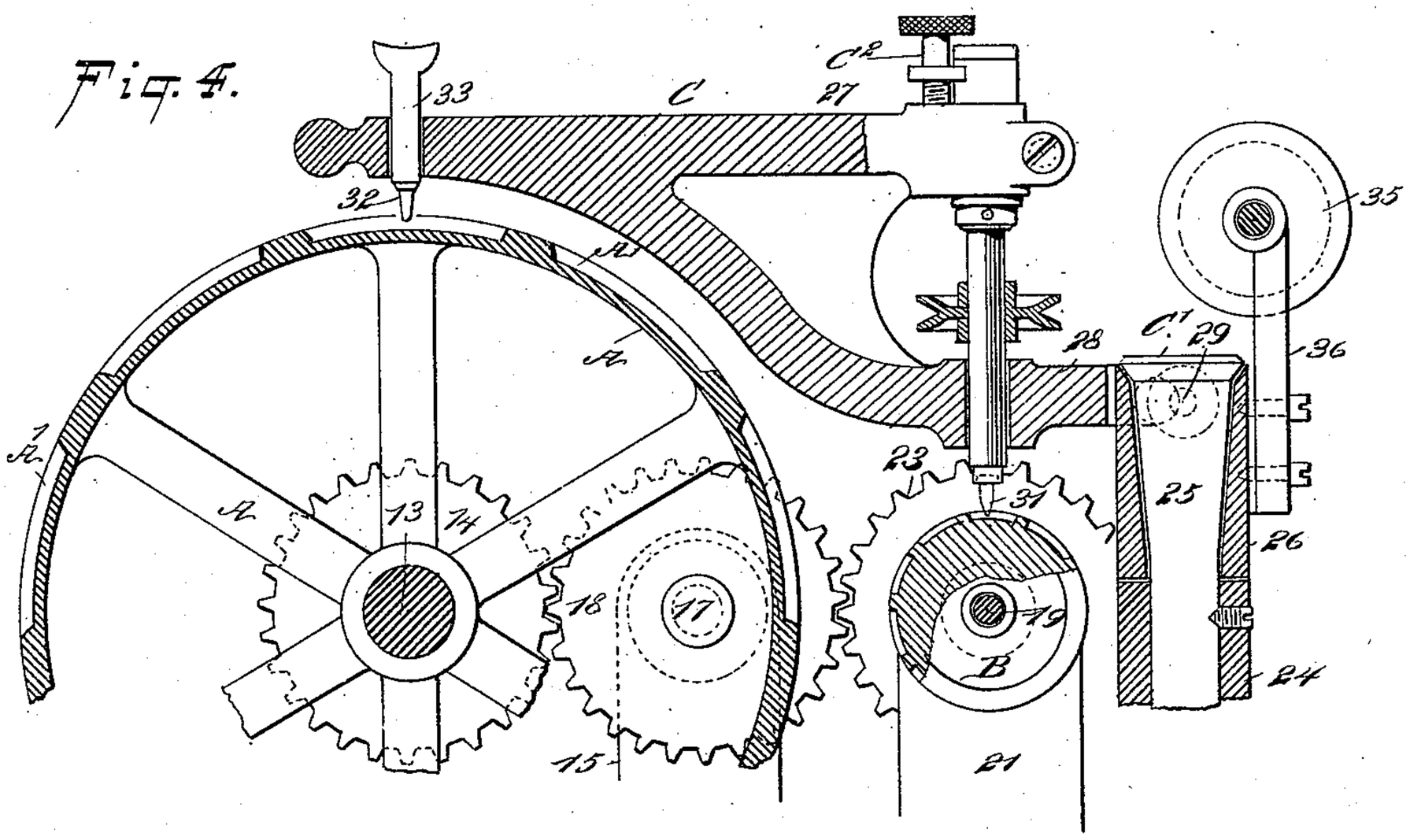

Fig. 5.

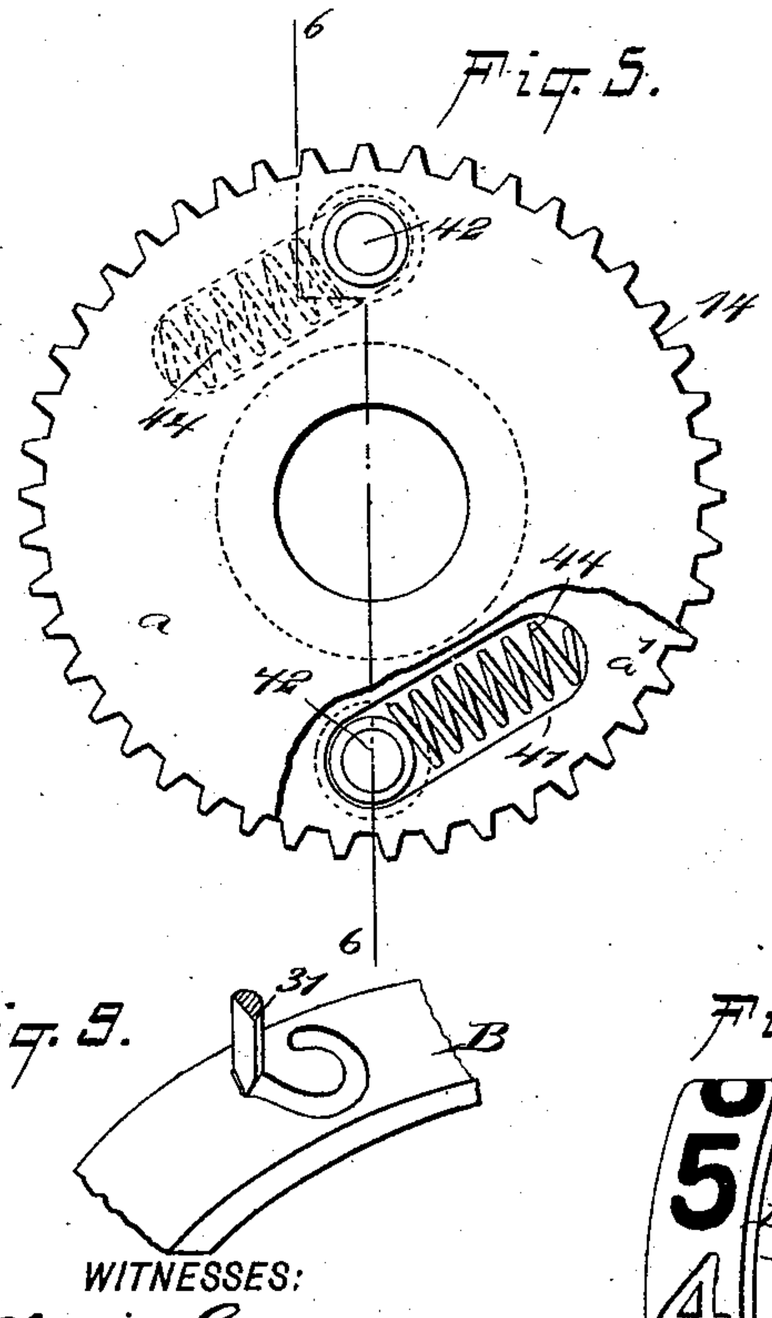

Fig. 6.

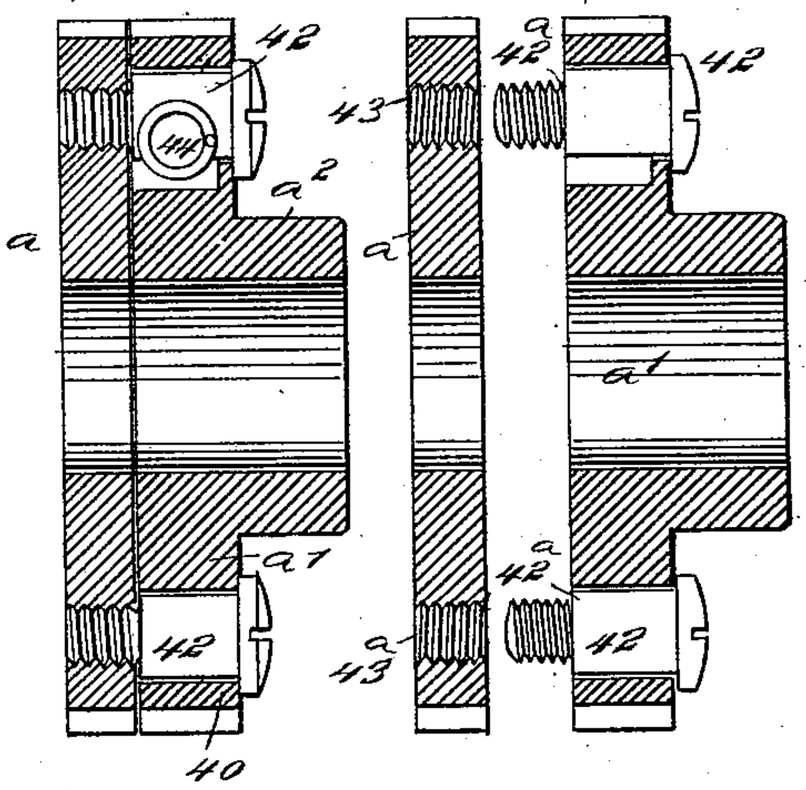

Fig. 7.

Fig. 9.

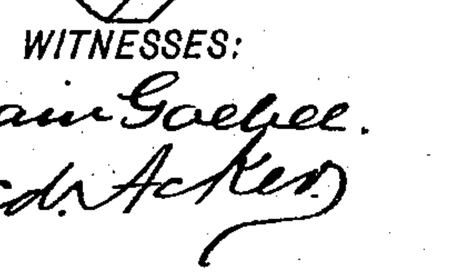

Fig. 8.

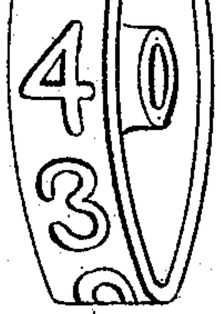

Fig. 10.

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UNITED STATES PATENT OFFICE.

JERE G. KINGSBURY, OF BRIDGEPORT, CONNECTICUT.

ENGRAVING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 546,542, dated September 17, 1895.

Application filed November 28, 1894. Serial No. 530,236. (No model.)

To all whom it may concern:

Be it known that I, JERE G. KINGSBURY, of Bridgeport, in the county of Fairfield and State of Connecticut, have invented a new and Improved Machine for Engraving Figures in Counting-Wheels, of which the following is a full, clear, and exact description.

My invention relates to a machine especially adapted for cutting or engraving numbers upon a numbering or counting wheel of a numbering or counting machine, the numbers being produced in the wheel in intaglio or sunken below the surface of the wheel; and the object of this invention is to construct a machine by means of which the numbers or other desired characters may be engraved in a wheel in a convenient and expeditious manner, and whereby the services of but a single attendant will be necessary, the machine accomplishing all the work of cutting and finishing.

The invention consists in the novel construction and combination of the several parts, as will be hereinafter fully set forth, and pointed out in the claims.

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

Figure 1 is a side elevation of the improved machine. Fig. 2 is a plan view thereof. Fig. 3 is a section through a portion of the delineating-arm and its bearings. Fig. 4 is a section taken through the machine, practically on the line 4 4 of Fig. 2. Fig. 5 is a partial face view and partial sectional view of one of the compensating gears that may be employed in the machine. Fig. 6 is a section through said gear, taken practically on the line 6 6 of Fig. 5. Fig. 7 is a section through a gear, substantially the same as shown in Fig. 6, the portions of the gear, however, being shown separated in this figure. Fig. 8 is a perspective view of the finished wheel. Fig. 9 represents the action of the cutting-tool on the wheel in producing a plain Gothic letter, and Fig. 10 is a similar view illustrating the action of the cutting-tool in producing a Roman intaglio letter.

In carrying out the invention the base 10 of the machine is provided, preferably, near one end with standards 11, provided with suitable boxes 12, and in these boxes a shaft 13 is journaled, and this shaft has secured upon it a master or matrix wheel A, and in the periphery of this wheel numbers A′, characters, or letters are produced in intaglio or are sunken below the surface of the wheel, these numbers or characters being intended to be reproduced upon the periphery of the counting-wheel B, the location of which will be hereinafter described.

On the shaft 13 a gear 14 is likewise secured, which is made to mesh with a gear 18, located on a short shaft 17, journaled in a box 16, located on a standard 15, near one of the standards 11, and the said gear 18 is made to mesh with another gear 23, located on a shaft 19, parallel with the master or matrix wheel shaft 13, and the said shaft 19 is preferably journaled between its ends in a box 20, located upon a standard or upright 21, projected from the base, and at its rear end is journaled in a suitable box located upon a second standard 22.

The shaft 19 carries at its inner or forward end a blank-wheel B, upon the periphery of which the numbers or characters are to be produced, and the periphery of this wheel B and that of the master or matrix wheel A are substantially opposite one another. A delineating-arm C is adapted to be swung over both the matrix or master wheel and the wheel to be engraved or cut. This arm C is preferably made as shown in Fig. 4, in which its front end consists of a single member terminating in a handle, and this single member extends over the periphery of the master or matrix wheel, while the rear end of the arm is made in two members 27 and 28, one below the other, the lower member 28 being longer than the upper one, and the arm is pivoted at C′, through the medium of its lower member 28, upon the frame of the machine. The pivotal attachment of the arm C to the machine-frame is preferably accomplished as shown in Figs. 3 and 4, in which it will be observed that a tubular post 24 is projected upward from the base of the machine-frame, and a shaft 25 is made to enter the tubular post, being held fixedly therein by means of a screw

or other means, and the upper end of this shaft is made tapering and is of greater diameter than its lower portion.

The upper or tapering end of the shaft 25 loosely receives a sleeve 26, the sleeve being prevented from slipping from the shaft by flaring the head of the latter. The rear end of the lower member 28 of the delineating-arm is bifurcated to receive the upper portion of the said sleeve 26, and is pivotally connected, as shown in Fig. 3, by pins or studs 29 with opposite sides of the sleeve. Therefore this delineating-arm is capable not only of a vertical movement, but of a horizontal movement likewise. A tool holder or spindle 30 is journaled in suitable bearings in the members 27 and 28 of the delineating-arm, and the spindle carries at its lower end a cutting-tool 31, the tool being located exactly over the center of the peripheral portion of the blank-wheel B to be cut. The spindle 30 may be adjusted vertically to regulate the cut by means of an adjusting device C^2, of any approved construction.

In the handle end of the delineating-arm the shank 33 of a tracing or guide pin 32 is located, being held in position by means of a set-screw 33^a, as shown in Fig. 2, or the equivalent of the screw may be used. This tracing or guide pin is located directly over the central peripheral portion of the master or matrix wheel A, as is also shown in Fig. 4.

In the operation of the machine the operator will guide the tracing-pin into the matrices or depressions A′ in the master or matrix wheel, and in so doing the cutting-tool 31 will reproduce the figure or character of the matrix-wheel upon the periphery of the wheel to be cut, but on a smaller scale, the matrix-wheel being turned by hand. Consequently, through the gearing 14, 18, and 23, heretofore described, the matrix-wheel shaft and the shaft upon which the wheel to be cut is placed will be rotated alike. The spindle 30, carrying the cutting-tool, is intended to be rapidly rotated, and this is accomplished by securing upon the said spindle a pulley 34, and placing guide-pulleys 35 upon a suitable bracket 36, as shown in Fig. 2, the bracket being secured to the U-sleeve 26, in order that the guide-pulleys shall turn with the said delineating-arm. The power by which the spindle 30 is rotated may be derived from any convenient source. The master-wheel is usually made a predetermined number of diameters larger than the wheel to be cut, and the master-figures are in the same ratio larger than the figures reproduced, and the delineating-arm C bears the same ratio of multiplication from the pivot C′ to the center of the cutter-spindle and guide or tracing pin that the master-wheel does to the wheel to be operated upon. It is not absolutely necessary that the master-wheel should be larger than the wheel to be cut, as it is only required that the moving parts above referred to shall be so proportioned as to produce a reproduction of the characters of the master-wheel upon the blank-wheel.

The machine will readily cut figures of the plain Gothic type, as shown in Fig. 9, in which the cutter will present a substantially flat cutting-surface to the metal, and it will likewise cut a Roman figure, as shown in Fig. 10, and in this event the master or matrix wheel has its master or matrix figures cut deeper in the shaded portions. When this form of type is to be cut, the cutter is conical and pointed, and as the guide or tracing pin in the delineating-arm follows the deeper portions in the matrix-figures the cutter also sinks deeper in the wheel it is engraving, and on account of the conically-shaped cutter it makes a wider cut, and thereby produces a shading. Preferably, but not necessarily, the gears 14 and 23 are compensating-gears, and when so made are constructed as shown in Figs. 5, 6, and 7, in which it will be observed that each of the gears is made in two sections, a thin section a and a thicker section a', the latter being provided with a hub a^2.

The thicker section a' is provided with two diametrically-opposite apertures 40, which extend in even diameter through from face to face, and each of these apertures is made to meet a recess 41, preferably of elongated shape, the recesses being made in the inner face of the said gear-section, as shown in Figs. 5 and 7. Each aperture 40 receives the plain surface of a screw 42, the said plain surface being of a diameter which will permit it to turn loosely in the aperture. The threaded surface of the screw is reduced, forming a shoulder 42^a, and in the thinner section a of the gear diametrically-opposite apertures 43 are made, having their walls threaded to receive the threaded section of the said screw, and when the screws are properly seated in the thinner sections of the gears their shoulders 42^a will be flush with the inner face of the larger gear-section a'. A spring 44 is located in each of the recesses 41, having bearing at one end against the larger section of the screw 42. The action of the springs 44 tends to roll the thinner portion a of the gear in an opposite direction to the thicker portion a', and owing to the looseness of the plain portions of the screws 42 the springs force the teeth out of line on the two sections of the gear. Since the center gear 18 is solid, it is obvious the teeth of the other two gears will bear on both sides of the teeth in the intermediate gear with sufficient force to prevent lost motion, and at the same time compensate for any small chips or imperfections due to the cutting of the teeth on the gears.

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

1. In an engraving machine the combination, of two shafts one adapted to support a master wheel and the other adapted to support a blank wheel, means for imparting rotary movement to one shaft, a compensating

gearing between the two shafts, and a delineating arm having a tracing point adapted to engage the master wheel and a cutting tool adapted to engage the blank wheel, substantially as set forth.

2. In a machine of the character described, a compensating gear adapted to mesh with a solid gear, said compensating gear being made in two circular sections, adapted to fit one against the other, one section being provided with apertures and recesses leading into said apertures, the recesses being provided with springs, and the other section being provided with corresponding threaded apertures of reduced diameter, and screws the plain surfaces of which are held loosely in the larger apertures of one section and in contact with the springs of the recesses leading into said apertures, the threaded portion of the screws being seated in the threaded apertures of the opposing section of the gear, as and for the purpose set forth.

JERE G. KINGSBURY.

Witnesses:
HIRAM S. HAMILTON,
BURTON C. HAMILTON.