

F. SCHIRMER.
ROSE ENGINE.

(Application filed July 22, 1898.)

(No Model.)

5 Sheets—Sheet 1.

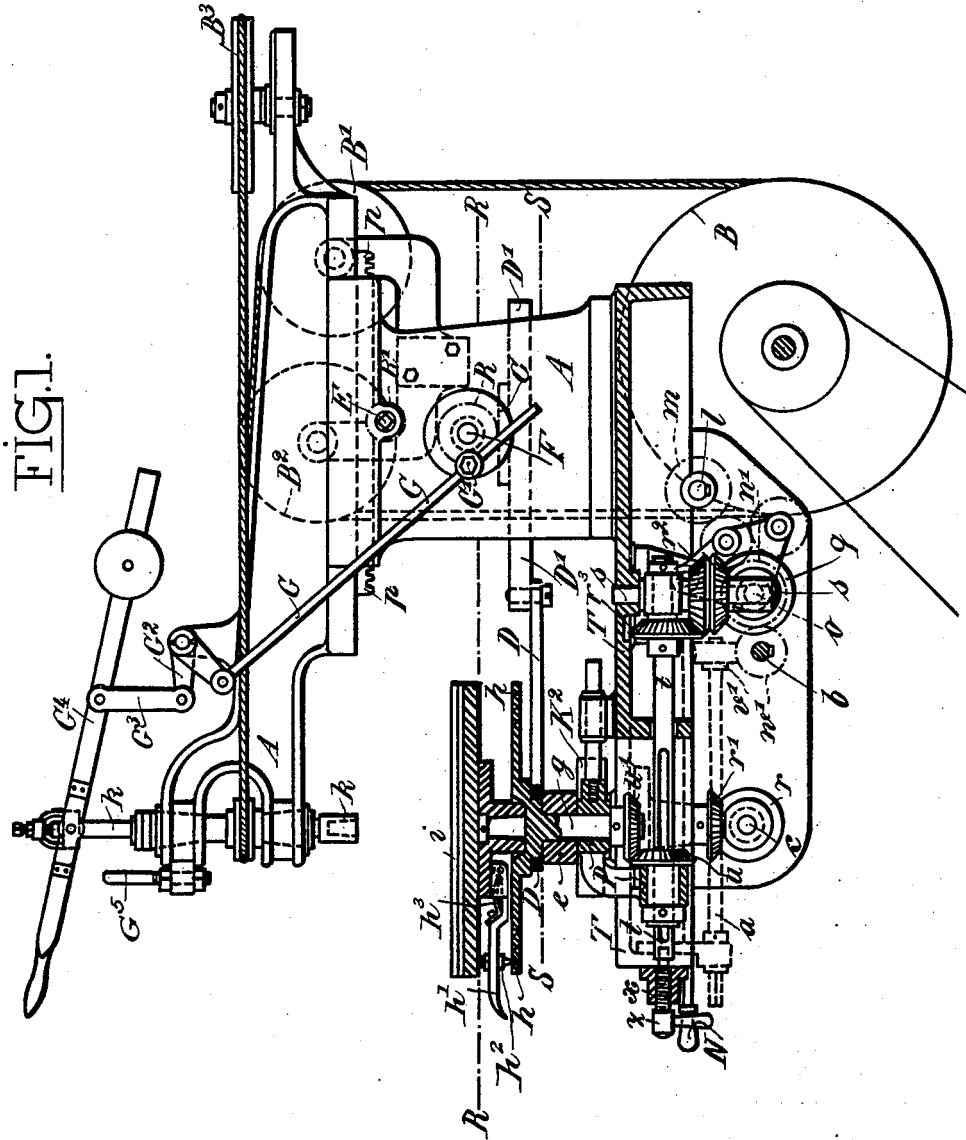


FIG. 1.

Witnesses:

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Inventor:

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by: Eudene Hopping
Att'y.

No. 676,611.

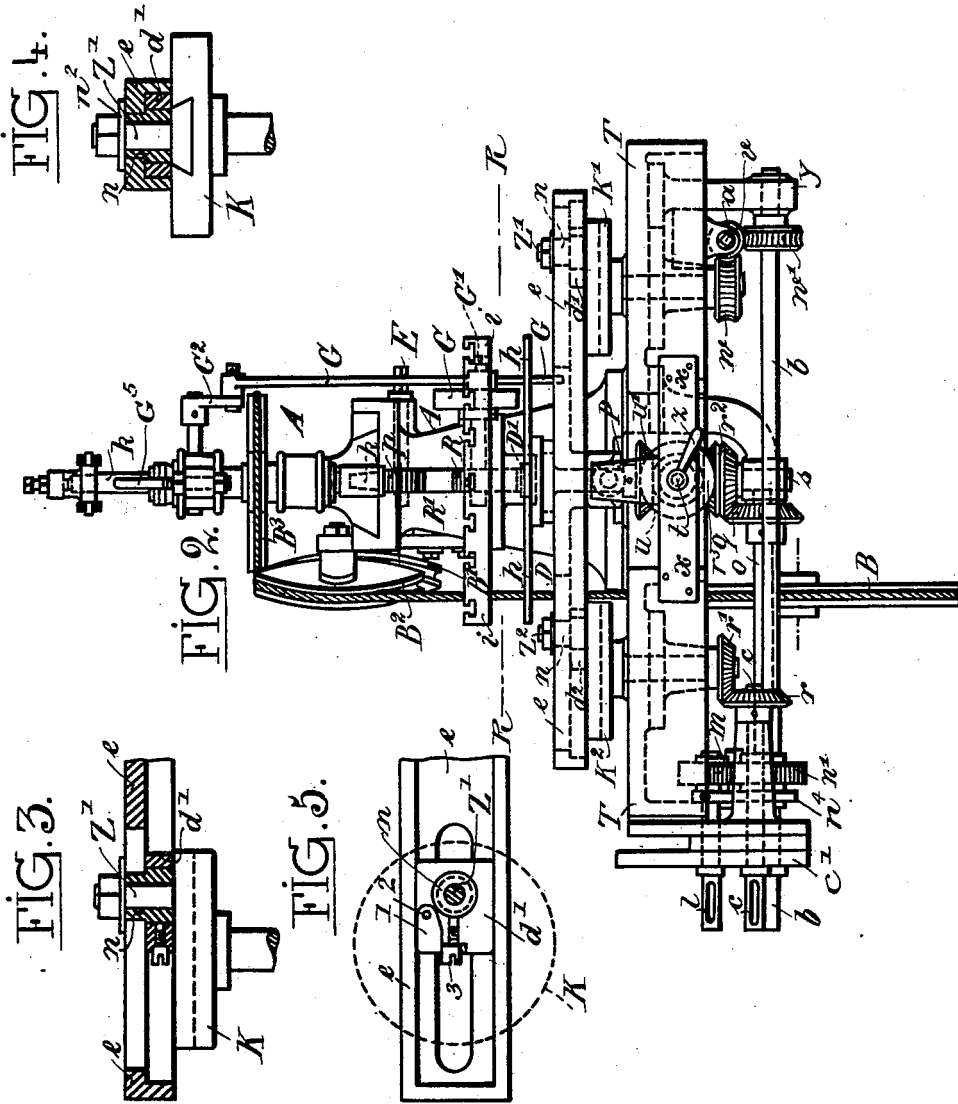
Patented June 18, 1901.

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(Application filed July 22, 1898.)

(No Model.)

5 Sheets—Sheet 2.



Witnesses:

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5 Sheets—Sheet 3.

FIG. 6.

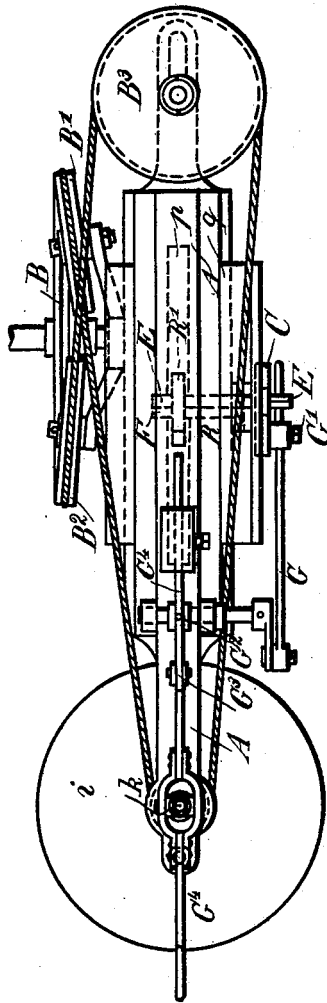
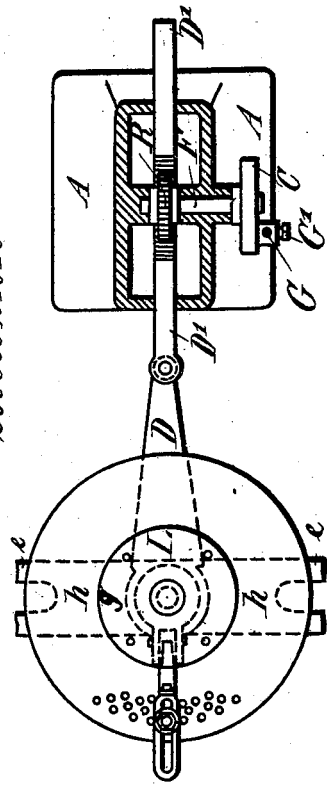


FIG. 7.
Section R-R



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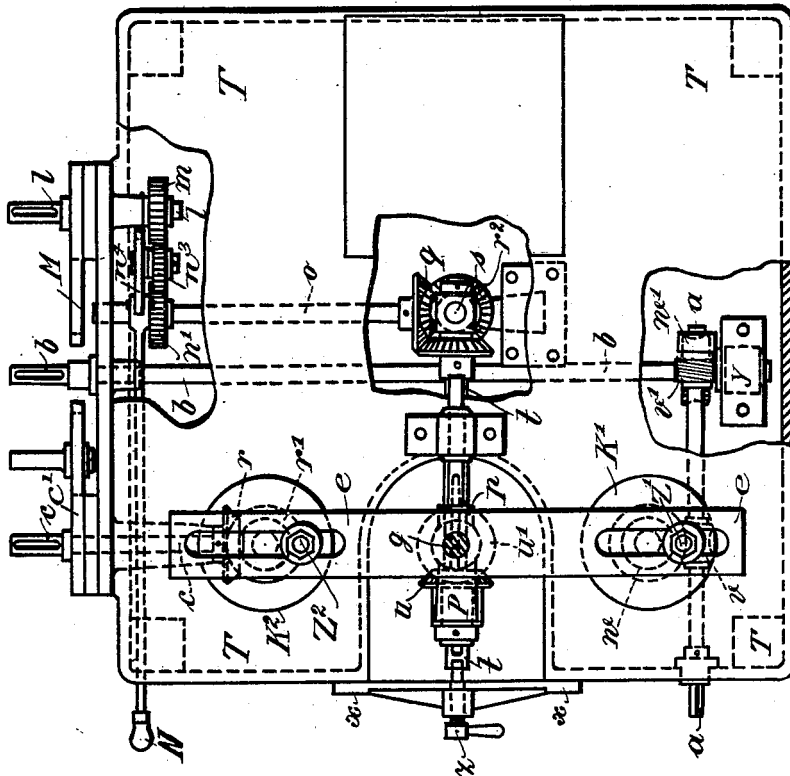
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(No Model.)

5 Sheets—Sheet 4.

FIG. 8.
Section S-S.



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5 Sheets—Sheet 5.

FIG. 12.
Section MN.

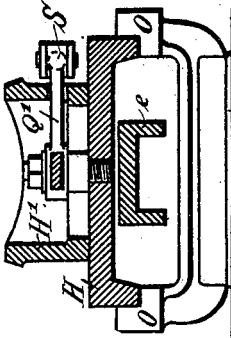


FIG. 11.
Section MN.

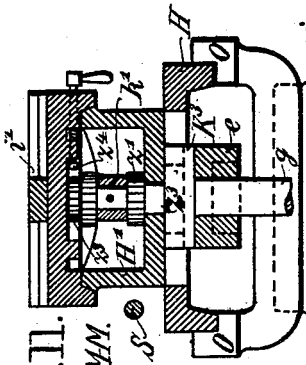


FIG. 9. M

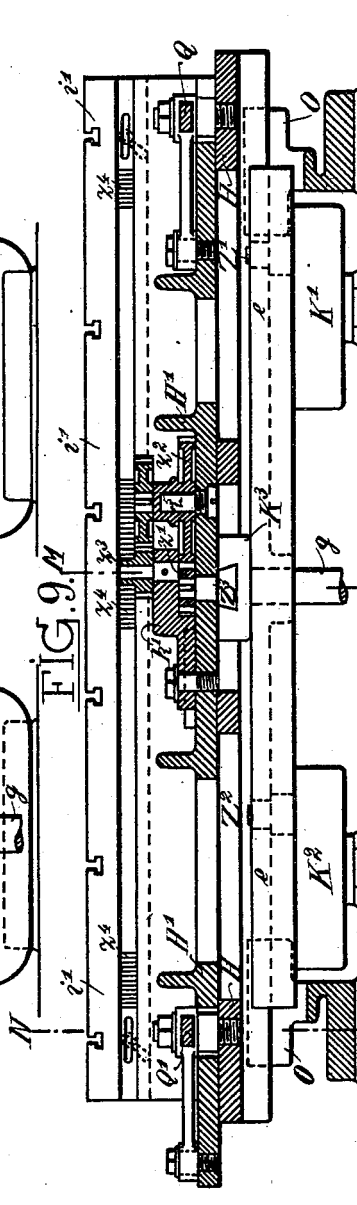
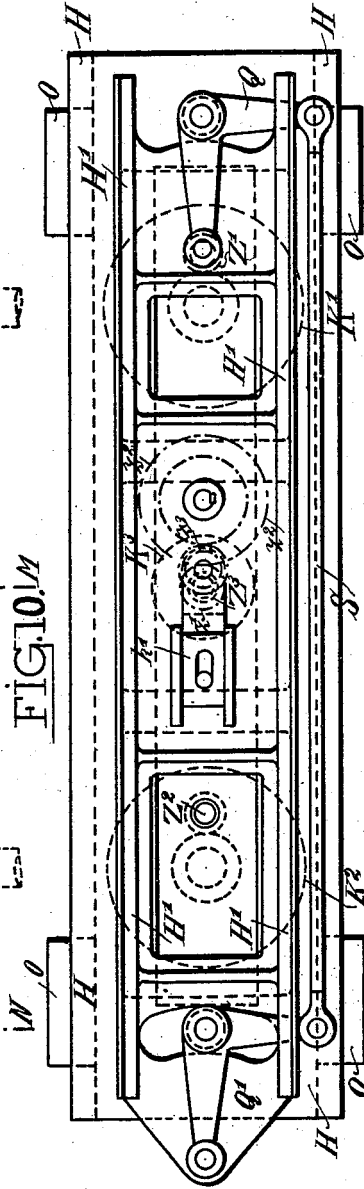


FIG. 10. M



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UNITED STATES PATENT OFFICE.

FELIX SCHIRMER, OF LEIPSIC, GERMANY.

ROSE-ENGINE.

SPECIFICATION forming part of Letters Patent No. 673,611, dated June 18, 1901.

Application filed July 22, 1898. Serial No. 686,622. (No model.)

To all whom it may concern:

Be it known that I, FELIX SCHIRMER, a subject of the King of Saxony, and a resident of Leipsic, Kingdom of Saxony, Germany, have
5 invented certain new and useful Improvements in Rose-Engines, of which the following is a full, clear, and exact description.

The present invention relates to engraving-machines or rose-engines; and it consists in
10 the details of construction hereinafter set forth, and particularly pointed out in the claims.

In order to render the present specification more easily intelligible, reference is had to
15 the accompanying drawings, in which similar reference characters denote similar parts throughout the several views.

Figure 1 is a side elevation of the machine; Fig. 2, a front elevation; Figs. 3 to 5, detail
20 views of the table-supporting bridge; Fig. 6, a plan of the tool-driving mechanism. Fig. 7 is a sectional view taken on line R R of Fig. 1; Fig. 8, a section on line S S, Fig. 1; Fig. 9, a sectional elevation of an auxiliary rectangular
25 table; Fig. 10, a plan of Fig. 9; Fig. 11, a section on line M M, Fig. 9; and Fig. 12, a section on line N N, Fig. 9.

According to the present invention two horizontally-disposed rotary disks are provided
30 with adjustable crank-pins, upon which is adjustably mounted a table connecting the two disks. At about the center of this table the carrier-plate is mounted, having its spindle extending down through the same, and means
35 are provided for rotating the same or for arresting it in any desired position. Thus if one end of the table, hereinafter called the "bridge," is clamped to one of the two disks,
40 but free to turn on its disk-pin, and the pin of the other disk is clamped to its disk at a different distance from its center to that of the first disk-pin and is allowed to engage the
45 other end of the bridge it will be obvious that a blank supported on a rotary table mounted at the center, or thereabout, of the disk and capable of gradual or stepwise rotation will be capable of being so moved as to produce
almost any variety of curves when moved under a vertically-rotating tool.

50 According to one modification of the machine the sum of the movements of the bridge-carrying disk is imparted to a work-carrier

table, which is also capable of a gradual longitudinal movement during the engraving, in which case the movements effected and the
55 curves formed may be combined to produce an ornamental edging automatically.

Referring to Figs. 1, 2, and 8, the shaft *a*, which may be turned by hand by means of a crank-handle or by machine-power by means
60 of fast and loose pulleys in the well-known manner, is provided with worms *v* and *v'*, the former serving by means of the worm-wheel *w* to rotate the crank-pin disk *K'*. The rear worm *v'* engages the worm-wheel *w'* and drives
65 the shaft *b*, which carries said worm-wheel. The shaft *b* is mounted in a suitable standard *y* and is provided with a keyway at its end to receive suitable gear. From the shaft *b* is driven the parallel shaft *c* by means of the
70 said gear and an interchangeable gear, (not shown,) which may be mounted on the adjustable arm *c'* in the known manner. The crank-pin disk *K²* is driven from the shaft *c* by means of the bevel-gears *r r'*, Fig. 8. Each
75 disk *K²* is provided with an adjustable crank-pin *Z'* and *Z²*, respectively, each pin being mounted in a dovetail slot of its respective disk and adjustable therein, said pins each engaging a sliding block *d'* and *d²*. On the
80 disks *K'* and *K²* is supported the bridge-piece *e*, while the sliding blocks which run in guide-ways of the said bridge *e* transmit the motion of the pins *Z'* and *Z²* to the said bridge in
85 such manner that the motion of the center point of the bridge is the result of the combined movements of the two crank-pins *Z'* and *Z²*. The said pins are provided above the bridge with disks or washers *n²* and nuts
90 *n*, encircling the pins, so as to clamp the disks in position fast enough to allow the bridge to move under them without having any play. The blocks *d'* *d²* are provided with small steel
95 wedges 1, Figs. 3, 4, and 5, pivotally supported at 2, which by means of screws 3 having eccentric heads may be forced or clamped against the downwardly-extending lateral
100 flanges of the bridge *e*, and thus clamp the said bridge to the one or other, or both, of the disks *K'* and *K²*.

In producing rose designs the shaft *t* may be loose and disengaged from the retaining-

pin or screw-spindle Z when one end of the bridge e is clamped to either K' or K^2 ; but in producing some classes of ornamentations hereinafter set forth more particularly with reference to Figs. 9 to 12 the spindle t must be clamped. In working the rose patterns as at present described the shaft t must be loose and the bridge e clamped to one or other of the disks K' K^2 .

10 If it is required to prevent the bridge from moving in its longitudinal direction with the pins of the disks K' and K^2 , a screw-spindle z , mounted in a cross-piece x at the front of the machine, is screwed inwardly until its end engages in a corresponding recess in the end of the shaft t , so that the said shaft is restrained from swinging around the axis of the stub-shaft s and the movement of the said shaft and with it the bridge e in the direction of the longitudinal axis of the bridge e is prevented, the bridge being thus constrained to move in the direction of the longitudinal axis of the said shaft t only. A pin g extends through the center, or thereabout, of the bridge e and is provided with a head at the upper part thereof, Fig. 1, a registering disk h being rigidly attached to the said head, and the circular work-supporting table i is mounted on a conical pin integral and concentric with the pin g , said disk being free to turn on said pin and being prevented from removal from the same by means of a head. The table may be coupled to the registering disk by means of a lever-arm h' , having a downwardly-extending laterally-adjustable pin h^2 , adapted to be held in the recess of the disk h by means of a spring h^3 and adjustable in said recess by hand. The table i is provided with T-shaped grooves, by means of which the blank may be attached thereto in the usual manner, the said table being preferably used for making rosette-like ornaments. The table i is rotated by means of the shaft t , which in its turn is driven by the shaft b by means of interchangeable gears. (Not shown.) By means of a swinging support M , mounted on the shaft l and provided with two suitably-mounted gears, the gearing between shafts b and l may be altered at will. Between the gears m and n' a pair of gears n^3 are mounted on a suitable segment n^4 , which may be adjusted by means of the rod and handle N , so as to cause the shaft o to rotate in either direction at will, Figs. 1 and 8. A bevel-gear q , fast on the shaft o , gears with the lower part of a double bevel-gear r^2 , which runs loosely on a stub-shaft s , mounted in the frame-plate T . The stub-shaft s is provided with a transverse boring above r^2 , in which the end of the shaft t carrying the bevel-wheel r^3 , gearing with r^2 , is mounted. A bevel-gear u , gearing with u' , is mounted to slide on the shaft t along a key-way provided thereon, the bevel u' being mounted on the lower part of the pin g of the bridge e . A yoke P keeps the two bevels u and u' in gearing while they are moving in

the direction of the longitudinal axis of the shaft t , said yoke engaging the lower end of g .

At right angles to the bridge e and a suitable distance from the same is mounted the head-stock A , carrying the tool, (shaping, grinding, or drawing instrument,) as shown at Figs. 1, 2, 6, and 7. The spindle of the tool (indicated by k) is driven by means of a cord from the disk B , mounted underneath the table, the said cord passing over guide-rolls B' and B^2 and having a tension or tightening roll B^3 mounted on the adjustable upper part of the stock, so that the tension of the cord remains the same whatever the position of the upper part of the stock. The latter is provided with a short rack p , which meshes with a gear R' , mounted on the horizontal spindle E , the end of which is squared to receive a hand crank-lever or the like. Thus by turning the crank-spindle E the upper part of the stock may be adjusted to and from the work-table. A screw (not shown) in the cheek of the guideway of the upper part may be provided to clamp the latter in any desired position. A short connecting-rod D , Fig. 1, encircles the pin g , connecting the said pin to a slide D' , guided in the stock. A short rack is attached to the slide D' , in which a gear R meshes, which imparts the movement of the said slide to a shaft F , mounted in the lower part of the stock. In one piece with or rigidly connected to the shaft F is a crank-pin disk C , and the pin of the said disk is connected, by means of a rod G , with a pair of levers G^2 , pivotally mounted at the upper part of the stock, so that these levers will participate in the swinging motion of the crank-pin G' , which is adjustable in a radial groove (not shown) of the crank-disk. A link G^3 carries a balanced pressure-lever G^4 , which is coupled to the spindle k by means of a universal joint. The front end of G^4 , which is provided with a handle, rests on an adjustable support G^5 at the front part of the stock, Figs. 1 and 2. Thus the fore-and-aft movement of the pin g will cause a rising and sinking of the spindle k and accordingly a more or less marked impression of the tool on the blank. If the pin G' is adjusted to the center of the disk C , the spindle k will remain stationary, as will be evident, unless the front end of the lever G^4 is moved by hand. From the foregoing it will be evident that shading by means of light and heavy lines may be effected by means of the present machine either automatically or by hand, according to the class of design being executed. If working mechanically, the rearward movement of the pin g toward the stock A , which would produce a constantly-darkening heavy line, should represent the shaded side of the design.

In order to produce straight or undulating profiles, the device illustrated in Figs. 9 to 12 is employed. In this case the bridge e , with disks K' K^2 , still controls the movement of the pin g ; but the latter is provided with an

adjustable pin and means for imparting its motion to parallel bars, and also means are provided for imparting a gradual longitudinal progressive motion to the said parallel-bar device. In guides O, fast on the frame-plate close to the disks K and K² and just above the bridge e, a slide H moves, having an upper shoe H', which is guided by means of the bell-crank levers Q Q', pivotally mounted on the slide H, said levers allowing the said shoe a movement of a swinging nature around their pivots. The free ends of the levers Q Q' are coupled by means of a rod S. This forms a parallel-motion device, which constrains H' to move transversely to H, while at the same time Q and Q' with H' serve as a pitman to communicate to H the longitudinal component of the motion of the crank-pin Z³. The upper side of H forms a guideway on which the work-table may slide parallel to the guides O O, and thus it will be seen that any point on the table has both a rotary and longitudinal motion in addition to any transverse movement communicated through g and its crank-disk K³. In this case, instead of the pin g, which is preferably employed for rosette patterns, acting direct on the blank a crank-pin disk K³ is fixed to its upper end and rotated, as previously explained, by means of the gear u. This disk is provided with a radial dovetail guideway, in which a small crank-pin Z³ is adjustable, said pin passing through an opening in the slide H into the shoe H', thus causing the latter to follow its motion. A gear z' extends into the shoe H', which gear meshes with a second gear z², having advantageously forty-four teeth. This gear is mounted on a vertical pivot z⁵, mounted fast in the shoe H'. The boss of z² is prolonged upwardly above the pivot z⁵ and serves to receive interchangeable gears, which may be keyed thereto and which transmit the motion of z² to a gear z³, mounted in an adjustable bearing-arm k' of the shoe H'. This latter gear meshes with a rack i' of the work-table i', which slides on guideways of the shoe H', thus causing the table i' to perform a continuous longitudinal motion independently of the circular movements of the crank-pin Z³ of the disk K³. This motion may be gradually backward or forward, according to the position of the reversing-gears, between m and n'. The upper surface of the table i' is provided with grooves by means of which the blank is fixed to the same. The upward and downward movement of the spindle k is effected by the connecting-rod G being attached to the disk K' in a similar manner to that described with reference to Fig. 1, the said rod being connected to the slide D'.

The parts may be differently arranged according to requirement; but the gist of the invention consists in the construction of the whole machine in such manner that the movements of the table by means of the disks K' K² and the crank-pins Z' Z² as imparted to

the bridge combine with the rotary movement of the table on its own axis and with the movements of the spindle to attain a great variety of adjustable movements.

I claim as my invention—

1. In an engraving-machine the combination of two disks mounted at suitable distance apart and having each a radially-adjustable pin thereon, said disks rotating in the horizontal plane, and means for effecting such rotation a bridge to extend across said disks and a rotary table mounted at about the center of said bridge between the two disks, means for clamping one or other end of the said bridge to one or other of the said disk-pins, means for allowing either of the pins to move freely and actuate the bridge when not coupled thereto, and a rotary engraving-tool mounted above the table substantially as described.

2. The combination of a pair of disks and means for rotating the same in a horizontal plane in either direction, radially-adjustable crank-pins to said disks a bridge extending across the said disks and adjustable on the said disk-pins, a table mounted about centrally on the said bridge and movable therewith and means for rotating the said table during its movement with the bridge, an engraving or cutting tool mounted vertically above said table and means for rotating the same substantially as described.

3. The combination of a pair of horizontally-rotatable disks having each a radially-adjustable pin on its upper surface, a bridge to extend over said disks and supported on said pins, so that the same may be free to move on one or both of the said pins, a work-table mounted on the said bridge and means for rotating the same, means for adjusting the same by hand on its rotary spindle during the rotation of the latter, means for reversing the direction of rotation of either of the disks and of the table, a vertically-supported tool to rotate above said table and means for rotating the same substantially as described.

4. The combination of a pair of disks to rotate in a horizontal plane and means for rotating either of the said disks in either direction independently of the rotation of the other, radially-adjustable pins on said disks, a bridge to extend across both disks and supported on said pins and for coupling the bridge to one or other of the said disks, a work-table mounted on the said bridge intermediate of the said disks, a tool vertically mounted above said table and means for rotating the same, and means in connection with the said bridge for increasing the pressure on the said tool at the fore-and-aft motion of the said bridge substantially as described.

5. The combination of a pair of horizontally-disposed disks and means for rotating the same at equal or varying speeds simultaneously, radially-adjustable pins in said disks and a bridge extending across both disks, a work-table supported on said bridge between

said disks, and means for rotating the same, during the various movements of the said bridge, a tool vertically disposed above said table and means in connection therewith for
 5 changing the vertical position of said tool according to the fore-and-aft movement of the said bridge substantially as described.

6. The combination of a pair of horizontally-disposed disks and means for rotating the
 10 same as specified, radially-adjustable pins one on each of said disks and a bridge extending across both the said disks and means for adjusting the same on the said pins, a table mounted above said bridge and means
 15 for restraining the same to partake of the resultant transverse movement only of the said disk-pins, a central rotary spindle extending through said table, and a crank-pin mounted
 20 thereon above the table, an upper table to slide on said bridge-table and parallel motion to constrain the said upper table to move parallelly on said bridge-table, means for
 coupling said upper table to the said central spindle crank-pin, and means for gradually
 25 moving said upper table in a longitudinal direction on the said bridge-table substantially as described.

7. The combination of a pair of horizontally-disposed disks and means for rotating the

same as specified, a radially-adjustable pin 30 on each disk and a bridge extending across said pins and means for securing to and adjusting the said bridge on said pins, a longitudinally-guided table mounted above said disks and a central spindle having a horizon- 35 tally-disposed disk thereon with adjustable pin therein to extend through a corresponding orifice in said longitudinally-guided table, an upper table to slide on said lower table and a crank-pin on the central spindle to 40 move said upper table, means for imparting parallel motion to said upper table when operated by the said crank-pin and means in connection with the said rotary disk to gradually move said upper table along the said 45 lower table in either longitudinal direction, a rotary tool vertically disposed above the said table and means for varying the vertical position of said tool according to the fore- 50 and-aft movements of the bridge in the manner and for the purpose substantially as described.

In witness whereof I have hereunto set my hand in presence of two witnesses.

FELIX SCHIRMER.

Witnesses:

HERM. SACK,

RUDOLPH FRICKE.