3 Sheets--Sheet 1.

E. G. CHORMANN.

Slide-Rests.

No. 146,872. Patented Jan. 27, 1874.

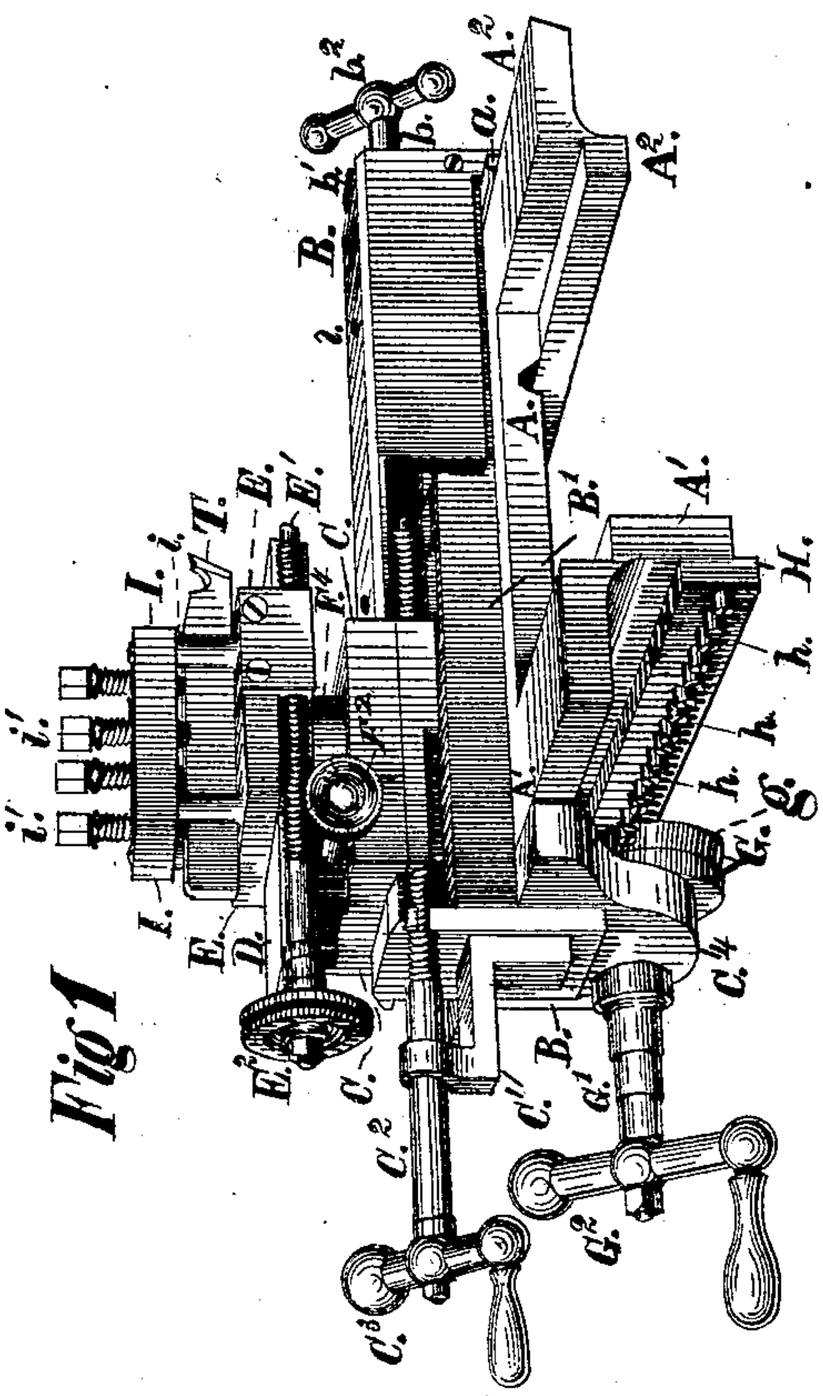

Fig 1

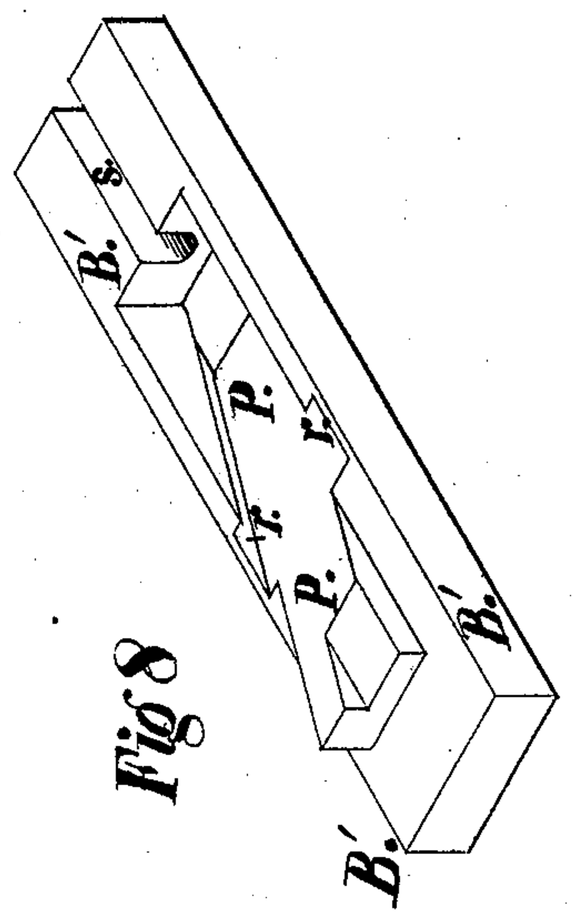

Fig 8

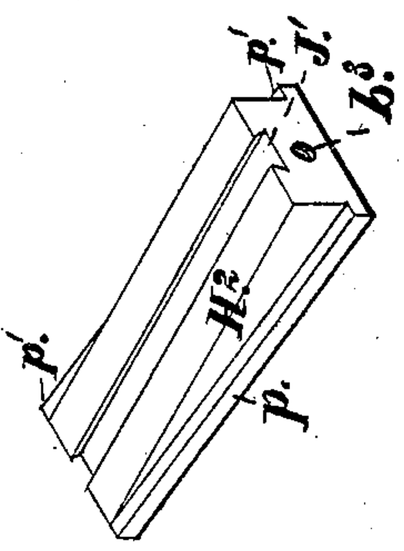

Fig 9

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Fig 2

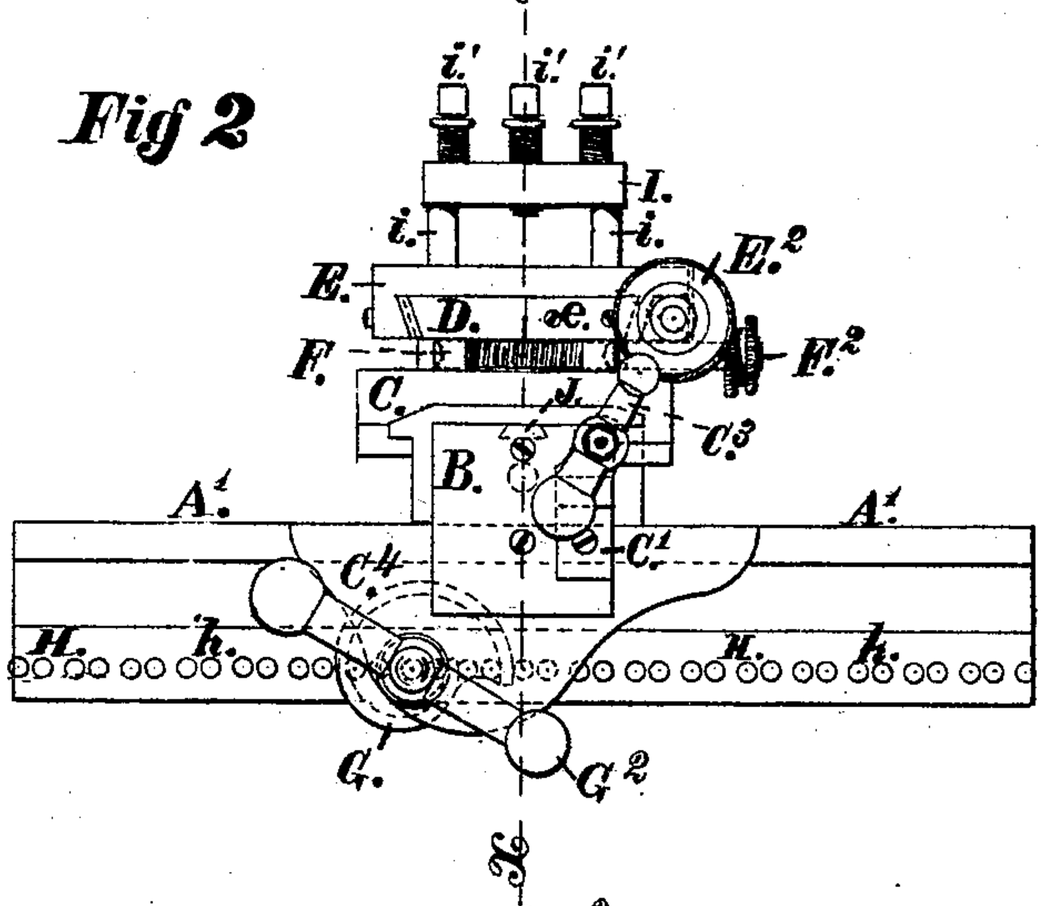

Fig 3

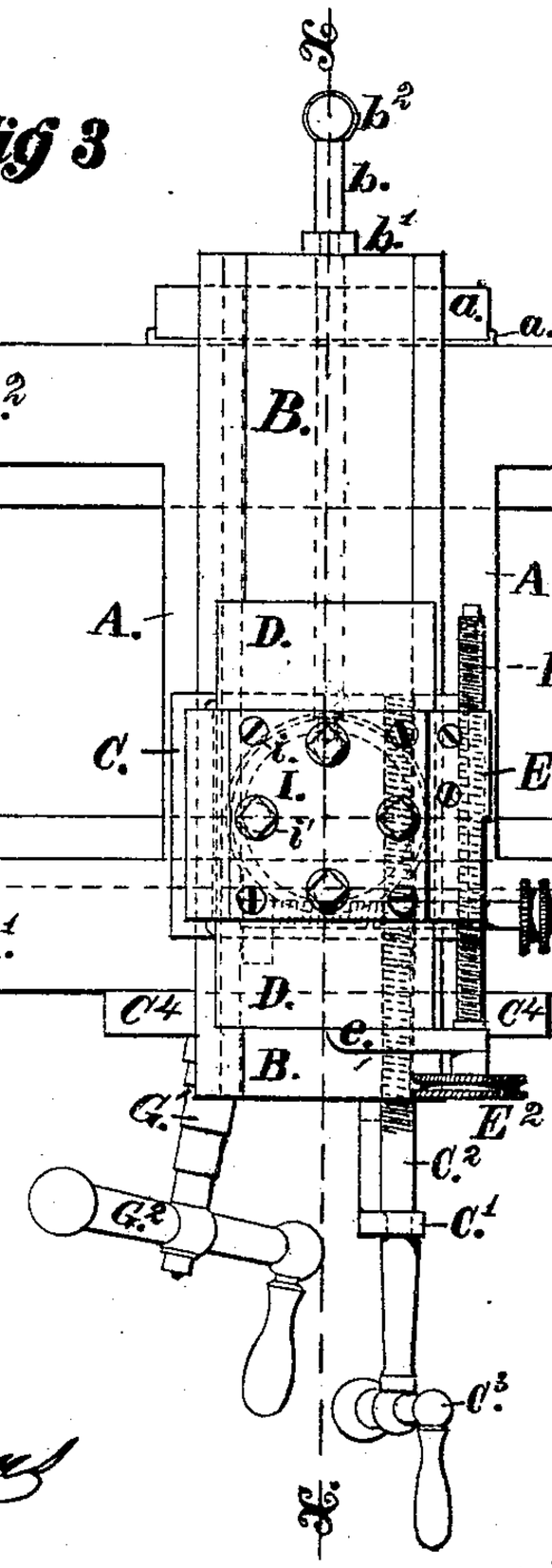

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Fig 4.

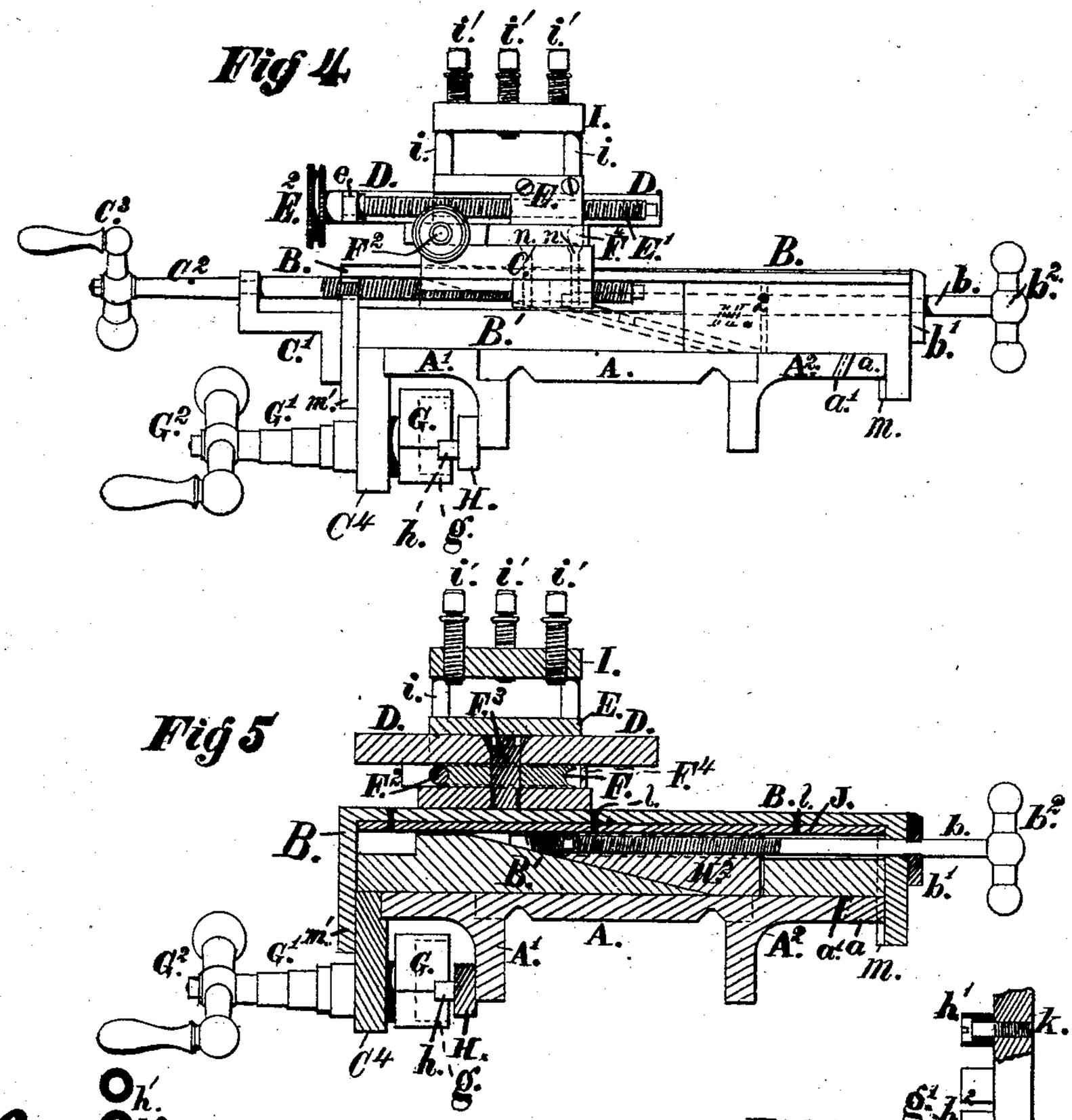


Fig 5

Fig 6

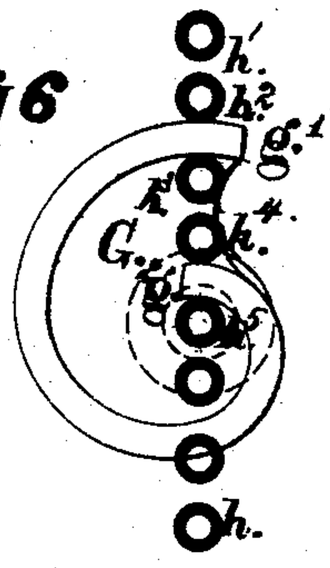


Fig 10

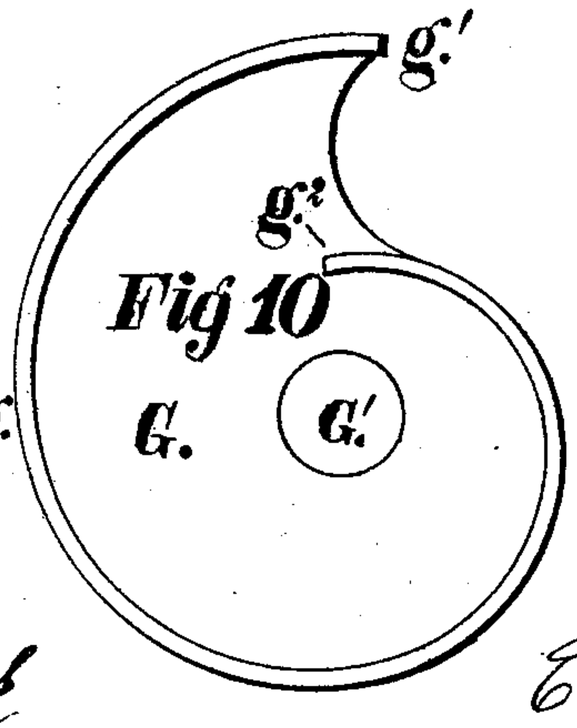
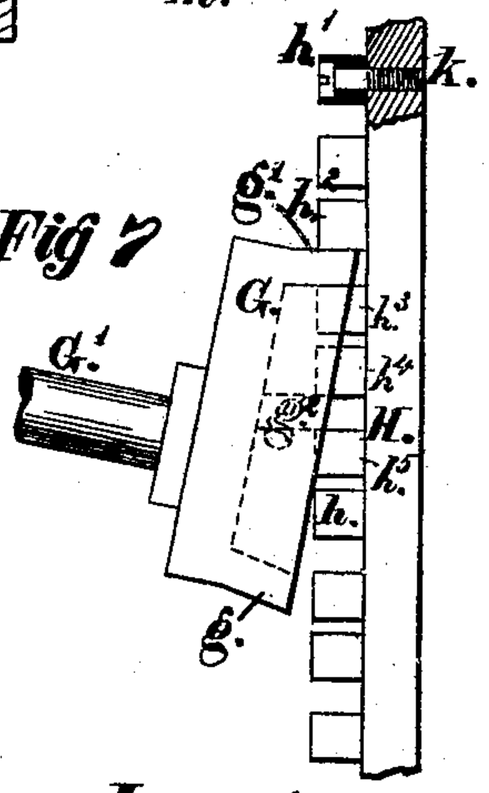


Fig 7



Witnesses:
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A. M. Ballade Jr

Inventor:
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UNITED STATES PATENT OFFICE.

ERNEST G. CHORMANN, OF PHILADELPHIA, PENNSYLVANIA.

IMPROVEMENT IN SLIDE-RESTS.

Specification forming part of Letters Patent No. **146,872**, dated January 27, 1874; application filed September 6, 1873.

To all whom it may concern:

Be it known that I, E. G. CHORMANN, of Philadelphia, county of Philadelphia and State of Pennsylvania, have invented a certain Improved Slide-Rest, of which the following is a specification;

The several parts of my invention will be hereinafter described with reference to the accompanying drawings, of which—

Figure 1 represents a view, taken in perspective, from a point a few degrees to the right and above the level of my improved slide-rest; Fig. 2, a front elevation of the same; Fig. 3, a plan or top view thereof; Fig. 4, an elevation of the right side of the same; and Fig. 5, an elevation of a vertical section made through from front to rear thereof, as indicated by the broken line *x x x* in Figs. 2 and 3. Fig. 6 represents a rear view, in detail, of the snail-plate, and the series of rollers mounted upon pins, and arranged in line and in pairs, upon which it is designed to operate, to produce the peculiar movement more fully described hereinafter; Fig. 7, a plan view, in detail, of the same rollers upon their pins, arranged as aforesaid, and inserted into the bar, which sustains them, and which is firmly joined to the base-plate or saddle of the machine, and also the said snail-plate attached edgewise to the face of dish or wheel G, and a portion of the shaft G′ fastened in the other face thereof, by means of which the wheel is revolved to operate the device; Fig. 8, a perspective detail view of block B′, having within its upper side an inclined plane; and Fig. 9, another block, H^2, having its lower side cut into the form of an inclined plane, corresponding inclination with the other mentioned above. It has also a screw-hole running lengthwise through it, in order that it may be driven by means of a screw-shaft, *b*, and so, in connection with the other before mentioned, produce the result designed, namely, the perpendicular elevation and depression of the parts above them. These blocks have other formations, and perform other functions, which will be more fully described hereinafter.

A A^1 A^2 indicate the base-plate or saddle, upon which all the operative parts are mounted. Upon the under side of the front end of the saddle the plate H, bearing the rollers *h h h*, is fastened edgewise, as shown in Figs. 1 and 2. Lengthwise of the cross-bar A extends the block B′, and under the front end of the block B′ is firmly fastened the plate C^4, provided with a shoulder, extending under the front of the saddle, thus forming a clamp, so that its inner face touches the outer face of the bar A^1 of the saddle, and under the rear end of block B′ is rigidly fastened a long block, *a*, making a close joint with the plate A^2, the outer edge of which inclines inwardly, and the inner edge of the block *a* outwardly, so that their touching edges form a dovetail; and, by reason of such construction, the block B′, plate C^4, and long block *a* embrace the top and sides of the saddle, and move freely upon the same to the right or left, cannot be moved lengthwise, and are confined in close contact with the upper surface of the saddle, and are further guided by the shoulder, before mentioned, as well as the dovetail described, and, therefore, when the shaft G′ is revolved, the block B′ will have a true and accurate movement to the right or left, and will impart the same to the other devices mounted upon it. The device composed of the snail-plate *g*, the dish G, and shaft G′, to operate a series of pins in line, upon which friction-rollers may be mounted, and arranged equidistant apart, is described and claimed in Letters Patent of the United States issued to me on the 7th day of January, 1873, for "improvement in gearing;" but I have invented a new arrangement of the rollers, in combination with that device, which is the placing the rollers in a series of pairs in line.

Now, according to my said new invention, the outer end g^1 of the snail-plate *g* in Fig. 6, while traveling over roller h^3, is in rolling contact with h^2 also; and the lower end of g^2, in traveling over and off h^5, is in rolling contact with h^4 also, and the two sets of rollers acted upon by each end of the snail-plate materially aid the movement. Such is the result of the arrangement of the rollers in pairs. The two extremes of the snail-plate embrace between them a pair of rollers instead of a single one, as in the said Letters Patent.

Where a single roller is so embraced, the upper or outer end of the plate in traveling over it is turned to the right, for instance; but the lower or inner end of the plate in trav-

eling under it, at the same time being in contact with it, will exert some force to revolve it to the left, and thus a loss of power will result. This defect is cured by my said new invention, and not only so, but the two rollers so in contact with the plate at each end positively enhance the movement.

The peculiar movement produced by my snail device is well suited to moving the block B′, as the motion given that block is one of the feed movements of my machine. For it will be observed that in revolving the device the outer end g^1 of the snail-plate, when first mounting above roller h^3, barely touches it, but gradually increases its pressure upon it in just the same degree that the inner or lower end g^2 diminishes its pressure upon roller h^5 until there is effected a complete transference of the force exerted upon the shaft G′ from roller h^5 to roller h^4. The movement cannot be otherwise than a steady one, provided all the parts described are properly adjusted. The slipping forward or backward of the device upon the rollers is impossible, because of the constant curve of the snail-plate, and because of the binding contact of the rollers on both faces of the same. Another excellence of the movement is that the device stands locked the moment the force to revolve it is withdrawn.

We recur again to the block B′, and refer particularly to Fig. 8, showing the recess in its upper face, and the path of the screw-shaft *b*, which drives the upper block H^2, having the inclined lower face, as shown in Fig. 9. The inner edges of the recess in the face of the block B′ are provided with cleats in such a manner as to furnish grooves running on a level with, and parallel to, the inclined plane, to receive corresponding tongues or flanges upon the sides of the upper block H^2, so that block H^2 is restricted to endwise motion merely; and when it is driven by the screw-shaft *b* in the direction of the front it necessarily wedges up and raises all the parts that rest upon block B′, but when driven the other way depresses the same. As an additional means of securing tone and uniform action in the block H^2, it is provided in its top side with a longitudinal groove from end to end, much wider at the bottom than at the top thereof, the sides being inclined, and into the same is inserted, from either end, a bar, J, of corresponding form, so as to fill it, and then by means of screw-bolts *l l* passing down through the top of the box B, which incloses both blocks B′ and H^2, and furnishes a bearing for the head of screw-shaft *b*, and into the bar J, so that the box B is held firmly to its level, and the sliding block H^2 may move freely back and forth, while the bar J is held fast by the said attachment to box B. The box B is incapable of any lateral movement because of its side pieces, (shown,) and of endwise motion because of its end pieces, provided with vertical grooves or guides *m m*. Its front end, with its collar C^1, furnishes a bearing for screw-shaft C^2, which operates the sliding cap C, which rides upon it. The upper edges of its top are beveled off, and the under side of the cap C is grooved out to fit upon and around its edges, so that when the cap C is moved back and forth, from front to rear, by the screw-shaft C^2, as it is designed to be done, it is strictly confined by its bearing to that movement alone. The advantage of this construction of slide over that heretofore known and used is obvious. For instance, the operation of the adjusting-screws *n n* can never draw the screw-shaft C^2 out of line. Next above the cap C is a combination of devices by which horizontal revolving motion is imparted to the device for supporting and confining in its bearing the turning-tool T above them, the principal among which is the worm-wheel F, which turns upon the screw-shaft F^3, which is provided with a head having the general form of an inverted cone, and which passes down through plate D, (which is properly countersunk for the head of the screw-shaft,) through it, and into the cap C, as shown. The periphery of the wheel F is grooved, and its groove is cut into alternate small diagonal cross grooves and ridges, in correspondence with the screw-shaft F^2, so that when the shaft is turned the wheel is revolved. The collar F^4 incloses the wheel, and through its ends the shaft F^2 is extended and sustained for its work.

By means of the compressive force exerted by the screw-shaft F^3, with its conformed head so embedded in the plate D, the worm-wheel F can be locked at any point within its revolution. The adjustability thus afforded the tool-holder is manifestly independent of any of the movements of the machine. Another use of the plate D is to furnish a bearing for the blank portion or heel of the screw-shaft E′, by which the tool-rest E is operated, and, further, by its smooth top surface and inwardly-inclined side edges, in correspondence with the dovetailed channel so formed, as aforesaid, on the under side of the tool-rest E, it confines the movement of the latter precisely within the limits designed, and especially prevents the dipping or yielding thereof under the resisting force opposed by the work to which it may be applied. Finally, upon the tool-rest E is mounted the tool-holder I, supported by four posts, *i i i i*, and through the crown-plate thereof, and arranged in the manner shown, extend the four set-screws *i′ i′ i′ i′*, in such a manner that, in any position of the tool, two of them will always impinge upon and hold it.

The impingement of two set-screws at the same time upon the tool, at different points along the length, will exert a much greater degree of holding force than that of one only, not only against force tending to spring the tool, but also against force tending to displace it in a lateral direction.

I will here add, in regard to the combination of the snail device and my new arrangement of rollers in pairs, before described, to move the box B laterally, this being one of my feed

movements, that I do not herein confine myself to that combination to produce the movement, as the same may be produced by a rack and pinion, or by a screw-shaft, in combination with any other improvements herein described.

What I claim as my invention is—

1. The improved snail device, composed of dish G, shaft G′, and curved plate *g*, in combination with a series of rollers, *h h h*, mounted upon pins, and arranged in pairs or sets of two each, substantially in the manner and for the purpose set forth and described.

2. The combination of the following co-operating devices: The block B′, provided with the inclined plane and cleats described, the block H^2, provided with its inclined plane and lateral flanges, the box B, the bar J, attached thereto by screws *l l*, and the screw-shaft *b*, each constructed and all arranged substantially as and for the purpose described.

3. The combination of the cap C, the worm-wheel F, the screw-shaft F^3, screw-shaft F^2, collar F^4, and plate D, each constructed and all arranged substantially as and for the purpose described.

4. The combination of the sliding cap E, operated by the screw-shaft E′, and the plate I, supported upon the cap by the posts *i i i i*, and the four vertical set-screws *i′ i′ i′ i′*, each constructed and all arranged substantially as shown and described, for the purpose set forth.

E. G. CHORMANN.

Witnesses:
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A. M. SALLADE, Jr.