(No Model.)

3 Sheets—Sheet 1.

J. DAVIDSOHN.

SCREW CUTTING MACHINE.

No. 510,329. Patented Dec. 5, 1893.

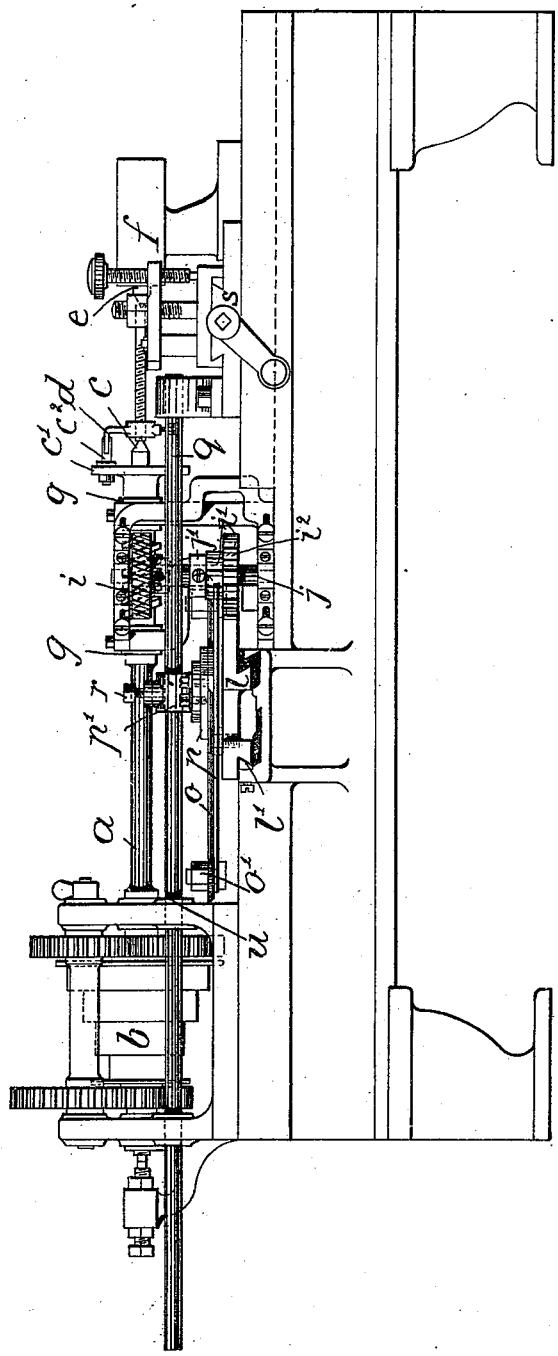

Fig. 1.

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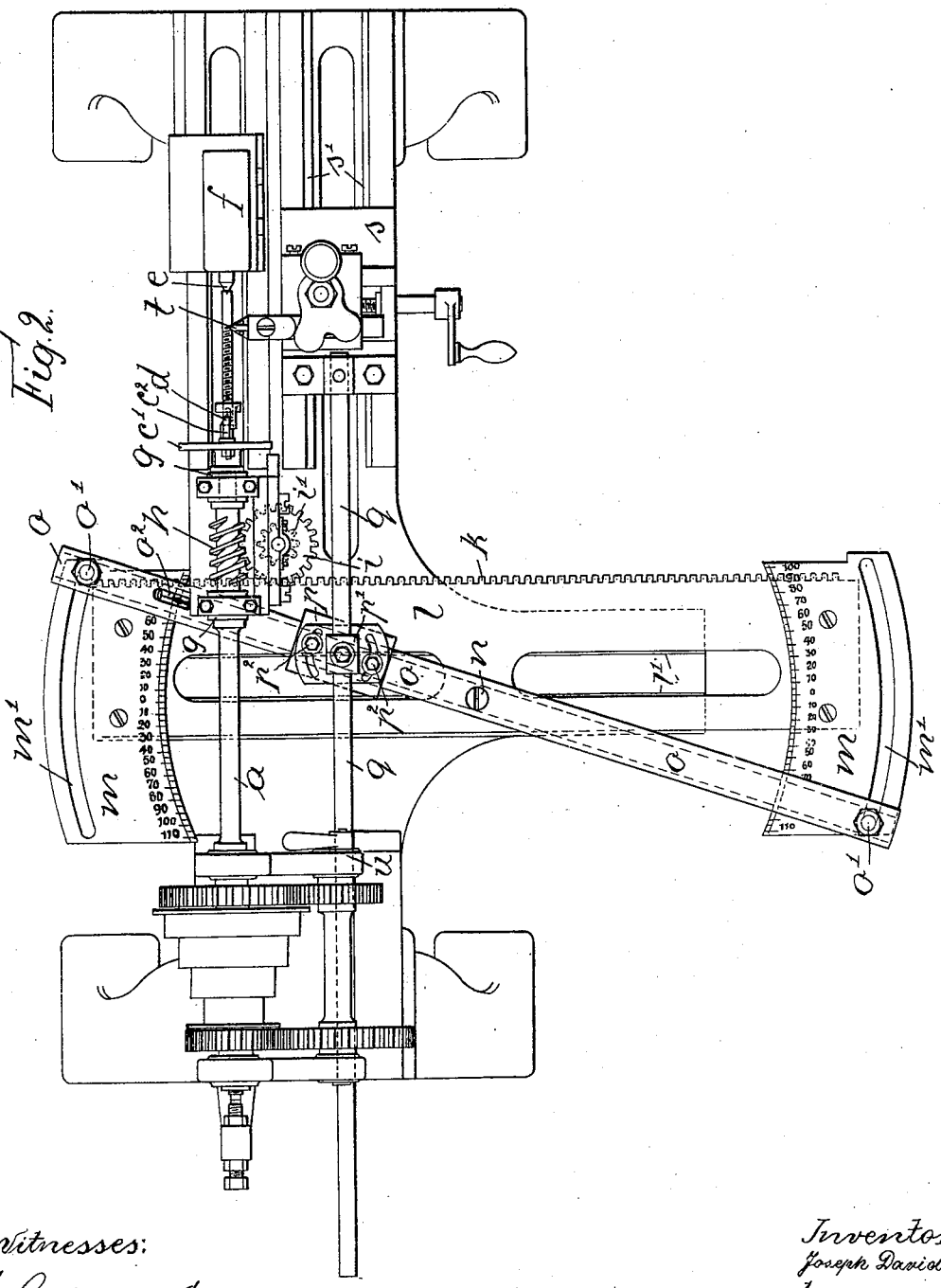
Fig. 2.



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SCREW CUTTING MACHINE.

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Fig. 3.

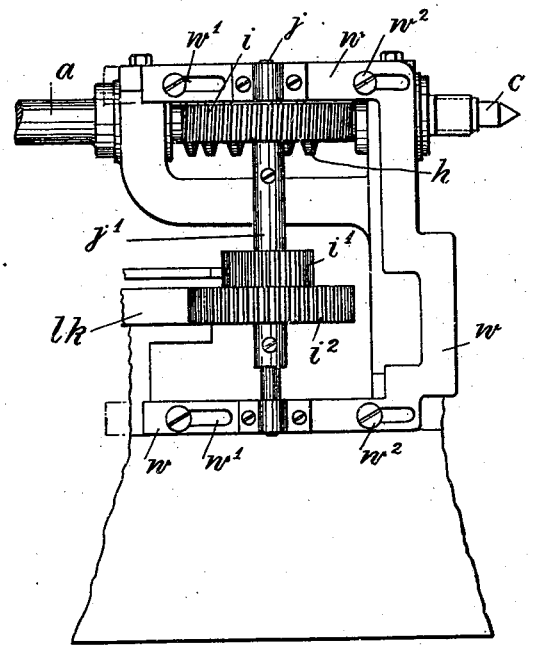
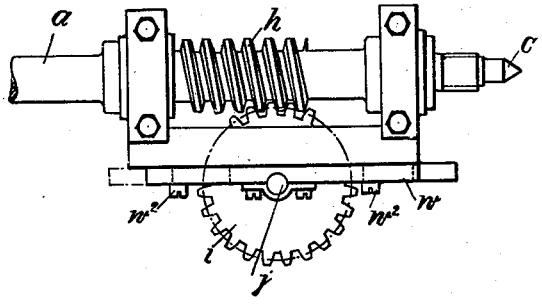


Fig. 4.



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UNITED STATES PATENT OFFICE.

JOSEPH DAVIDSOHN, OF BERLIN, GERMANY.

SCREW-CUTTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 510,329, dated December 5, 1893.

Application filed July 30, 1892. Serial No. 441,763. (No model.) Patented in Germany June 22, 1892, No. 67,664; in France June 29, 1892, No. 222,691, and in England July 16, 1892, No. 13,100.

To all whom it may concern:

Be it known that I, JOSEPH DAVIDSOHN, a subject of the King of Prussia, German Emperor, and a resident of Berlin, in the Kingdom of Prussia, Empire of Germany, have invented certain new and useful Improvements in Screw-Cutting Machines, (for which I have obtained patents in Great Britain, No. 13,100, dated July 16, 1892; in France, No. 222,691, dated June 29, 1892, and in Germany, No. 67,664, dated June 22, 1892,) of which the following is a full, clear, and exact specification.

My invention relates to a screw-cutting lathe which by means of a simple mechanism, permits the production of threads of different pitch, and right-handed screws as well as left-handed ones. The mechanism by means of which this result is accomplished consists of a slide, which is displaced transversely to the main-spindle, from which it derives its movement, and is provided with an adjustable guide-bar effecting the lateral displacement of the slide-rest carrying the tool according to the angular position said guide-bar occupies in relation to the path of the slide. It will be obvious that by altering the position of this guide-bar the lateral displacement of the slide-rest will be increased or decreased, and that this lateral displacement will be to the right or to the left according to the inclination of the guide-bar. Thus it will be apparent that right-handed and left-handed screws of different pitch may be cut on my improved lathe. The main feature, however, of my new device consists in the arrangement of a rod by means of which the slide on the guide bar and the slide rest for the tool are adjustably connected with each other, and by which, further, the movement of the slide on the guide bar is transferred to said slide rest. By aid of this arrangement the distance between both slides may be altered according to any requirement and the tool may be directed to any part of the work piece independent of the position of the other slide. Finally, it is made possible by that arrangement to disengage the whole device, or even to remove it entirely from the lathe, so as to turn thereby the latter into a common lathe, which now, of course, may be used as such one.

My invention will be more readily understood by reference to the accompanying drawings, in which—

Figure 1 is a front elevation, and Fig. 2 a plan of my improved screw-cutting lathe, like letters denoting like parts in both views. Fig. 3 is a front elevation of a part of the screw-cutting lathe, drawn on a larger scale. Fig. 4 is a plan of the same parts, as in Fig. 3, also drawn on the larger scale.

The main spindle a is rotated in any usual manner, for instance by means of the cone b and a double geared fast head, as shown. The right half of the spindle a is supported in bushes g and the spindle is provided at its right end with the center c, the face-plate c' and the catch-pin c^2, adapted to collide with the catch d fastened to the blank. The latter is held between the center c, already mentioned, and the center e provided on the loose head f. Between the bushes g, the spindle a is provided with a worm h. A worm-wheel i, Figs. 3 and 4, engages with the worm h; said worm-wheel is fixed to a vertical axle j, on the lower end whereof there is mounted a sleeve j', to which are secured the change-wheels i' and i^2 [or more change-wheels, if required]. The sleeve j' may be locked in relation to the axle j by means of screws.

The part w, Figs. 3 and 4, of the machine in which the axle j is journaled, may be displaced laterally, by means of slots w' and screws w^2, so that by suitable displacement of said part and by a vertical displacement of the sleeve j' either of the toothed wheels i' i^2 may be brought to engage with the rack k, provided on the transverse slide l. During the lateral displacement of the axle j the worm wheel i remains meshing with the worm h, the length of the latter being sufficient for securing this result. It is obvious that when rotating the main spindle a, the worm h, worm wheel i, and either of the change-wheels i' and i^2 will effect a displacement of the slide l, having the rack k, transversely to the spindle a. The slide l is guided in the gauntree of the lathe, as shown at l'. Said slide is provided at its ends with plates m, each of which has a slot m'. In the middle of the slide l, or nearly so, is located the pivot n for the guide-bar o. The latter may be secured in various positions by means of screws and nuts o' pass-

ing through the slots m'. One of the plates m, or both as shown, are graduated, and the guide-bar o is provided with a corresponding sight and with a pointer o^2.

On the guide-bar glides the slide p, composed of two parts, the upper of which may be turned in relation to the lower one; when adjusted, both parts may be secured to each other by means of screws p^2 sliding in suitable slots. To the upper part of the slide p there is secured the boss p', through which passes the guide-rod q; the screw r serves for locking the guide-rod q and the boss p' in their relative positions.

At the right end of the guide-rod q there is secured the slide-rest s, carrying the tool t, which is arranged in the usual manner. The slide-rest s glides in a guide s'. The left end of the guide-rod q is guided in a bearing u.

The operation of my improved screw-cutting lathe is as follows: First of all, the axle j is locked against lateral displacement in such a position, that either of the wheels i' or i^2 meshes with the rack k. Similarly the guide-bar o is secured by means of the screws o' and the upper and lower part of the slide p by means of the screws p^2, and finally the guide-rod q is secured to the boss p' by means of the screw r. The lathe may then be set in motion by rotating the main spindle a. The worm h, meshing with the worm-wheel i, effects a rotation of the latter, of the axle j and the change-wheels i' and i^2. One of these wheels engages with the rack k on the slide l, and thus causes the latter to be displaced transversely to the main spindle a. During this displacement the slide p glides along the guide-bar o, and the slide-rest s which is connected to the said slide p by means of the guide-rod q is also displaced laterally more or less according to the angle of inclination of the guide-bar o, the displacement being effected from the right to the left, when the guide-bar o is inclined to the left, whereas the displacement is effected in the opposite direction when the guide-bar o is inclined to the right [as shown in the drawings]. If the ratio between the worm h, the worm-wheel i, the change-wheels i' i^2 and the rack k is known, it will be easy, by reading the number indicated on the scale by the pointer o^2, to calculate the displacement of the slide p during one rotation of the main spindle a, that is to say, the pitch of the screw cut during this rotation. It will be obvious that by altering the position of the guide-bar o the lateral displacement of the slide p and consequently of the tool t will also be altered, so that screw-threads of very different pitch may be cut by means of my improved machine. By the employment of change-wheels the limits within which these alterations of the pitch may be made are extended considerably.

Besides the advantage of permitting the production of left-handed and right-handed threads, as already mentioned, my improved screw-cutting lathe presents the further advantage, that the tool, after having been brought back to its initial position in order to cut the blank for a second time, passes exactly through the thread produced at the first cut. This is of particular importance when cutting screws of small pitch.

What I claim, and desire to secure by Letters Patent of the United States, is—

1. In a screw cutting lathe: the combination of the slide rest s carrying the tool t, and of the adjustable guide-bar o carrying the slide p, with a rod q arranged above the bed of the lathe, said rod connecting slide rest s with the slide p, for the purpose set forth.

2. In a screw cutting lathe: the combination of the slide rest s carrying the tool t, and of the adjustable guide-bar o carrying the slide p, with a rod q arranged above the bed of the lathe, said rod adjustably connecting slide rest s with slide p for the purpose set forth.

3. In a screw cutting lathe: the combination of the slide rest s carrying the tool t, and of the adjustable guide-bar o carrying the slide p, with a rod q arranged above the bed of the lathe, in front of, and parallel to, the spindle a, said rod connecting slide rest s with the slide p, for the purpose set forth.

4. In a screw cutting lathe of the kind described: the combination, with the main spindle a and the worm h, of the worm-wheel i, secured to the axle j, the change-wheels i' i^2, secured to the sleeve j' displaceable bearings of said axle being displaceable laterally, and of the slide l, having rack k, for the purpose set forth.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

JOSEPH DAVIDSOHN.

Witnesses:
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R. HERPICH.