

W. H. Warren.

Crank-Planer.

N^o 73412

Patented Jan. 14, 1868.

FIG. 1.

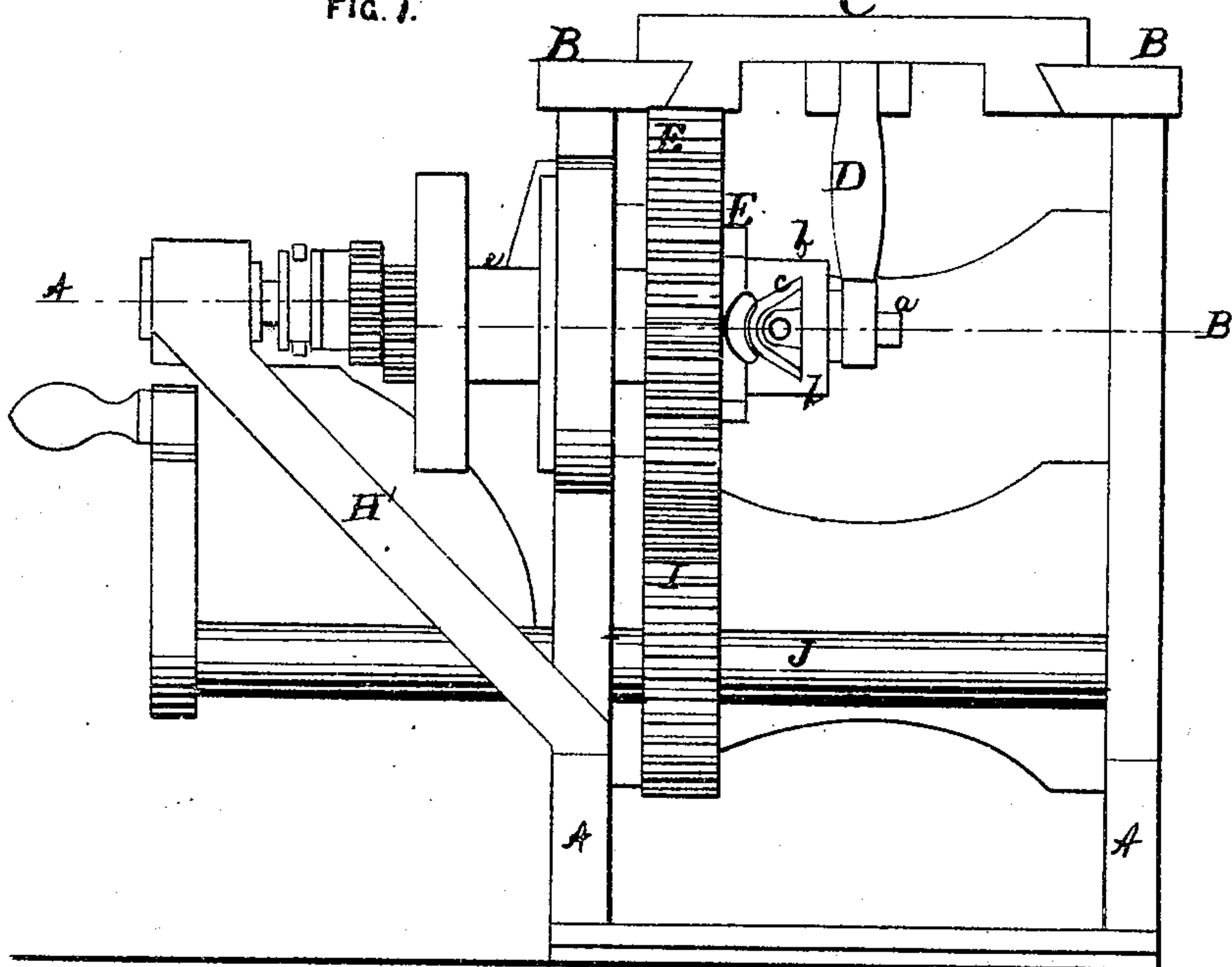
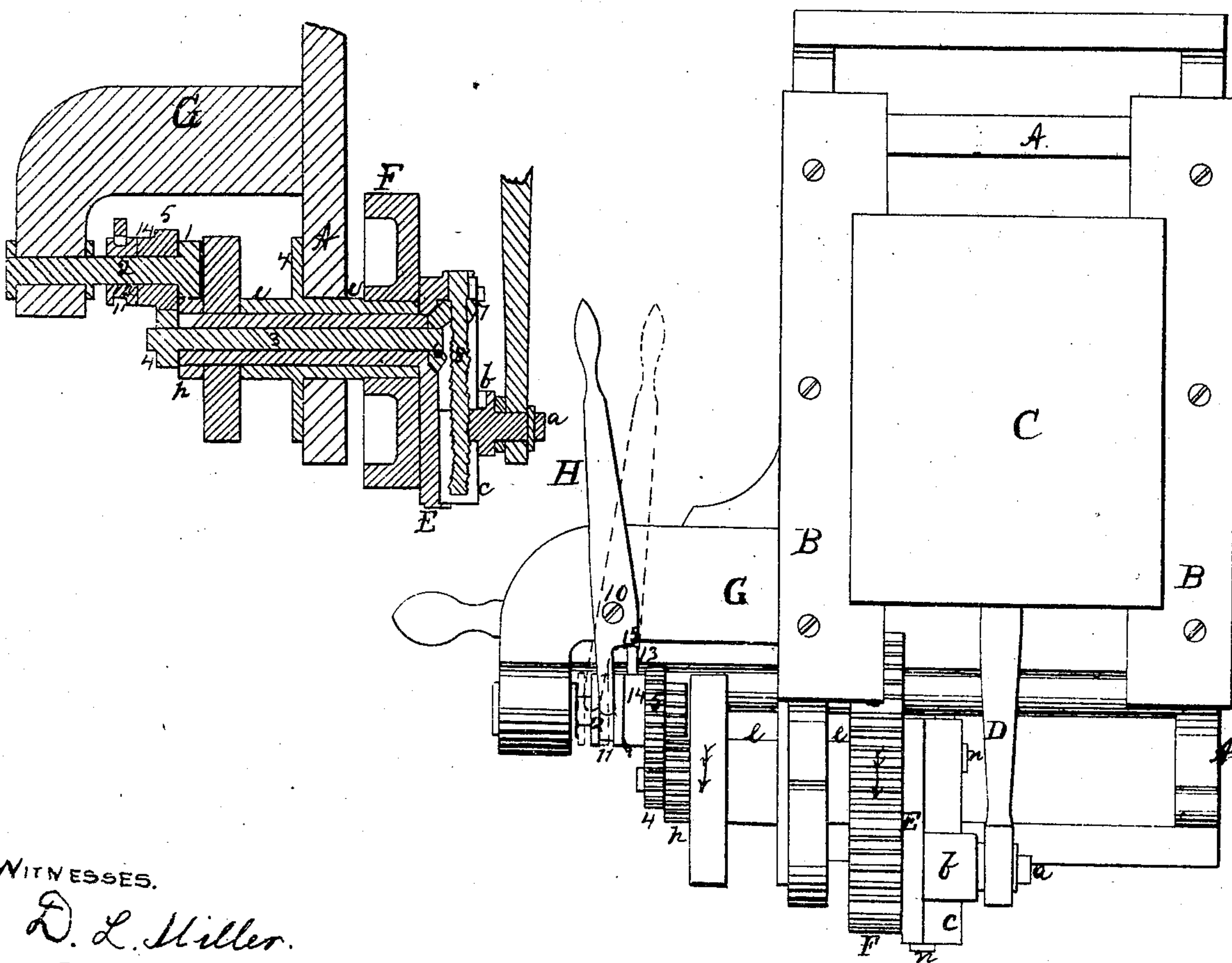


FIG. 2.



WITNESSES.

D. L. Miller.

Geo. H. Miller.

INVENTOR.

William H. Warren.

United States Patent Office.

WILLIAM H. WARREN, OF WORCESTER, MASSACHUSETTS.

Letters Patent No. 73,412, dated January 14, 1868.

IMPROVEMENT IN CRANK-PLANERS.

The Schedule referred to in these Letters Patent and making part of the same.

KNOW ALL MEN BY THESE PRESENTS:

That I, W. H. WARREN, of the city and county of Worcester, and Commonwealth of Massachusetts, have invented certain new and useful Improvements in Crank-Planers and other similarly-operated machines; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification, in which—

Figure 1 represents a front view of so much of a crank-planer as is necessary to illustrate my invention,

Figure 2 represents a plan view, and

Figure 3 represents a longitudinal central section on line A B, fig. 1, of the crank-operating mechanism.

To enable those skilled in the art to which my invention belongs to make and use the same, I will proceed to describe it more in detail.

In crank-planers and other similar machines, it is often desirable to reduce or increase the throw of the crank, to give a greater or less motion to the table of the planer, or whatever is to be moved by the crank; and the nature of my invention consists in mechanism so constructed that the operator can change the throw of the crank as may be desired, without stopping the driving-mechanism, and without affecting the stability and strength of the crank-connection.

In the drawings, the part marked A is the frame, upon the top of which are the ways B B, between and upon which the table C works, as indicated in the drawings. D is the connecting-rod or connection, one end being hinged to the table C, and the other attached to the wrist-pin *a*, which is fastened to the slide-piece *b*, which works on the dove-tail way *c*, on the face of the plate E, which is fastened to side of gear F, which has its bearing on the end of a stationary cylindrical journal, *e*, which passes through and is supported in the main frame A, while a plate, *f*, attached thereto, is also fastened to the side of the frame, to give greater strength to it. Within the tubular bearing *e* is a tubular shaft, *g*, one end of which is fastened to the face-plate E, while on the other end is fastened the gear *h*, which meshes into the gear 1 on shaft 2, which is supported in the arm G on frame A, strengthened by the brace H'. Within the tubular shaft *g* is a shaft, 3, having fastened to its outer end a gear, 4, which meshes into gear 5, loose on shaft 2, while a bevel-gear, 6, is fastened on the inner end, to mesh into a bevel-gear, 7, on the screw-shaft 8, the head of which is swivelled in the end of the face-plate E, and its free end passing through a projection, 9, on the slide-piece *b*, a thread being tapped or cut in the projection 9 to fit the thread on shaft 8. H is a lever pivoted at 10 upon the arm G, the front of the lever being made flat, and rounded out in the end, to fit the groove 11 in the pulley 12 of shaft 2, pulley 12 and shaft 2 being made and combined with a tongue and groove in such a manner that pulley 12 will always revolve with shaft 2, while at the same time it can be moved back and forth, by means of lever H. 13 is a pin projecting from the hub 14 of gear 5, the face of the pin being bevelled off on one side, so that when lever H is moved to the position shown in red lines, fig. 2, the bevelled part of the pin 13 will strike against the shoulder 15 of lever H, as indicated in fig. 2.

The operation is as follows: Motion now being imparted to gear F, which may be produced by a gear, I, upon shaft J, driven by belt or otherwise, as gear F revolves, it carries around with it the face-plate E and wrist-pin *a*, and thus imparts through the connecting-rod D a reciprocating motion to table C, upon the ways B B. If it is desired now to increase the motion of table C, the operator takes hold of lever H, and moves it into the position shown in dark lines, fig. 2, thereby causing gear 5, which is loose upon shaft 2, to be pressed between gear 1 and pulley 12, thus imparting a rapid motion to gear 5, and through that an increased motion to gear 4 and shaft 3, which gives motion to bevel-gears 6, 7, and screw-shaft 8. It will be seen that as screw-shaft 8 is turned, it will run slide *b*, to which the wrist-pin *a* is attached, out from the centre of motion, and thus increase the throw of the crank and motion of table C. When the motion of table C has been sufficiently increased, the operator releases his hold of lever H, and the speed of shaft 3 falls to that of the tubular shaft *g*, and as shaft 3 turns, runs with the same speed as gear F, face-plate E, and the dove-tail way *c*, the slide-piece *b* and wrist or crank-pin *a* will remain at the same distance from the centre of motion, until changed by the operator by means of lever H. If it be desired to shorten the throw of the crank, and thus give a less motion to the table C, the operator moves lever H into the position shown in red lines, fig. 2, whereby the shoulder 15 of lever H is brought into the path of pin 13, and the motion of the latter stopped, whereby the motion of gear

4, shaft 3, and bevel-gear 6, is also stopped, while the screw-shaft 8 and bevel-gear 7 continue to revolve with plate E, and so long as the bevel-gear 6 remains at rest, and the bevel-gear 7 revolves around gear 6, the screw-shaft 8 will be turned so as to run the slide-piece *b* and wrist-pin *a* towards the centre of motion of the gear F and face-plate E, and thus shorten the throw of the crank and the movement of table C. As soon as the desired adjustment has been made, the operator releases his hold on lever H, and the bevel-face of pin 13 forces shoulder 15 out of the path of the pin, and gear 4, shaft 3, and bevel-gear 6 are again allowed to revolve with and at the same speed of gear F, plate E, and gear 7, and the throw of the crank remains as thus adjusted, until it is changed again by the operator in one of the ways above described.

It will be observed that when the speed of the table and throw of the crank are to be increased, the speed of shaft 3 is increased so that the shaft revolves at a greater speed than the tubular shaft *g*, gear F, and face-plate E, while when the throw of the crank and motion of the table are to be shortened, the speed of shaft 3 is reduced below that of shaft *g*, gear F, and plate E, and in this instance the motion of shaft 3 is stopped entirely. Stops *n n* are fastened or combined with the end of the face-plate E, against which the slide *b* will strike when run to the extreme ends of the screw-thread of shaft 8. Slide-piece *b* is cut out so that it can be run over the bevel-gear 7, to bring the crank-pin *a* over the centre of motion when desired.

The crank-planers as constructed heretofore, could be adjusted by stopping the machine, one mode being to fit the wrist-pin in a slot and fasten it there by a nut, which had to be loosened and tightened every time the adjustment was made. Another mode consisted in combining the crank-pin with a screw similar to the screw-shaft 8, which shaft had to be turned by hand, or by a wrench in the hand of the operator. All these hand-adjustments are attended with much delay and inconvenience, but which objections are obviated by my improvements, as will be seen, especially by those skilled in the art to which my invention belongs.

The work to be planed is placed upon the table C, and is moved back and forth with the table, while the tool is supported in a frame above the same, as in the common iron planing-machines. The planer is usually driven by a belt running upon cone-pulleys at the side of the machine, so that the operator, when planing short work or pieces, can quickly increase the speed of the machine, or *vice versa*. Again, he can adjust the throw of the crank, while looking at his work, and without stopping the machine, and thus bring the motion of the table to any desired point with ease and accuracy.

It will be further observed that the device for adjusting the throw of the crank is such that there is no liability of breaking the machine, even if the slide *b* is run both ends against the stops *n n*, when being adjusted. In the first mode of adjustment, if the slide should strike against one of the stops *n*, the friction of wheel 12 against the side of gear 5 would not be sufficient to cause any breakages, while if a stop should be struck while the bevel-face of pin 13 rested on the shoulder 15, the bevel-face of the pin would force shoulder 15 back out of its path before any damage was done. Arrows indicate the directions in which some of the parts move.

Having described my improvements in crank-planers and other similar machines, what I claim therein as new and of my invention, and desire to secure by Letters Patent, is—

1. The combination, with a crank-planer or like machine, of mechanism substantially as herein described, for regulating the throw of the crank without stopping or interrupting the continuous operation of the machine, as shown and set forth.

2. The combination, with gear F and face-plate E, of the tubular shaft *g*, central shaft 3, screw-shaft 8, and gears 4, *h*, 6, and 7, substantially as and for the purposes set forth.

3. The combination, with the shaft 2 and gear 1, of the loose gear 5 and pulley 12, or its mechanical equivalent, operating substantially in the manner and for the purposes herein shown and described.

4. The combination, with gears 1 and 5, and pulley 12, mounted on the shaft 2, as described, of gears 4 and *h*, and their respective shafts, arranged for operation substantially as and for the purposes herein shown and specified.

5. The combination, with the friction-pulley 12 and bevelled pin 13, of the lever H and shoulder 15, substantially as and for the purposes set forth.

WILLIAM H. WARREN.

Witnesses:

D. L. MILLER,
GEO. H. MILLER.