No. 674,952. Patented May 28, 1901.

R. W. & L. H. BATEMAN.

MACHINE TOOL.

(Application filed Sept. 29, 1900.)

(No Model.) 3 Sheets—Sheet 1.

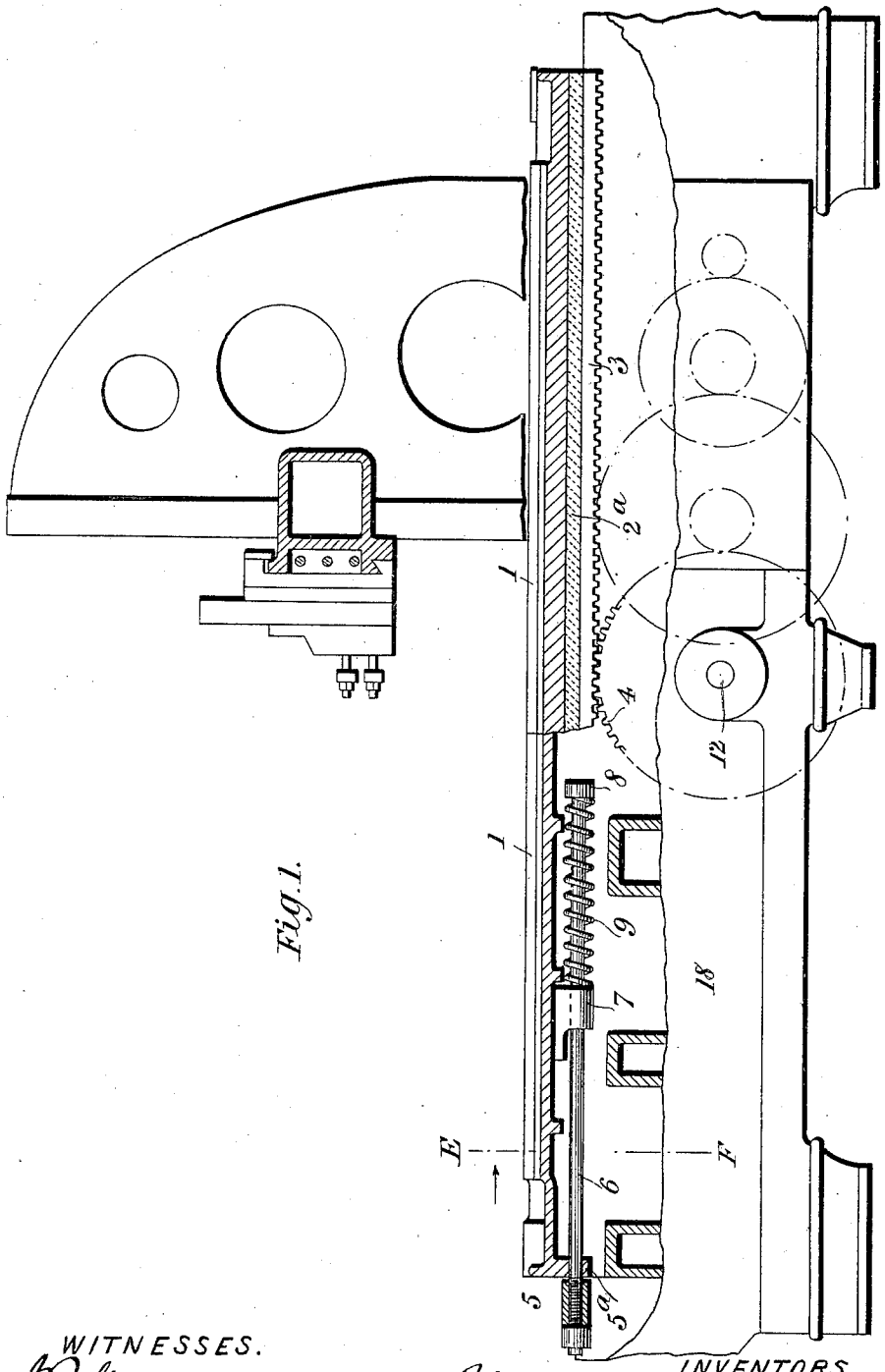


Fig. 1.

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Fig. 3.

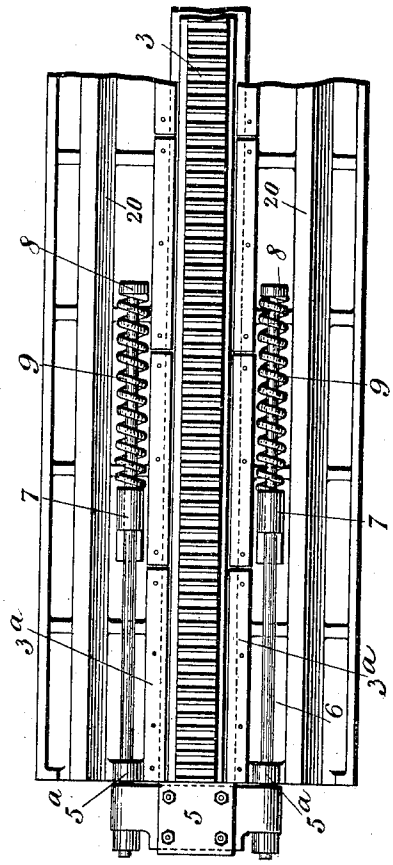
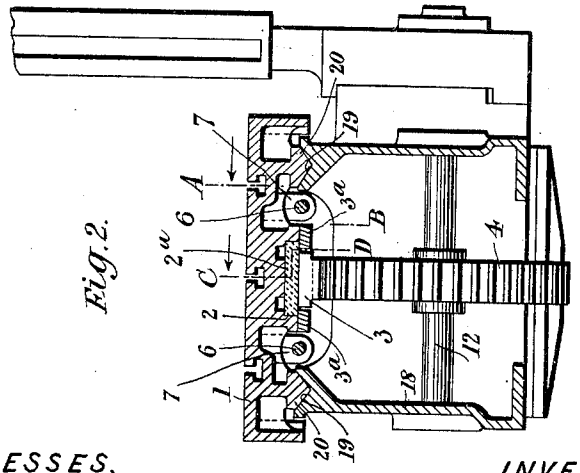


Fig. 2.



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Fig. 7.

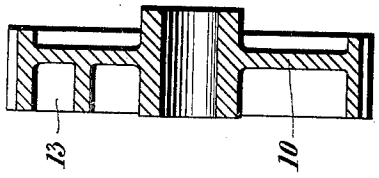


Fig. 9.

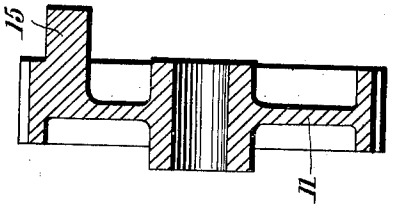


Fig. 6.

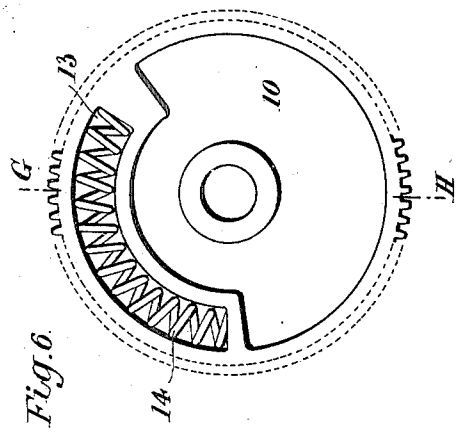


Fig. 8.

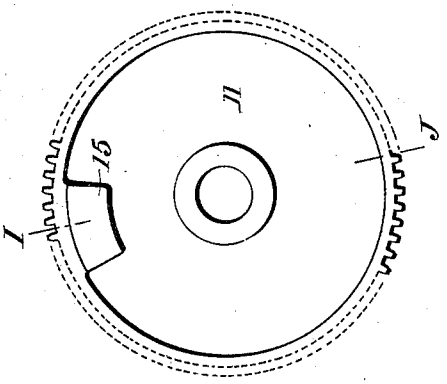


Fig. 4.

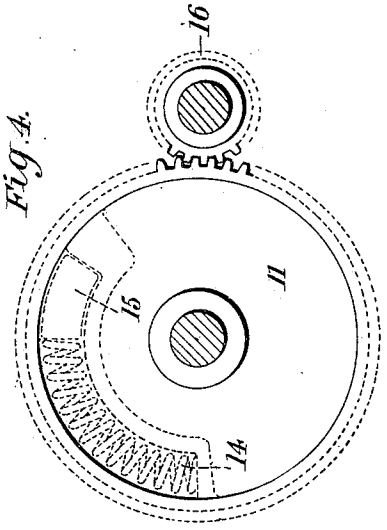
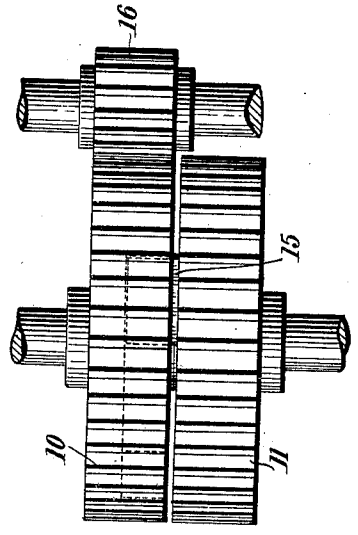


Fig. 5.



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UNITED STATES PATENT OFFICE.

RICHARD WILKINSON BATEMAN AND LOFTUS HANSON BATEMAN, OF HALIFAX, ENGLAND.

MACHINE-TOOL.

SPECIFICATION forming part of Letters Patent No. 674,952, dated May 28, 1901.

Application filed September 29, 1900. Serial No. 31,514. (No model.)

To all whom it may concern:

Be it known that we, RICHARD WILKINSON BATEMAN and LOFTUS HANSON BATEMAN, subjects of Her Majesty the Queen of Great Britain, residing at Halifax, in the county of York, England, have invented a certain new and useful Improvement in Machine-Tools, of which the following is a specification.

Our invention relates to an improvement in machine-tools—such as planers, shapers, cutters, slotters, and the like—the object being to increase the capacity of such machines by providing means whereby the shock usually given upon the reversal of travel of the table carrying the work is taken up, so that the return movement of the table can be made more quickly, and hence the machine be worked with greater rapidity than heretofore.

The invention consists in one form in the use, in combination with the table or ram, of buffers or cushion-like devices which take up the first shock given on reversal of the bull wheel or gear in such a manner that the teeth of the wheel and rack or gear are engaged without the sudden jar heretofore felt. The buffer arrangement may, however, be applied to the moving part, whether it is the tool, the cutter, or the work.

In the accompanying drawings, Figure 1 is a sectional side elevation of a planer with the improvement applied thereto, the view showing the table in section through lines A B and C D in Fig. 2 looking in the direction of the arrows. Fig. 2 is a cross-section of the planer bed and table on line E F, Fig. 1, looking in the direction of the arrow. Fig. 3 is a plan view of the under side of the planer-table. Fig. 4 is a side elevation of a modified form of mechanism for effecting the same purpose as Fig. 1. Fig. 5 is a plan of Fig. 4. Fig. 6 is an elevation of one of the wheels shown in Fig. 5, showing a recess or chamber and spring therein. Fig. 7 is a section through line G H in Fig. 6 with the spring removed. Fig. 8 is an elevation of the other wheel shown in Fig. 5 with a projecting lump or block. Fig. 9 is a section through line I J in Fig. 8.

Referring to Figs. 1 to 3, there is on the under side of the table 1 a recess 2, extending the length of the table to receive a bar 2^a, to which is secured the rack 3. This rack and bar are capable of a sliding movement in the recess, and they are held in the latter by side plates 3^a. The table slides in the frame 18 in suitable guide-grooves 19, being provided with suitable slide-faces 20 to travel in such grooves. The rack 3 engages with the usual bull-wheel 4 on spindle 12, which drives it. At one end the combined bar 2^a and rack 3 carry a cross-head 5, having two buffer-rods 6 6, which pass freely through brackets 5^a on the under side of the table 1, such brackets forming stops for the cross-head. Such rods also pass freely through lugs 7 7, secured in any suitable manner to the under side of the sliding table 1, and are provided with the heads 8, between which and the lugs 7 7 are buffer-springs 9. In the forward movement of the table the rack draws the cross-head close to the brackets 5^a, and the table is moved positively through such abutments; but on the commencement of the quick or return stroke the teeth of the bull-wheel 4 coming in contact with the reverse side of the teeth of the rack 3 cause the said rack and bar 2^a to move forward, the cross-head 5 drawing out the rods 6 and compressing the springs 9 against the lugs 7 before the weight of the table is taken by the teeth of the rack and wheel, so that such table is started by a yielding motion device, whereby the shock is very largely relieved and breakage of the teeth is prevented.

For heavy planers a combination of three or more buffer-rods and springs and two or more racks and bull-wheels may be used, and for light planers which have an exceedingly quick return stroke the planer-table may have a set of buffer rods and springs at each end connected to separate racks and driven by separate bull-wheels, so as to form a cushion at the reversal of each traverse of the table.

Instead of the above-described mechanism we may employ two wheels 10 11 side by side on the same spindle 12, the wheel 10 being driven by the pinion 16 and the wheel 11 gearing with the rack 3 and taking the place of the bull-wheel 4, the rack in this case forming a fixed part of the table 1, as usual. In the face of the wheel 10 is a curved recess 13, extending about one-third of the circumference of the wheel. In this recess is a strong spiral spring 14, which is compressed by a

block 15, projecting from the wheel 11 and entering the recess 13. For forward driving the block 15 acts directly against the leading end of the recess 13. When the table 1 is reversed, the block 15 compresses the spring 14, and said spring takes up the first shock of the reversal of the wheels until the inertia is overcome, so that the sudden jar and breakage of teeth in the rack or wheels are avoided.

In the case of a slotting-machine and a shaping-machine the buffer arrangement is applied to the ram carrying the tool or cutter instead of to the table carrying the work.

It will be obvious that instead of the springs 9 air-cushions might be substituted; but in practice we have found the springs the most advantageous.

What we claim is—

1. In machine-tools having a movable reversing table the combination with such table of a rack movable therein a cross-head carried by the rack, rods carried by the cross-head and springs adapted to be compressed by the rods on the first movement of reversal of the table before the latter is started substantially as described.

2. In machine-tools having a movable reversing table the combination with such table of a rack movable therein, a cross-head carried by the rack, headed rods carried by such cross-head, lugs connected to the table through which the rods pass, springs between the heads of the rods and the lugs and stops for the cross-head carried by the table through which the rods pass substantially as described.

3. In machine-tools having a movable reversing table, the combination with a rack on said table, and a gear-wheel meshing with said rack and having a lateral projection thereon; of a second gear-wheel having a curved slot to receive the projection on the first gear-wheel, a spring in said curved slot arranged to bear against said projection when the second gear-wheel is driven in one direction, and means for driving the second gear-wheel; substantially as described.

4. In machine-tools having a movable reversing table, the combination with such table, of a sliding part movable therein, a cross-head carried by the sliding part, rods carried by the cross-head and springs adapted to be compressed by the rods on the first movement of reversal of the table before the latter is started, substantially as described.

In testimony whereof we have hereunto set our hands in the presence of two subscribing witnesses.

RICHARD WILKINSON BATEMAN.
LOFTUS HANSON BATEMAN.

Witnesses:
J. B. HOWARD,
GERVASE APPLEYARD.