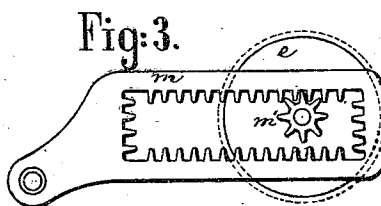
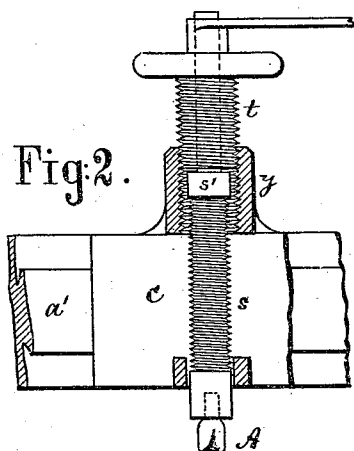
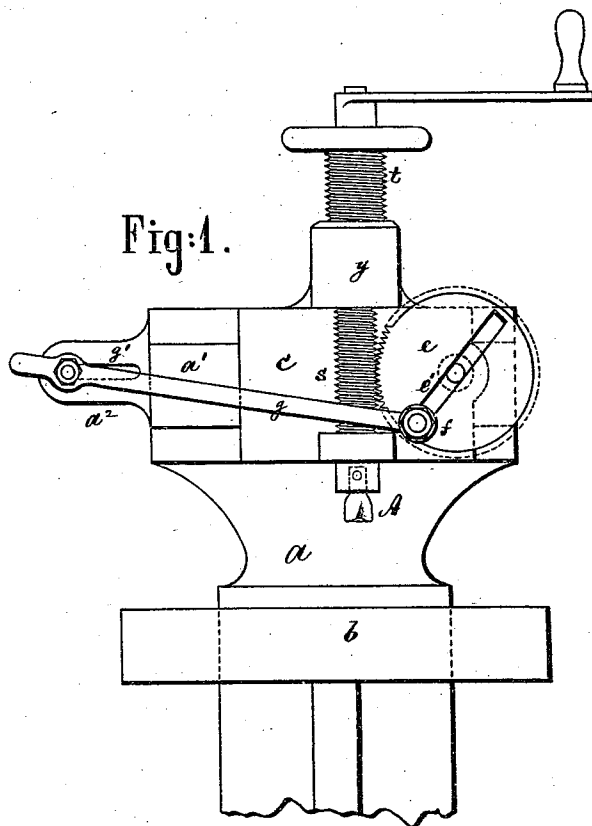


(No Model.)

J. H. SPOERL.
MILLING TOOL.

No. 551,841.

Patented Dec. 24, 1895.



Witnesses:
William Schulz
John Becker

Inventor:
Johann Heinrich Spoerl
by his attorneys
Roeder & Briesen

UNITED STATES PATENT OFFICE.

JOHANN HEINRICH SPOERL, OF DUSSELDORF, GERMANY.

MILLING-TOOL.

SPECIFICATION forming part of Letters Patent No. 551,841, dated December 24, 1895.

Application filed November 9, 1894. Serial No. 528,305. (No model.) Patented in Germany November 24, 1893, No. 78,334; in Belgium December 13, 1893, No. 107,692; in England December 19, 1893, No. 24,444; in France December 1, 1894, No. 230,334, and in Austria January 19, 1895, No. 45/245.

To all whom it may concern:

Be it known that I, JOHANN HEINRICH SPOERL, a subject of the German Emperor, residing at Dusseldorf, Germany, have invented certain new and useful Improvements in Milling-Machines, (for which I have obtained patents in Germany, dated November 24, 1893, No. 78,334; in Belgium, dated December 13, 1893, No. 107,692; in England, dated December 19, 1893, No. 24,444; in Austria, dated January 19, 1895, Tom. 45, p. 245, and in France, dated December 1, 1894, No. 230,334,) with description as follows.

This invention relates to a milling-machine for cutting keyways and grooves, and which may be readily transported and applied.

In the accompanying drawings, Figure 1 is an elevation of my improved milling-machine. Fig. 2 is a vertical section through the spindle-bearings, and Fig. 3 a detail of a modification of the transmitting mechanism.

The letter *a* represents the frame of the milling-machine provided with a work-table *b* and with a longitudinal rail *a'*. Upon this rail there is free to reciprocate parallel to the work-table a slide *c*, that carries the milling-head *A*. This head is secured to a left-hand worm *s*, guided in the slide *c* and engaging a worm-wheel *e*, pivoted to said slide. The worm *s* passes through a hollow screw *t*, that bears upon a shoulder *s'* of the worm and engages a nut *y* of slide *c*. Thus by revolving the screw *t* the milling-head is forced down upon the work. The wheel *e* is provided with

a slot *e'*, engaged by an adjustable pin *f*, to which one end of a draw-bar *g* or a crank is secured. The other or fixed end of this bar is attached by a pin *g'* to a slotted lug *a''* of frame *a*.

In use a revolution of the worm *s* will cause a slow revolution of wheel *e*, and consequently a slow reciprocating motion of slide *c*, together with the worm and wheel. In this way the milling-head is both revolved and slowly reciprocated. The adjustment of the pin *f* regulates the throw of the machine, while the adjustment of the pin *g'* regulates the lateral initial position of the milling-head.

In Fig. 3 the wheel *e* transmits motion to the slide *c* by means of a mangle-rack *m*, that engages a pinion *m'* on the spindle of wheel *e*. The rack will thus not only be reciprocated but will be automatically raised and lowered at the end of the throw.

What I claim is—

A milling machine composed of a work table, a slide movable parallel thereto, a longitudinally adjustable worm and a worm wheel carried by the slide, and a draw bar engaging the wheel and connected to the machine frame, substantially as specified.

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

JOHANN HEINRICH SPOERL.

Witnesses:

E. ANDRÉ,

WM. ESSENWEIN.