

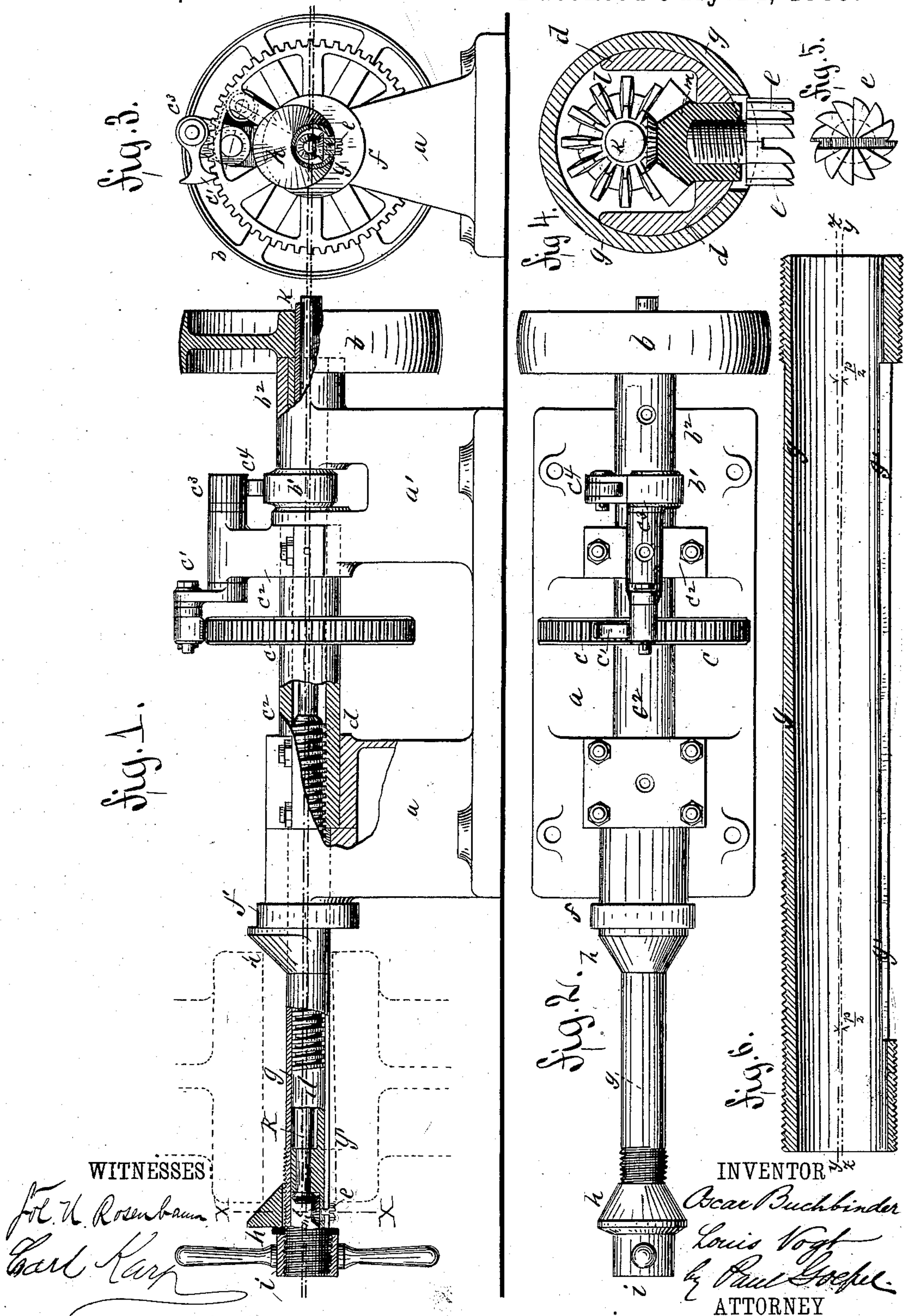
(No Model.)

O. BUCHBINDER & L. VOGT.

MACHINE FOR MILLING KEY SEATS.

No. 281,833.

Patented July 24, 1883.



UNITED STATES PATENT OFFICE.

OSKAR BUCHBINDER AND LOUIS VOGT, OF VIENNA, AUSTRIA-HUNGARY.

MACHINE FOR MILLING KEY-SEATS.

SPECIFICATION forming part of Letters Patent No. 281,833, dated July 24, 1883.

Application filed February 19, 1883. (No model.)

To all whom it may concern:

Be it known that we, OSKAR BUCHBINDER and LOUIS VOGT, both of Vienna, Austria-Hungary, have invented certain new and useful Improvements in Machines for Milling Key-Seats, of which the following is a specification.

Heretofore key-seats of pulleys, gear-wheels, shafts, &c., have either been cut by hand with chisels, or by means of slotting-machines or similar apparatus, by which the desired grooves had to be formed gradually by a succession of cuts. The accuracy of such key-seats always depended upon the skill and experience of the workman in handling the chisel or arranging his machine.

The object of this invention is to render the production of key-seats independent of such circumstances, and to furnish a machine by means of which key-seats of any size can be milled with the proper degree of inclination or taper; and the invention consists of a rotary cutter to which simultaneously rectilinear motion is imparted by a sliding tube or box and a suitable pawl-and-ratchet mechanism, the sliding tube being guided in a fixed exterior and longitudinally-slotted tube, the interior surface of which is at an inclination to the outer surface, so as to give the required taper to the key-seats.

In the accompanying drawings, Figure 1 is a side elevation of our improved machine for milling key-seats, partly in section, to show the interior construction. Fig. 2 is a plan of the machine. Fig. 3 is a vertical transverse section on line *x x*, Fig. 1. Fig. 4 shows on an enlarged scale the rotary cutter and its driving-gear. Fig. 5 is a detail bottom view of the cutter shown in Fig. 4, and Fig. 6 is a vertical longitudinal section through the guide-box of the cutter, drawn on a larger scale.

Similar letters of reference indicate like parts in all the figures.

Referring to the drawings, *a a'* represent the supporting-standards or head-stock of our improved machine for milling the key-seats of pulleys, gear-wheels, shafts, and similar articles. The standards *a a'* are provided with bearings for the mechanisms by which rotary motion is imparted to the milling-tool or cutter *e*, and simultaneously rectilinear motion in the direction of the longitudinal axis of the

machine. The vertical shaft of the milling-cutter *e* is secured to a horizontal bevel-wheel, *m*, that turns in bearings at the outermost end of a longitudinally-movable tube or box, *d*. The bevel-wheel *m* receives rotary motion from a bevel-wheel, *l*, at the outer end of a shaft, *k*, that is supported in bearings at the interior of the tube *d*, but eccentrically to the same, so as to provide the required space for the bevel-wheel *m* of the cutter *e*.

The tube *d* is guided by means of a longitudinal tongue and groove in an exterior tube or box, *g*, which is rigidly screwed or otherwise fastened by its inner threaded end to the socket-shaped end portion *f* of head-stock *a*.

On the exterior tube or box, *g*, are placed loose conical blocks or jaws *h h*, which are tightened up on the articles to be milled by a nut or screw wheel, *i*, applied to the outer end of the box *g*.

In order to be able to firmly hold articles of different diameters, the blocks *h h* are made flaring to one side, so that they will enter any bore wider than the outside diameter of box *g*. The lower part of the box *g* is thereby brought in contact with the interior surface of the article to be grooved and into a position parallel to the axis of the box.

The box *g* is provided at its lower part with a longitudinal slot, *g'*, for the longitudinally-moving cutter *e*, said slot serving also as a guide for the shank of the cutter *e*. The bore of this cylindrical guide-box, which is shown clearly in detail in Fig. 6, is slightly inclined at an angle to the axis of the box, the axis *z z* of the bore crossing the axis *y y* of the cylinder at the center. By this construction, when the article to be milled is held in contact with the exterior of the box, the movable tube *d*, carrying the cutter, slides at an angle to the axis of the box and causes the cutter to be gradually elevated as it moves along its work, whereby a groove is formed of the required inclination or taper.

The interior tube, *d*, is provided with an exterior screw-thread throughout the greater part of its length. The tube *d* is engaged by the interior screw-thread of the extended hub *c'* of a cog-wheel, *c*, which is located between the head-stocks *a a'*, its hub being extended at both sides and supported in bearings of both head-stocks *a a'*.

The cog-wheel c receives rotary motion by a fixed pawl, c' , at the crank end of a short intermediate shaft, c^3 , the downwardly-extending crank-arm c^4 of the opposite end of which is raised by an eccentric, b' , keyed to the extended hub b^2 of a driving-pulley, b , to which motion is transmitted by a suitable driving-belt.

The transmitting-shaft k of the bevel-wheel m extends longitudinally through the tube d and the extended hubs c^2 and b^2 of the cog or ratchet wheel c , and of the driving-pulley b , it being splined to the latter so as to receive rotary motion while moving simultaneously in longitudinal direction through the hub of the pulley in following the motion of the interior tube, d . The rotary and rectilinear motions which are thus imparted to the cutter e by the mechanisms described produce a milled key-seat at the required point, which receives at the same time the proper degree of taper by the gradual rising of the cutter.

The machine may also be used for cutting or milling spiral key seats or grooves by placing upon the head-stock a a suitable set of gear-wheels for rotating the piece to be worked with a speed corresponding to the pitch which the groove is intended to receive.

The machine may also, without any material alteration, be adapted for cutting or milling key seats and grooves upon the outside of bodies—such as shafts or spindles, for instance—by simply providing a proper bed or rest for the pieces to be worked upon and eventually a suitable stiffening or brace for box g . In this case the nut i and clamping-jaws h have to be removed from the box g .

Having thus described our invention, we claim as new and desire to secure by Letters Patent—

1. The combination of a milling-tool or cutter, means for revolving the same, an interior tube supporting the cutter and having an exterior screw-thread, a screw-sleeve engaging the exterior thread of the cutter-tube, a pawl-and-ratchet mechanism for turning the sleeve and imparting rectilinear motion to the cutter, and a fixed exterior and longitudinally-slotted guide-box provided with means for attaching the articles in which key-seats are to be milled, substantially as specified.

2. The combination of a cylindrical guide-box provided with a longitudinal guide-slot, a cutter-tube adapted to traverse said box, and a rotary cutter connected to said cutter-tube, the interior bore of said guide-box being slightly inclined to the axis of said cylindrical box, whereby, when the wheel or hub being milled is held in contact with the exterior of said box, the line of traverse of the cutter will be inclined to the axis of the wheel or hub, substantially as described.

3. The combination of a cylindrical guide-box provided with a longitudinal guide-slot, a cutter-tube adapted to traverse said box, a rotary cutter connected to said cutter-tube, inclined jaws, one of which is adapted to slide on said cylindrical box for clamping the work, and means for operating said jaw, substantially as described.

4. The combination of a cylindrical guide-box provided with a longitudinal guide-slot, a cutter-tube adapted to traverse said box, a rotary cutter connected to said cutter-tube, inclined jaws, one of which is adapted to slide on said cylindrical box for clamping the work, and a nut or screw-wheel applied to the end of the guide-box for operating the clamping-jaw, substantially as described.

5. The combination of a milling-tool or cutter, means for rotating the same, a cutter-tube, a screw-threaded sleeve engaging the exterior thread of the cutter-tube, a pawl-and-ratchet mechanism for turning the sleeve and imparting rectilinear motion to the cutter-tube and cutter, a cylindrical guide-box provided with a longitudinal guide-slot, inclined blocks or jaws, one of which is adapted to slide on said cylindrical box for clamping the work, and means for operating said jaw, substantially as described.

In testimony that we claim the foregoing as our invention we have signed our names in presence of two subscribing witnesses.

OSKAR BUCHBINDER.
LOUIS VOGT.

Witnesses:

WILLIAM HÜNING,
ROBERT B. JENTZSCH.