

G. E. GREENLEAF.
CLAMP FOR MACHINE TOOLS.
APPLICATION FILED APR. 1, 1912.

1,035,784.

Patented Aug. 13, 1912.
2 SHEETS—SHEET 1.

Fig. 1.

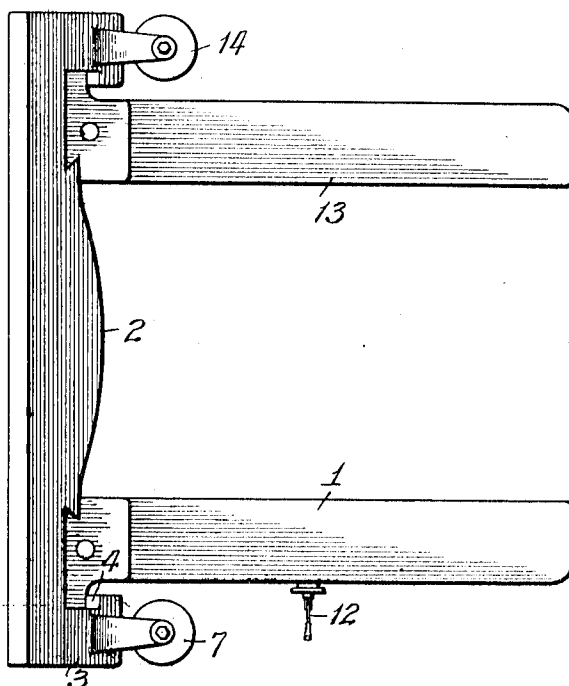
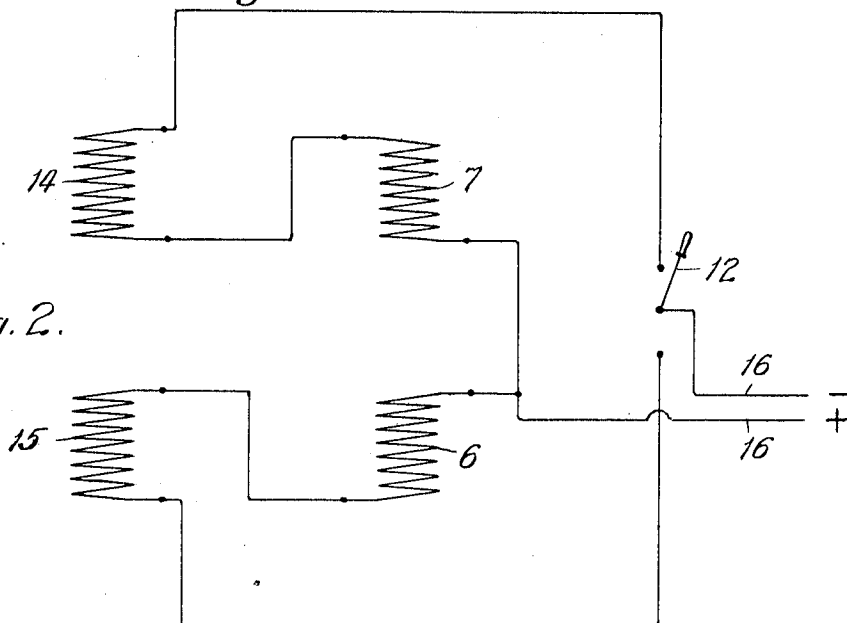


Fig. 2.



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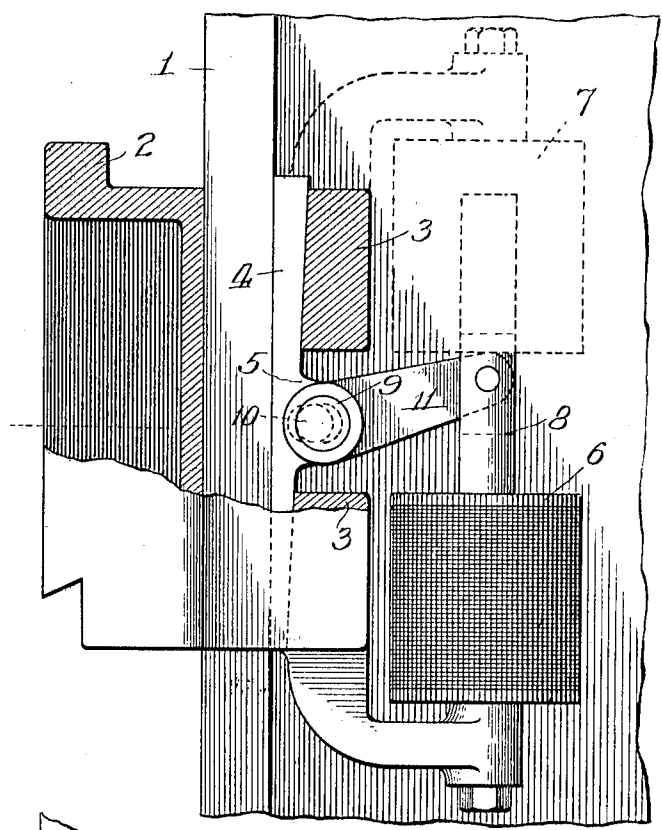


Fig. 3.

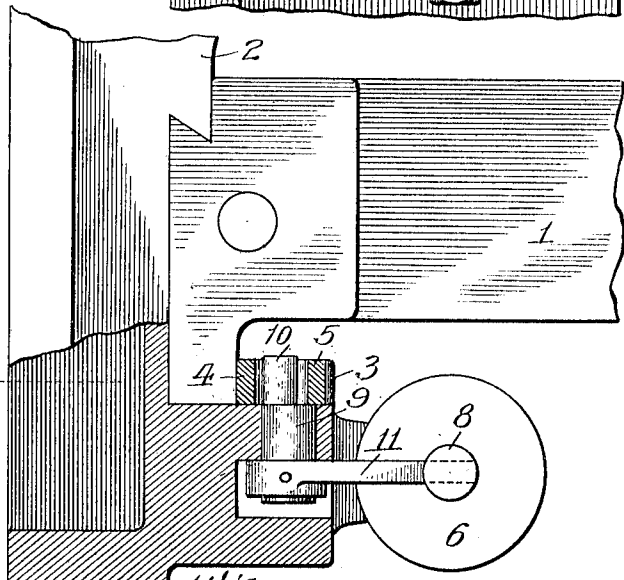


Fig. 4.

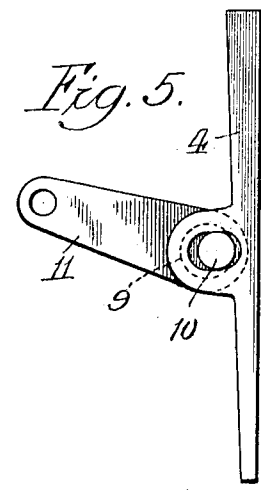


Fig. 5.

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UNITED STATES PATENT OFFICE.

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CLAMP FOR MACHINE-TOOLS.

1,035,784.

• Specification of Letters Patent.

Patented Aug. 13, 1912.

Application filed April 1, 1912. Serial No. 687,570.

To all whom it may concern:

Be it known that I, GEORGE EDWARD GREENLEAF, a citizen of the United States, residing at Plainfield, Union county, New Jersey, have invented certain new and useful Improvements in Clamps for Machine-Tools, of which the following is a specification.

In some varieties of machine tools one part is arranged to have sliding adjustment upon another part and then be firmly clamped thereto until another adjustment is called for. A good example may be found in the cross-rail clamping devices of planers and boring mills where the rail is adjustably fixed upon the housing. Generally the back of the rail has been provided with gibs projecting from its back and extending around and engaging the rear of some vertical element of the housing, the gib carrying a separable part which, by means of screws can be drawn tightly up to the proper surface of the housing after the rail has been adjusted upon the housings. My present invention aims to facilitate this clamping operation and the invention will be readily understood from the following description taken in connection with the accompanying drawings in which:—

Figure 1 is a plan of the two housings and rail of the planer or boring mill whose clamping devices exemplify my invention: Fig. 2 a diagram of the electric circuits employed in the exemplifying device: Fig. 3 an end view of the rail in clamped condition upon the housing, the rail appearing partially in vertical transverse section: Fig. 4 a plan of a portion of one of the housings and of one end of the rail, the rail appearing partially in horizontal section, and Fig. 5 an elevation of the rear side of the wedge and its actuating lever.

In the drawings:—1, indicates one of the housings of the machine: 2, the rail: 3, the usual gib portion of the rail projecting from the back thereof and hooking around behind a vertical rib on the housing, that portion of the gib which is disposed to the rear of the rib of the housing standing away

from the rib and standing away a greater distance at the top of the gib than at the bottom, thus leaving a wedge-shaped space between the gib and the rib of the housing: 4, a wedge seated in the space between the gib of the rail and rib of the housing and adapted, when forced downward to wedge the rail tightly to the housing: 5, a slotted lug projecting from the rear of the wedge: 6, a vertically disposed solenoid supported by the rail rearward of the wedge and below the horizontal plane of lug 5: 7, a similar solenoid supported by the rail in axial alinement with the first solenoid but disposed above the horizontal plane of lug 5 so as to leave considerable space between the contiguous ends of the two solenoids: 8, a core adapted to reciprocate in the pair of solenoids according to which of the two solenoids is energized: 9, a short shaft journaled in the gib of the rail in the general horizontal plane of lug 5: 10, an eccentric on the inner end of shaft 9, this eccentric engaging the slot of the wedge and adapted, when the shaft is partially rotated in one direction or the other, to raise or lower the wedge: 11, an arm fast on the outer end of shaft 9, the outer end of this arm being pivoted to the core of the solenoid: 12, a switch for controlling the energization of the solenoids: 13, the second housing of the machine, the rail being provided with a second clamping equipment, like the one previously described, for clamping the rail to the second housing: 14, the upper solenoid of the pair of solenoids pertaining to the second housing: 15, the lower solenoid of the pair of solenoids pertaining to the second housing, and 16, electric mains to supply the solenoids with current when required.

Looking at Fig. 3, core 8 is seen drawn to an upper position as a result of the energizing of the upper solenoid. The upward movement of arm 11 which has been thus produced has served in forcing the wedge downward thus clamping the rail firmly to housing 1. If, now, the upper solenoid be deenergized and the lower one energized the core will be drawn downward and the wedge

will be forced upward thus releasing the rail from the clamping effect upon housing 1.

Now turning to Fig. 2 illustrating the preferred arrangement of electric circuits, it is to be observed that switch 12 is open, current, therefore, going to none of the solenoids, under which condition the cores of the solenoids will be free, so far as the solenoids are concerned. Assuming both wedges to be down and in the performance of their clamping office, if switch 12 be turned down to its lower contact point, the lower solenoids 6 and 15 will become energized and both cores will be drawn down and both wedges will be elevated and the clamps loosened. If, on the other hand, switch 12 be turned to its upper contact point the circuit through the lower solenoids will be open and these solenoids will become de-energized while at the same time energizing current will go to the upper solenoids 7 and 14, thus drawing the cores upward and forcing the wedges downward into clamping condition.

I claim:—

1. A clamping device comprising, a fixed member provided with a rib, an adjustable member seating against the fixed member and having a gib hooking behind said rib, a wedge disposed between the rib and the hooking portion of the gib, an electromagnetic translating device, means connecting the wedge with the translating device whereby the translating device may move the wedge endwise, an electric conductor for supplying current to the translating device, and a switch for controlling the conductor, combined substantially as set forth.

2. A clamping device comprising, a fixed member provided with a rib, an adjustable member seating against the fixed member and having a gib hooking behind said rib, a wedge disposed between the rib and the hooking portion of the gib and engaging against the rib, an eccentric mounted on the gib and engaging the wedge, and means for turning the eccentric to shift the wedge endwise, combined substantially as set forth.

3. A clamping device comprising, a fixed member provided with a rib, an adjustable member seating against the fixed member and having a gib hooking behind said rib, a wedge disposed between the rib and the hooking portion of the gib, an eccentric mounted on the gib and engaging the wedge, an electromagnetic translating device mounted on the adjustable member, means connecting the translating device with the eccentric, a conductor for supplying current to the translating device, and a switch for the control of the conductor, combined substantially as set forth.

4. A clamping device comprising, a fixed member provided with a rib, an adjustable

member seating against the fixed member and having a gib hooking behind said rib, a wedge disposed between the rib and the hooking portion of the gib, an eccentric mounted on the gib and engaging the wedge, a solenoid carried by the adjustable member, a movable core cooperating with the solenoid, means connecting the core with the eccentric so that reciprocations of the core brings about rotatory motion of the eccentric, an electric conductor for supplying current to the solenoid, and a switch for the control of the conductor, combined substantially as set forth.

5. A clamping device comprising, a fixed member having a rib, an adjustable member seating against the fixed member and having a gib hooking behind the rib, a wedge disposed between the rib and the hooking portion of the gib, a shaft journaled in the gib and having an eccentric portion engaging the wedge, a pair of solenoids disposed in a common axial line and spaced apart and carried by the adjustable member, a movable core cooperating with the solenoids, an arm connecting the core with the shaft, an electric circuit for supplying current to either one of the two solenoids, and a switch for the control of the circuit, combined substantially as set forth.

6. A clamping device comprising, a pair of fixed members each of which is provided with a rib, an adjustable member seating against the two fixed members and provided with gibs hooking behind the ribs, a wedge disposed between each rib and the hooking portion of the appropriate gib and engaging against the rib, and means connecting the two wedges to serve in moving them endwise simultaneously, combined substantially as set forth.

7. A clamping device comprising, a pair of fixed members each of which is provided with a rib, an adjustable member seating against the two fixed members and provided with gibs hooking behind the ribs, a wedge disposed between each rib and the hooking portion of the appropriate gib, an eccentric mounted on each gib and engaging the appropriate wedge, a solenoid mounted on each gib, movable cores cooperating with the respective solenoids, means connecting the cores with their respective eccentrics, an electric circuit for supplying current to the solenoids, and a switch for the control of the circuit, combined substantially as set forth.

8. A clamping device comprising, a pair of fixed members each of which is provided with a rib, an adjustable member seating against the two fixed members and provided with gibs hooking behind the ribs, a wedge disposed between each rib and the hooking portion of the appropriate gib, an eccentric

mounted on each gib and engaging the appropriate wedge, a pair of separated alining solenoids carried by each gib, a movable core coöperating with each pair of solenoids, means connecting each core with its appropriate eccentric, an electric circuit for supplying current to the two pairs of solenoids, and a switch to serve in putting the current to corresponding solenoids of each pair, combined substantially as set forth.

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Witnesses:

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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."
