

Aug. 24, 1943.

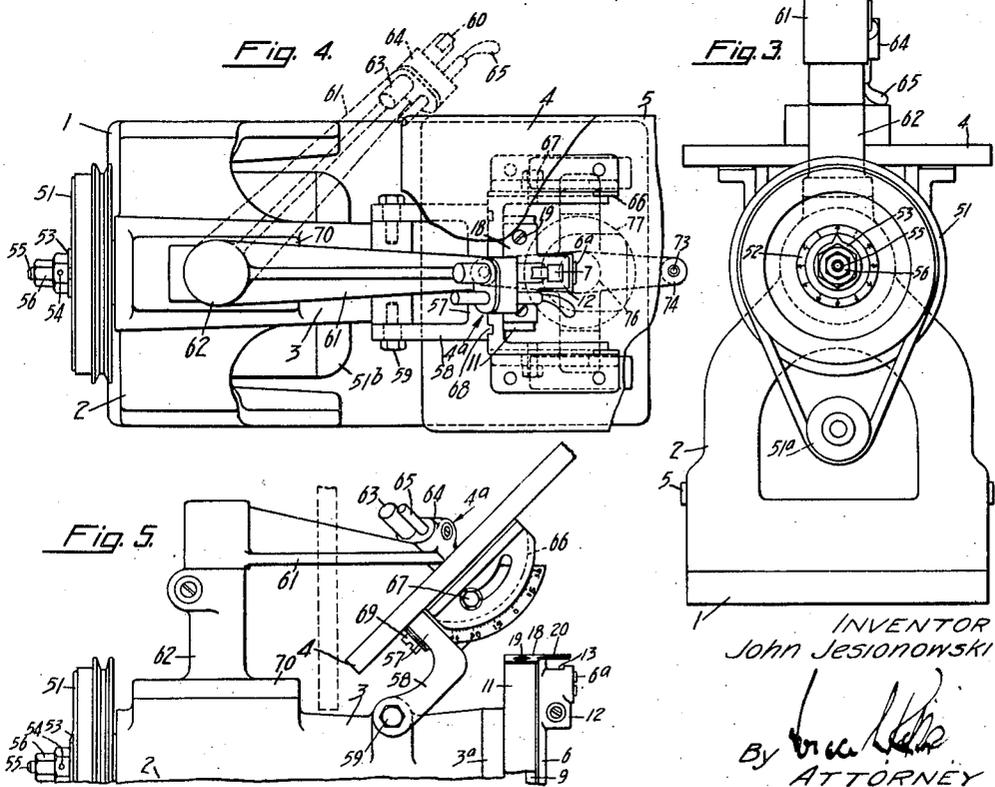
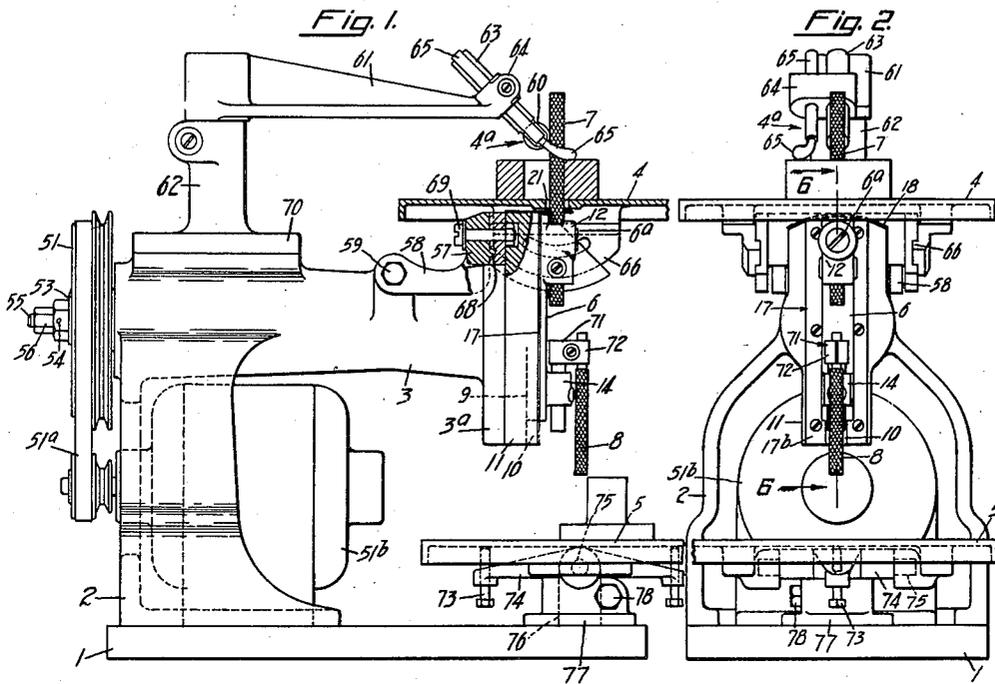
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2,327,843

FILING MACHINE

Filed Aug. 27, 1940

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

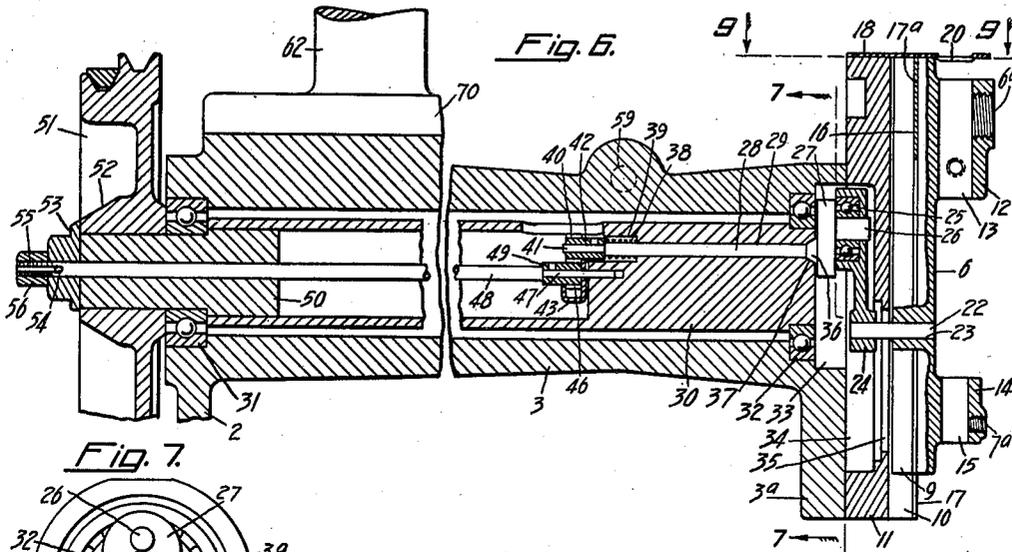


Fig. 7.

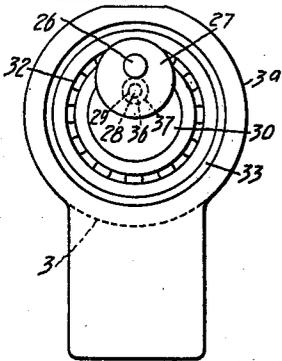


Fig. 8.

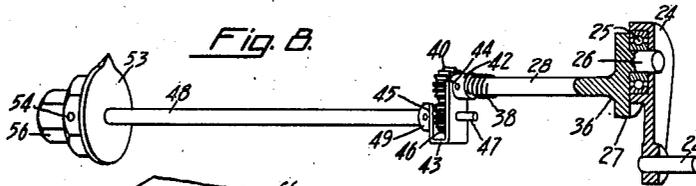


Fig. 11.

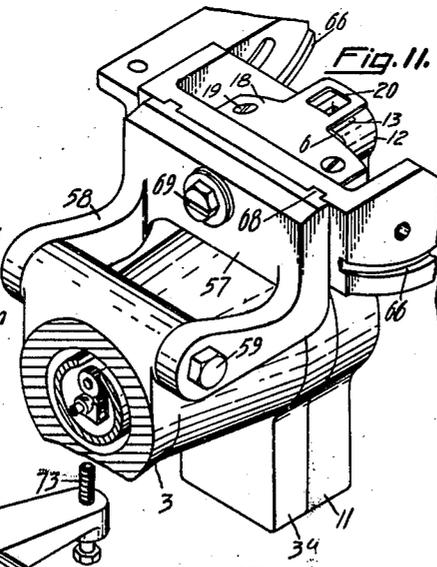


Fig. 10.

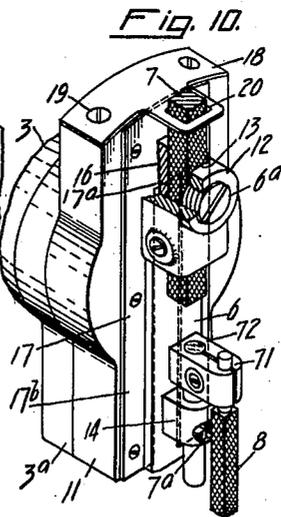


Fig. 9.

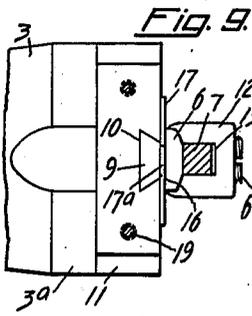
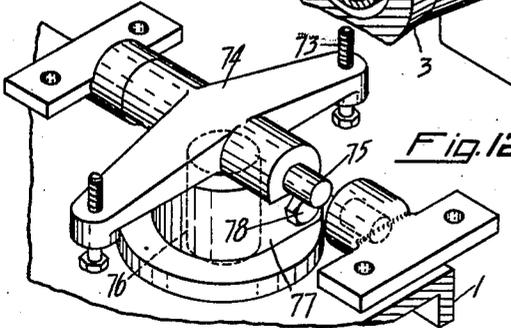


Fig. 12.



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2,327,843

FILING MACHINE

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14 Claims. (Cl. 29—76)

My invention relates to filing machines.

It has among its objects to provide an improved filing machine for tool makers' use and, more particularly, to provide an improved duplex machine adapted either to use on die or punch filing. A further object of my invention is to provide improved file operating mechanism for a filing machine including improved means for varying the stroke of the file actuating member and effecting adjustment of said stroke. A still further object of my invention is to provide such improved operating mechanism having improved friction and positive drives in the driving train for the stroke varying mechanism and between the latter and the manually adjustable controlling member for effecting adjustment thereof. Still other objects of my invention are to provide an improved machine having improved file carrying slide mechanism of an improved compact and safe construction and disposed in an improved location relative to a plurality of selectively usable superimposed die and punch filing tables and adapted to carry either die or punch files acting on work on different tables, and also to provide improved means whereby the upper table and its associated upper file pressing and work holding means may be readily swung when desired into an inoperative position permitting ready access to and free vision of the lower table. Other objects include the provision of improved means for holding down the work, and the provision of improved means for preventing the entry of filings into the slide carrying guides. Still further objects of my invention are to provide such an improved mechanism which of very compact form and one which has a wider range of use and is adapted to be very inexpensively manufactured as compared with such devices now on the market. These and other objects and advantages of my improved construction will, however, hereinafter more fully appear.

In the accompanying drawings, I have shown for purposes of illustration one embodiment which my invention may assume in practice.

In these drawings:

Figure 1 is a side elevation of my improved device, the same for convenience of illustration being shown as equipped with both die and punch files and with work disposed on both tables and both tables broken away at their front ends;

Fig. 2 is a front end elevation of the structure shown in Figure 1;

Fig. 3 is a view similar to Figure 2 showing the rear end of the machine;

Fig. 4 is a top plan view of the structure shown in Figure 1, the upper table being broken away to facilitate illustration and the file pressing and work holding members being shown in full and dotted lines in their operative and inoperative positions;

Fig. 5 is a side elevation of the upper portion of the machine with the upper table and its associated file pressing and work holding members swung into their inoperative position to provide access to the lower table;

Fig. 6 is an enlarged longitudinal sectional view on line 6—6 of Figure 2;

Fig. 7 is a detail sectional view on line 7—7 of Figure 6;

Fig. 8 is a perspective view, partially in section, of the variable stroke crank mechanism and its driving gearing and tensioning controlling and adjusting mechanisms;

Fig. 9 is a section on line 9—9 of Figure 6;

Fig. 10 is a perspective view of the file operating slide equipped with its means for preventing the entry of filings;

Fig. 11 is a detail perspective view of the adjusting mechanism for the upper table, parts being broken away to facilitate illustration, and

Fig. 12 is a like detail view of the adjusting mechanism for the lower table.

In this illustrative construction, I have shown a machine including a base 1 and having an upstanding frame 2 on one end thereof and an upper horizontally disposed extension 3 and the base 1 carrying superimposed adjustable die and punch filing tables 4 and 5, respectively, and the extension 3 housing the operating mechanism for a vertically movable file carrying slide 6 carrying both an upwardly projecting file 7 movable through the upper table 4, and also a depending punch file 8 adapted to operate on work on the lower table 5; the upper table 4 and its associated file and work holder, generally indicated at 4a, being adapted to be swung out of the way while the lower table 5 is in use, all as herein-after more fully described.

Referring more particularly to the file carrying slide 6, this member is preferably very light and formed of aluminum or other light and strong metal, in order to enable it to operate at the desired high speed without causing objectionable vibration. It will also be observed that the same is provided throughout its length with an oppositely bevelled longitudinally extending slide portion 9 (Figure 9) received in a correspondingly shaped vertical guideway 10 in a stationary narrow guide 11 suitably fixed to an enlargement 3a on the free front end of the projecting arm or extension 3. Here it will also be observed that this member 6 has a lateral extension 12 at its top provided with a vertical passage 13 therein adapted to receive the file 7 and a bottom lateral extension 14 provided with a vertical passage 15 therein adapted to receive a support for the file 8; suitable holding set screws 6a, 7a being provided to hold the file or support in their desired vertical position in these lateral extensions. Herein, the member 6

is also provided with a short vertical slot 16 in its upper end between the extension 12 and the adjacent end of the portion 9 and adapted to receive the top 17a of a vertically slotted U-shaped guard 17 fixed to guide 11 and having sides 17b which extend down along the portion 9 in suitable grooves therein extending longitudinally thereof, these sides cooperating with the top 17a in preventing the entry of fillings between the portion 9 and guideway 10. Herein also, an upper transverse guard 18 is fixed as at 19 to the top of the member 11 and has an aperture 20 in its smaller and rounded front end through which the file 7 projects at a point just beneath the table 4. Thus, it will be observed that the file carrying slide 6 is guided for movement in opposite directions in the guide 10, while any chips or filings dropping down through the file passage 21 in the upper table 4 are effectually prevented from entering the guides by the member 17 and the guard 18, both of which are so disposed as not to interfere in any way with the operation of the slide.

Operatively connected to the slide 6 is improved crank mechanism for actuating the same. This mechanism herein includes a crank pin 22 having its front end extending through an opening 23 in the slide 6 between the bevels thereon and at a point just above the lateral extension 14 carrying the punch file 8. The rear end of this pin 22 is carried by a rod or crank 24 journalled on suitable anti-friction bearings 25 on a cooperating crank pin 23 which is, in turn, eccentrically mounted on an eccentric 27 rotatable with a shaft 28 rotatably adjustable in a longitudinal passage 29 in a power driven member 30 journalled in anti-friction bearings 31 and 32 at opposite ends of the extension 3. Adjacent faces of the extension 3a and member 11 being recessed to provide a substantially round recess 33 and the member 11 being longitudinally recessed to provide communicating slots 34 and 35, it will be apparent that when the member 30 is rotated, the adjusting shaft 28 will be rotatable bodily therewith and thereby rotate the eccentric 27 and pin 26 with the crank 24 in such manner as to cause the crank pin 22 to move rapidly up and down in the slot 35 and, accordingly, reciprocate the file carrying slide 6 in the guideway 10. Further, it will be apparent that when the adjusting shaft 28 is adjusted about its axis in the passage 29, the pin 26 carried on the eccentric 27 will be adjusted about the axis of the adjusting shaft 28 in such manner as to increase or decrease, as desired, the distance between the axis of this pin and the axis of the power driven member 30. Thus, with the pin 26 in the full line position indicated in Figure 7, the maximum stroke of the crank, and consequently of the file carrying slide 6 and any file thereon, will be obtained, this stroke being equal to twice the distance between the axis of the pin 26 and the axis of the member 30. However, when the eccentric 27 is adjusted about the axis of the adjusting shaft 28 in either direction from the position shown in Figure 7, the axis of the pin 26 is moved to any desired operating position nearer to the axis of the power driven member 30 with a consequent reduction in the length of stroke of the crank 24, slide 6 and any file on the latter. Further, when the axis of the pin 26 coincides with the axis of the member 30, a zero stroke position is reached wherein there is no reciprocatory movement imparted to the slide 6 and any file thereon.

To effect these adjustments of the pin 26, improved mechanism is provided for rotating the shaft 28. This mechanism herein is adjustable from the rear end of the member 30 and also includes improved friction and positive drives. Herein a tapered portion 36 is provided on the shaft 28 coaxial therewith and between the same and the eccentric 27, and a correspondingly tapered seat 37 is provided to receive this portion. Further, a coiled spring 38 is provided around the opposite end of the shaft 28 and seated in a coaxial longitudinal recess 39 in the member 30, while a driven gear 40 is suitably fixed to the extremity of a reduced extension 41 on the end of the shaft 28 and provided with a hub 42 abutting against the end of the shaft 28 and forming an abutment for the adjacent end of the coiled spring 38. Herein also a bracket 43 is provided having a notched or forked end 44 receiving the hub 42 and a like notched end 45 parallel to the end 44 and a cooperating gear 46 meshing with the gear 40 is journalled in this bracket on a reduced extension 47 on a shaft 48 extending rearwardly in the member 30 in parallel relation to the shaft 28. As shown, the front end of the reduced extension 47 is journalled in a suitable recess in the member 30 and a suitable locking hub 49, corresponding to the hub 42, is fixed to the extension 47 between the end of the shaft 48 and the forked end 45 of the bracket. Herein, the shaft 48 also extends rearwardly through an end block 50 fixed to the member 30 and protruding from the rear end thereof beyond the bearing 31 and also protruding beyond the hub of a driving pulley 51 fixed to the protruding end of the block 50; this pulley herein being driven through a suitable belt and pulley connection 51a from a motor 51b protruding through a suitable aperture in the rear of the frame 2 and disposed in parallel relation to the extension 3 beneath the latter and behind table 5.

In a preferred construction, the hub of this pulley 51 is also tapered, as at 52, to provide a suitable graduation carrying surface, preferably bearing numbers arranged as shown in Figure 3, and so disposed that the "0" position corresponds to the zero position of the pin 26 and the highest number, 6, is located opposite this zero position to correspond to the maximum stroke position of this pin 26. Cooperating with these numbers is also a rotatable dial member 53 suitably keyed, as at 54, to a rearwardly protruding end of the shaft 48 which, as shown at 55 is also threaded and carries a lock nut 56. As a result of this mechanism, it will be apparent that when this nut 56 is released, the rotatable dial member 53 may be adjusted as desired into any of the positions indicated to vary the location of the pin 26 and, accordingly, to vary the length of stroke of the crank 24, slide 6 and any file thereon as desired; while tightening of the nut 56 will hold the crank in any adjusted position as the result of friction between the tapered portion 36 and its tapered seat 37. It will also be evident that, depending upon the position of the nut 56, either a friction drive or safety clutch is provided in the crank drive, or the latter when sufficiently tightened is, in effect, positively connected to the pulley 51.

In the use of the above described mechanism, it will be apparent that either the file 7 or the file 8 may be used as desired, depending upon the character of the work, improved means being provided whereby when it is desired to work upon

the lower table 5, the upper table 4 and its associated mechanism may be readily swung out of the way. Herein, this mechanism includes a supporting member 57 which carries the table 4 and its angle adjusting mechanism, and this member 57 is provided with an L-shaped rearward extension 58 pivoted at 59 on a transverse axis on the top of the extension 3 in rear of the portion 3a thereon. Further, it will be observed that the usual roller 60 engaging and pressing the upper end of the file 7 against the work is herein carried on a rearwardly extending arm 61 pivoted on a vertical axis on an upstanding stud 62 on the rear end of the extension 3.

For ordinary die filing, the file 7 will be used in a usual manner with the parts in the position shown in Figure 1, the work then being on the table 4 and the latter adjusted as desired into any suitable compound adjustment obtainable by the adjusting mechanism provided between the table and the frame. Herein, in addition to the roller 60, carried on a slide 63 longitudinally adjustable toward and from the file in the free end 64 of the arm 61, a work holding member 65 is provided which is similarly adjustable in this end 64 and so laterally deflected at its lower end and adjustable toward and from the work as to enable this member 65 to hold down the work against the table 4 and, accordingly, eliminate the need for the operator to hold the same down with his hand. Attention is also directed to the universal adjustment provided herein for the table 4, cooperating arcuate slides 66 and clamping members 67 being provided to permit adjustment about a transverse axis and like arcuate slide 68 generally similar to the slides 66 and a clamping bolt 69 being provided to permit adjustment about a longitudinal axis which is transverse to the above mentioned transverse axis.

When it is desired to use the table 5 for punch filing as, for example, when filing a flanged piece such as illustrated in Figure 1, the arm 61 carrying the roller 60 and work holding member 65 is swung laterally about its pivot on the stud 62 to either position illustrated in Figure 5 and the table 4 is then also swung upward about its pivot 59 into the angular positions illustrated therein. In either position, it will be observed that the rear end of the table clears an upward projection 70 on the base of the upstanding stud 62 and that the table is also adapted to be held in inclined position by tightening the screws which herein form the pivots 59 for the table support 53 while the mere weight of the parts holds it in the vertical position indicated in dotted lines.

In this position of the parts, it will be noted that with the file 7 removed, the upper end of the slide 6 is so covered by the stationary guard 18 as effectually to protect the operator against injury by the moving slide when the operator leans over the work, while the slide 6, guideway 19, and the adjacent portion of the extension 3 are of such dimensions and so disposed as not to interfere with the worker's view of the work on the table 5. Attention here is also directed to the file carrying member 71 also provided and having a depending portion suitably secured in the vertical aperture in the lateral extension 14 and the forwardly disposed file carrying portion 72 in which the file 8 is adjustably mounted, this construction, while not required, being further advantageous and facilitating adjustment and making the file and work

readily visible to the operator. Here also it will be understood that, as shown in Figure 12, the table 5 may be adjusted into different angular positions. As shown, the same is adjustable about a transverse axis by adjustment of the set screws 73 on opposite ends of a bracket 74 to adjust the latter about a transverse shaft 75 carried by the bottom of the table 5, while the bracket 74 is also provided with a depending shaft 76 journaled on a vertical axis in a bearing 77 carried by the base 1, this shaft 76 being held in different angular relations to this bearing 77 by a clamping screw connection 78.

While I have in this application specifically described one embodiment which by invention may assume in practice, it will be understood that this form of the same has been chosen for purposes of illustration and that the invention may be modified and embodied in various other forms without departing from its spirit or the scope of the appended claims.

What I claim as new and desire to secure by Letters Patent is:

1. In a filing machine, a reciprocable file-carrying slide, crank mechanism for operating the same including an adjustable member for adjusting the stroke of said mechanism and a rotatable power driven member carrying said adjustable member at one end thereof, and means for adjusting said first mentioned member to vary the stroke of said crank mechanism including a tensioning spring within said power driven member and a friction clutch having a friction member tensioned by said spring and carried by said power driven member and adjustable from the remote end of the latter.

2. In a filing machine, a reciprocable file-carrying slide, crank mechanism for operating the same including an adjustable crank pin carrying eccentric and a power driven shaft having said eccentric adjustably mounted on one end thereof and rotating said eccentric body therewith, and means for adjusting said eccentric relative to said shaft extending through the latter and adjustable from the opposite end of the latter from said eccentric and including shafts journaled in said shaft and geared together and a normally spring pressed friction connection between the shaft driving said eccentric and said first mentioned shaft.

3. In a filing machine, a frame, a reciprocable tool carrying slide vertically mounted thereon and carrying means for connecting upwardly or downwardly projecting files thereto, work tables carried on said frame above and below said slide, the upper table having a file aperture through which a file on said slide may operate, and mechanism carried on said frame for vertically reciprocating said slide including driving mechanism operatively connected to said slide between said tables.

4. In a filing machine, a frame, a reciprocable tool carrying slide vertically mounted thereon and carrying means for connecting upwardly or downwardly projecting files thereto, work tables carried on said frame above and below said slide, the upper table having a file aperture through which a file on said slide may operate, and crank mechanism carried on said frame for vertically reciprocating said slide including a crank operatively connected to said slide between said tables and crank-operating mechanism disposed in horizontal planes between the planes of said tables.

5. In a filing machine, a frame, a vertically reciprocable file carrying slide thereon carrying

means for connecting upwardly or downwardly projecting files thereto, tables on said frame including a table above said slide apertured to receive an upwardly projecting file on said slide and a table below said slide for supporting work beneath a downwardly projecting file, driving mechanism for said slide including a crank, and operative connections for the latter including a rotatable driving member rotatable on a horizontal axis between said tables, and means for adjusting the stroke of said crank to vary the travel of said slide when filing work on either table and having an adjusting member extending through said driving member and adjustable from the remote end thereof from said crank.

6. In a filing machine, a frame, a reciprocable tool carrying slide vertically mounted thereon and carrying means for connecting upwardly or downwardly projecting files thereto, work tables carried on said frame above and below said slide, the upper table having a file aperture through which a file on said slide may operate, and mechanism carried on said frame for vertically reciprocating said slide including a power shaft rotatable in horizontal planes between the planes of said tables, crank mechanism driven by said shaft and operatively connected to said slide between said tables and a driving motor on said frame beneath said shaft and in rear of the lower table.

7. In a filing machine, a frame, a reciprocable tool carrying slide vertically mounted thereon and carrying means for connecting upwardly or downwardly projecting files thereto, work tables carried on said frame above and below said slide, the upper table having a file aperture through which a file on said slide may operate, mechanism carried on said frame mechanism for vertically reciprocating said slide and operatively connected to the latter between said tables, and a swinging mounting for the upper table carried on said frame for enabling said table to be swung away from said slide to permit use of said lower table.

8. In a filing machine, a frame, a reciprocable tool carrying slide vertically mounted thereon and carrying means for connecting upwardly or downwardly projecting files thereto, work tables carried on said frame above and below said slide, the upper table having a file aperture through which a file on said slide may operate, mechanism carried on said frame for vertically reciprocating said slide and operatively connected to the latter between said tables, and a mounting for said upper table carried on said frame including a table support pivoted on a horizontal axis on said frame in rear of said slide and means on said support for varying the angular relation of said table to said support.

9. In a filing machine, a frame, a reciprocable tool carrying slide vertically mounted thereon and carrying means for connecting upwardly or downwardly projecting files thereto, work tables carried on said frame above and below said slide, the upper table having a file aperture through which a file on said slide may operate, mechanism carried on said frame for vertically reciprocating said slide and operatively connected to said slide between said tables, a swinging mounting for said upper table on said frame for enabling said table to be swung away from said slide to permit use of said lower table, and a guideway for said slide carried by said frame and disposed to permit unobstructed vision of said lower table when said upper table is so swung away.

10. In a filing machine, a frame, a reciprocable tool carrying slide vertically mounted thereon and carrying means for connecting upwardly or downwardly projecting files thereto, work tables carried on said frame above and below said slide, the upper table having a file aperture through which a file on said slide may operate, mechanism carried by said frame for vertically reciprocating said slide and operatively connected to said slide between said tables, a swinging mounting for said upper table on said frame for enabling said table to be swung away from said slide to permit use of said lower table, a guideway for said slide carried by said frame and so disposed as to permit unobstructed vision of said lower table when said upper table is so swung away, and guard means carried on said guideway and apertured to permit passage of an upwardly projecting file when said upper table is in use and disposed over the top of said slide to protect the worker from injury by said slide during use of the lower table.

11. In a machine such as described, a reciprocable file carrying slide, a rotary power operated member rotating on an axis transverse to the slide, a crank pin carrying eccentric for reciprocating the slide having a friction seat in said power driven member, and means for adjusting said eccentric angularly relative to said power driven member from a remote point including a spring-urged shaft holding the eccentric frictionally in its seat.

12. In a machine such as described, a reciprocable file carrying slide, a power driven member rotatable on an axis transverse to the slide comprising an elongated shaft having a solid portion at one end disposed toward said slide and a hollow portion rearwardly of the solid portion, an eccentric seated against the solid portion of said member and having a pin operatively connected to said slide, said power driven member having an accessible remote end rearwardly of the slide and eccentric, and means for adjusting said eccentric from said remote end including a central shaft operating in the hollow portion of said power driven member and a second shaft intergearing with the last-mentioned shaft extending through the solid portion of said power driven member and offset from the axis of said member.

13. In a machine such as described, the combination of a base, a frame on said base having a substantially vertically extending guideway, a slide mounted in said guideway adapted to carry a file or like tool projecting from the upper end thereof, a table mounted on the frame and having an aperture through which the tool extends upwardly, said table being mounted so that it can be moved out of its position above the slide, and a guard member projecting laterally from the upper end portion of a guideway and extended over the slide so as to prevent injury to the operator when the table is in an inoperative position.

14. In a machine such as described, the combination of a base, an upstanding frame on the base, a horizontal extension or arm projecting from the frame at one side and having a free end overhanging the base, a substantially vertical guideway on the free end of the arm, a file carrying slide movable up and down in said guideway, a table above the guideway and slide having an opening through which the file extends, and means mounting said table on said arm to swing in a vertical plane so that it can be moved out of its operative position.

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