

Aug. 1, 1944.

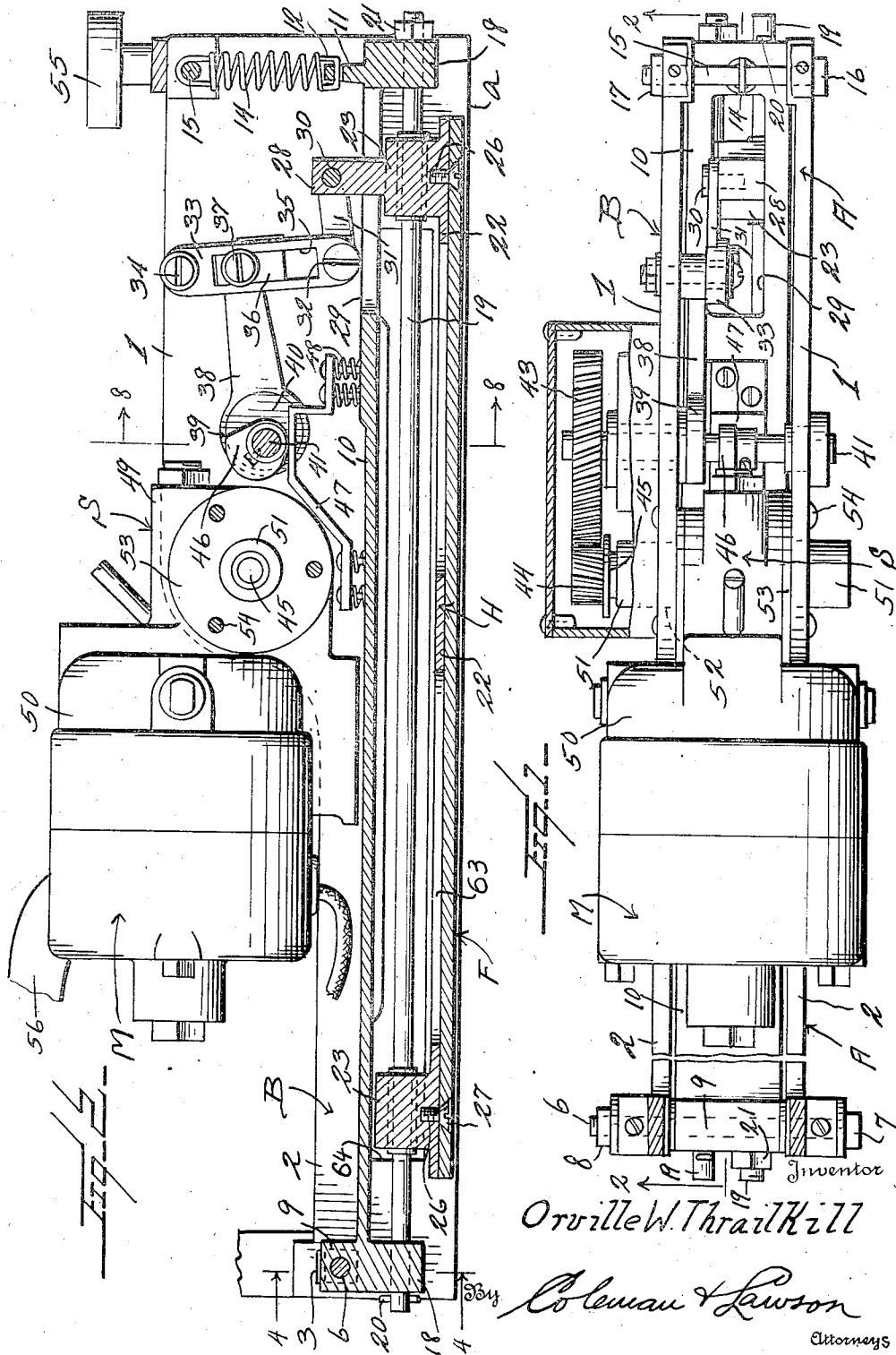
O. W. THRAILKILL

2,354,716

FILING TOOL

Filed May 26, 1942

3 Sheets-Sheet 1



Aug. 1, 1944.

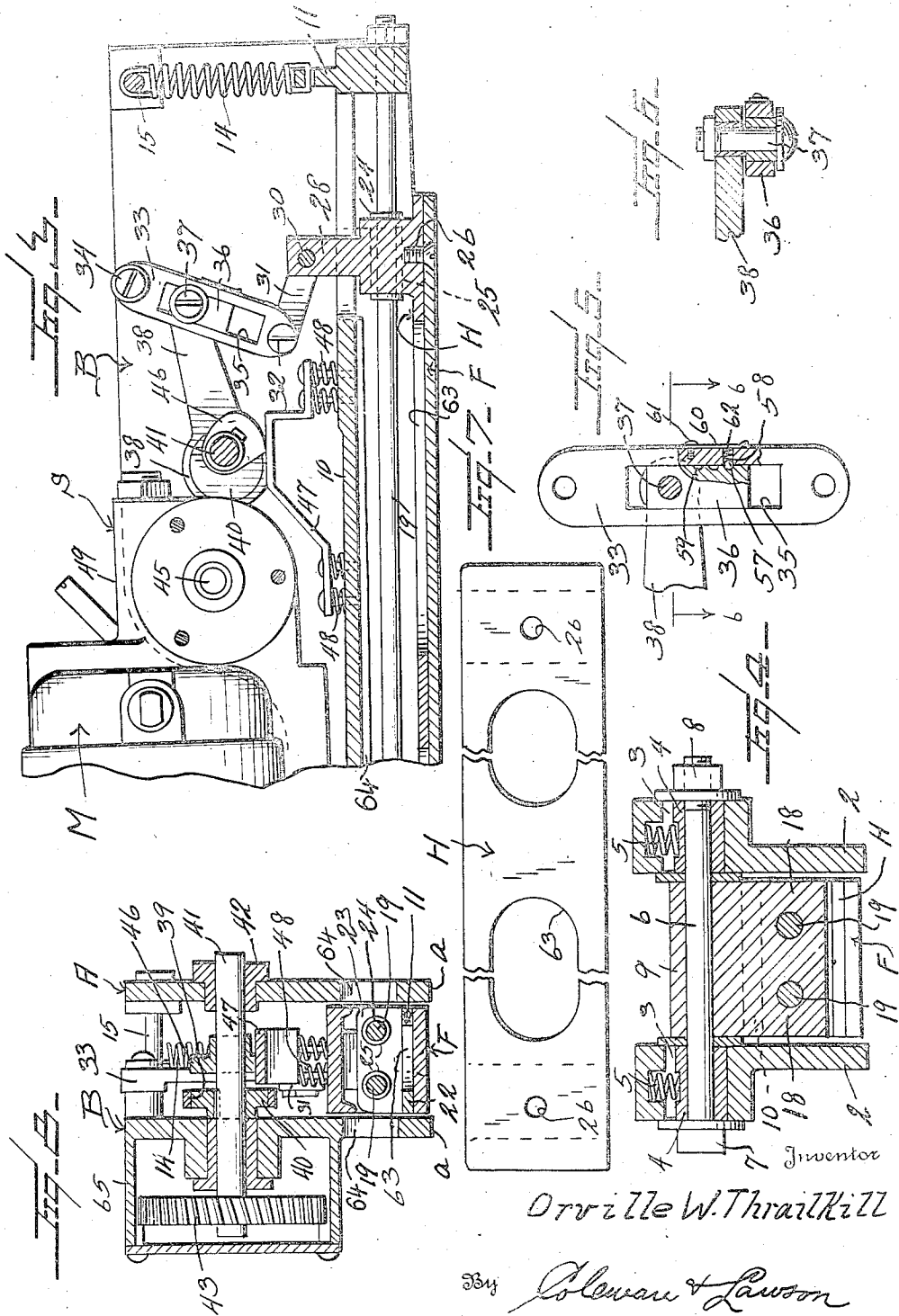
O. W. THRAILKILL

2,354,716

FILING TOOL

Filed May 26, 1942

3 Sheets-Sheet 2



Aug. 1, 1944.

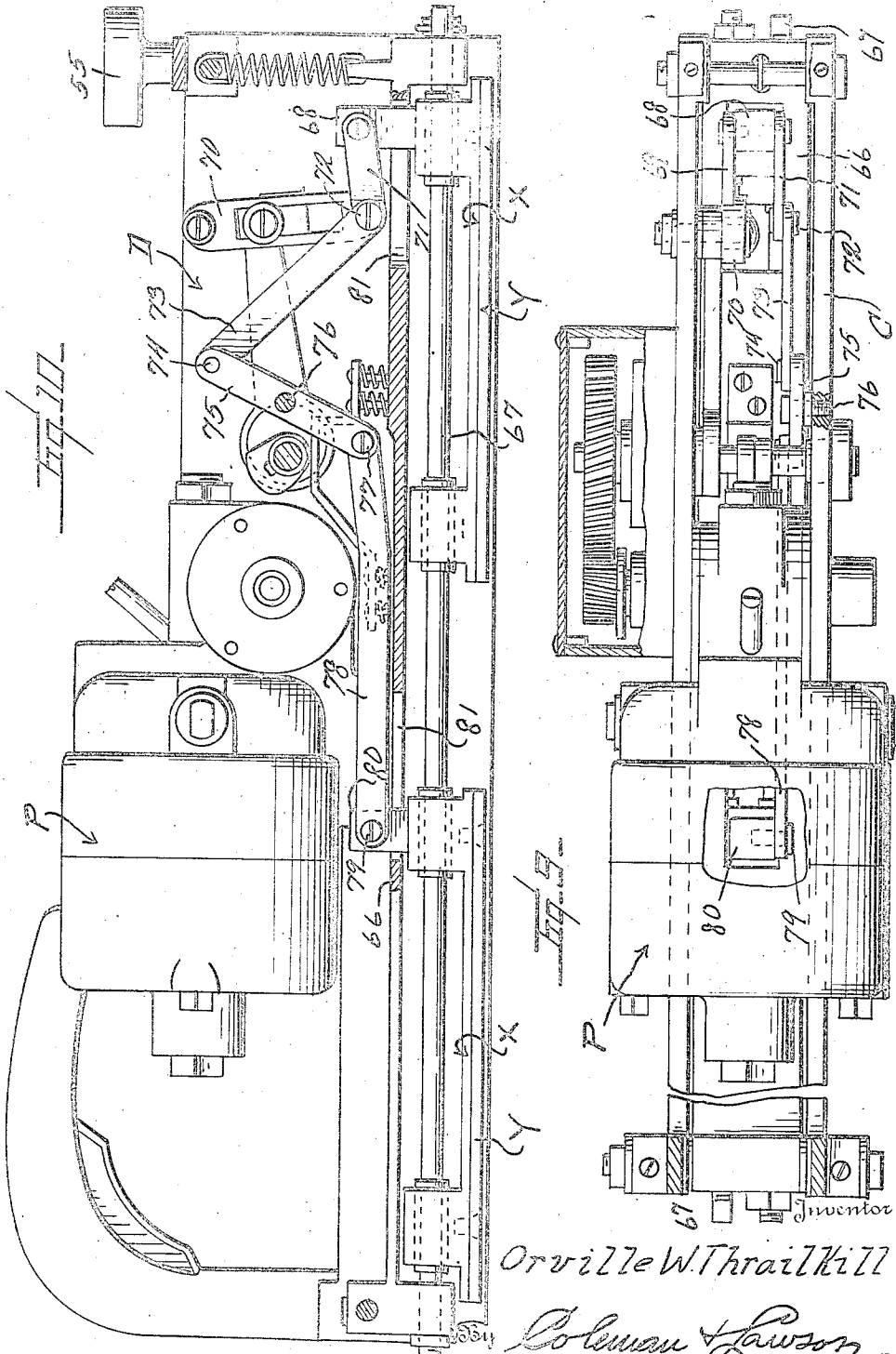
O. W. THRAILKILL

2,354,716

FILING TOOL

Filed May 26, 1942

3 Sheets-Sheet 3



Attorneys

UNITED STATES PATENT OFFICE

2,354,716

FILING TOOL

Orville W. Thrailkill, Wellington, Kans.

Application May 26, 1942, Serial No. 444,586

7 Claims. (Cl. 29-76)

This invention relates to a filing tool, and it is primarily an object of the invention to provide a tool of this kind wherein a file element is power driven in a manner to oscillate the same in close simulation to the movements of a hand operated file, whereby effective action may be had on the work with which the tool is used.

It is also an object of the invention to provide a filing tool which is readily portable and which comprises a holder for a filing element, said holder being mounted for both endwise movement and rocking movement, and wherein power driven means is provided for reciprocating the holder and for imposing pressure thereon during the working stroke of the holder.

Another object of the invention is to provide a filing tool comprising a portable unit including a file holder mounted for both endwise and swinging movement, together with an operating means for said holder including a motor.

The invention consists of the details of construction and in the combination and arrangement of the several parts of my improved filing tool whereby certain important advantages are attained, as will be hereinafter more fully set forth.

In order that my invention may be the better understood, I will now proceed to describe the same with reference to the accompanying drawings, in which

Figure 1 is a view in top plan of a filing tool constructed in accordance with an embodiment of my invention, a portion being broken away.

Figure 2 is a longitudinal vertical sectional view taken through Figure 1 on substantially the line 2-2.

Figure 3 is a fragmentary longitudinal vertical sectional view at the forward end portion of the tool and showing certain of the parts in a second position, the line of section of Figure 3 being also substantially on the line 2-2 of Figure 1.

Figure 4 is a transverse sectional view taken substantially on the line 4-4 of Figure 2.

Figure 5 is an enlarged fragmentary view, partly in section and partly in elevation, illustrating the means as herein comprised for regulating the swinging movement of the file holder.

Figure 6 is a fragmentary detailed sectional view taken substantially on the line 6-6 of Figure 5.

Figure 7 is a view in bottom plan of the file holder unapplied.

Figure 8 is a sectional view taken substantially on the line 8-8 of Figure 2.

Figure 9 is a view in top plan illustrating a

filing tool constructed in accordance with another embodiment of my invention.

Figure 10 is a view in side elevation, with portions in section, of the tool as illustrated in Figure 9.

In the embodiment of my invention as illustrated in Figures 1 to 8 of the accompanying drawings, A and B denote suitably spaced side plates arranged in parallelism and substantially duplicate as to dimensions and configuration. These plates A and B have their lower longitudinal edges *a* straight from end to end and coplanar in a direction transversely of the tool. The forward end portion 1 of each of the plates A and B is of a width or height materially in excess of the corresponding dimensions of the rear portion 2.

The outer extremity of the portions 2 of the plates A and B, adjacent to the upper margins thereof, are provided with the rectangular openings 3 in which are positioned the boxings 4. The openings 3 are of such increased size with respect to the boxings 4 to allow said boxings 4 to have a limited up and down movement within the openings 3. The boxings 4 are constantly urged to their lower or innermost positions by the expansible members 5 herein disclosed as coil springs interposed between the boxings 4 and the upper or outer walls of the openings 3. Disposed through the boxings 4 is an elongated headed bolt or pivot member 6, the head 7 of which contacting with the outer end of one of the boxings 4, while the outer or free end portion of the bolt 6 has threading thereon a holding nut 8 contacting with the outer end of the second boxing 4. This bolt 6 is freely disposed through an upstanding flange 9 extending transversely across an end portion of an elongated plate 10. This plate 10 is of a length substantially coextensive in length with the side plates A and B and is of a width to substantially bridge the space between said plates A and B. The opposite or free end portion of this plate 10 is provided with an upstanding lug 11 with which is connected, as at 12, the lower or inner extremity of a retractile coil spring 14 depending from the central portion of a bolt 15 disposed transversely of the tool. This bolt 15 is positioned at the upper outer corner of the portions 1 of the plates A and B and has its head 16 contacting with the outer face of the side plate A and the holding nut 17 threading thereon in contact with the outer face of the side plate B. The retractile member 14 is such as to constantly urge upwardly the plate 10.

At its opposite end portions the plate 10 is provided with the transversely disposed and depending flanges 18 through which are directed the extremities of the transversely spaced guide rods 19. These rods 19 may be held in position in any manner desired but, as herein disclosed, each of said rods 19 has disposed through one end portion outwardly of a flange 18 a holding pin 20, while threading on the opposite end portion of such rod and outwardly of the adjacent flange 18 is a holding nut 21.

The file holder H comprises an elongated plate 22 of a width substantially equal to the space between the side plates A and B, and which plate is of a length to extend along between the major length of said plates A and B. This plate 22, at its opposite end portions, is provided thereacross with the upstanding heavy flanges 23 through which the rods 19 are disposed, said rods directly passing through bushings 24 snugly fitting within suitably positioned openings 25 extending through said flanges 23. The opposite end portions of this plate 10 are provided in their under or outer surfaces with the threaded sockets 26 into which thread the screws 27 for holding in secure position upon the under surface of the plate 10 the file or rasp F. This file or rasp F may be coarse or fine or of such gauge as required by the work. It is believed to be obvious that the holder H, with, of course, the applied file or rasp F, has reciprocatory movement along the rods 19, and at the same time swinging movement in a direction substantially at right angles to the path of reciprocation.

The flange 23 at the forward end portion of the tool, or at that end portion adjacent to the free end of the plate 10, is provided with an upstanding post 28 which passes up through an elongated slot 29 provided in the adjacent portion of the plate 10. This slot 29 extends lengthwise of the plate 10 and is of a length sufficient to allow for the desired reciprocation of the holder H.

Pivotally connected, as at 30, with the portion of the post 28 above the plate 10, is an end portion of a rigid link 31, the opposite end portion of which being pivotally connected, as at 32, with the lower end portion of a vertically disposed rock arm 33. The upper portion of this rock arm 33 is pivotally connected, as at 34, to the upper part of the portion 1 of the plate B. The central portion of this arm 33 is provided with a longitudinally disposed slot 35 in which is slidably mounted a block 36. This block 36 has pivotally connected thereto, as at 37, an end portion of a lever 38. The opposite end portion of this lever 38 is provided with a rigid strap 39 which operatively surrounds a disk 40 eccentrically mounted upon a shaft 41. This shaft 41 is rotatably disposed through and supported by the bushings 42 inserted through the side walls A and B, and which shaft extends, in the present embodiment of my invention, a material distance outwardly beyond the wall B. This extended portion of the shaft 41 carries a spiral gear 43 meshing with a spiral pinion 44 carried by a transversely disposed driven shaft 45 comprised in the motor structure S. This shaft 45 is in conventional driven connection with the drive shaft of the motor E proper which, in the present instance, is of an electrical type.

Fixed to the shaft 41 for rotation therewith is an outstanding cam arm 46 which, during the rotation of the shaft 41, intermittently contacts from above with an upstanding bracket 47 car-

ried by the plate 10. As is clearly illustrated in the accompanying drawings, the connection between the bracket 47 and the plate 10 is of a cushioned type, as indicated at 48, so that in the use of the tool compensation will be made for any inequalities in the surface of the work upon which the tool is operated. It is to be pointed out that as the cam arm 46 passes down and over the bracket 47 the holder H is being moved rearwardly or in the direction desired to effect the cutting action of the file F on the work. This contact of the cam arm 46 with the bracket 47 exerts the desired downward pressure on the file F with respect to its work. It is also to be pointed out that the cam arm 46 is so arranged and is of such dimensions and design to allow immediate upward swinging movement of the holder H and the file F carried thereby through the action of the spring 14 when the holder H reaches the limit of its working stroke. It is also believed to be apparent that the movement imparted to the holder H and the file F carried thereby are in close simulation to the movements when a file is being hand operated or in an oscillating manner, thereby assuring the most effective working action of the file.

The shaft 45 is disposed through a boxing 49 extending forwardly from the casing 50 of the motor E, said shaft being rotatably directed through outstanding tubular bearings 51 carried by the opposite side walls of the boxing 49. These outstanding tubular bearings 51 are directed through suitably positioned openings 52 whereby the motor structure S is effectively supported by the side plates A and B. Each of these members 51, immediately adjacent to the boxing 49, rigidly carries a surrounding annular plate or flange 53 having close contact with the inner face of a side plate A or B, and secured thereto by the screw members 54 or the like disposed outwardly through the side plate A or B and operatively engaging the plate or flange 53.

From the foregoing it is believed to be readily apparent that the tool as disclosed is one which can be readily portable and can be readily manipulated manually and after once being placed upon the surface to be treated can be readily shifted therealong as the progress of the work demands.

To facilitate the use of the tool the forward end portions of the side plates have operatively engaged therewith in any desired manner an upstanding knob to be readily grasped by one hand of the operator and the rear portions of the side plates A and B and the motor E have suitably secured thereto a hand grasp or handle 56, as illustrated in fragment. It is believed to be obvious that any other means desired may be employed to facilitate an operator having effective hold on the tool.

The block 36 is held in its selected adjusted positions within its slots 35, in the present embodiment of my invention, through the medium of a spring pressed tubular member or ball 57 working within an opening 58 in the rock arm 33 to one side of the slot 35 and in communication with such slot. This member or ball 57 is partially received in one of the parti-spherical depressions 59 provided in the adjacent face of the block 36. These depressions 59 are spaced apart a desired distance in a direction lengthwise of the block 36. The spring pressed member or ball 57 is maintained in applied or working position by an arm 60 pivotally connected, as at 61, with the rock arm 33 and of a length to extend over

and close the outer end of the opening 58. As is clearly illustrated in Figure 5 of the drawings, the expansible coil spring 62 coacting with the member or ball 57 is interposed between said member or ball 57 and the portion of the arm 60 disposed over the outer end of the opening 58.

As illustrated in the drawings, the file F is of a solid type. It is to be stated, however, that the tool can be employed with equal facility with a file of slotted or perforated type. In order to facilitate the use of such type of file, the holding plate 22 of the file holder H is provided with the suitably positioned and longitudinally disposed elongated slots 63 to allow for the ready passage of the filings working up through the slotted or perforated file. In order to readily dispose of such filings the lower portion of each of the side plates A and B is provided therealong with an elongated clean-out slot 64 so that upon slight lateral tilting or turning of the tool in either direction the filings can be readily removed.

I also find it of advantage to provide the plate B with a suitable housing 65 to enclose the worm wheel 43 and its associated worm pinion 44.

In Figures 9 and 10 is illustrated an embodiment of my invention wherein two file holders are employed, together with means for reciprocating such holders in unison but in opposite directions. A tool having this compound action will remove substantially all the filing thrust load from the hands of the operator. In this second embodiment of my invention an elongated plate 66 is supported between the side plates C and D in the same manner as hereinbefore set forth with respect to the plate 10 of the first embodiment of my invention. The parallel rods 67 carried by and below the plate 66 have slidably mounted thereon the file holders X, one positioned in advance of the other, and each of these holders X has suitably secured to the under surface thereof a desired file Y. The forward holder X, at its front end, is provided with an upstanding post 68 having pivotally connected therewith a rigid link 69 which is also operatively engaged with the rock arm 70. This rock arm 70 is operated from the electric motor P in substantially the same manner as described in detail in the first embodiment of my invention with respect to the rock arm 33 and, therefore, it is believed unnecessary that a further detailed description of such operation be given. Also pivotally connected with the post 68 is a second rigid link 71 which in turn is pivotally connected, as at 72, with the lower end portion of an upwardly and rearwardly directed rigid link 73. The upper end portion of this link 73 is pivotally connected, as at 74, with the upper extremity of a lever 75. This lever 75, substantially midway its ends, is mounted, as at 76, upon the adjacent side plate C for rocking movement. This lever 75 is disposed generally in a vertical direction and its lower extremity has pivotally connected therewith, as at 77, the forward end portion of a rearwardly disposed elongated rigid link 78 which is also pivotally connected, as at 79, with an upstanding post 80 carried by the forward portion of the rear holder X. The plate 66 is provided with the suitably positioned elongated and longitudinally extending slots 81 to allow for the desired passage therethrough of the posts 68 and 80.

The plate 66 has desired intermittent swinging movement with the downward movement under pressure in the same manner as hereinbefore described in detail with respect to the plate 10 and

during this swinging movement of the plate 66 the holders X with their applied files Y will be reciprocated, but with the holders moving in opposite directions.

From the foregoing description it is thought to be obvious that a filing tool constructed in accordance with my invention is particularly well adapted for use by reason of the convenience and facility with which it may be assembled and operated.

I claim:

1. A filing tool comprising spaced side plates, an elongated plate positioned therebetween, means for pivotally mounting an end portion of said last-named plate with the side plates, a file holder carried by the last-named plate and having reciprocating movement, a driven shaft carried by the side plates, a cam member carried by the shaft for intermittent coaction with the swinging plate for forcibly swinging the same outwardly, means for swinging said plate inwardly, a rock arm supported between the side plates for swinging movement, an operative connection between the driven shaft and the rock arm for swinging the rock arm, an operative connection between the rock arm and the file holder for reciprocating the file holder upon swinging movement of the rock arm, a motor supported between and to the side plates, and a driving connection between the motor and the driven shaft.

2. A filing tool comprising spaced side plates having lower longitudinal edges straight from end to end and coplanar in a direction transversely of the tool, a plate positioned between the side plates and of a length to extend substantially from end to end of the side plates, means for pivotally connecting the last named plate with the side plates, with said last named plate a material distance above the lower longitudinal straight edges of the side plates, flanges depending from the opposite end portions of the pivoted plate, guide rods secured to and bridging the space between the flanges, an elongated file plate holder underlying the rods, upstanding parts carried by the file plate holder and engaged with the rods for suspending the file plate holder from the rods and for reciprocating movement on the rods, yieldable means for supporting the free end portion of the pivoted plate, and power driven means for reciprocating the file holder plate.

3. A filing tool comprising spaced side plates having lower longitudinal edges straight from end to end and coplanar in a direction transversely of the tool, a plate positioned between the side plates and of a length to extend substantially from end to end of the side plates, means for pivotally connecting the last named plate with the side plates, with said last named plate a material distance above the lower longitudinal straight edges of the side plates, flanges depending from the opposite end portions of the pivoted plate, guide rods secured to and bridging the space between the flanges, an elongated file holder plate underlying the rods, upstanding parts carried by the file holder plate and engaged with the rods for suspending the file holder plate from the rods and for reciprocating movement on the rods, yieldable means for supporting the free end portion of the pivoted plate, an upstanding post carried by one of the parts engaged with the rods, a rock arm supported by and between the side plates, an operative connection between the rock arm and the post, and means for rocking the rock arm, the pivoted plate being provided with a slot through which the post freely passes, said

slot being of a length to offer no obstruction to the reciprocating movement of the file holder plate upon rocking of the rock arm, and means for swinging the plate downwardly during movement of the file holder plate in the direction of the cutting.

4. A filing tool comprising a supporting structure, a plate, means for pivotally connecting the plate with the supporting structure for swinging movement toward or from the work with which the tool is used, a file holder, means for suspending the file holder from the plate for reciprocating movement, a driven element carried by the supporting structure including a cam member, a part yieldingly mounted upon the plate and with which the cam member engages from above for intermittently forcing the plate in a direction toward the work upon operation of the driven element, and means operated by said driven element for reciprocating the file holder in a file cutting direction while the plate is being forced toward the work.

5. A filing tool comprising spaced side plates, an elongated plate positioned therebetween, means for pivotally mounting an end portion of said elongated plate with the side plates, a file holder carried by the last named plate and having reciprocating movement therealong, a motor supported by and between the side plates, and

means operated from the motor for intermittently forcing the elongated plate in a direction toward the work and for reciprocating the file holder.

6. A filing tool comprising spaced side plates, an elongated plate positioned between the side plates, means for pivotally supporting one end portion of the elongated plate from the side plates, a file holder carried by and below the swinging plate for reciprocating movement, and means carried by the side plates and coacting with the pivoted plate for rocking the same and for reciprocating the file holder, said file holder being spaced from the elongated plate, the side walls being provided with clean-out slots communicating between the file holder and the elongated plate.

7. A filing tool comprising a supporting structure, an elongated swinging plate carried by said structure for swinging movement toward or from the work, an elongated file holder plate carried by and positioned below the swinging plate and spaced therefrom, said file holder plate being provided with openings for the passage of filings, means for forcing the swinging plate toward the work, and means for reciprocating the file holder plate.

ORVILLE W. THRAILKILL.