

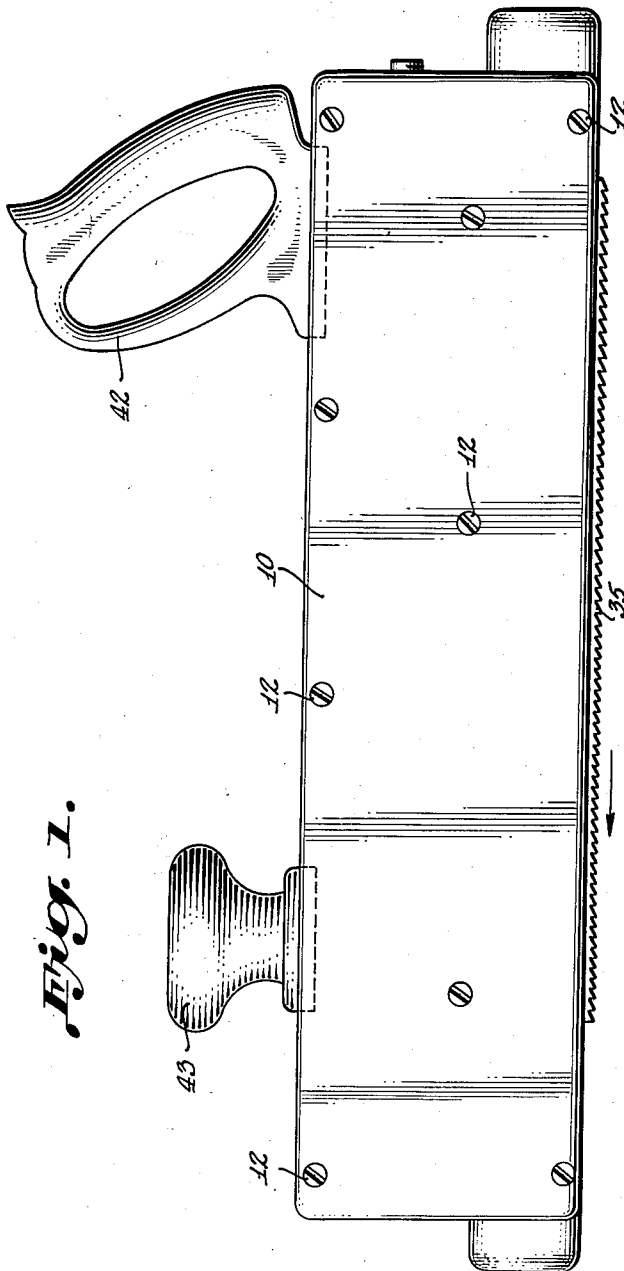
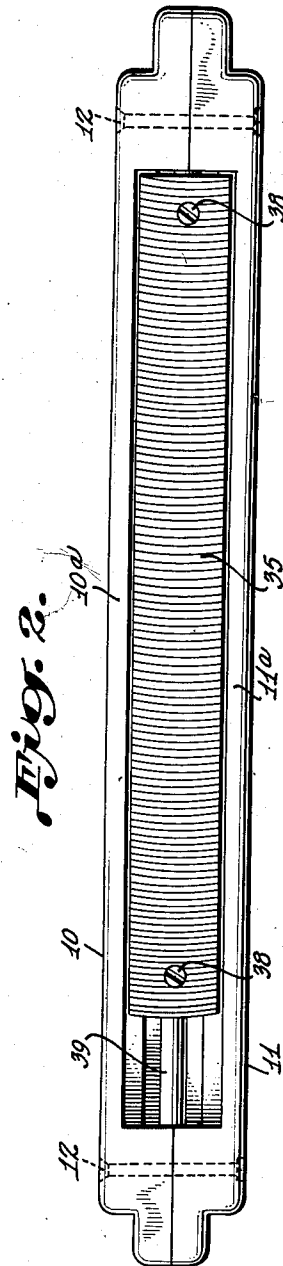
June 6, 1944.

A. LAPKOFF
FILING MACHINE

2,350,779

Filed April 30, 1942

3 Sheets-Sheet 1



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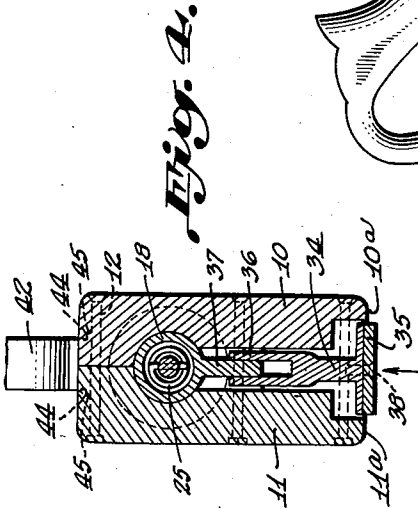


Fig. 4.

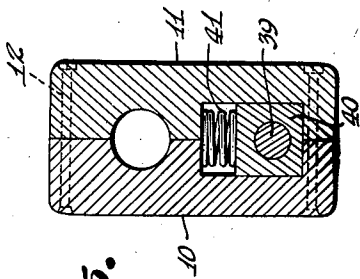
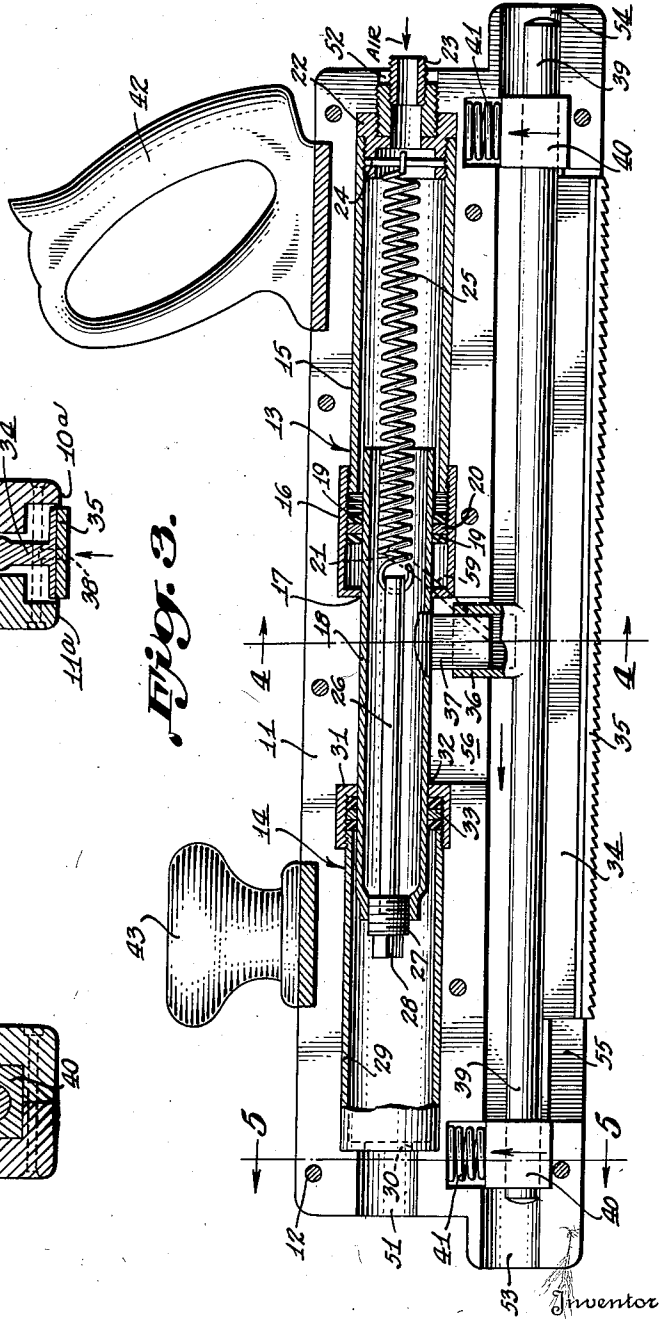


Fig. 5.



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Fig. 2.

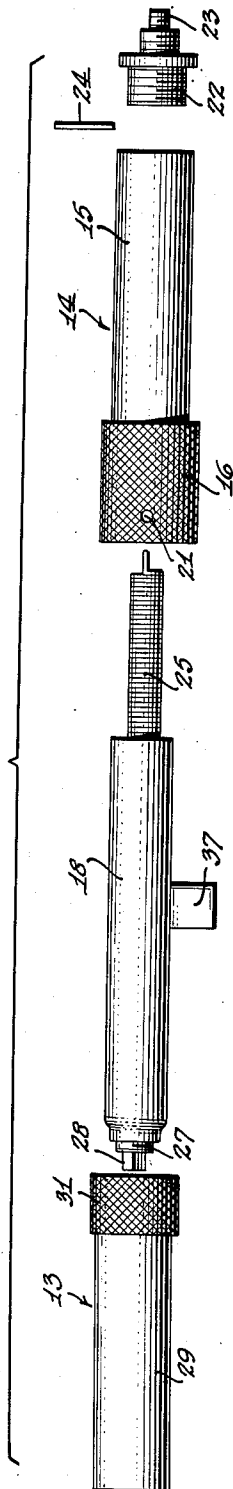
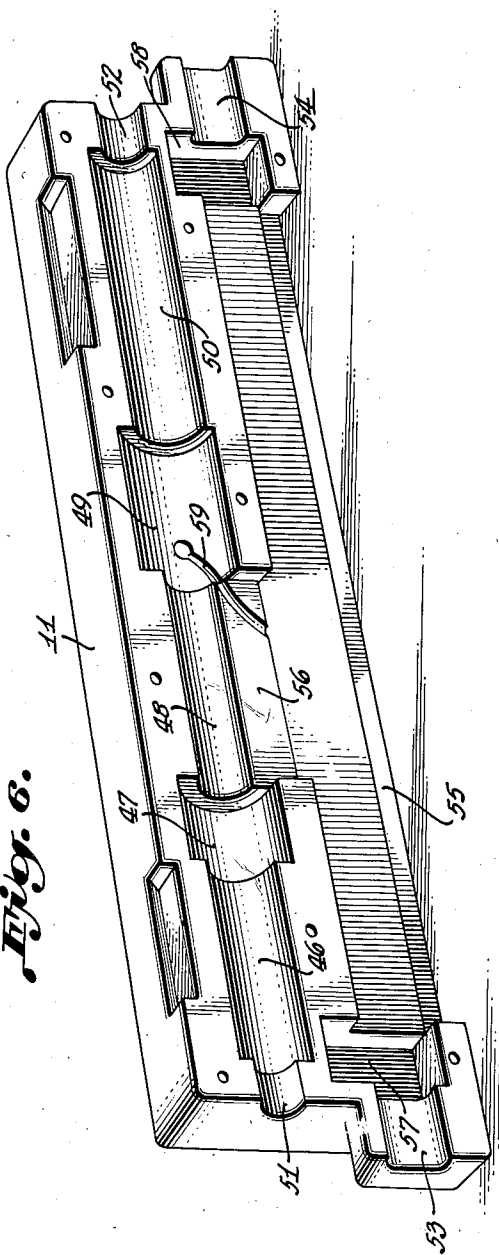


Fig. 6.



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UNITED STATES PATENT OFFICE

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FILING MACHINE

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7 Claims. (Cl. 29—76)

My invention relates to a power driven, reciprocating machine tool and more particularly to a tool of portable character adapted for reciprocation of a filing device for filing metallic surfaces.

It has been found that there are certain mechanical operations which can be performed only by reciprocating motion of a tool or working part. For example, the filing of metallic surfaces, particularly an automobile fender or other body parts of an automobile, requires the use of a file in reciprocating motion to remove the slight indentations caused by straightening of the bent surface. Until recently, work of this character has been done manually, but now filing machines are used, which for the most part have been found unsatisfactory. It is, therefore, the main object of the present invention to provide a portable, power operated filing machine which will efficiently perform the filing operation in a minimum amount of time and with minimum human effort.

A further object of the present invention is to provide a filing machine having a simple but rugged construction, being relatively inexpensive to manufacture, and in which the various parts may be readily disassembled and replaced.

Further and more specific objects and advantages of the present invention will be made evident throughout the following part of the explanation.

Referring to the drawings which are for illustrative purposes only,

Figure 1 is a side elevation of a power driven reciprocating file embodying my invention.

Figure 2 is a bottom plan view thereof.

Figure 3 is a side view of the invention, this view being partly sectioned on a central vertical plane.

Figure 4 is a vertical transverse section taken on the line 4—4 of Figure 3.

Figure 5 is a vertical transverse section taken on the line 5—5 of Figure 3.

Figure 6 is a perspective view of a section of the casing.

Figure 7 is an exploded view of the operating mechanism.

Referring to the drawings in detail, my invention comprises a casing formed of two complementary sections 10 and 11, having lower bearing surfaces 10a and 11a respectively. The casing is preferably formed of light cast metal but may be constructed of wood if desired. The sections 10 and 11 are secured together by means of a plurality of bolts indicated by the numeral 12.

Referring to Figures 3 and 7, the operating mechanism comprises a pair of cylinders 13 and 14 rigidly held within the casing in a manner to be described. Cylinder 13 comprises a body portion 15 having an interiorly threaded cap member 16 threaded to one end of the body portion. The

cap member 16 is bored at 17 to receive a sliding, cylindrical piston 18. A packing assembly comprising outer rubber gasket rings 19 and a central fiber ring 20 is mounted within cap member 16 and slidably engages the piston 18 with a tight sealing fit. The interior threads of cap 16 hold the gasket assembly in fixed position as clearly evident from the disclosure. A pair of exhaust ports 21 are provided in the wall of cap member 16 and are located between the gasket assembly and bore 17.

A tubular fitting 22 is threaded to the opposite end of cylinder portion 15 and includes a nipple 23 through which the fluid pressure medium, for instance compressed air, is supplied to the sliding piston 18. A cross bar 24 is mounted in fitting 22 and supports one end of a spring 25. The opposite end of the spring is attached to rod 26, which in turn has an enlarged threaded portion 27, threaded to one end of piston 18 to close off said end of the piston. Threaded portion 27 terminates in a square stub 28 to facilitate engagement by a wrench for adjusting the tension of spring 25.

The cylinder 14 comprises a cylindrical body portion 29, having an exhaust opening 30 at one end and a threaded cap member 31 at the other end thereof. Threaded cap member 31 is bored at 32 to receive piston 18. A packing assembly 33 surrounds the piston and is held in place by cap member 31 which may be turned to take up any wear on the gasket members.

The mechanism for mounting the file, forming a very important part of the present invention, will now be described. This mechanism comprises a reciprocating carrier 34 to which a file 35 is detachably secured by means of screws 38. The carrier is provided at its upper surface substantially midway of its ends with a socket portion 36. The socket portion 36 slidably receives a bar member 37 rigidly secured to sliding piston 18 as clearly shown in Figure 3. As seen in said figure, members 36 and 37 are so proportioned as to permit sliding movement between said members but preventing lateral movement between them. When the device is at rest, the file 35 protrudes but a very slight distance below the lower surface of the casing. The two ends of the carrier 34 are constructed in the form of rod portions 39 and are slidably received in block members 40. The casing is so constructed as to provide chambers for the block members which will permit limited vertical movement but will hold said block members against any lateral movement. Spring members 41 bear against the upper surfaces of the block members 40 and offer a yielding resistance to upper vertical movement of the block members.

A pair of handle members 42 and 43 are mounted at the upper surface of the machine.

Member 42 is provided with projecting edges 44 adapted to be received in the undercut grooves 45 formed on the upper inner edges of sections 10 and 11. When the two sections of the casing are bolted together, the handle member 42 is rigidly locked in position without the need of additional securing means. Handle member 43 is shown as being similarly secured in position but may be bolted to either of the casing sections if desired.

A novel manner of assembling the device resulting in a rugged construction and yet permitting ready disassembly of the device will now be described. Referring to Figure 6, section 11 of the casing will be described and since section 10 is complementary to section 11, the following description will serve to describe both sections. As shown, section 11 is substantially solid except for the various cutout portions for housing the various parts of the operating mechanism shown in Figures 3 and 7. Thus, the semi-cylindrical sections 46, 47, 48, 49 and 50 when associated with the corresponding sections in casing section 10 will form substantially cylindrical chambers of such size as to tightly house members 29, 31, 18, 16 and 15 respectively against any movement. It is to be understood of course that if it be desired to use less metal to form a casing of less weight, the casing need not be cast to form a solid construction but may be cast in such manner as to provide a skeleton frame with the chambers of the size shown in the present construction. The cutout portions 51 and 52 provide the exhaust and inlet ports. The sections 53 and 54 accommodate the sliding rods 39. The section 55 will receive the reciprocating file 35, section 56 the reciprocating socket 36 and bar 37, and sections 57 and 58 will form chambers for the floating blocks 40 and springs 41. As seen in Figure 6, a groove 59 is formed in section 49 and leads to section 56 for a purpose which will appear in describing the manner of operation.

The device operates in the following manner:

At rest, the sliding piston is in its right hand position as seen in Figure 3. The air pressure is supplied to nipple 23 and builds up pressure within the piston 18 and cylinder 15 to overcome the tension of the spring thereby causing the piston to move to the left. When the pressure on piston 18 forces the right hand edge of the piston slightly beyond the innermost gasket 19, the compressed air will exhaust through exhaust ports 21 and the spring will cause the piston to return to its initial point. The action is very rapid and the reciprocating piston will impart a rapid reciprocating movement to the file. The groove 59 will lead the exhaust air downwardly on the reciprocating file and will serve to blow away the filings. In working on metal, the file is placed on the surface to be filed and forward movement of the file causes the file to bite into the metal surface. Unless some compensating provision is made, the bite of the file into the metal will cause the file to stop and the continued building up of air pressure will cause the casing to reciprocate over the file rather than the file itself, thereby defeating the primary purpose of the tool. This defect, however, is cured by the floating support for the file furnished by the block and spring arrangement. With the present construction, the machine is applied to the work surface and due to the retractable springs, the file will yield until the surface 10a and 11a contact the work. As a result, the file cannot bite too deeply into the metal surface halting the operation of

the file, but will contact the surface with a yielding pressure sufficient to take a small cut out of the surface. Rapid reciprocation of the file will remove sufficient metal from the surface as desired.

Thus it will be seen that I have described a construction well adapted to produce the various objects and advantages pointed out above. While I have shown and described a preferred embodiment of the device, it will be understood that the invention is not to be limited to the particular embodiment shown but may be modified within the scope of the appended claims.

What I claim is:

1. A filing machine comprising a housing, bearing surfaces on the underside of the housing adapted to contact the work, a file mounted in said housing and having its filing surface projecting a slight distance below the bearing surfaces, means within the housing for reciprocating said file, means providing limited vertical movement of said file, and spring means urging said file outwardly.

2. A filing machine comprising a casing, bearing surfaces on the under side of the casing adapted to rest on the work, a file mounted in said casing and having its filing surface projecting a slight distance below the bearing surfaces, a reciprocable piston within the casing, means for reciprocating said piston, means for connecting said file to said piston whereby the file reciprocates with the piston but is movable away from the piston, and yieldable means for moving said file outwardly.

3. A machine as described in claim 2, the means for reciprocating the piston comprising fluid pressure means, and means for directing the exhaust pressure means downwardly against the reciprocating file.

4. A filing machine comprising a housing, bearing surfaces on the underside of the housing adapted to rest on the work, reciprocating means within the housing, a file loosely mounted in said housing and having its filing surface projecting a slight distance below the bearing surfaces, said file being reciprocable by said reciprocating means, means for urging said file outwardly, and means limiting outward movement of said file.

5. A filing machine comprising a housing, a reciprocable piston within the housing, a file within the housing having a filing surface projecting a slight distance below the under surface of the housing, a bar projecting from the underside of the piston, a socket member in said file, said bar and socket member cooperating to reciprocate said file and permit outward movement of said file, means limiting said outward movement, and spring means urging said file outwardly.

6. A filing machine comprising a housing, a reciprocating member in said housing, recesses formed at each end of the housing, block members retained in said recesses for limited vertical movement, a file within said housing having its filing surface projecting a slight distance below the underside of the housing, said file having its ends receivable in said block members, and means on said file cooperating with the reciprocating member for reciprocating the file and permitting vertical movement of the file.

7. A filing machine as described in claim 6, and spring means urging the block members downwardly.

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