

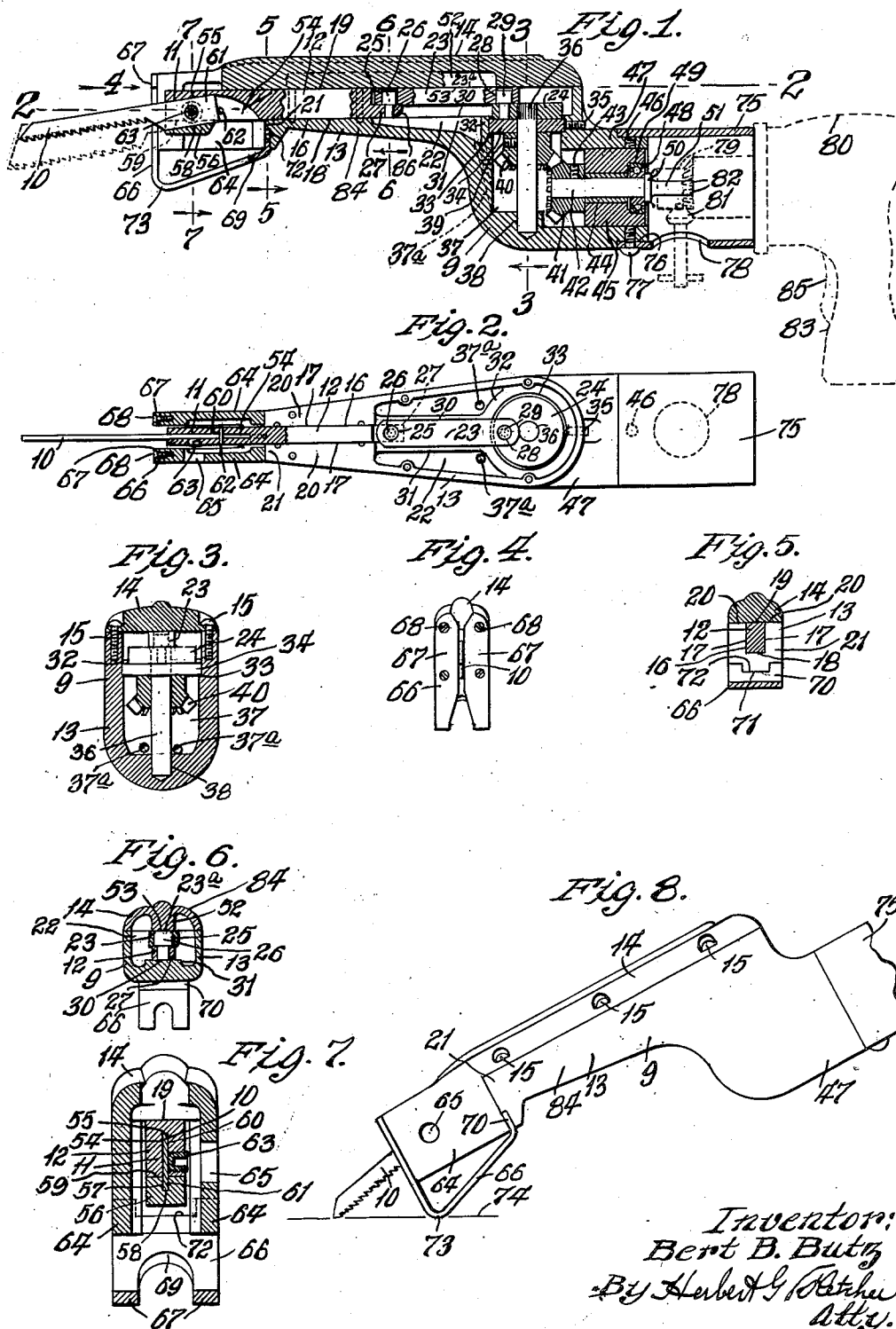
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HAND CARRIED POWER TOOL

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HAND CARRIED POWER TOOL

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This invention relates to a hand carried power tool of the reciprocating type and pertains more particularly to the structure thereof for simplifying the assembly and disassembly of the tool, this being the primary object of the invention.

Another object of the invention is to provide a casing of an improved structure for retained seating of the operating parts of the tool, and a cover therefor having seating cooperation with certain of the operating parts.

A further object is to provide the operating parts of the tool of a character to be self-seating with respect to their assembly in the casing of the tool.

A still further object is to provide the casing and its cover of a construction to form a holder for the tool, which can be fittingly held by the hand of the operator for guiding and directing the tool.

Still another object is to provide the holder with a longitudinal flat-sided tool chuck, which is reciprocally encased in surrounding guiding walls.

Another still further object is to provide the holder with an improved work-rest at one end and a guard at its opposite end.

It is still another object of the invention to provide a tool chuck of a character to downwardly incline the tool such as a saw blade at a desired angle so that the blade will clear itself of sawdust during reciprocation thereof.

With the foregoing and other objects in view which will appear as the description proceeds, my invention resides in the combination and arrangements of parts and in the details of construction hereinafter described and claimed, it being understood that changes may be made within the scope of what is claimed, without departing from the spirit and intents of the invention.

An embodiment of the invention is illustrated in the accompanying drawing wherein:

Figure 1 is a longitudinal vertical sectional elevation taken through this improved hand carried power tool.

Figure 2 is a horizontal sectional elevation taken approximately on the line 2—2 of Fig. 1.

Figure 3 is a transverse vertical sectional elevation taken approximately on the line 3—3 of Fig. 1.

Figure 4 is an end elevation taken in the direction of the arrow 4 in Fig. 1.

Figure 5 is a transverse vertical sectional elevation taken approximately on the line 5—5 of Fig. 1.

Figure 6 is a transverse vertical sectional ele-

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vation taken approximately on the line 6—6 of Fig. 1.

Figure 7 is an enlarged transverse sectional elevation taken approximately on the line 7—7 of Fig. 1.

Figure 8 is a side elevation of the tool with an end portion thereof broken away.

Referring by numerals to the accompanying drawing, 9 designates a holder for encasing the operating parts for reciprocating the tool or hack-saw blade 10, projected from the chuck 11 formed on one end of a cross-head 12.

The holder 9 comprises a longitudinally extending casing 13 and a cover 14 therefor, secured thereto by cap screws 15, said casing having a longitudinal open top guideway 16 formed therein and having finished vertical side walls 17 and a finished bottom wall 18, for the reception of the cross-head 12 which is rectangular in cross section for snug guiding fitness with the walls of the guideway 16 and with the top side 19 of the cross-head in flush horizontal alinement with the finished surfaces 20 on each side of the guideway 16 of the casing 13.

The guideway 16 extends to the front end 21 of the casing 13, and rearwardly of the inner end of the guideway, a well or depression 22 is formed in the casing 13 in which a longitudinally extending connecting rod 23 and a flywheel 24 are disposed, said rod 23 having a bearing 25 at one end for engagement on a dowel pin 26, vertically extended from the end portion 27 of the cross-head 12 and a bearing 28 at its other end for engagement on a dowel pin 29 which is vertically extended from the flywheel 24 adjacent its perimeter.

The end portion 27 of the cross-head 12 is formed by cutting away that part of the material thereabove, so that the bottom surface of the end portion will remain flush with that of the cross-head and in continued horizontal alinement with the bottom wall 18 of the guideway 16 is a longitudinally extending bearing surface 30 on the top side of a ridge 31, for sliding cooperation with the bottom side of the cross-head, said ridge being in the well 22 and extending to and joining a circular wall 32 at the rear end of the well.

The wall 32 is disposed at the rear end of the well 22 and has an annular seat 33 formed therein for the support of a bearing 34, secured therein by a set-screw 35, said bearing supporting the upper end of a shaft 36, vertically depending in a well 37 and being seated at its lower end in a bearing 38 in a part of the casing 13 at the bottom of the well 37.

Fixedly secured to the upper end of the shaft

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36 above the bearing 34 is the flywheel 24, and securely fixed to said shaft beneath said bearing by a set-screw 39 is a miter gear 40 meshing with a miter gear 41, securely fixed to an end of a horizontal shaft 42 by a set-screw 43, said shaft being mounted in an Oilite sleeve 44, supported in a bearing 45 which is held fixed by a set-screw 46 in the cylindrical portion 47 of the casing 13 at the rear end thereof.

A thrust bearing 48 is mounted on the shaft 42 and is seated in a counter-bore 49 formed in the rear end of the bearing 45, said bearing 48 being held in position by a collar 50 on the extending end 51 of the shaft 42.

The cover 14 for the casing 13 of which the holder 9 is comprised, is provided with finished meeting edges for cooperation with the finished meeting edges of the casing so that a seal-tight joint is maintained therebetween, when the cover and casing are secured by the cap screws 15, and in addition, the cover has a centrally disposed longitudinally depending ridge 52 having a finished bottom surface 53 for bearing clearance with the top sides 19 and 23a of the cross-head 12 and the connecting rod 23, respectively.

The tool chuck 11 which is formed on the outer extending end of the cross-head 12 opposite to the end 27 to which one end of the connecting rod 23 is connected, is provided by milling a slotted recess 54 in the bottom side of the extending end of the cross-head to provide an inverted bottom 55 therein which is inclined downwardly and forwardly as shown in Fig. 1, and in completing the making of the chuck, a block 56 having a recess 57 with a bottom end 58 paralleling the bottom 55 of the recess 54, is brazed or welded to the cross-head on the meeting line 59, shown in Figs. 1 and 7, thereby providing an elongated vertical opening 60 for the reception of the shank 61 of the saw blade 10, said blade being secured in the chuck with the shank end in abutment against the pin 62 by a set-screw 63 of the Allen type which is threadingly secured in a side wall of the chuck.

The front end of the cover 14 is bifurcated for providing a pair of forwardly and downwardly extending portions 64, the inner ends of said portions abutting the front end 21 of the casing 13, forming protecting sides for the chuck 11, one of said portions having an opening 65 for the insertion of a wrenching tool for engagement with the set-screw 63.

A combined guard and work-rest 66 having a pair of vertically extending branches 67 secured to the front ends of respective portions 64 by screws 68, forms a part of this improved tool, said branches being rearwardly bent at their lower ends and extending to the front end 21 of the casing 13, and are joined with each other at 69, there adjacent, for providing an upwardly extending portion 70 having a recess 71 for over engaging a depending shoulder 72 formed on the front end 21 of the casing 13 (Fig. 5), said portion 70 overlapping the inner ends of the pair of portions 64 of the cover 14 (Figs. 1 and 8).

Obviously, the combined guard and work-rest 66 is carried by the cover 14, and the branches 67 being spaced from each other, straddle the saw blade 10, and the said branches where they are rearwardly bent, form work-resting shoulders 73 for the tool for engagement against the structure worked upon as indicated at 74 in Fig. 8.

In readiness for assembling the tool, the related parts of respective shafts 36 and 42 are first mounted and secured thereon, the shaft 36

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with its mounted parts, gear 40, bearing 34 and flywheel 24, being lowered in the well 37 of the casing 13, until the bearing 34 comes to rest on its seat 33, and the setscrew 35 is tightened against the periphery thereof. The shaft 42 with its mounted parts, gear 41 and bearing 45 supporting the sleeve 44 and the thrust bearing 48, is horizontally slid into the cylindrical portion 47 of the casing 13, with the gear 41 in working mesh with the gear 40, and the set-screw 46 is tightened for fixedly securing the bearing 45.

The cross-head 12 is then seated in the guideway 16, and the connecting rod 23 is mounted on the dowel pins 26 and 29 of the cross-head and the flywheel 24 respectively. Grease is then filled in the well 22 of the casing and the cover 14 is mounted thereon and secured by the cap screws 15.

The mounting and securing of the related parts on respective shafts 36 and 42, ready for them being inserted as separate units in the casing 13 enhances them for both ease and simplicity of mounting in the casing and whereby the units are held in their adjusted cooperating settings by the respective set-screws 35 and 46.

The mounting of the cross-head 12 in the guideway 16, and the ease of connecting the rod 23 thereto and to the fly wheel 24, is of maximum simplicity and the sliding surface 53 of the ridge 52 of the cover 14, bearing against the top sides of both the cross-head and the connecting rod, will fittingly seat them against slap or looseness.

In the event there is requirement for removability of the operating parts, removal of the cover 14 will provide access to the parts 12 and 23 for lifting them from their seated positions, and retraction of the set-screws 35 and 46 will permit removal of the units having the respective gears 40 and 41. Grease filled in the well 37 may retard pulling of the unit of the shaft 42, due to a formed vacuum in said well, and in this event vacuum relief may be had through the oil or grease ducts 37a, which extend from the well 22 to the bottom of the well 37.

A cylindrical guard 75 is removably mounted on the reduced end 76 of the cylindrical portion 47 of the casing 13, by the cap screw 77, said guard having an opening 78 in its periphery and preferably in the bottom disposed side thereof.

The branches 67 of the work-rest 66 being separated from each other provide for said work-rest being free from accumulating sawdust.

In preparing the tool for operation, the desired saw blade 10 is selected and its shank 61 is inserted in the opening 60 of the chuck 11 in abutment with the pin 62 and with the upper and lower edges of the shank fitting against respective inclined bottoms 55 and 58 of the opening 60 and the set-screw 63 is tightened by a wrench in the socket of said set-screw.

The driving end or chuck 79 of an electric motor 80 is inserted in the guard 75, and the chuck is gripped on the extending end 51 of the shaft 42 by a geared tool 81 which is inserted through the opening 78 for meshing with the teeth 82 of the chuck for hand turning the chuck in tightening it on the shaft end 51. The tool 81 is then released from the chuck 79 and is withdrawn through the opening 78 of the guard 75.

In operation, the hand grip portion 83 of the motor 80 is grasped in one hand by the operator and the other hand is gripped around the barrel portion 84 of the holder 9 and that portion of the cover 14 thereabove, and upon actuation of

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the switch lever 85 of the motor, the shaft 42 is revolved, thereby revolving the vertical shaft 36 and the fly wheel 24 by the meshing gears 41 and 40, said fly wheel reciprocating the cross-head 12 by the connecting rod 23 and the saw blade 10 in the extending end of the cross-head or chuck 11.

The work-rest 66 and its shoulders 73 is important in carrying out certain kinds of work, and is particularly important at the beginning of the saw cutting, in that a firm saw directing grip of the tool holder 9 can be maintained, against the structure to be worked on as exemplified at 74 in Fig. 8, and the angle of incidence given to the saw blade, which approximates 7 degrees from a horizontal plane through the holder, provides more effective cutting in the work, than if the blade was held in a horizontal plane with respect to the chuck 11 by reason of the inclined and inward pulling tendency given to the blade with respect to the saw cutting being made by the blade, when in operation.

The extreme end of the end portion 27 of the cross-head 12 on its bottom side is rounded at 86 so that scraping of said end portion on the bearing surface 30 on the ridge 31 is prevented, in the event that the chuck end of the cross-head tends to cant upwardly, due to wear on the guiding walls of the cross-head.

Differing types of sawblades of differing widths and lengths can be used providing the shanks thereof are of sizes comparable with the chuck opening 60.

Obviously constructional modifications of the device shown, are possible without departing from the spirit of the present invention and therefore it is to be understood that it is not necessary to limit the invention by the terms used in the foregoing description, excepting such as the state of the art may require.

What I claim is:

1. In a hand-carried power-operated tool having a casing with a pair of opposed extensions at one of its ends, a tool-receiving chuck disposed between said casing extensions, and means for imparting reciprocal motion to said chuck, the improvement comprising a work rest member having a pair of parallel branch members for disposition in opposed lateral relation with respect to the tool-receiving chuck as the same is reciprocated, said branch members being each secured on the outwardly presented face of a casing extension for projection therebeyond, said branches being each angulated at a point spacedly from said casing extensions to provide inwardly directed portions for securement to said casing at points remote from the outwardly presented face of the casing extensions.

2. In a hand-carried power-operated saw having a casing, a cross-head disposed in said casing and projecting at one end therebeyond, and means for imparting axial reciprocal motion to said cross-head, the improvement comprising a chuck carried by said cross-head on its projecting end and having a socket the axis of which is inclined to the axis of the cross-head for maintaining a saw blade at an angle to the axis of reciprocation of said cross-head in order to provide a pulling force to said saw blade during operation.

3. In a hand-carried power-operated saw having a casing, a cross-head disposed in said casing and having one end extending therebeyond, and means for imparting axial reciprocal motion

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to said cross-head, the improvement comprising a chuck integrally formed on the extending end of said cross-head for movement toward and away from the casing upon operation of the cross-head, said chuck having a socket axially inclined with reference to the axis of the cross-head for receiving the shank of a saw blade to present the cutting edge thereof at an angle to the axis of reciprocation of said cross-head, and means for removably securing the shank of said saw blade in the chuck socket.

4. In a hand-carried power-operated tool having a casing and a cover for said casing, the improvement comprising a cross-head disposed in said casing and extending at one end therebeyond, means for imparting axial reciprocal motion to said cross-head, said cross-head at its projecting end being provided with a recess having one face thereof inclined with respect to the axis of reciprocation of the cross-head, and a block member secured to the projecting end of the cross-head and being complementarily recessed to form with the cross-head recess a chuck-forming socket, the axis of which is inclined to the axis of reciprocation of the cross-head, so that the shank of a tool received within the socket will be disposed at an angle to the axis of reciprocation of the cross-head.

5. In a hand-carried power-operated tool having a casing and a cover for said casing, the improvement comprising a cross-head disposed in said casing and extending at one end therebeyond, means for imparting axial reciprocal motion to said cross-head, said cross-head at its projecting end being provided with a recess having one face thereof inclined with respect to the axis of reciprocation of the cross-head, a block member secured to the projecting end of the cross-head and being complementarily recessed to form with the cross-head recess a chuck-forming socket, the axis of which is inclined to the axis of reciprocation of the cross-head, so that the shank of a tool received within the socket will be disposed at an angle to the axis of reciprocation of the cross-head, a pin extending transversely across the socket at its interior end for abutment against the end face of the shank of the tool for limiting the reception of the same within the socket, and means for removably maintaining the tool therein.

6. In a hand-carried power-operated tool having a casing with a pair of opposed extensions at one of its ends, a tool-receiving chuck disposed between said casing extensions, and means for imparting reciprocal motion to said chuck, the improvement comprising a pair of parallel branch members for disposition in opposed lateral relation with respect to the tool-receiving chuck as the same is reciprocated, said branch members being each secured in covering relation on the outwardly presented face of a casing extension for projection in one direction therebeyond, said branch members being each angulated at a point spacedly from said casing extensions to determine the outer limits of projection and providing return portions directed inwardly toward the casing, said return portions being bent at their ends for securement to the casing at points remote from the outwardly presented faces of the casing extensions.

7. In a hand-carried power-operated tool having a casing with a pair of opposed extensions at one of its ends, a tool-receiving chuck disposed between said casing extensions, and means for imparting reciprocal motion to said chuck,

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the improvement comprising a pair of parallel branch members for disposition in opposed lateral relation with respect to the tool-receiving chuck as the same is reciprocated; said branch members being each secured in covering relation on the outwardly presented face of a casing extension for projection in one direction therebeyond within a plane parallel to the plane of the outwardly presented faces of the casing extensions, said branch members being each angulated at a point spacedly from said casing extensions to determine the outer limits of projection and providing return portions directed inwardly toward the casing, said return portions being bent at their ends for securement to the casing at points remote from the outwardly presented faces of the casing extensions.

8. In a hand-carried power-operated tool having a casing and a cover for said casing, the improvement comprising a cross-head disposed in said casing and disposed at one end thereof, means for imparting axial reciprocal motion to said cross-head, said cross-head at its projecting end being provided with a recess, the axis of which is inclined with respect to the axis of reciprocation of the cross-head, said recess providing a socket for receiving the shank of a tool to present same at an angle to the axis of reciproca-

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tion of the cross-head, detent means extending transversely across the recess at its inner end to limit the insertion therein of the tool shank, and means for removably maintaining the tool in said recess.

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