No. 827,062. PATENTED JULY 24, 1906.

C. F. FRAIN.

COMBINED DRILL BLOCK AND BENCH BLOCK.

APPLICATION FILED APR. 1, 1905.

Fig. 1.

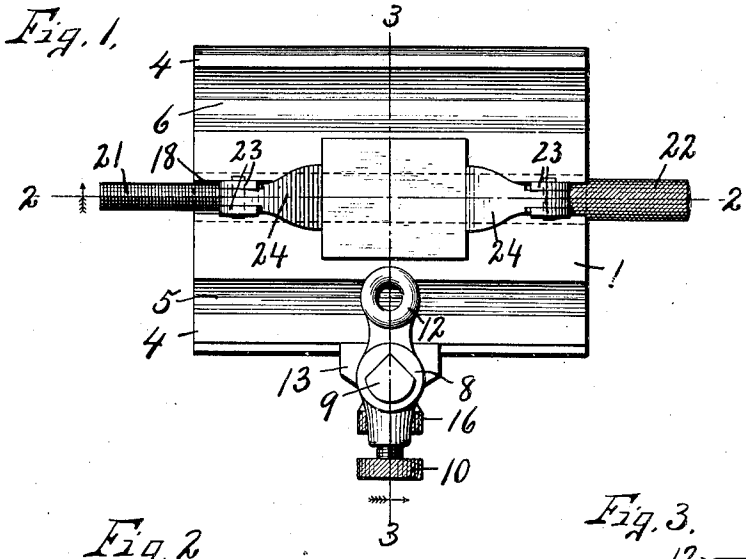


Fig. 2

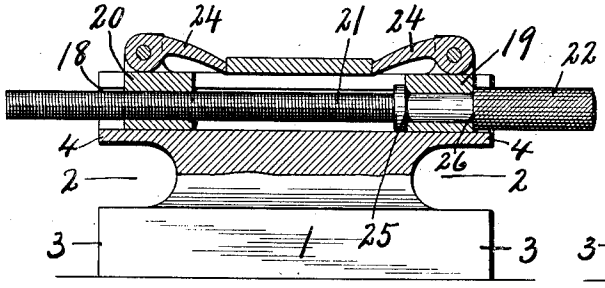


Fig. 3.

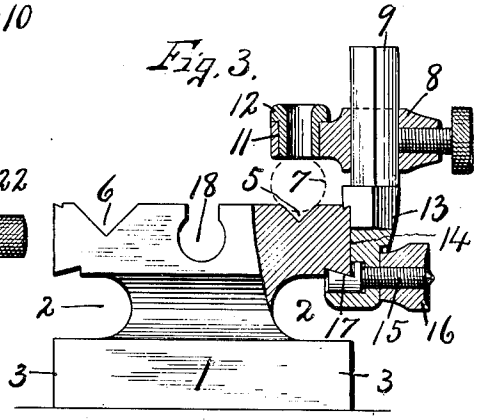


Fig. 4.

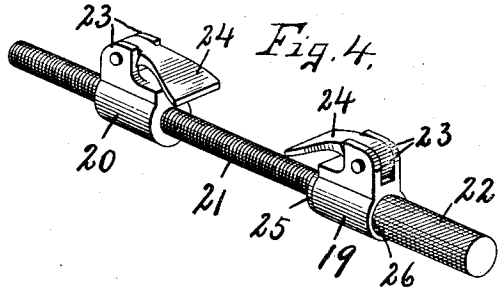


Fig. 6.

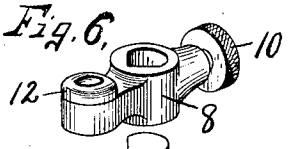


Fig. 5

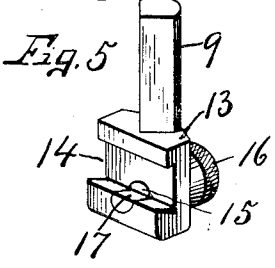
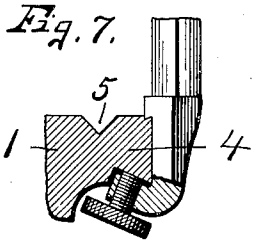


Fig. 7.



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COMBINED DRILL-BLOCK AND BENCH-BLOCK.

No. 827,062. Specification of Letters Patent. Patented July 24, 1906.

Application filed April 1, 1905. Serial No. 253,231.

To all whom it may concern:

Be it known that I, CHARLES F. FRAIN, of Syracuse, in the county of Onondaga, in the State of New York, have invented new and useful Improvements in a Combined Drill-Block and Bench-Block, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

This invention relates to a combined drill-block and bench-block as a new article of manufacture to be used by machinists, tool-makers, and bench-workers for the reception and retention of various tools which a machinist, tool-maker, or bench-worker would use in laying out and finishing the same or different kinds of work.

It is well known that in this class of work a large variety of tools are employed and that considerable time is lost in the selection and mounting of these various tools to perform the different grades of work.

Among the various tools which might be enumerated as separate parts of the usual "kit" of machinists' and bench-workers' tools are, first, a drill-block; second, a V-block; third, the bench-block; fourth, surface-gage; fifth, various kinds of clamping devices for holding the work upon the drill-block, bench-block, and similar supports, and, sixth, clamps for holding these various parts in a fixed position.

The primary object of my invention is to combine all of these parts in one general utility block or implement, which may be used as a bench or drill block and is equipped with means for centering and drilling radially through round bars of different diameters, for clamping and laying out work, for supporting surface and other similar gages, and for many other purposes not necessary to herein enumerate or describe.

Other and more specific objects relating to the block and to its specific attachments will be brought out in the following description.

In the drawings, Figure 1 is a top plan of my improved and combined bench-block and drill-block, showing thereon two forms of work-holding attachments, one for holding the work to be laid out and the other for centering a drill and holding the rods to be drilled. Fig. 2 is a sectional view taken on line 2 2 of Fig. 1, showing the lower portion of the block in elevation. Fig. 3 is an end view, partly in section, on line 3 3, Fig. 1, of the parts seen in Fig. 1, omitting the adjustable work-holding clamps. Fig. 4 is a perspective view of the detached work-holding clamps previously mentioned. Figs. 5 and 6 are perspective views showing, respectively, the adjustable spindle-head and drill-centering head, which is mounted upon and adjustable lengthwise of said spindle-head. Fig. 7 is a sectional view of a slightly-modified form of the spindle-head.

In carrying out the various objects of my invention I provide a block 1 of suitable dimensions, which is usually made of steel and in this instance is rectangular in form and has its opposite faces disposed in substantially flat parallel planes, this being particularly true of the top and bottom faces, which are interchangeable as the block is reversed or inverted for different uses. This block is preferably of greater length and width than its depth from top to bottom and is provided with a marginal groove 2, which in this instance extends entirely around the block midway between its lower and upper faces for forming opposed lengthwise and transverse flanges 3 and 4. The sides of the block are parallel, and the ends are disposed at right angles to the sides, which facilitates the "squaring up" and laying out of the work upon the block and also affords means for testing the accuracy of rectangular work.

Although I have shown the groove 2 as extending along the sides and ends of the block, it is evident that I may in some instances omit the groove in one side and in one or both ends, the sole object of this groove being for the purpose of forming the flanges 3 and 4, whereby a suitable shoulder is formed for the reception of one or more clamps to hold the work to the block or to enable the block to be clamped to another support.

As best shown in Figs. 2 and 3, one face of the block is preferably left plain and unbroken to permit the device to be used as a bench-block for laying out work, truing it up, and for other purposes for which such a block might be used by bench workmen. When this side of the block is in use, the attachments which are applied to the other side may be removed, if necessary, and, in fact, this opposite side of the block may also be utilized for laying out work, if desired, it being understood that both faces of the block are adapted for many uses in benchwork and that it is simply preferable, though not necessary, to leave one face plain and unbroken, so that such face may be used for hammering or straightening

plates or bars of metal. The opposite face, which in the drawings is shown as the upper face, renders the device particularly useful as a V-block and drill-block, as well as for many other purposes, some of which will be hereinafter described, and for this purpose this face of the block is provided with one or more lengthwise V-grooves, as 5 and 6, of different dimensions to receive and retain round or other bars, as 7, which are to be drilled transversely or radially or upon which other work is to be performed.

In Fig. 3 of the drawings I have shown a round bar 7 in dotted lines as seated in the groove 5 in position to be drilled transversely, and in order that the drill may be properly centered I provide a suitable centering-head 8, which is adjustably mounted upon and secured to a suitable spindle 9 and is held in its adjusted position by a set-screw 10. A portion of this centering-head 8 overhangs the upper surface of the block 1 and is provided with a vertical opening 11 to receive any one of a number of different sizes of hardened-steel bushings 12, according to the size of the drill which is to be used, said bushing having its central vertical opening or drill-hole disposed in vertical alinement with the base of one of the grooves 5 or 6, according to which side of the block or groove the centering-head is used in connection with. The centering sleeve or bushing 12 is removably inserted in the opening 11 to permit different bushings to be inserted, corresponding to the size of the drill which is used.

In the block shown in the drawings both of the parallel lengthwise edges of the flange 4 are dovetailed and are exactly alike, so that the spindle-head 13, which supports the spindle 9, and drill-centering head 8, may be interchanged from one side of the block to the other and used in connection with either of the grooves 5 or 6, it being understood that the base of both grooves are the same distances from the corresponding edges of the flange 4, so as to bring the center of the drill-hole of the centering-head 8 into vertical alinement with the base of either of the grooves when used at either side of the block.

The spindle-head 13 is provided with a dovetailed groove 14 of substantially the same cross-sectional form as the dovetailed ribs at either side of the block 1, which permits said head to be used on either dovetailed rib, said groove having an easy sliding fit upon the dovetailed ribs to permit the spindle-head to be adjusted longitudinally of the block. This longitudinal and vertical adjustment of the centering-head 8 greatly facilitates the work of centering the bushing 12 with the drill and holding the work, such as the bar 7, or other objects of greater or less thickness.

In order to prevent the centering-head 8 from turning upon its spindle 9, said spindle is preferably angular in cross-section, and the head 8 has a similarly-shaped vertical opening therein fitting with an easy sliding fit upon the angular portion of the spindle 9, so that when the head 8 is brought down upon the work the axis of the drill-hole in the bushing 12 will always be in vertical alinement with the base of the groove 5 or 6 and also with the center of the bar 7, the head 8 being held in its adjusted position by the set-screw 10, while the sliding spindle-head 9 is held in position by a suitable bolt 15 and nut 16. This bolt 15 has an enlarged inner head or end formed with a beveled or undercut face 17, fitting against the lower beveled edge of one of the dovetailed ribs on the flange 4, so that when the nut 16 is tightened the bevel-face 17 of the bolt 15 is wedged against the dovetailed rib and firmly holds the head 13 against lengthwise movement. Either one of the faces, as the upper face of the drill-block, is provided with an additional lengthwise groove 18, the base of which is circular in cross-section and in which is fitted with a sliding fit two opposed circular heads 19 and 20, both of which are mounted upon a rotary spindle 21, having a handpiece 22. Each of these heads 19 and 20 is provided with a bifurcated projection for forming opposite ears 23, between which is pivoted a downwardly-deflected gripping-pawl 24, so that two of these pawls are provided, having their free edges disposed in a plane below their pivots and facing each other to grip the opposite edges of the work and at the same time to force it down onto the surface of the block, thereby not only clamping the work upon the block, but at the same time clamping the screw 21 and heads 19 and 20 to said block against sliding or endwise movement.

The spindle 21 is movable endwise in the groove 18 below the surface of the block, so as not to interfere with the laying of the work flatwise upon said surface, and the heads 19 and 20 are mounted upon said spindle and are movable endwise therewith in the groove 18. These heads 19 and 20 project some distance above the surface of the block through the open side of the groove, the head 19 being journaled upon the spindle near the handpiece 22 and between opposed annular abutments 25 and 26 to prevent endwise movement of the head relative to the spindle. The other head 20 is formed with a threaded aperture, which receives the screw end of the spindle and is therefore moved endwise toward and away from the head 19 by the rotation of the spindle in opposite directions. It is now clearly apparent that the pawls 24 are supported above the surface of the block and that their free ends engage and ride upon said surface as the spindle is moved back and forth in the groove 18, thereby permitting the jaws to be shifted together to any desired position along the groove 18 for receiving the

work, after which the screw may be rotated to draw the pawl 24, which is engaged with the screw, toward and from the other jaw to clamp or loosen the work, as may be desired.

When it is desired to use the drill-centering device, the spindle 21, with the clamping-heads and pawls thereon, may be readily withdrawn endwise from the groove 18, or, on the other hand, if it is desired to use the clamping device the drill-centering head may also be readily removed endwise from the dovetailed flange upon which it is mounted.

When the block is to be used for bench-work, both of these devices may be removed in the manner described, and the block may be then inverted, so as to bring the plain flat side of the top to be used for straightening or for other purposes requiring a flat level surface.

It will be observed that the flanges 3 and 4, which are formed by the groove in the edge of the block, afford means by which different kinds of work may be clamped to the block by other devices than those shown and also enable the block to be clamped to any other support.

Another important feature of this invention is that the drill-centering head, which is adjustable on the vertical spindle, may be readily removed and other devices, such as surface-gages, substituted therefor. The invention therefore comprises, briefly, the specific formation of the block with the marginal groove and V-grooves, together with the adjustable spindle-head for supporting the drill-centering head and other devices, and also the surface-clamp, as the spindle 21, clamping-heads 19 and 20, and pivoted pawls 24, all of which parts constitute a new article of manufacture capable of a large variety of uses in connection with the usual work of machinists, tool-makers, and bench-workers; but I do not wish to limit myself to the precise construction shown and described.

Having thus fully described my invention, what I claim, and desire to secure by Letters Patent, is—

1. As a new article of manufacture, a combined drill and bench block, opposite heads, both slidably interlocked with the block, a screw connecting both heads to move them toward and from each other and slidable endwise therewith, and jaws on the heads and having their work-engaging ends in a plane within their connections with their respective heads whereby when screw is tightened to clamp the jaws to the work, the latter is pressed against the block, thereby holding the heads and screw against endwise movement relatively to the block.

2. As a new article of manufacture, a combined drill and bench block, opposite heads both slidably interlocked with the block, a screw journaled in one head and screwed into the other head to move the heads toward and from each other, and jaws each pivoted to one of the heads and having its work-engaging end between the plane of its pivot and adjacent surface of the block.

3. As a new article of manufacture, a combined drill-block and bench-block, comprising a rectangular metal body having opposite substantially flat working surfaces and provided with a groove in one edge between said surfaces forming opposed flanges, one of said flanges having its lengthwise edge dovetailed in cross-section, a spindle-head having a dovetail groove receiving the dovetail flange, and a drill-centering head adjustably mounted on the spindle-head.

4. As a new article of manufacture, a combined drill-block and bench-block for machinists, tool-makers and bench-workers, comprising a rectangular metal body having opposite substantially flat working surfaces, one of which is formed with a V-groove, said body having a dovetail flange parallel with the groove, a spindle-head mounted upon and movable along the flange, a drill-centering head adjustably mounted on the spindle-head, and a sleeve removably mounted on the drill-centering head and having its axis intersecting the base of the V-groove.

5. A combined drill-block and a bench-block comprising a metal body having opposed parallel substantially flat surfaces and a lengthwise groove opening from one of said surfaces, a rotary screw-spindle movable endwise in said groove, clamping-heads on the spindle and movable in said groove, one being engaged and actuated by the threaded part of the spindle, and opposed swinging jaws, one on each clamping-head, said jaws having their gripping ends operatively within the planes of their swinging axes, whereby the work, screws, heads and jaws are clamped to the block.

In witness whereof I have hereunto set my hand this 27th day of March, 1905.

CHARLES F. FRAIN.

Witnesses:
H. E. CHASE,
HOWARD P. DENISON.