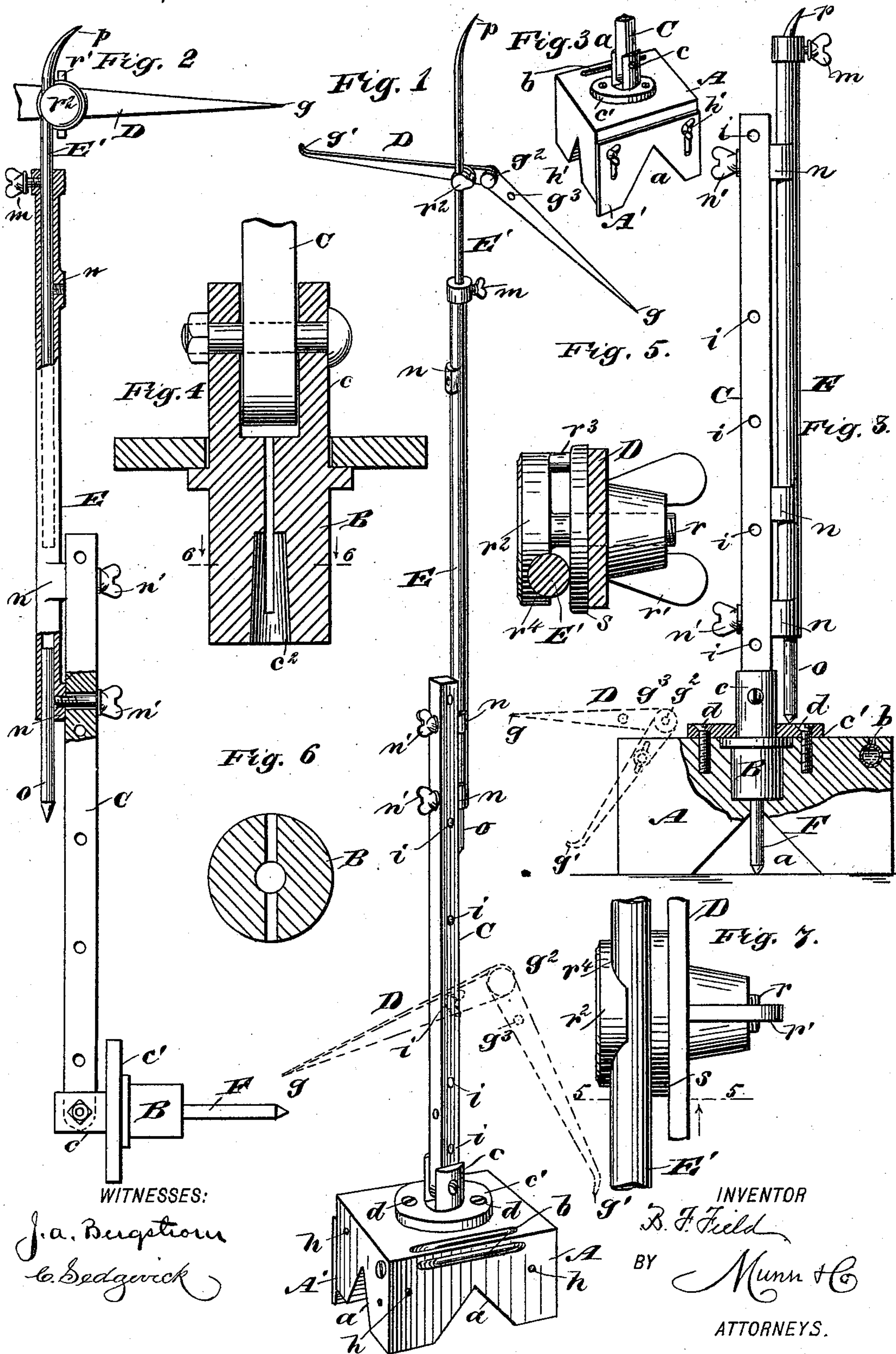


(No Model.)

B. F. FIELD.  
COMBINATION TOOL.

No. 491,840.

Patented Feb. 14, 1893.





# UNITED STATES PATENT OFFICE.

BENJAMIN F. FIELD, OF ELMIRA, NEW YORK.

## COMBINATION-TOOL.

SPECIFICATION forming part of Letters Patent No. 491,840, dated February 14, 1893.

Application filed July 22, 1892. Serial No. 440,868. (No model.)

*To all whom it may concern:*

Be it known that I, BENJAMIN F. FIELD, of Elmira, in the county of Chemung and State of New York, have invented a new and useful Combination-Tool for Machinists' Use, of which the following is a full, clear, and exact description.

The object of this invention is, to provide an improved composite tool, the members of which when assembled as one implement, will afford a convenient device for use as a surface gage, a box-square, a level, a trammel gage, and a scribing gage. Some of the component parts when detached are serviceable as separate tools for specific purposes.

The novel combination tool is well adapted for the use of machinists, in the placing and gaging of work in the process of execution, on a metal planer or lathe, and also in the erection of various kinds of machinery.

My invention consists in the peculiar construction and combination of parts as is hereinafter described and claimed.

Reference is to be had to the accompanying drawings forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a perspective view of the combination tool in an upright position; Fig. 2 is a partly sectional broken view of main portions of the composite device removed from a base portion; Fig. 3 is a side view of a composite implement partly in section, some parts in closed adjustment and other parts arranged for use as a surface gage or scribe block; Fig. 3<sup>a</sup> is a perspective view on a reduced scale, showing the base-block, attached standard in part, and a shoulder plate that is adjustable vertically on the side of said block; Fig. 4 is a detached, broken and enlarged sectional view of an essential portion of the improvement; Fig. 5 is an enlarged, detached and partly sectional view of parts shown enlarged in Fig. 7, taken on the line 5—5 in said figure; Fig. 6 is a view in cross section of parts complete, taken on the line 6—6 in Fig. 4; and Fig. 7 is an enlarged broken side view of an important feature of improvement.

A base block A, is provided, and forms one element of the composite tool; preferably said block is made of metal, rectangular in form,

and transversely grooved on the lower surface at right angles, as indicated in Fig. 1, which will produce four points of support for the block at its corners. The angular grooves  $\alpha$ , are each adapted to seat the block A on a cylindrical shaft or like piece in a plane parallel with the axis of the piece it engages.

A spirit level  $b$ , is embedded in the block A, in its top face, and above one edge, which coacts therewith and serves to indicate if a cylindrical body or a plane surface is horizontal when thereto applied.

In Fig. 3, it will be seen, that the base block A, is centrally and vertically perforated producing a circular socket hole of a proper depth; there being a counter bore produced from the upper surface of the block, thereby enlarging the hole diametrically near its upper edge.

Within the socket hole of the block A, a swivel joint piece B, is neatly fitted; it consisting of a cylindrical plug, flanged to fit the counter-bore of the socket hole, and projecting above the block a proper distance, said projecting portion  $c$  having a longitudinal slot axially formed in it, of a suitable width to receive the lower end portion of a standard C. As represented in Figs. 4 and 6, the cylindrical lower portion of the swivel piece B, is axially and longitudinally slotted to a point near the lower end. The piece B is by preference made of elastic metal and the plug portion of the same proportioned in diameter, so as to require a slight compression of its slotted body to introduce it within the socket hole of the block A, thereby affording a close fit while rotation of the swivel piece is permitted; a washer plate  $c'$ , that encircles the part  $c$ , and rests on the block over the flanged portion of the swivel piece, being secured on the block by screws  $d$ .

The standard C, is a bar of metal or hard wood, rectangular in cross section and of a length suited to the service to be rendered; having its lower end pivotally secured between the ears of the piece B, that project above the base block A.

A pair of calipers D, are provided which are of a style having one leg pointed as at  $g$ , and the free end portion of the other leg curved as indicated at  $g'$ , in Figs. 1 and 3.



There are threaded holes  $h$ , formed in the sides of the base block A, near the corners for the clamped attachment of the calipers D, to said block; a set screw that passes through a hole in a leg of the calipers and engages an appropriate threaded hole in the block, serving to adjustably secure the parts together as shown by dotted lines in Fig. 3.

The attachment of the calipers D, upon the block A, as stated, affords a convenient implement for setting work true upon a planer bed, either the pointed leg or curved leg being available for such a purpose; the method of connection allowing the ends of the legs to project beyond the base block and the joint of the same at  $g^2$ , facilitating the vertical adjustment of the point of a leg that is used as a gage or scriber.

The standard C, is perforated laterally in series as at  $i$ , for the removable attachment thereto of the calipers D, which when clamped upon the piece C, at any desired point of elevation, as shown by dotted lines in Fig. 1, will afford a surface gage and scribing block for work of greater height from the planer bed.

The telescopic trammel bar E, E', is another element of the composite tool, and as shown consists of a tubular section E, into which a cylindrical rod E', is introduced so as to slide therein with a neat fit; a set screw  $m$ , serving to retain the rod at any point of extension from the tube. At suitable points on the tubular piece E, nut blocks  $n$ , are formed or secured, which are perforated and tapped to receive the threaded bodies of set screws  $n'$ , which are inserted through transverse perforations made in the standard C; said holes being so located, that the entire trammel bar may be secured as shown in Fig. 3, in lowered adjustment on the standard, or be projected above the latter, as indicated in Fig. 1. A steel point or nose piece  $o$ , is secured in the lower end of the trammel bar tubular portion E, which point serves as a terminal end for the trammel, when it is employed to measure interior diameters of cylinders, or distances between shoulders on machinery or other structures. The free end  $p$ , of the rod E', is pointed, and preferably curved slightly, which will adapt it to serve as a trammel point, or a gaging point when the composite tool is employed to place work in parallel with a planer bed, or locate a line on the material, at an equal distance from the working face of said bed or platen (not shown.) There is a center point piece F, removably inserted in an axial perforation  $c^2$ , formed in the lower part of the swivel joint piece B, said point piece being of such a proportionate length as will allow its tapered point to enter a prick punch mark on a rod or plane surface whereon the block A, may be placed, and thus retain the composite tool with the center of the standard C, directly above the engaged punch mark, so that any desired interval or space subtended by the combined length of the standard and tram-

mel bar, may be marked upon work, either above, or at each or either side of the engaged center piece F.

The calipers D, may also be used in connection with the trammel bar E, E', and standard C, upon, or removed from the base block A, as shown in Figs. 1 and 2.

The preferred means for removably clamping the calipers on the rod E', is represented clearly in Figs. 5 and 7, and consists of a bolt  $r$ , having a winged nut  $r'$  and a flat head  $r^2$  provided with a stud  $r^3$ , formed near one edge on the side nearest to the nut, and a groove  $r^4$  is formed in this side of the head opposite the stud and near the periphery of the head. Upon the bolt body  $r$ , a washer  $s$ , is loosely mounted before the bolt is inserted through one of the perforations  $g^3$  in the legs of the calipers, and then the clamp is slid upon the body of the trammel rod E', engaging the groove  $r^4$  and washer  $s$ , so that the tightening of the nut  $r'$  will secure the calipers leg upon the rod and project therefrom at any desired angle.

It will be seen that the free leg of the calipers D, may be set at any angle to the trammel bar by flexure of the joint  $g^2$ , which will adapt the tool for universal adjustment; the jointed attachment of the standard C, with the swivel piece B, facilitating such a result, as it permits the standard and trammel, along with the calipers attachment, to be inclined at any desired angle from a cylindrical or plane surface whereon the base block A is imposed, to scribe or gage work with the calipers points or the point  $p$  of the trammel rod E'.

In Fig. 2, the standard, trammel, calipers, and swivel joint piece B, are shown detached from the base block A, and arranged as an extension trammel bar, the swivel piece B with the point F, forming one leg of the trammel by flexure of the parts so as to extend the point at a right angle to the standard C, the pointed leg of the calipers D, being clamped upon the rod E' so as to produce the other trammel limb.

It will be evident that the block A, may be used alone as a level, or a box square to lay off key seats in shafts; also that the trammel E, E', can be separately used, and that the calipers may be employed for usual purposes if separated from the trammel bar.

A useful attachment for the base block A, is shown in Fig. 3<sup>a</sup>, consisting of a vertically-adjustable shoulder plate A' that is slotted opposite the perforations  $h$  in the block, for the passage of clamping screws  $h'$  through the plate into said holes, whereby the shoulder plate is adapted for depression below the bottom face of the block along one edge; and when clamped in such a position, affords a gaging shoulder for the block that will be serviceable if it is desired to set work parallel with the side edge of a planer bed; the depending plate being made to bear on such an edge as the block and scriber point are moved along the latter.

Having thus fully described my invention,



I claim as new, and desire to secure by Letters Patent,—

1. A surface gage, comprising a base block, a vertically-adjustable shoulder plate on said block, and calipers secured adjustably on the block, substantially as described.

2. The combination with the rectangular block A, having a central vertical aperture, and a cruciform recess in its lower face, the members of which intersect at said aperture, a level tube on the block; the sides of the block being provided with apertures *h*, of the calipers provided with a clamping screw to engage any one of said apertures, substantially as set forth.

3. In a combination tool, the rectangular block A having a central vertical aperture, a cruciform recess on its lower face the members of which intersect at said aperture, in combination with the horizontally swiveling piece B mounted in said central aperture and provided with a depending center F, and the standard hinged to the upper end of the piece B, substantially as set forth.

4. In a combination tool, the combination with the standard D, of the telescopic trammel bar E E' parallel therewith, upper and lower bolts passed through the standard into the bar E and permitting it to be raised and lowered, a calipers, and means for securing the calipers to the standard D or to the section E' of the said bar, substantially as set forth.

5. The combination with the standard D, of the trammel bar E adjustably secured thereto and provided at its ends with the extensible rod E' and point or nose piece *o*, the rod E' and piece *o* being separate and independent one of the other substantially as set forth.

6. The combination, with a slotted swivel piece, a base block wherein said piece swivels,

and a center point piece projected axially from the swivel piece, of a standard jointed to the swivel piece, an extensible trammel adjustably secured on the standard, and calipers removably attached with a swiveling clamp on the trammel, substantially as described.

7. The combination, with a standard, a hinge jointed piece at one end of the standard, and a center point piece axially projected from said hinge-jointed piece, of a longitudinally extensible and adjustable trammel bar, calipers on the trammel bar, having one leg pointed and the other leg curved near its outer end, and a clamping device adapted to permit the calipers to swivel or flex in any direction on the trammel bar, substantially as described.

8. A composite tool, comprising a base block transversely grooved on its lower face, a spirit level tube on the top face of the block and parallel with one edge thereof, a swivel joint piece loosely secured in a socket located centrally of the base-block, a standard hinged to the swivel piece by one end, an extensible trammel bar adjustably secured on the standard, calipers having a pointed and a curved leg, and a swivel clamp adapted to removably connect either leg of the calipers to the trammel bar, substantially as described.

9. The combination with the centrally apertured base, of the longitudinally split swivel piece B swiveled therein, the split in the swivel piece imparting a spring action thereto and causing it to expand against the walls of the base aperture and bind by friction and the post hinged to the upper end of said piece, substantially as set forth.

BENJAMIN F. FIELD.

Witnesses:

E. J. BALDWIN,  
J. N. COLLINS.