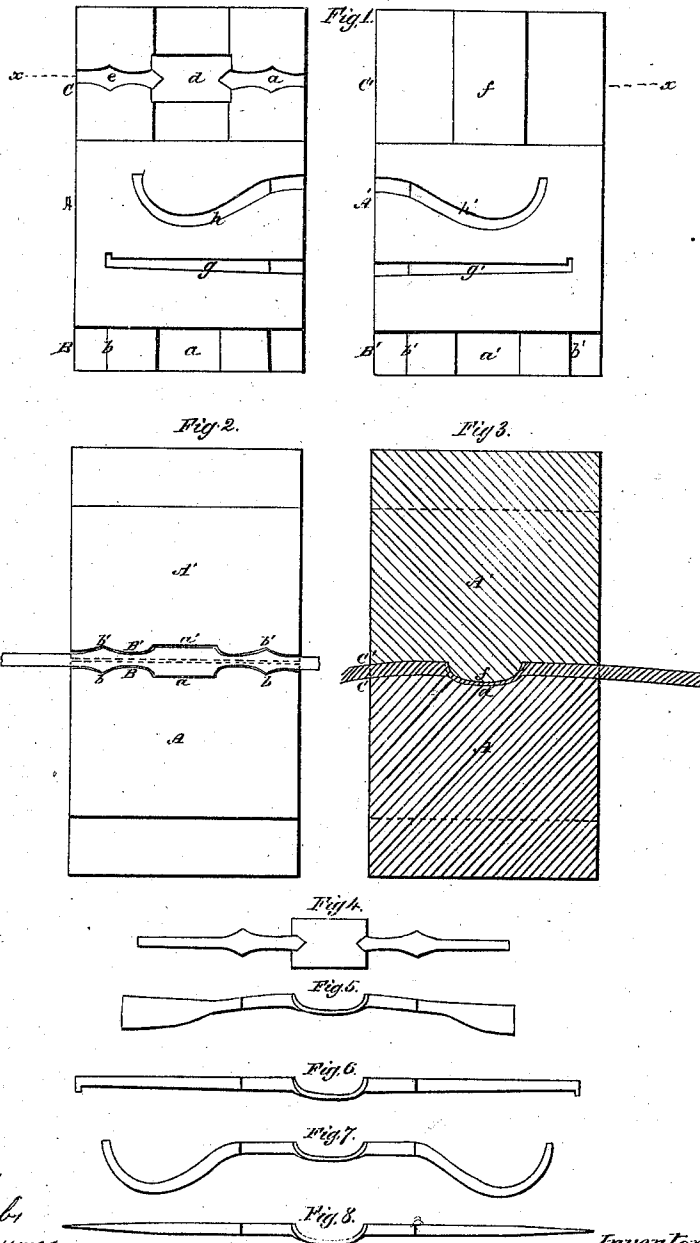


N. C. Smith

Making Calipers.

N^o 94,920.

Patented Sept. 14, 1869.



Witnesses:

J. H. Coombs
Thos. Haynes

Inventor:

N. C. Smith

United States Patent Office.

NOAH C. SMITH, OF BERLIN, ASSIGNOR TO THE ROYS & WILCOX COMPANY, OF EAST BERLIN, CONNECTICUT.

Letters Patent No. 94,920, dated September 14, 1869.

IMPROVED DIE FOR MANUFACTURING SPRING-CALIPERS.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, NOAH C. SMITH, of Berlin, in the county of Hartford, and State of Connecticut, have invented a new and useful Improvement in the Manufacture of "Spring-Calipers or Dividers," of which the following is a full, clear, and exact description, reference being had to the accompanying drawing, forming part of this specification, and in which—

Figure 1 represents face views of a pair of dies for making spring-caliper or divider-blanks, in accordance with this, my improvement;

Figure 2, an end view of a pair of such dies when arranged in position to do their work; and

Figure 3, a transverse section of the same, taken as indicated by the line *x x* in fig. 1.

Figures 4, 5, 6, 7, and 8, represent caliper or divider-blanks under different forms and at different stages of their manufacture.

Similar letters of reference indicate corresponding parts.

This invention consists in swage-dies, into the faces of which are worked or formed the required shape of spring-caliper or divider-blanks at different stages of their manufacture, and whereby the same are produced from a plain or straight bar of steel, (through the action of the dies as applied to a drop-press, or otherwise equivalently operated,) in a finished or nearly finished condition, ready for attachment of the screw which is used to effect the adjustment of the calipers or dividers.

Referring to the accompanying drawing—

A represents the lower die, which may be fitted in any suitable manner to the bed of an ordinary drop press, and A', the upper die, designed to be carried by the hammer of said press.

B B' are corresponding depressions, formed in the faces of the dies, between which is properly entered and centred a heated straight bar or piece of steel, of the requisite length and uniform width and thickness, or thereabouts.

These depressions are enlarged, as at *a a'*, and *b b'*, so that on bringing the upper die down on to the bar, stock is taken from the portions of the bar lying between and outside of such enlargements, and forced into the latter, as represented in fig. 2, to give the necessary amount of, and preparatory shape to, the metal to form the spring or bow and swells in

the legs of the calipers or dividers for attachment of the adjusting-screw.

The blank, thus partially formed, is then laid in another depression, C, in the lower die, that is designed to operate in concert with a peculiar formation, C', to the upper die, so that on the two dies being brought together to act upon the blank, they give a finished shape to the spring and swells, hereinbefore referred to.

This is accomplished by making the depression C, in the lower die, of circumscribed width, which was not necessary or desirable for the depression B B', and further forming said lower depression, C, with enlargements, *d* and *e e*, that correspond in a measure to the enlargements *a* and *b b'*; but the enlargement is made of concave form, for operation in concert with a convex projection, *f*, on the upper die, that gives to the spring its necessary arched shape or bend, as represented in fig. 3, and which forms the blank, as illustrated in figs. 4 and 5.

The blank has either of its end or leg-portions then laid in succession within depressions (as shown at *g* and *h*) in the lower die, (preparatorily bending said legs to fit, if necessary,) so that on bringing down the upper die, which is provided with corresponding depressions, *g' h'*, the necessary shape or finish is given to the blank to complete its spring-swells and legs, accordingly as said blank is required for an inside calipers, outside calipers, or for a divider.

Figure 6 represents such a blank as finished for a callipers for taking inside measurements;

Figure 7, a blank to form an outside calipers; and

Figure 8, a blank to form a divide or spring-compass, the depressions *g* or *h*, and *g'* or *h'*, in the dies, varying according to the blank required.

The after bending of the blank into bow or compass-form, removal of fin from it, and otherwise furnishing it, to complete the instrument, require no reference here, as such form no part of the invention.

What is here claimed, and desired to be secured by Letters Patent, is—

The dies A A', constructed and operating to form spring-caliper and divider-blanks, substantially as specified.

Witnesses:

FRED HAYNES,
EDWD. ADAMS.

N. C. SMITH.