J. ATKINS.

SHEET-METAL GAGE.

No. 173,104. Patented Feb. 8, 1876.

Fig. 1.

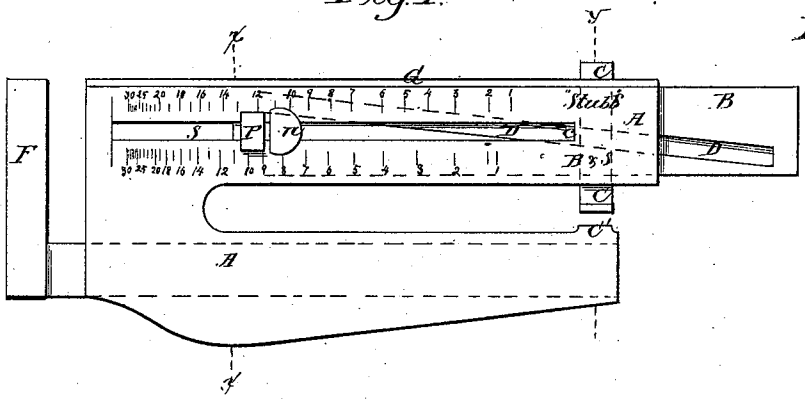


Fig. 4. Fig. 5.

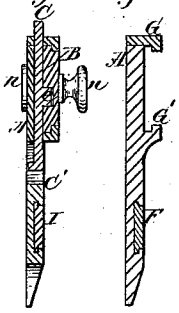


Fig. 3.

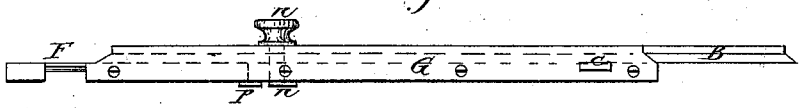


Fig. 2.

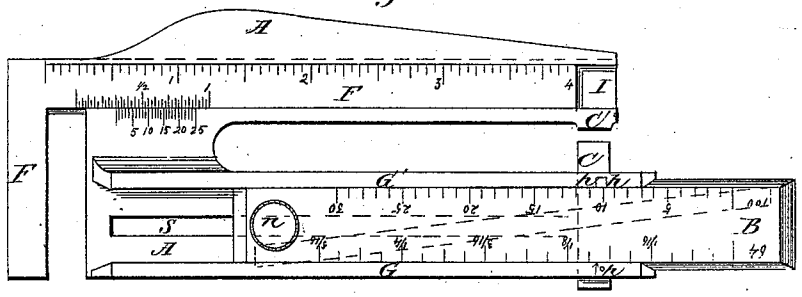
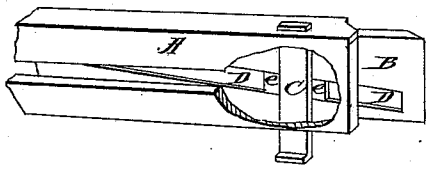


Fig. 6.



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UNITED STATES PATENT OFFICE.

JAMES ATKINS, OF BROOKLYN, NEW YORK.

IMPROVEMENT IN SHEET-METAL GAGES.

Specification forming part of Letters Patent No. **173,104**, dated February 8, 1876; application filed June 2, 1875.

To all whom it may concern:

Be it known that I, JAMES ATKINS, of Brooklyn, Kings county, New York, have invented a Measuring-Gage, of which the following is a specification:

This invention consists in the construction and arrangement of a measuring-gage for sheet metal, wire, and other substances, whereby the measurements can be read in equal divisions of the inch, or in the "numbers" of sheet metal and wire by the English or American, or any other standard according to which it is marked, whereby measurements of the thickness of sheet metal can be made at a distance from the edges of the sheets, thereby avoiding the burrs and inequalities usually existing on such edges, and whereby all measurements can be made with great accuracy, and the results correctly and easily read.

The following is a detailed description of my invention, reference being had to the accompanying drawing, which represents one of these gages, measuring from zero to three-tenths of an inch by the pin C, and four inches by the caliper.

Figures 1 and 2 are views of the two opposite sides of the instrument. Fig. 3 is a top view. Figs. 4 and 5 are transverse sections through Fig. 1, on the lines *y y* and *x x*, respectively. Fig. 6 is a perspective view of the end of the larger arm of the frame A, together with the slide B and pin C, with a portion of A removed to more clearly show the relation of these several parts to each other. For the same purpose the drawing represents the slide B and the caliper-square partially drawn out.

Similar letters of reference indicate corresponding parts.

A is the frame or body of the gage, divided, throughout the greater part of its length, into two arms, which span the substance to be measured, and made preferably of steel, and of such proportions as to insure the necessary rigidity of the parts. Across one of these arms, near its end, in a suitable slot, moves the pin C, and opposed to its foot is the projection C′ on the other arm of the frame. Between this pin C and projection C′ the measurements are made, and their opposing faces are made true planes and parallel to each other. The pin C is moved to and from C′ by the action of the inclined planes formed by the faces of the slot D, through the medium of the tongue *e*, which is part of the pin C, and fits accurately in the slot. The plate B moves in a direction parallel to the length of the larger arm of the frame A, and, consequently, at a right angle to the direction of the pin C, this direction being secured by the guides G G′. The angle of the slot D with the parallel edges of B, or, in other words, the inclination of the planes, may vary in different instruments, as their proposed use may require, but should never be large, as on the smallness of the angle, and, consequently, the great space through which B moves compared with that through which it moves the pin C, depends the degree of minuteness to which the measurements can be carried.

In the accompanying drawing, the inclination of the planes is as one in ten, so that a movement of B through one-hundredth of an inch shows a movement of one-thousandth of an inch in the pin C. To indicate the extent of these movements of C, or the space between the opposing faces of C and C′, suitable divisions are marked off on the back of B or other suitable place, and fixed indicating-pointers *p p*, or their equivalents, are so situated as to point to zero when C and C′ are in contact with each other, and when the latter are separated from each other the position of *p p* on their respective scales indicates the amount of that separation. In the case illustrated by the drawing the divisions of these scales correspond to movements of C through hundredths of an inch and sixty-fourths of an inch, respectively; and on G′, to the right of the pointer *p*, are marked off ten divisions of one-hundredth of an inch each, by which means measurements can be read to thousandths of an inch.

With a properly-proportioned instrument of this kind, the accuracy with which these minute measurements can be made is limited only by the degree of perfection of the fitting of the working parts.

To adapt the gage to measuring by the standard sheet-metal and wire "numbers," two or more series of divisions are marked off on the back of the frame A, one corresponding to

he Stubs (or English) standard, and the other o the Brown & Sharpe (or American) standard, r any other desired standard, and the measure- nent is indicated by the position of the point- r P on these scales. The pointer P is per- nanently attached to the slide B, and moves vith it along the slot S.

The length of the divisions in the latter scales is easily determined as follows: The in- line of the slot D being in this case as one in en, the mark in the scale corresponding to each number is distant from the zero-mark ust ten times the size of that number. Thus 'No. 1" iron (Brown & Sharpe standard) is $\frac{289}{1000}$ inch thick; hence the mark on the scale lenoting that number is $\frac{289}{1000} \times 10 = 2\frac{89}{100}$ inches from the zero-mark. "No. 30" is one-hun- dredth inch thick; hence, its corresponding mark is one-tenth inch from the zero-mark in the scale.

Passing through the plate B and slot S in frame A, and moving with B, is the screw- clamp *n*, by means of which B and C may be held in any desired position.

Movable in the groove I in the smaller arm of the frame A is the slide and jaw F F, form- ing, with the end of A, a sliding caliper, which may be graduated to even divisions of the inch, and by means of a vernier may be read to thousandths of an inch, as sliding calipers are ordinarily marked. F is so constructed, also, that it may be used as a machinist's square.

The gage may be made of any size, from a small pocket-instrument to a heavy stationary one for the use of manufactories, &c.

Having thus described my invention, I claim as new and desire to secure by Letters Pat- ent—

1. The combination of the frame A, pin C, slide B, the graduated scales on A and B, and the pointers P and *p p*, or their equivalents, substantially as and for the purpose described.

2. The combination of the frame A, slide B, and pin C, and the caliper-square F, substan- tially as and for the purpose set forth.

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