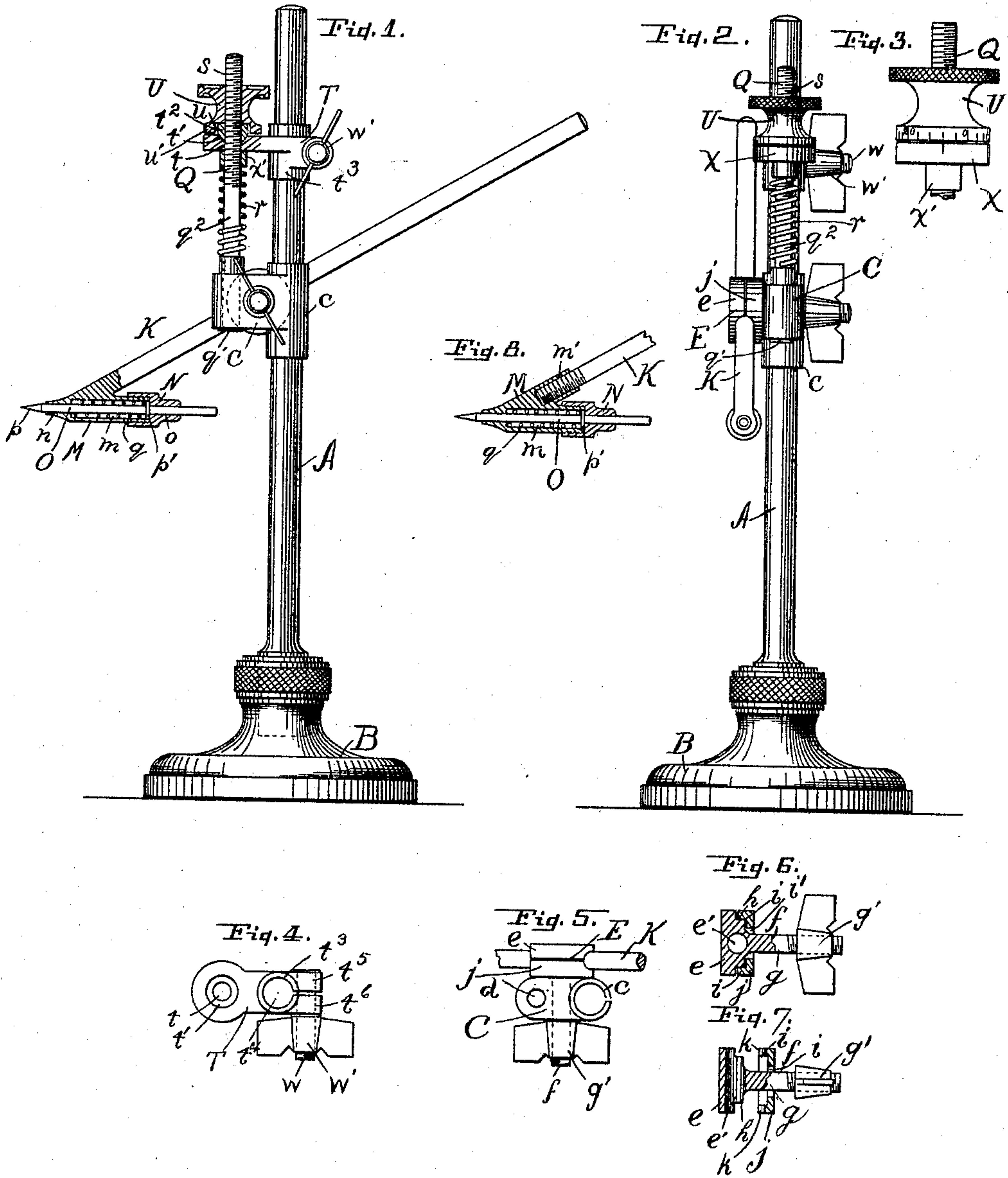


(No Model.)

P. A. RENKO.  
SURFACE GAGE.

No. 495,565.

Patented Apr. 18, 1893.



WITNESSES:

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# UNITED STATES PATENT OFFICE.

PETER ANTONOVITCH RENKO, OF PRINCE'S BAY, NEW YORK.

## SURFACE-GAGE.

SPECIFICATION forming part of Letters Patent No. 495,565, dated April 18, 1893.

Application filed June 27, 1892. Serial No. 438,202. (No model.)

*To all whom it may concern:*

Be it known that I, PETER ANTONOVITCH RENKO, a citizen of Russia, and a resident of Prince's Bay, in the county of Richmond and State of New York, have invented certain new and useful Improvements in Surface-Gages, of which the following is a specification.

My invention relates to improvements in surface gages, and it is the object of my invention to adapt the instrument to the very accurate locating of points as well as of lines, and to accurately mark the points on the work.

Essentially my invention consists in a spring actuated prick or plunger which can be used singly or in arrangement with an accurate micrometer adjusting device. When the plunger is brought by the micrometer to very accurate adjustment, a light blow on the plunger makes a prick mark in the work without any displacement of the instrument, so that greater accuracy in marking points, as at the intersection of lines and the various centers of work, is attained than is possible with existing gages, which have not the plunger.

Referring to the drawings which accompany the specification to aid the description, Figure 1 is an elevation of the instrument showing the adjustable arm and the plunger, the latter however in section. Fig. 2 is an elevation of the instrument looking toward the plunger. Fig. 3 is an enlarged detail of the micrometer nut. Fig. 4 is a plan of the upper sliding block. Fig. 5 is a plan of the lower sliding block showing the adjustable arm broken. Fig. 6 is a detail, partly sectioned, of the clamp for the arm taken on a plane perpendicular to the arm. Fig. 7 is a detail of the same on a plane parallel to the arm. Fig. 8 is a detail of the plunger when made separately from the arm and threaded thereto.

A, is the standard of any suitable metal, usually steel, finished accurately cylindrical and set in a base, B, and exactly perpendicular to the plane bottom of said base.

C, is a sliding block having a true working fit on the standard, A, and preferably made with the collar, c, split as seen in Fig. 5. Said sliding block, C, has the eye, d, see Fig. 5 for the micrometer screw, and carries the clamp,

E. Said clamp is preferably made with the eye block e, and clamp bolt, f, in one piece, said bolt, f, having a smooth part g, which passes with nice working fit through a horizontal hole in the sliding block, C, and has threads on its end catching female threads on the thumb nut, g'. Said eye block, e, has a shoulder h, fitting with true working fit in the rim, i, of the clamp block, j, said bolt, f, passing with easy fit through an axial hole, i', in the back plate of said clamp block, j, (Figs. 6 and 7,) and diametrically opposite in said rim, i, in line with the eye, e', of the eye block, e, are semi-cylindrical sockets, k, so that when the eye block e, and clamp block, j, are drawn together they will clamp between them the arm, K, which carries the plunger. Any other clamp may be substituted for that shown, and I do not claim said clamp as my invention. As said, the arm, K, finished truly cylindrical and preferably of steel passes with true working fit through the eye, e', and carries at its operative end the case, M. Said case is approximately cylindrical, is chambered internally as at m, the tip being bored axially at n, and a cap, N, bored at o, and threaded to catch threads on the case, M, is provided to close the open end of the chamber, m, and form a shoulder for the collar p' on the plunger O. Said plunger is a truly cylindrical rod of steel, working with true fit in the holes n and o, pointed at its working end, p, and having the collar, p', to bear against the cap, N.

q is a spring around the plunger, O, to push the same back after it has been advanced.

Said case, M, may either be formed integral with the arm, K, or may have a threaded sleeve, m', to thread on the end of said arm. As said the micrometer screw, Q, passes with working fit through the eye, d, in the sliding block, C, having the flanged head, q', to engage on said sliding block, the smooth body, q<sup>2</sup>, around which is coiled the spring, r, and the fine-pitch micrometer screw threads, s. The threaded end of the screw, Q, passes with easy fit through the eye, t, in the upper sliding block, T. The top of the said sliding block, T, has a semispherical recess, t', in which is freely set the ball washer, t<sup>2</sup>, on the flat top of which bears the micrometer nut,



U, said nut being recessed out on the under side, as at  $u$ , forming a rim,  $w'$ , which does not quite touch the sliding block, T, so that there is little friction. Said sliding block, T, 5 has a collar,  $t^3$ , with eye,  $t^4$ , which fits over the standard, A, the said collar,  $t^3$  being split behind and having lugs,  $t^5$ ,  $t^6$ , through which is a hole for the bolt  $w$ , with its thumb nut,  $w'$ . On the periphery of the aforesaid nut, 10 U, are marked divisions of the circumference as shown, and the sliding block, T, has a corresponding circular part,  $x$ , on the periphery of which is indicated the zero. Said part,  $x$ , also has a collar,  $x'$ , forming a shoulder for 15 the spring,  $r$ .

The screw, Q, has forty threads to the inch, and the nut, U, has twenty-five divisions on it, so that the movement of the nut one division corresponds to a movement of one 20 thousandth of an inch of the plunger point,  $p$ .

Now the operation is as follows: The work being set up, suppose it is desired to mark parallel lines thereon. By slacking the thumb nut,  $w'$ , the sliding block, T, can be raised or 25 lowered moving, the block, C, also, until the plunger point,  $p$ , is at exactly the right height. In reaching this adjustment the thumb nut,  $g'$ , may be slackened, and the arm, K, inclined at different angles. Then the thumb nut,  $g'$ , 30 will be tightened, thereby clamping the arm, K, and then the upper thumb nut,  $w'$ , will also be tightened, clamping the sliding block, T, to the standard, A. If a very exact adjustment is required, the micrometer nut, U, may 35 then be turned raising or lowering the sliding block, C, and getting the adjustment with great accuracy. The line is then drawn by moving the standard along on the surface plate. To draw a new line any desired number of thousandths of an inch from the original line the micrometer nut is turned in the 40 proper direction, each division of the scale representing one-thousandth of an inch vertical motion of the point. Thus the second line is located with great accuracy and drawn, 45 and so on. Similarly to fix any center, or point, as the intersection of two lines, the plunger point,  $p$ , will be brought very accu-

50 rately to the proper position against the work by the micrometer nut U, as described, and a tap given to the end of the plunger without disturbing the instrument. A prick-mark will be thus very accurately made.

Now having described my improvement, I claim as my invention— 55

1. In surface gages, and in combination with an adjustable arm, a retractile plunger adapted to prick the work.

2. In surface gages, a retractile plunger adapted to prick work, a guide socket for the 60 plunger and a tension device to retract said plunger.

3. The plunger, O, case, M, and spring,  $g$ , as and for the purpose described.

4. The combination in surface gages, of a 65 standard, an adjustable arm carried by the standard, a retractile plunger carried by said arm and a tensional device to retract said plunger.

5. The combination in surface gages of a 70 standard, an adjustable arm carried by said standard, a retractile plunger carried by said arm, a micrometer screw adapted to move said arm rectilinearly and micrometer nut supported by said standard for said screw. 75

6. In surface gages, the combination of a standard, a sliding block working on said standard and carrying a clamp in which is an adjustable arm, a retractile plunger on said arm, a micrometer screw movably connecting 80 said sliding block with a second sliding block that is clamped on said standard, and a micrometer nut for said screw carried by said second sliding block.

7. In surface gages, the combination of a 85 micrometer screw, a block through which said screw works, a ball washer in a socket in said block, and a micrometer nut meshing with said screw and carried by said washer.

Signed at New York, in the county of New York and State of New York, this 4th day of June, A. D. 1892. 90

PETER ANTONOVITCH RENKO.

Witnesses:

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