(No Model.)

V. L. OURDAN.

PROPORTIONAL DIVIDERS.

No. 342,455. Patented May 25, 1886.

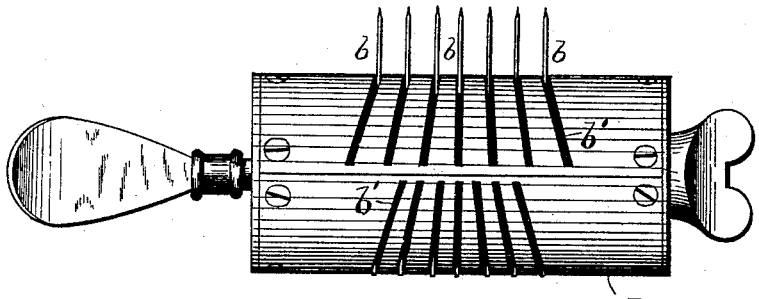

Fig 1.

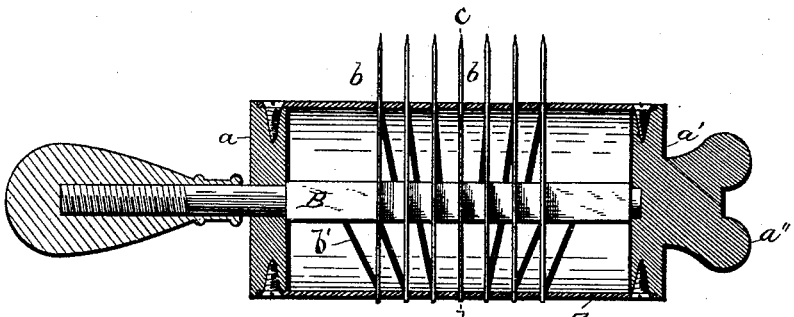

Fig 2.

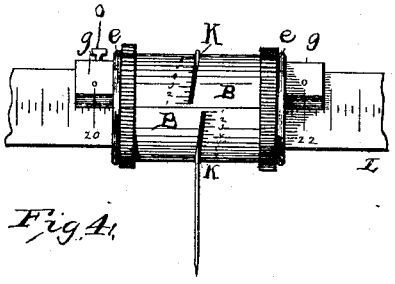

Fig 4.

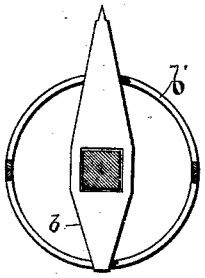

Fig 3.

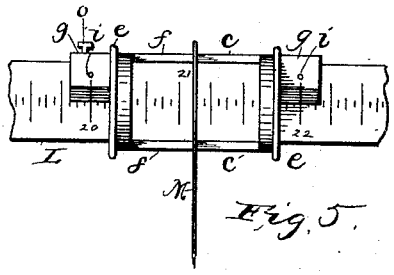

Fig 5.

Witnesses:
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Inventor,
Vincent L. Ourdan
by V. D. Stockbridge
Atty.

UNITED STATES PATENT OFFICE.

VINCENT L. OURDAN, OF WASHINGTON, D. C., ASSIGNOR OF ONE-HALF TO GEORGE L. DYER AND JOHN H. FILLMORE, OF SAME PLACE.

PROPORTIONAL DIVIDER.

SPECIFICATION forming part of Letters Patent No. 342,455, dated May 25, 1886.

Application filed August 29, 1885. Serial No. 175,668. (No model.)

To all whom it may concern:

Be it known that I, VINCENT L. OURDAN, a citizen of the United States, residing at Washington, in the District of Columbia, have invented certain new and useful Improvements in Proportional Dividers; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to an improvement in drafting or engraving instruments and other instruments and machines wherein an equal, unequal, or proportional subdivision of lines or spaces or an equal, unequal, or proportional spacing of points, pens, knives, saws, or other tools may be required.

My invention consists, essentially, in a new and improved instrument for measuring or dividing lines or spaces or for pointing, working, or writing in parallel lines or in lines having any desired relation to each other, any surface or substance, the distance between said points, marks, or cuts being capable of ready and certain adjustment by means connected with and a part of the instrument itself.

It also consists in the construction and combination of various parts of an instrument or machine, which will be hereinafter described, and specifically pointed out in the claims.

The principle of my invention is not limited to the particular application to an engraving or drafting instrument herein shown, the same being applicable to ruling-machines, sawing-machines, leather cutting or slitting machines, and others of like character, and, indeed, to any machine where an easy and accurate control over the position and movement of a point or tool may be required.

In the drawings I have illustrated a drafting and engraving instrument for facilitating the projection of maps and charts or other drawing or engraving where the accurate proportional dividing of lines and spaces is required.

Figure 1 represents a side elevation of my instrument. Fig. 2 represents a longitudinal section, and Fig. 3 represents a cross-section through *c d* of Fig. 2. Figs. 4 and 5 are views in elevation and section, respectively, of a special application of my invention to a beam-compass.

The instrument, which is illustrated by the accompanying drawings, consists—

First. Of a cylinder, A, made by joining two half-cylinders, each of which is provided with a number of slots or grooves, *b'*, these slots being so cut and arranged that when the two half-cylinders are put together, as shown in the drawings, a straight line drawn through a slot and the axis of the cylinder and perpendicular to the axis will pass through a corresponding slot of the opposite half-cylinder. The slots of each half-cylinder begin near one edge at equal or at any predetermined distances apart and run across toward the opposite edge (converging toward an apex) or running in any required relation to each other to cause the carriers or points to assume successively any required relation to each other.

Second. Of the shaft B, extending through the center of the cylinder, having a bearing in head *a'*, and extending out of the cylinder through a bearing in head *a*. To this extended end of the shaft is attached a handle. The portion of this shaft which is inside the cylinder is square or of other prismatic form, or of such form as to prevent the carriers or arms (hereinafter described) from turning thereon, and the inner portion of this shaft is of such size as to prevent its passing through the head.

Third. Of two cylinder-heads, *a* and *a'*, secured in the ends of cylinder by screws, as shown, or otherwise. In the drawings the head *a'* has a thumb-screw, head, or knob, *a''*, on its outer side, for use in handling and turning the cylinder about the shaft. It has also a socket-bearing to receive the end of the shaft. The other head has a hole through the center, forming a bearing for the handle end of shaft.

Fourth. Of an arm or arms, or carrier, or a series of arms or carriers, *b b*, having holes through them of the same shape as the cross-section of the shaft, and made to fit accurately in the slots of the cylinder, and of such length as to allow them to pass completely through the cylinder and be flush with the outside on one side, and to extend beyond the outside of the cylinder on the other side to a suitable distance, upon which points, pens, knives, saws, or other bits or tools may be attached.

Fifth. Of a suitable scale on the surface of the cylinder, as shown in the drawings at Fig. 4, for showing the distance apart of the points or other required distance or relation. A set-screw may also be fixed on the head, for fixing or setting the arms or carriers in any required

position in the device or machine. When the cylinder is turned on the shaft, the arms, or carriers will move in the slots and approach or recede from any given point, or toward or from each other, according to the law determined by the relation of the slots to each other. The arms will slide along the shaft, and as each end of each carrier passes through a close-fitting slot, the carrier must move steadily and evenly along the shaft.

As an example of the use of the above-described instrument, suppose it is desired to divide a number of unequal lines or spaces proportionally—that is, into the same number of equal parts—say six. Turn the cylinder on the shaft until six spaces of the points of the instrument just cover the line or space. Then a slight pressure on the instrument will cause it to register the proper number of marks along the line or space for such a division. Then, any other line or space may be divided proportionally—that is, into the same number of equal parts—by turning the cylinder on the shaft until that line or space is just covered by the same number of spaces of the points of the instrument. Then a slight pressure on the instrument will cause it to register the proper number of marks along the line or space for the required subdivision. In the same manner any number of lines or spaces can be divided proportionally—that is, into the same number of equal parts.

An application of my invention to a beam-compass is shown in Figs. 4 and 5. In making this application I mount on a beam, L, a kind of saddle, *c c*, parts *e e* of which are cylindrical, forming a bearing for the controlling-cylinder B B. The parts *f f* slide freely along the beam-scale, and the extensions *g g* carry the zero-points *i i*. These being in coincidence with any two desired inch-divisions—say 20 and 22—the point M, being at the zero-point of the graduation of the slots K K, will be exactly opposite the intermediate inch-division—say 21. The graduation of the slots K K are such that by clamping the saddle to the beam-scale by means of screw *o* and turning the controlling-cylinder the point M will be moved accurately and easily any required fractional distance along the beam-scale from the intermediate division—that is, the moving point M can be accurately set for any required distance along the beam-scale to a degree of minuteness much exceeding the original divisions of the beam-scale. Thus this instrument is capable of performing the functions usually required of a vernier.

It is observed that cylinders of one instead of two parts may be used. The slots may be a single set running entirely around the cylinder, in which case the carriers may have hubs for long bearings on the shaft and pass through a single slot, or the thickness of the shell be increased to give the proper surface for moving the arms. Both ends of the shaft may pass entirely through the cylinder-heads for the adaptation of a yoke-like handle.

The head and shaft may be so arranged that the shaft can be withdrawn and any required number of carriers may be removed from the instrument, leaving the rest for use.

Although I have described one way of applying my invention, it is evident that the carriers or arms for the points, markers, knives, saws, or other tools may be operated by shells or cores or surfaces of other forms than cylindrical, as shown, and that they need not be rotated in fixed guides, as shown and described, as other equivalent means will occur and may be adopted, as convenience may suggest to skilled mechanics.

An essential feature of my invention is the maintenance of the predetermined relation of the carriers with each other, and the means for changing their positions or distances apart at will.

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

1. The new spacing or dividing instrument herein described, consisting, essentially, of an arm or holder for carrying a point, bit, or tool, a shaft or support for said arm, a fixed point, and a relatively-moving member provided with a slot arranged to bear against the arm and cause it to approach or recede from said fixed point in an easy and certain manner, substantially as described.

2. A new spacing or dividing instrument, substantially as described, consisting of a series of three or more arms or holders for carrying points, bits, or tools, and a relatively-movable member provided with a corresponding series of slots to bear against and cause the arms or holders to approach or recede from each other in an easy and certain manner, substantially as described.

3. In combination, a shaft, an arm or holder, provided with a hub to fit and slide on said shaft, and a relatively-movable member provided with a slot for causing the desired movement of said arm or holder in an easy manner, substantially as described.

4. The combination of a series of three or more arms or holders, a shaft, and a relatively-movable member provided with a corresponding series of slots for causing the recession or approach or otherwise controlling the position and movement of said arms or holders, substantially as described.

5. The combination of a series of arms or holders, a shaft, and a slotted cylinder for readily controlling the movement and position of said arms, substantially as specified.

6. The combination of a series of arms, a shaft for supporting said arms, a slotted cylinder, and a graduated scale, as and for the purpose set forth.

In testimony whereof I affix my signature in presence of two witnesses.

VINCENT L. OURDAN.

Witnesses:

V. D. STOCKBRIDGE,

WM. A. ROSENBAUM.