(No Model.)

F. ABORN.

DEVELOPING OR TRACING MACHINE.

No. 282,831. Patented Aug. 7, 1883.

Fig. 1.

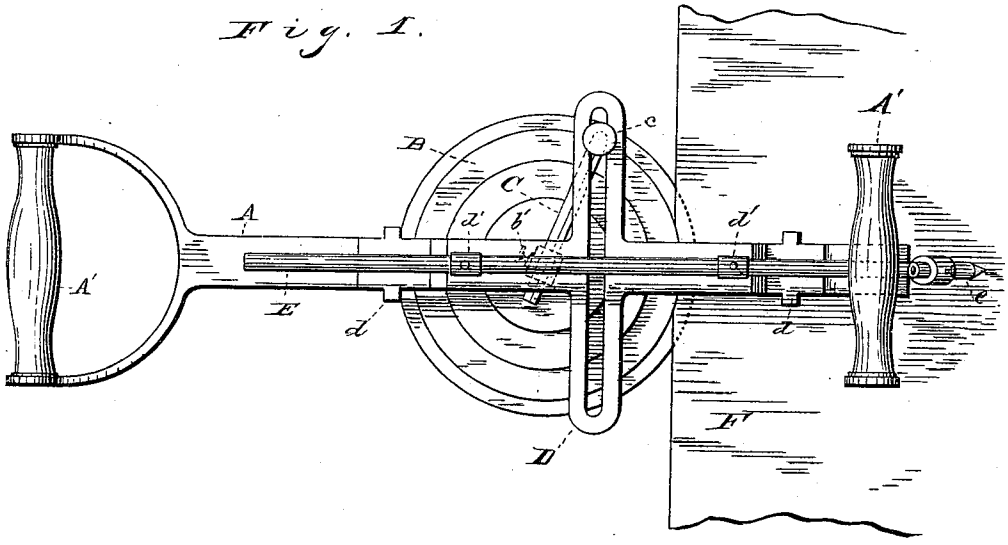
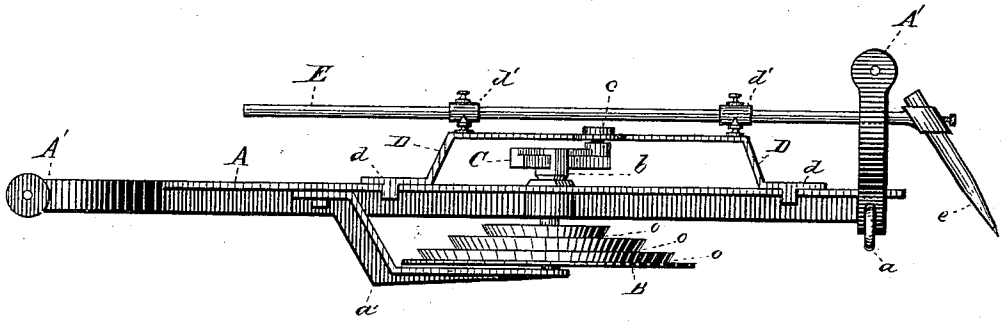


Fig. 2.



WITNESSES

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FRANK ABORN, OF CLEVELAND, OHIO, ASSIGNOR OF ONE-HALF TO FRANK H. LUNTE, OF SAME PLACE.

DEVELOPING OR TRACING MACHINE.

SPECIFICATION forming part of Letters Patent No. 282,831, dated August 7, 1883.

Application filed May 22, 1883. (No model.)

To all whom it may concern:

Be it known that I, FRANK ABORN, of Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Developing or Tracing Machines; 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 pertains to make and use the same.

My invention relates to improvements in developing-machines by means of which patterns of various kinds may be traced; and it consists of certain features of construction and in combination of parts hereinafter described, and pointed out in the claims.

In the drawings, Figure 1 is a plan view, and Fig. 2 is a side elevation, of an instrument embodying my invention.

A represents a bar of metal, that constitutes a bed or support for the instrument, and is provided at each end with handles A′, and at one end by a small guide-roller, *a*, and has attached underneath the arm *a′*. Between the arm *a′* and the bar A operate the pulleys or wheels B, that are attached to the shaft *b*, in such a manner that the shaft and wheels will turn together. These wheels are of any desired size, and should be so attached to the shaft that they can be easily removed and their place supplied by other wheels of different sizes, if so desired. These wheels are beveled on the edge, as shown, and preferably at an angle of about thirty degrees from the axis of the shaft *b*, for reasons hereinafter shown.

The shaft *b* is journaled in the arm *a′* and in the bar A, and passes through the latter, and is slotted or chambered at this end to embrace the crank-arm C, and has also the set-screw *b′* to secure the crank-arm C in any desired position.

The arm C is provided at one end with the wrist *c*, that operates in a transverse slot in the sliding frame or cross-head D. This frame is in the form of a cross, with the slot, as shown, in the transverse arms, while the longitudinal arms at their respective ends are bent down at *d* and embrace the bar A, and slide thereon. By bending the ends of the frame in the manner described an offset is formed that spans the said crank-arm C, as shown.

To the frame D are attached the thimbles *d′*, that support the rod E, and they are each provided with set-screws to hold the said rod in the desired position, and so that it will be operated by the frame D. The rod E is provided at one end with the adjustable tracing-point *e*.

The operation of my device is as follows: The sheet of metal or other substance, F, is laid on the table with the edge overhanging, and is secured in this position. The instrument is placed in the position shown in Fig. 1, with the edge of the wheel, that is of the required size, engaging the edge of the sheet F. The crank is made long or short, as may be required, by moving the crank-arm C through the slot in the shaft *b*, and when set at the required length is fastened by the set-screw *b′*. Next, the rod E is moved through the thimbles *d′* until the tracing-point will reach a suitable distance on the sheet F, and is then fastened by means of the set-screws on the said thimbles. Now, if the instrument is pressed against the edge of the sheet F and held in such position that the rod E will be at right angles to the said edge of the said sheet, and while held in this position the instrument is moved in a lateral direction, the wheel engaging the sheet F will revolve, and will cause also to revolve the attached shaft *b* and the attached crank, which in turn, by means of the engagement of the wrist *c* with the slot in the cross-head D, will reciprocate the said cross-head and the attached rod and tracing-point *e*, and in a direction at right angles to the aforesaid lateral movement of the instrument. If in the meantime the tracing-point *e* has been pressed upon the sheet F, there will have been traced an undulating curved line whose undulations are exactly alike. It will be found that the two dimensions—length and breadth—of any one of these undulations, the first measured laterally or on the base-line and the second measured on a line perpendicular to the base-line, will bear the same proportion to each each other as the circumference of the wheel bears to the throw of the crank.

A figure may be made of any desired size or shape that is within the capacity of this instrument by using a wheel whose circumference is equal to the length of the desired figure

measured on the base-line, and by setting the crank so that its throw will be equal to the desired width of the figure measured on a line perpendicular to the said base.

This instrument is well adapted to develop patterns in sheet-metal work, and it is often the case that an allowance must be made for the thickness of the metal, in order that one part of the work may fit into another part. This allowance is made by means of the beveled edge on the wheels B, and the angles, as shown, at the intersection of the line of the beveled edge with the horizontal line of the flange or wheel below, as at *o*, Fig. 2. If the metal is very thin, it will extend into the acute angle, so as to engage the wheel near the point of its smallest diameter; but if the metal is thick it cannot reach into the said angle so far, but will engage the wheel at a point farther upon the beveled edge, where the wheel is of greater diameter; and this increase in the size of the operating part of the wheel will increase the length of the figure or pattern traced or developed by the instrument.

What I claim is—

1. In an instrument for tracing or developing patterns, the combination, with developing-wheels adapted to make the figures or patterns developed or traced in their lateral measurement on the base-line equal to the circumference of the respective wheels, of an adjustable crank and mechanism adapted to trace or develop the same figures of a desired size or measurement on a line perpendicular to the base-line, substantially as described, and for the purpose set forth.

2. In an instrument for developing or tracing patterns, developing-wheels with beveled edges adapted to increase or to decrease the length on the base-line of the pattern or figure traced by increasing or decreasing the thickness of the plate on which the tracing was made by the instrument, substantially as shown and described.

3. In a developing-machine, the combination, with the wheels B, of the crank C, the cross-head D, the rod E, and the pointer *e*, substantially as described, and for the purpose specified.

In testimony whereof I sign this specification, in the presence of two witnesses, this 11th day of May, 1883.

FRANK ABORN.

Witnesses:
JNO. CROWELL,
CHAS. H. DORER.