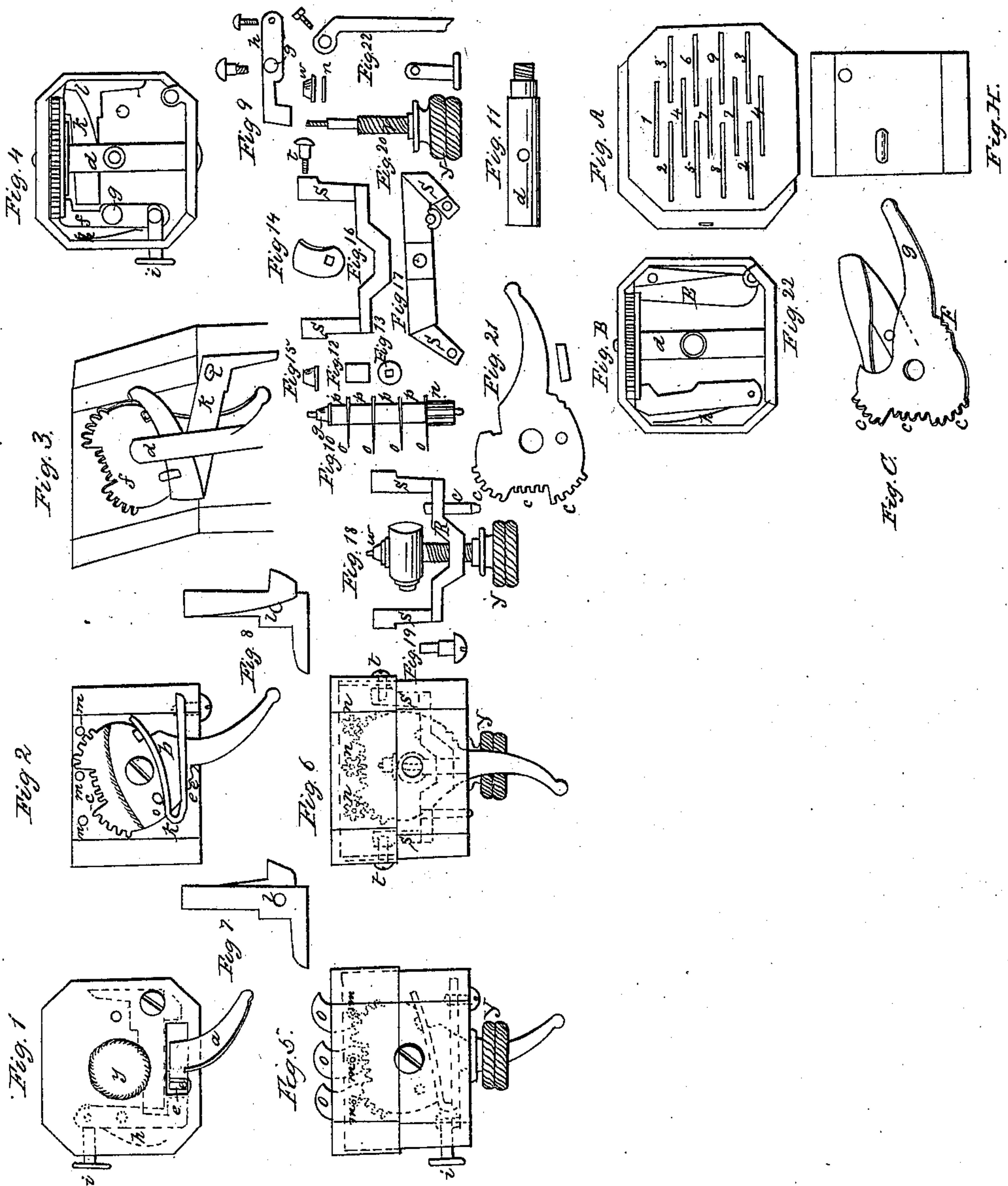


F. Leynoldt,
Scarificator,

No 5,111,

Patented May 15, 1847.



UNITED STATES PATENT OFFICE.

FREDERICK LEYPOLDT, OF PHILADELPHIA, PENNSYLVANIA.

SCARIFICATOR.

Specification of Letters Patent No. 5,111, dated May 15, 1847.

To all whom it may concern:

Be it known that I, FREDERICK LEYPOLDT, of the Northern Liberties, in the county of Philadelphia, in the State of Pennsylvania, have invented new and useful additions and Improvements in the Surgical Instrument or Machine Commonly Called a "Scarificator;" and I hereby declare that the following is a true and exact description thereof, reference being made to the accompanying drawings, as part of this specification.

To enable manufacturers of the said machine or instrument to distinguish my improvements and the machine, as heretofore made, I proceed first to describe the latter as follows:—

The case (Figure 1, an outside bottom view, and Figs. 5 and 6, lateral views of opposite sides and A, figure view of the outside of the top section of the case, and B, figure, an angular downward view of the inside of the lower section of the case, containing the mainspring, axle and tumbler) in which the machine is principally constructed, is soft metal, of such dimensions as contains the works and operate as hereinafter described. The case is made in two sections (Figs. A and B,) horizontally, the upper section fitting on and sliding down, over the lower section, a short distance. A tumbler (Fig. C, spring E,) with a lever or handle, (a, Fig. 1,) extending therefrom through and beyond the case, is furnished, within the case, with cogs (c c c Figs. 2 and C) on several segments of concentric circles, and turns on the end of a fixed axle (d, B figure, and d, Fig. 4,) at right angles therewith, in segments of revolutions, backward and forward. Another part of the lower edge of the tumbler (F, Fig. C) is cut into teeth, into which a trigger (f, Fig. 4 and f, Fig. B) moving on a screw or rivet, (g, Fig. 4 and g, Fig. B,) fastening it to the bottom of the case, works, to keep the machine set or cocked for an operation, and is pressed against the said teeth by a small spring (h, Figs. 1, 9 and 4 and h, Fig. B,) and to the trigger is attached a button (i, Figs. 1, 4 and 5,) outside the case; and pressure on the said button withdraws the trigger from the tumbler. Nearly at right angles with the horizontal diameter of the

tumbler, under its side which is opposite to the said teeth, a mainspring (E, Figs. B and C) is fastened with a screw or rivet (x, Fig. B,) to the bottom of the case; and pulling the lever (G, Fig. C and a, Fig. 1), in the proper direction, bends the mainspring down, and the trigger holds it so. Over each of the said cogged segments of concentric circles, on the tumbler, is placed a shaft (Fig. 10,) parallel with the said axle and extending into holes (m, m, m Figs. 2 and 5,) in opposite sides of the case near its upper edge, in which holes the shafts turn on their ends as pivots, each shaft having fixed on its end, over the cogs, a pinion (n, n, n, Fig. 6 and n, Fig. 10) in which one of the said cogged segments works. On each of said shafts are fastened as many lancets or cutters (o, Figs. 5, 10 and 14) as the length of the shaft and the maker's choice will admit, and of such form that, the shaft being turned on its central line, nearly the whole edge of the lancets will describe equal circles. The lancets are kept separate and fast, on the shafts, by metallic washers (p, p, Fig. 10 and Fig. 12, Fig. 13, representing a transverse section of a washer) slipped on the shaft alternately with the lancets and fastened against the pinion (which is on the other end of the shaft) by a screw and nut (q Fig. 10 and Fig. 15,) on that end of the shaft over which they are slipped. In the middle of the case, under and at right angles with the axle is placed a bar (Figs. 16 and 17 and R Fig. 18) reaching to both sides of the case. (In the said bar, near its end, there is, sometimes, a hole for a slide, which slide is a metallic pin, having its lower end fastened into the bottom of the case, and standing perpendicular to the bar; its use being to prevent the bar from turning, but this object being answered by the pins in the arms, hereinafter described, the said slide is often omitted, it is marked in the drawings, however, as d, Figs. 17 and 18.) On each end of said bar is an upright arm, (S, S, Figs. 6, 14, 17 and 18) reaching to near the upper edge of the case; and into the upper end of each arm is screwed, horizontally, a metallic pin (t, t, Figs. 6 and 14) through the case, wherein a slit (l Fig. 6) is made

parallel with said arms, to guide an up and down movement of said pins and arms. In the middle of the said bar is a hollow screw (*u*, Fig. 17) in which works another long screw (*v*, Figs. 18 and 20,) from the outside of the case's bottom, up through it and the said hollow screw and the axle; and on the upper side of the axle the top of the said long screw is secured by a screw nut (*w*, Figs. 18 and *w*). By turning the long screw (*y*, Figs. 5, 6 and 18,) the said bar, arms and pins may be altogether lowered or raised, a short distance, along the said case and slits. The upper section of the said case (A figure,) (acting as a gage to the depth of scarifications made by the operation of the said lancets,) fits the outside of the top of the lower section and slides down over it, as far as the pins in the arms will permit it. In the top of the said upper section, opposite to each lancet, is a slit (A Figs. 1, 2, 3, 4 and C) in the direction of the lancet's movements and just large enough to permit the lancets moving with their edges above the lid or upper section of the case, and without touching any part of it. Now the parts of this scarificator being fixed in their proper positions, and the lid or top section of the case put on and adjusted as the operator desires, the machine may be set or cocked, for operating, by pulling the said lever so as to press down the mainspring until the trigger will catch the teeth; and then, by pressing on the button, toward the trigger, the latter is withdrawn from the tumbler, and the mainspring causes the tumbler to perform a segment of a revolution on said axle, and the cogs turn the pinions and shafts, giving a quick and regular motion to the lancets.

Now the above described machine I wholly disclaim; but in it I detect the following defects:—The mainspring acts, in some stages of its movements, more forcibly on one side of the tumbler's edge or periphery than on the other, makes the strain on the axle-joint unequal; and the power being applied nearer the tumbler's center of motion than is necessary, part of the spring's force is worse than wasted—is straining and injuring the machine. The means of stopping the machine (when let off in performing operations) is the striking of the lever against the case, which is thus gradually injured; and to retard that injury the case must be made thicker and heavier than else would be needful or convenient; but still the case is battered where struck, and this lengthens the range of the lever's movement as well as of that of the cogs; so that the latter will derange the pinions and lancets, and render the machine (requiring very delicate and secure adjustment and operation) finally useless and even dangerous, causing undeserved blame to the most meri-

torious and scientific skill. The case, as hitherto made, is necessarily made of brass, copper, silver, iron and such as are strong and liable to oxidize readily, or are too costly for general use, and either putting it, by its cost, beyond the reach of the poor, or, by its too great affinity for oxygen, liable to be impure and unsafe to the patient; whereas the case, with my improvements, may be made of tin; and if the precious metals be chosen for it, its lightness will contribute to its cheapness; and in either case be less liable to verdigris or other metallic oxids that would be deleterious to patients by their contact.

To remedy the aforesaid defects is the object of my improvements; and this object I accomplish as follows—I form my mainspring (Figs. 7 and 8 and R, Figs. 2 3 and 4) with the end of its stationary or fixed part or side extended around inside and on the bottom of the case, to which a screw or rivet (*z*, Figs. 3 and 4) fastens it, its curve assisting greatly to keep it firmly in its place, which (instead of its position in the machine above described) is below and inside of the tumbler, parallel with the latter's horizontal diameter. This spring's moving end is bent aside, so as to press upward against the lower side or edge of the tumbler, at a point the most distant, in that direction, from the latter's center of motion. Thus, I use the whole force of the spring, (without abusing any of it to the injury of the other works) and make a smaller spring produce a better effect, and the machine more efficient, safe and durable. To stop the motion of the tumbler (when the machine is let off) I make a strong catch (*x*, Figs. 3, 7 and 8,) on that side of the moving end of this spring, that is next to and under the tumbler: also on the tumblers under edge or side, next to the said catch, I form a step or shoulder (catch, Fig. 21,) which it strikes against (*x*, Fig. 3,) and which stops its moving farther when the machine is let off in performing an operation. Further to secure the same stoppage, I fix a strong iron pin (*o*, Figs. 3 and 2,) into the inner disk of the tumbler on the opposite side (to the said step or shoulder) of its center of motion, and nearly over the turn or doubling point of the mainspring, so as to rest on that spring's upper surface when the machine shall have been let off in performing an operation. The said pin and shoulder or step in the tumbler, and the catch in the side of the mainspring fitting and catching against the said step or shoulder, act so equally on the opposite sides of the tumbler's center of motion as to stop the machine with the utmost certainty, and without straining, wrenching or injuring any of its parts; while also the material (iron) of which they are made is most du-

nable and least liable to be impaired by use.

What I claim as my invention, and desire to secure by Letters Patent, is—

- 5 The combination of the tumbler and mainspring, substantially as herein described; the mainspring having a catch, and the tumbler a shoulder or step and pin;

these parts being arranged and operating in the manner and for the purposes described.

FREDERICK LEYPOLDT.

Witnesses:

DANL. McLAUGHLIN,
J. H. SMITH.