(No Model.)

E. L. BARBER.

SOLDERING TOOL.

No. 485,161. Patented Nov. 1, 1892.

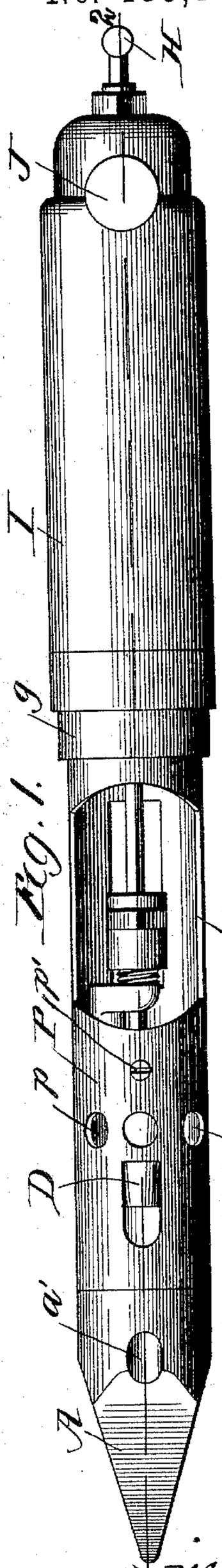

Fig. 1.

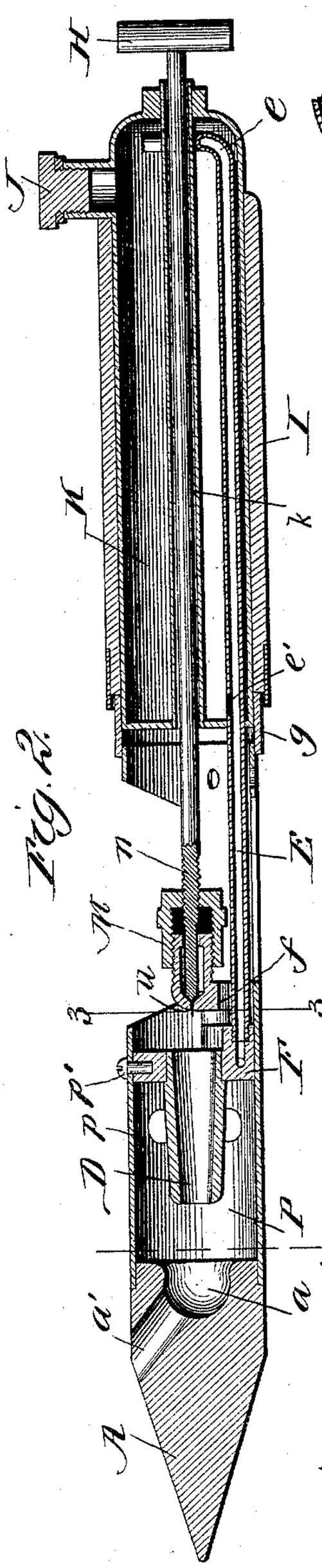

Fig. 2.

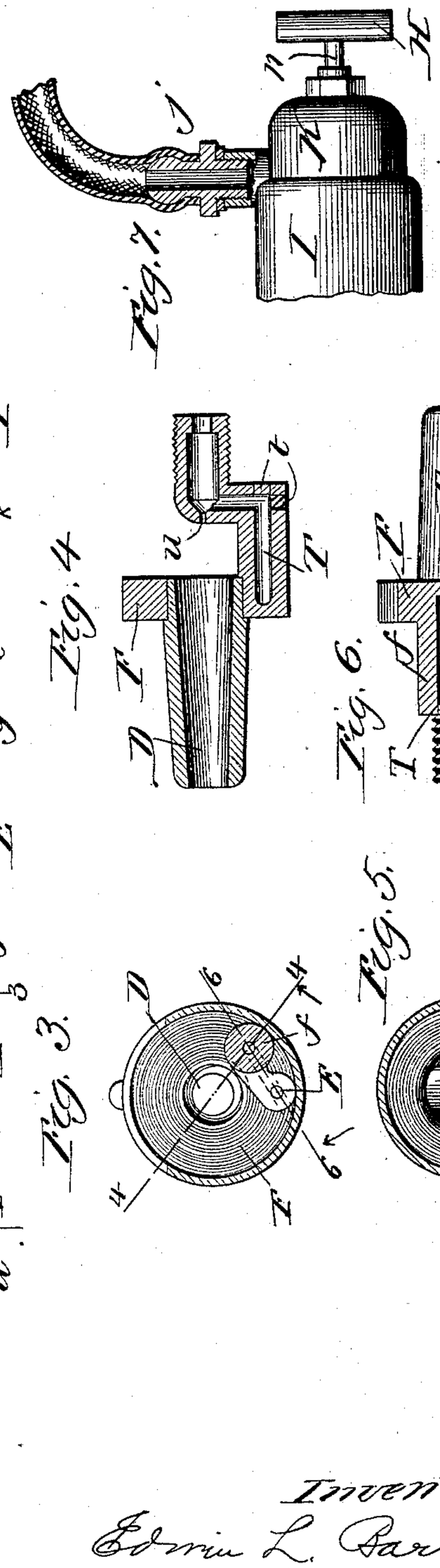

Fig. 4.

Fig. 3.

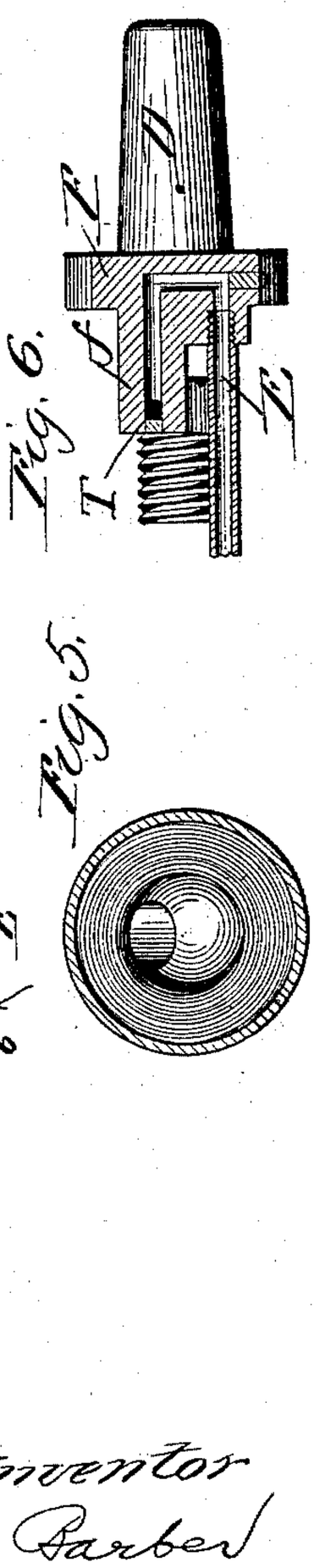

Fig. 6.

Fig. 5.

Witnesses.
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UNITED STATES PATENT OFFICE.

EDWIN L. BARBER, OF CHICAGO, ILLINOIS.

SOLDERING-TOOL.

SPECIFICATION forming part of Letters Patent No. 485,161, dated November 1, 1892.

Application filed January 30, 1892. Serial No. 419,762. (No model.)

To all whom it may concern:

Be it known that I, EDWIN L. BARBER, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Soldering-Tools; and I do 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, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

My invention consists in improvements in self-heating soldering-tools, and particularly in the tool of this class for which Letters Patent of the United States, No. 446,765, were issued to me February 17, 1891.

The object of the invention is to secure a concentration of the flame within the soldering-point and to modify and change the construction of various parts of the tool for the purposes of simplicity and effectiveness, as hereinafter fully set forth.

In the accompanying drawings, Figure 1 is an elevation of the improved tool. Fig. 2 is a longitudinal section on the line 2 2 of Fig. 1. Fig. 3 is a transverse section on the line 3 3 of Fig. 2. Fig. 4 is a sectional view on the line 4 4 of Fig. 3. Fig. 5 is a view of the heel of the soldering-point. Fig. 6 is a sectional view on the line 6 6 of Fig. 3, and Fig. 7 is a sectional view of a modification of the device for filling the reservoir of the tool.

As in the tool described in my former patent above referred to, I use an outer metal sleeve or shell P. Within one end of this shell is inserted the heel of the soldering-point A, these parts being firmly held together in any desired manner. The shell P is prolonged at its opposite end by means of arms G; or, more properly, portions of the shell are cut away so as to leave one or more large openings. Beyond these openings the shell is again circular in form, and upon its end is rigidly fitted a ring *g*.

A tubular tank or reservoir K for holding gasoline or other volatile hydrocarbon has one of its ends inserted firmly within the ring *g*. A small tube E extends from the reservoir K longitudinally within the shell P and communicates with a channel T in an annular diaphragm F, which is located across the shell P. The diaphragm F is of cast metal and of such thickness as to give it considerable body. An arm *f* extends from the diaphragm, of which it forms an integral part, toward the reservoir, and inclines substantially to the center of the shell P, and is again projected longitudinally toward the tank K, the central section being externally screw-threaded to receive a cap *m*, which forms a stuffing-box, for the purpose hereinafter described. That portion of the arm *f* at which it is carried from the wall of the shell P to the center thereof forms a shoulder, into which the pipe E is tightly secured by screw-thread or otherwise. The channel T is drilled into the casting F *f* so as to extend from the end of the pipe E nearly but not completely through the diaphragm F and then backwardly through the arm *f*, and follows the conformation of the piece last named. At *t t*, Fig. 4, are shown openings made in drilling the channel T, which openings should be carefully plugged. A burner-tube D, open at both ends, is fitted within the central orifice of the diaphragm F and extends toward the heel of the point A, but does not come in contact therewith. At a point directly opposite the center of the tube D a small orifice *u* is made in the arm *f*, reaching to the channel T. A needle-valve *n* controls this orifice from within the channel T, its stem passing through an opening in the arm *f* opposite the orifice *u* and through the stuffing-box M, the orifice in the cap of which and the stem of the valve being correspondingly screw-threaded.

A longitudinal sleeve *k* extends entirely through the reservoir K for the accommodation of the stem of the valve *n*. The valve-stem extends beyond the end of the reservoir K, and a suitable wheel or T-handle H is adjusted to it.

The shell P and the diaphragm F are secured together in any desirable manner, as shown, by means of a screw *p'*. Openings *p* are formed in the shell P between the diaphragm F and the soldering-point for the escape of the products of combustion.

The tube E extends through the inner end of the reservoir K and terminates near its outer end, the end of the tube being curved

somewhat, as shown at *e*. An orifice *e'* is formed in the side of the tube within the reservoir K and near the inner end of the latter. There is a filling-orifice in the side of the reservoir K, a cap J being used to close it. A suitable gasket should be used with this cap to secure a gas-tight joint. If desired, there may be substituted for the cap J a nipple *j*, upon which may be adjusted a flexible hose to communicate with the gas-pipe, so that gas may be used in lieu of gasoline, the tool being adapted equally well for the use of either.

It is found in practice that the reservoir K becomes heated to such an extent as to be uncomfortable to handle. To obviate this difficulty I, supply the tool with a wooden handle in the form of a sleeve I, which is adapted to slide upon the reservoir K before the shell P is adjusted to it.

As shown, the recess *a* in the heel of the soldering-point A is necessarily secured by the use of a core in casting. It may be found desirable to form this recess by means of a drill.

In operation, the flame having been started by allowing a small quantity of gasoline to drop into the tube D, gas is immediately generated in the channel T and escapes through the orifice *u*. The casting F soon becomes heated to such an extent that the generation of gas is sufficient to cause a back-set into the reservoir K. This back-set of gas finds its way to the farther end of the reservoir and develops considerable pressure within it. Gasoline enters the pipe E through the orifice *e'* and creeps down the tube past the gas to the channel T, and thereby feeds the flame. The gas is forced out of the orifice *u* with sufficient velocity to pass through the tube D and carry with it air in quantity ample to insure prefect combustion and throw a strong flame into the recess *a*. This recess tends to concentrate the heat upon the body of the soldering-point A, which becomes heated very quickly. A portion of the flame finds its way through the channel *a'*, and other portions are deflected back against the diaphragm F, thereby maintaining it at a high temperature and insuring a constant development of gas.

The coiled pipe shown in my former patent, heretofore referred to, is found unnecessary in the present form of construction, thereby lessening the cost of production and decreasing the liability of injury to the tool by careless handling. By using a long stem for the needle-valve the handle is so located as to be easily manipulated and is so far removed from the flame that it does not become excessively hot.

It is found in practice that the curvature *e* in the pipe E insures a much stronger flame than can be obtained without it.

In the use of gas drawn from the gas-pipe in lieu of gasoline the operation of the tool is the same as heretofore described.

I claim—

1. In a self-heating soldering-tool, the combination of a tubular shell P, a soldering-point having its heel centrally recessed and fitted within the shell, a fuel-reservoir adjusted to the opposite end of the shell, a solid annular diaphragm adapted to fit within the tubular shell and having an arm extending toward the reservoir and inclined to the central line of the shell, said diaphragm having a passage through it from a point on its arm adjacent to the side of the shell to a point adjacent to the remote side of the diaphragm and returning through the arm and opening in both directions substantially upon the median line of the shell, a tube leading from the reservoir to the side opening of said passage, a needle-valve adapted to close the two central openings, and a burner-tube having both ends open and fitted within the central orifice of the diaphragm, substantially as described.

2. The combination, with a self-heating soldering-tool, of a vapor-burner, a fuel-reservoir, and a service-pipe leading from the reservoir to the burner, said pipe being extended into the interior of the reservoir and having openings at its end and also at its side within the reservoir, substantially as described.

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

EDWIN L. BARBER.

Witnesses:
J. H. DARIAN,
FRANK G. WARD.