

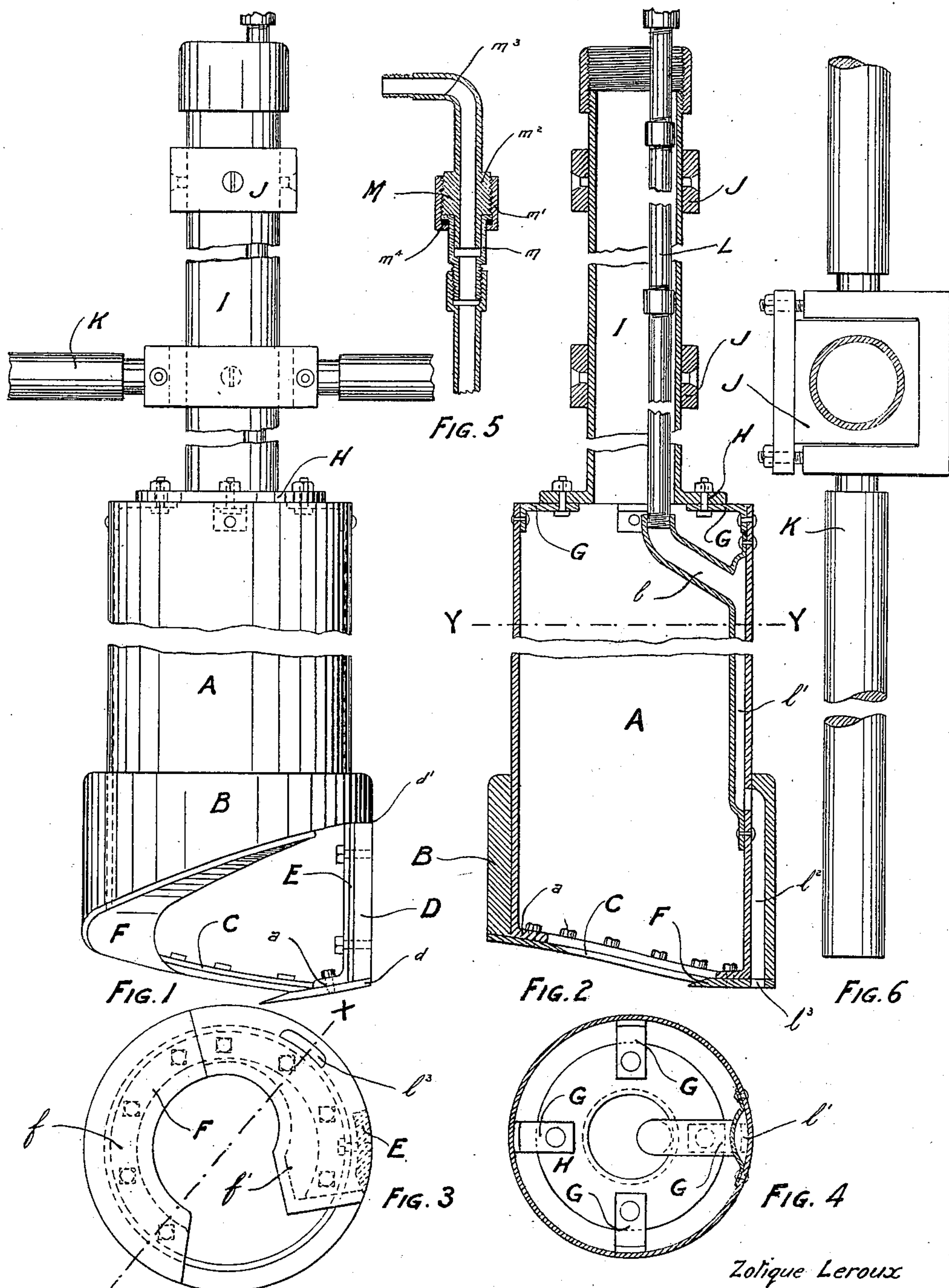
No. 618,422.

Patented Jan. 31, 1899.

Z. LEROUX.  
EARTH BORING AUGER.

(Application filed Apr. 2, 1898.)

(No Model.)



Witnesses  
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# UNITED STATES PATENT OFFICE.

ZOTIQUE LEROUX, OF MONTREAL, CANADA.

## EARTH-BORING AUGER.

SPECIFICATION forming part of Letters Patent No. 618,422, dated January 31, 1899.

Application filed April 2, 1898. Serial No. 676,249. (No model.)

*To all whom it may concern:*

Be it known that I, ZOTIQUE LEROUX, a citizen of the Dominion of Canada, residing in the city and district of Montreal, Province of Quebec, Canada, have invented certain new and useful Improvements in Earth-Boring Augers; 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 has reference to an earth-boring auger having its lower extremity strongly reinforced and its underside cut off spirally, it being provided with both vertical and horizontal cutters, while a jet of steam is brought down to the auger through a steam-pipe inserted inside the tube that operates the auger, all as more fully explained hereinafter.

The object of my invention is to provide an earth-boring auger that can be operated in frozen earth.

Referring to the drawings, similar letters refer to similar parts throughout the several views.

Figure 1 is a general view of my invention. Fig. 2 is a vertical section on line X X of Fig. 3. Fig. 3 is an under side view. Fig. 4 is a section on line Y Y of Fig. 2, but looking upward. Fig. 5 is a section of the device I use to connect my steam-hose with the vertical steam-pipe. Fig. 6 is a plan view of the double lever I use to turn my auger.

My auger is composed of the cylindrical barrel A, which is strongly reinforced at its lower extremity by means of the piece B, which can be made out of any suitable material and secured by any suitable means.

The under portion C is cut off spirally, as shown on the drawings, in such a way that the spiral ends exactly above the point where it commenced, so that there is a straight vertical wall D left between these two points  $d$  and  $d'$ , which is provided with a vertical cutter E, firmly secured to the barrel A, while the under part of the barrel A is provided with a spiral cutter F, composed of two pieces, one,  $f$ , that is permanently secured, while the

one  $f'$  is so arranged that it can be changed at will, this latter one being the cutter proper.

The lower extremity of the barrel A of my auger is provided with a flange  $a$  to secure the spiral cutter F. The top or upper portion of the barrel A of my auger is provided with a sufficient number of angles G, to which is secured a flange H, the latter serving to connect the auger to the vertical operating-tube I, which is secured together in sections, as is the usual practice. Over this tube I at convenient intervals are secured the square collars J, which serve to place the double lever K, by means of which the auger is turned by applying power to it.

Of course my auger can be operated by hand, also by steam and horse power.

Inside the vertical operating-tube I, I introduce a steam-pipe L, which screws into the passage  $l$ , the casing  $l'$  of same being placed either inside or outside the barrel A; but in any case it passes through the reinforcing-piece B at  $l^2$ , so that when steam is introduced into the pipe L it will pass right down and out at the orifice  $l^3$ , Figs. 3 and 4, so that it will thaw frozen earth through which the auger is boring, as not only the whole barrel A of my auger is heated, but also this jet of steam or hot water coming from the condensation of the same continually oozes out at orifice  $l^3$ , and as the latter is turned around it comes in contact with the frozen earth all around the hole. As the steam-pipe L turns around with the auger, I use a special joint M to permit the attaching of a steam hose or pipe thereto and that will not turn. It is simply a flanged piece  $m$ , secured to the top of the steam-pipe L, over which slides the piece  $m'$ , which screws over the end  $m^2$  of the bent connecting-piece  $m^3$ , there being a rubber gasket  $m^4$  introduced, so as to make a tight joint, this permitting the connecting-piece  $m^3$  to turn without losing any steam. Of course any other suitable contrivance would do for this purpose.

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

In an earth-auger, the combination, with a barrel having a hole in its side, and an operating-tube I; of a collar secured around the lower part of the barrel and having a steam-  
5 passage connected with the said hole and discharging at the bottom of the barrel, a hollow casing l' secured against the inside of the upper part of the barrel and connected with the said hole and provided with a projecting

pipe or passage l, and a steam-pipe extending through the tube I and connected to the pipe l, substantially as set forth.

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

ZOTIQUE LEROUX.

Witnesses:

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