

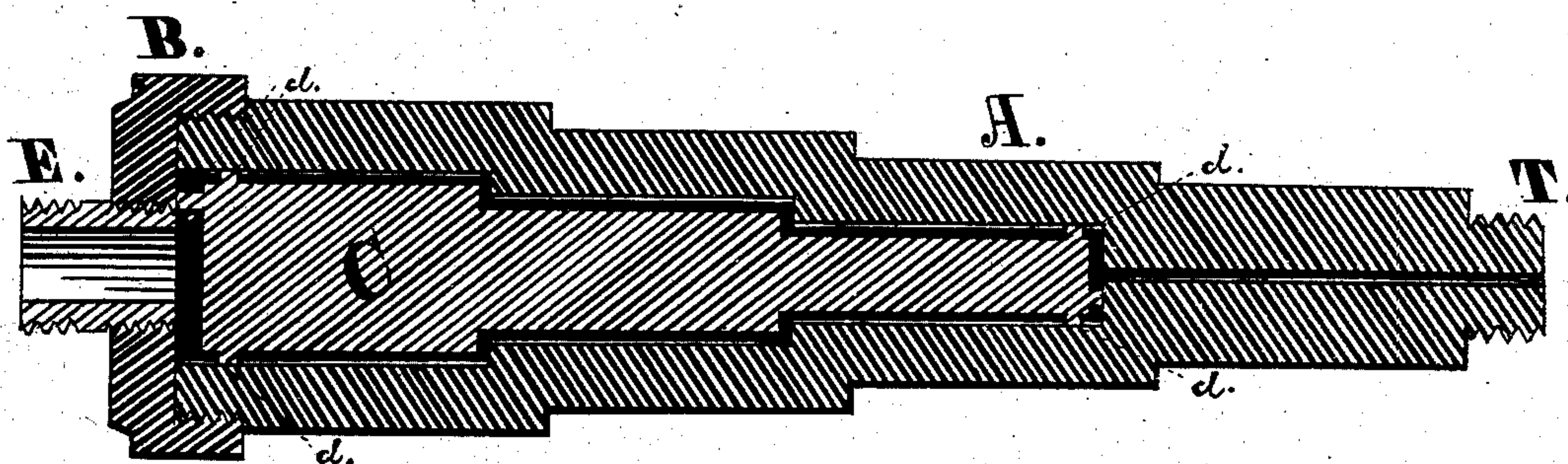
(No Model.)

A. E. FRANCIS.
STEAM GENERATING TUBE.

No. 257,931.

Patented May 16, 1882.

Fig. 1.



WITNESSES:

M. M. Francis
James S. Francis

INVENTOR:

Alvan E. Francis

UNITED STATES PATENT OFFICE.

ALLAN E. FRANCIS, OF CLEVELAND, OHIO.

STEAM-GENERATING TUBE.

SPECIFICATION forming part of Letters Patent No. 257,931, dated May 16, 1882.

Application filed July 30, 1881. (No model.)

To all whom it may concern:

Be it known that I, ALLAN E. FRANCIS, of Cleveland, in the county of Cuyahoga and State of Ohio, have invented a new and useful Improvement in Steam-Generating Tubes, which improvement is fully set forth in the following specification, reference being had to the accompanying drawing.

The object of my invention is to instantaneously convert water into steam for purposes of motive power and steam-heating, in such a manner as to economize fuel and space and obviate the existing danger attending the use of steam, by dispensing with a boiler.

To attain this I have constructed a massive iron steam-tube, A, (shown on the drawing in longitudinal section,) with its internal diameter much greater at one end than at the other, the small internal diameter being the size of the stream of water it is calculated the generating-tube can receive without chilling. The large internal diameter at the other end must be sufficient to allow a free escape for the steam which passes between the inner walls of this tube and the iron core C, which is of a form corresponding to the enlarged inner portion of the tube A, but smaller, and is secured within the same by small projecting points of contact *d d d d*, leaving a steam-space entirely around and at the ends of the core. The large end of tube A is closed with a cap, B, provided with steam-exit E; or, if more than one

is used, they are to be connected with a steam-chamber.

In use this generating-tube is placed in a fire and heated to redness. The water is forced into the tube at T, and, if the tube is quite red, will assume a spheroidal state, and in this condition much would pass out with the steam were it not that the temperature of the core when in use is below a red heat and instantly converts the water into steam by contact. The steam thus generated is also superheated, and a large per cent. of the heat from the fuel is utilized.

I claim as my invention—

Tube A and core C, combined and constructed substantially as shown, the tube A having its interior smallest at its inlet end and made with varying but increasing widths from inlet to exit to accommodate the expansion of water and steam, and core C having its exterior smallest at the end nearest the inlet and its external surface so arranged that when in position in tube A a narrow space is left between the external surface of core C and the internal surface of tube A, said space expanding in area from inlet toward exit, and in which space steam can be generated or heated.

ALLAN E. FRANCIS.

Witnesses:

M. M. FRANCIS,
JENNY L. FRANCIS.