July 5, 1932. I. LAMSTEIN 1,865,472

TEST TUBE HEATING APPARATUS

Filed June 6, 1928

Fig. 1.

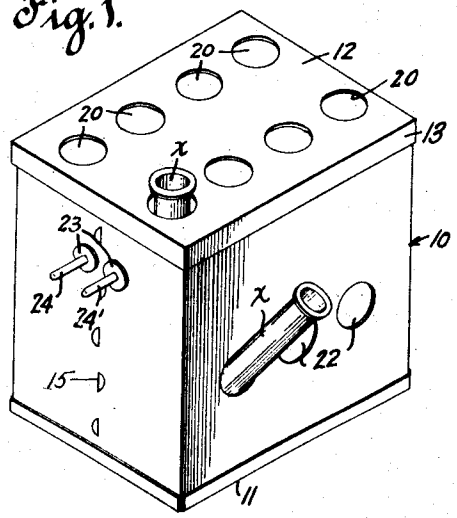
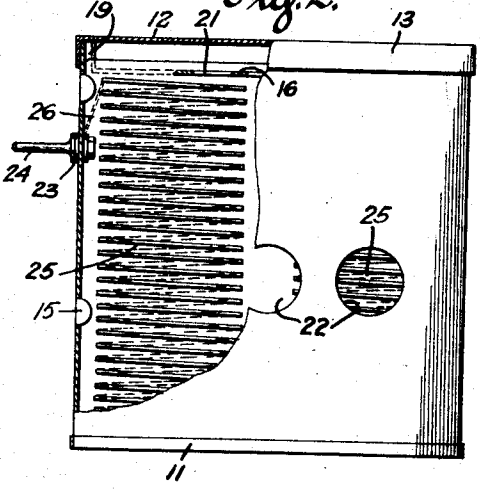


Fig. 2.



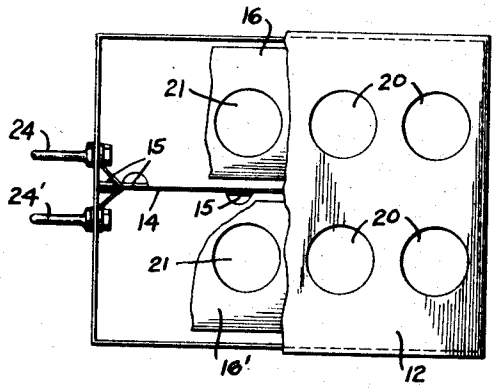


Fig. 3.

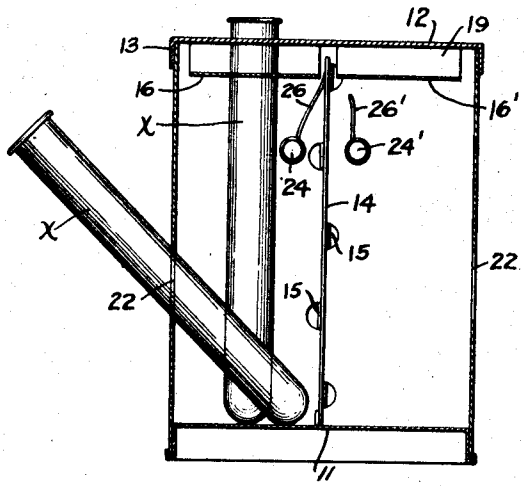


Fig. 4.

Irving Lamstein
INVENTOR

Patented July 5, 1932 1,865,472

UNITED STATES PATENT OFFICE

IRVING LAMSTEIN, OF BROOKLYN, NEW YORK

TEST TUBE HEATING APPARATUS

Application filed June 6, 1928. Serial No. 283,348.

This invention relates to electrical heating apparatus and more specifically to apparatus adapted to heat a plurality of test-tubes simultaneously.

An object of the invention is to provide an electrical apparatus for laboratories, in which a number of ordinary commercial test-tubes may be heated without the use of water or a naked flame.

A further feature is in the provision of a heater completely enclosed in a casing arranged to receive one or more test-tubes and which may be readily connected with a source of electrical energy and as easily disconnected, the device being movable as occasion requires.

Another aim is to produce a portable electrical heating device capable of receiving test tubes in either an upright or inclined position in which they are retained during the heating operation.

These and other advantageous objects are accomplished by the novel construction and combination of parts hereinafter described and shown in the accompanying drawing, constituting a material part of this disclosure, and in which:

Figure 1 is a perspective view of an embodiment of the invention showing test-tubes in upright and inclined positions therein.

Figure 2 is a side elevational view with the casing partially broken away to show the construction.

Figure 3 is a top plan view with the cover and tube guide broken away.

Figure 4 is a transverse sectional view, showing two tubes in operative position.

The apparatus as shown consists of a rectangular casing, generally designated by the numeral 10, having a fixed inset bottom 11 and a removable cover 12 provided with town-turned engaging flanges 13.

Extending centrally through the casing is an upright partition 14 held at its end and bottom edges to the interior of the casing by a series of lugs 15 sheared from the casing walls and inbent to contact with opposite sides of the partition, this partition being a sheet of mica or similar dielectric material.

Spaced below the cover plates 12 are two horizontal guide plates 16—16′ held by flanged lugs 19 to the cover, which is provided with a plurality of openings 20 in register with similar openings 21 in the guides, these openings being loosely receptive of the test tubes X, the lower closed ends of which rest upon the raised bottom or flooring 11.

In the side walls of the casing are other openings 22 through which the tubes X may be entered to rest on the flooring 11 in an inclined position, as seen in Figures 1 and 4, the openings 22 being in planes intermediate the planes of the openings 20—21.

Fixed in insulating bushings 23, set in one of the end walls of the casing, are terminals 24—24′ adapted to be respectively engaged by the sockets of conductors from any convenient source of electrical energy in a well known manner.

The heating elements consist of flat coils 25 of high resistance wire disposed vertically within the casing, and supported by the partition 14 in such manner as to avoid interference with tubes disposed in the openings 20—21 and 22, these coils being in circuit with the terminals 24—24′ by conductors 26—26′ at their respective ends.

From the foregoing it will be seen that any number of tubes, within the capacity of the apparatus, may be heated at one time, that their entry or removal is of the simplest character, and that no steam, water or flame is employed.

As changes of construction could be made within the scope of the invention, it is intended that all matter contained in the foregoing description or shown in the accompanying drawing shall be interpreted as illustrative and not in a limiting sense.

Having thus described the invention, what is claimed as new and desired to secure by Letters Patent, is:

1. A test-tube heater comprising a casing having a cover, a plate carried in spaced relation below said cover, said cover and plate having registering openings to guide tubes vertically therein, openings in the side walls of said casing to receive tubes in an inclined position, a raised bottom in said casing to

support the ends of tubes entered therein, high resistance coils disposed in the casings, and electrical connections to energize said coils.

2. A test-tube heater comprising a casing having a cover, means in said casing to support test tubes in a variety of angular positions, a vertical dielectric partition centrally within the casing, high resistance heating coils supported vertically on each side of said partition, non-conducting bushings fixed in the casing walls, electric terminals fixed in said bushings, and connections between said terminal and coils.

In witness whereof, I have hereunto set my hand this 28th day of May 1928.

IRVING LAMSTEIN.