

H. GÖHRIG.

SUPERHEATER.

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944,428.

Patented Dec. 28, 1909.

Fig. 1-ELEVATION.

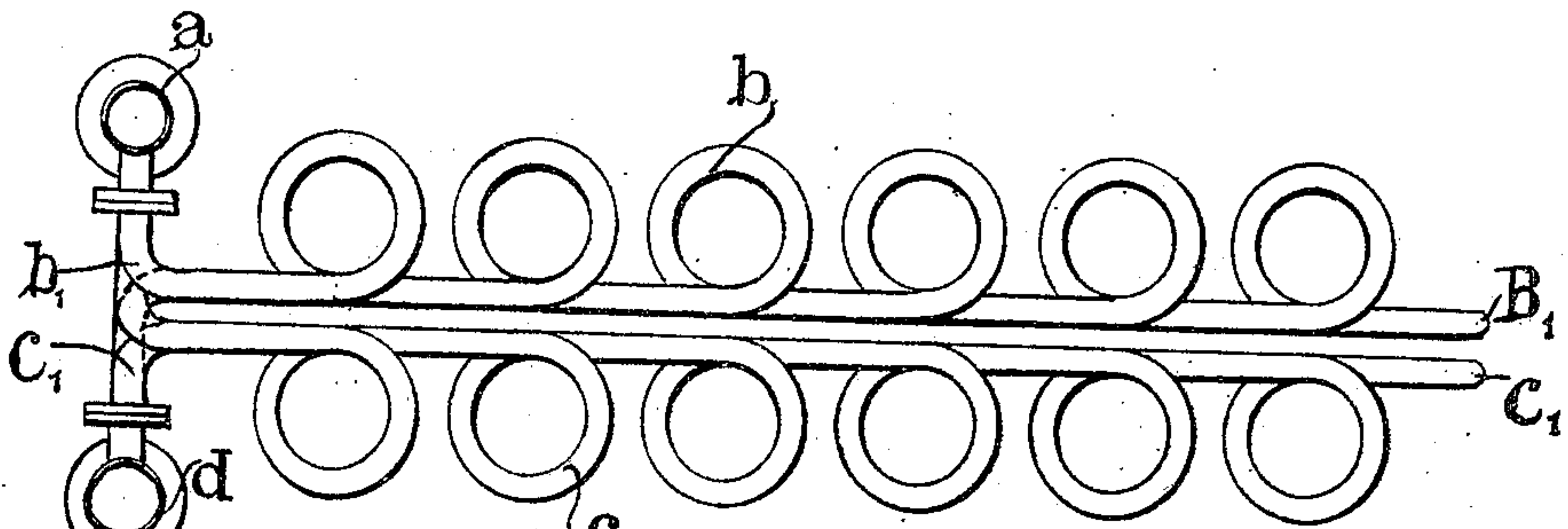


Fig. 2-PLAN.

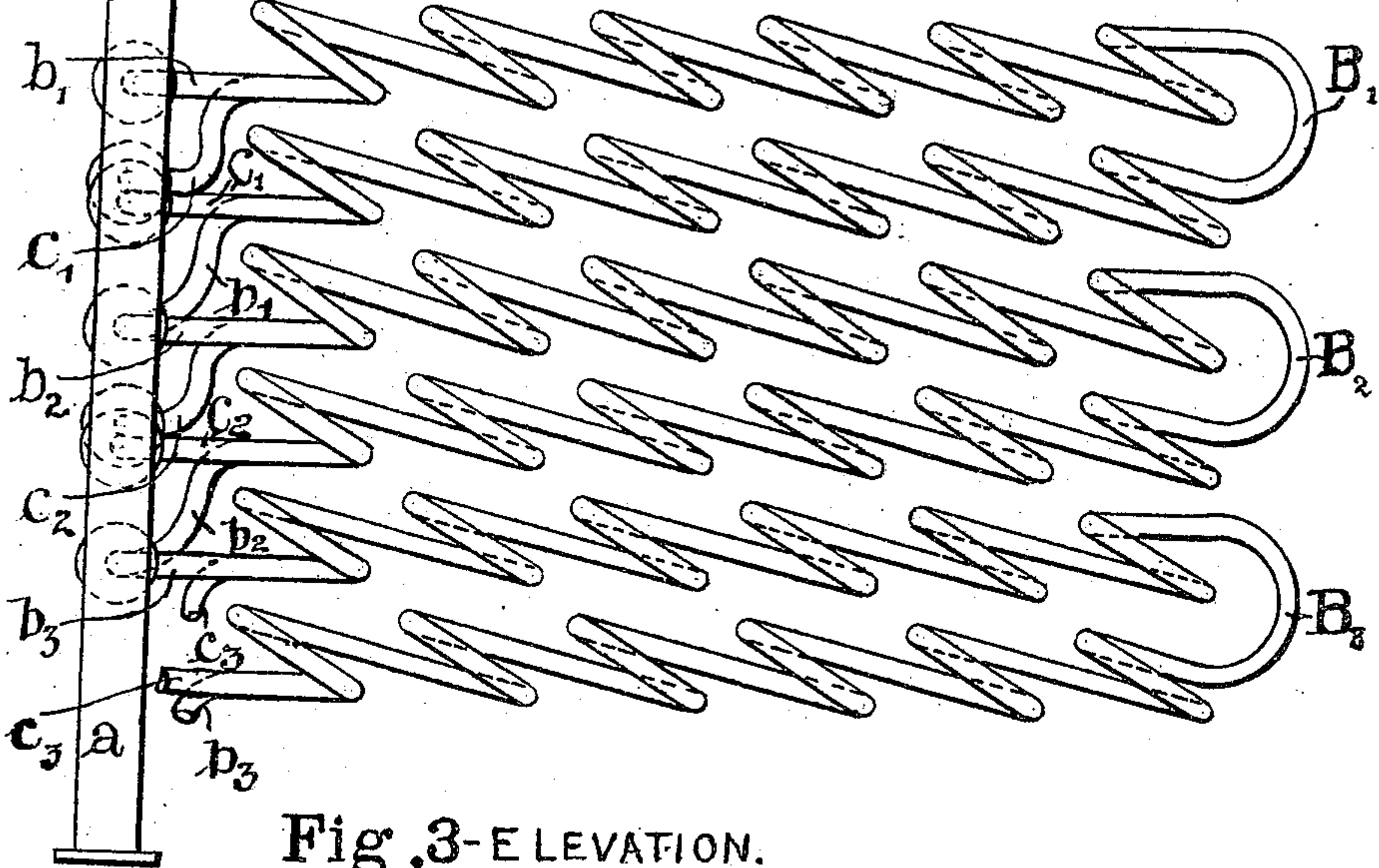
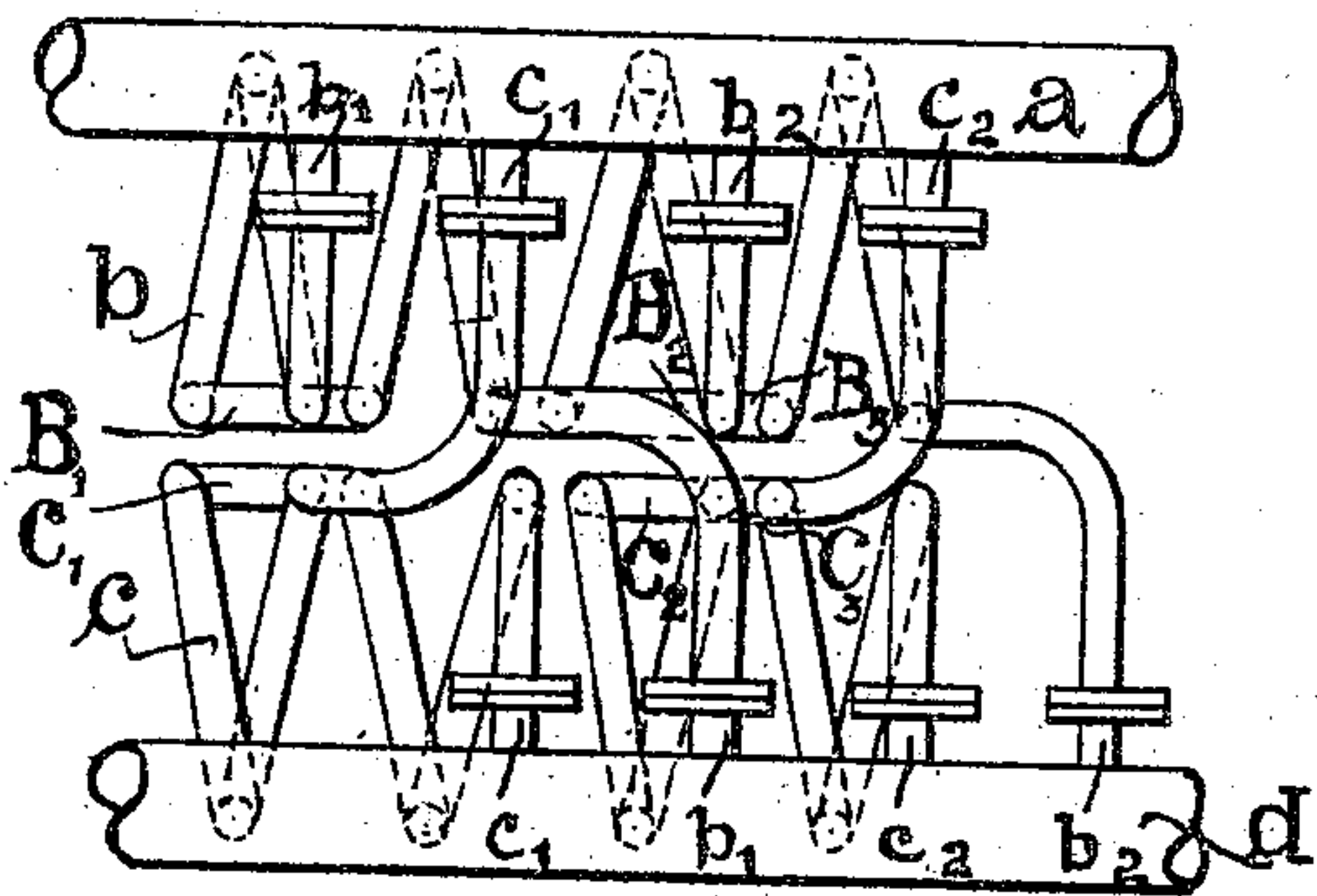


Fig. 3-ELEVATION.



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To all whom it may concern:

Be it known that I, HEINRICH GÖHRIG, a subject of the Grand Duke of Hesse, residing at Darmstadt, Hesse, German Empire, have invented a new and original Improvement in Superheaters, of which the following is a specification, reference being had to the accompanying drawing, forming part thereof.

This invention relates to improvements in superheaters for steam and gas and more particularly to the arrangement and shape of the superheater pipes.

An object of this invention is to provide a system of loops superseding the coils which may be cylindrical or not, as desired, and which have heretofore been in use.

It is a further object of my invention to provide such construction and arrangement of the piping that an increased transmission of heat and a cooling of the pipes may be obtained thereby.

Other objects and advantages will be more fully set forth and described or more particularly pointed out in the appended claims made part of this application.

In describing the invention in detail reference will be had to the accompanying drawing forming part of this specification, wherein like characters denote corresponding parts in the several views, in which,

Figure 1 is a side elevation of my improved superheater. Fig. 2 is a top plan view thereof, showing the zigzag arrangement of the coils, and Fig. 3 is a front elevation of the same, in part.

As illustrated in the drawings, I have shown the preferred form of my invention which comprises a number of pipes formed with circular, inclined loops arranged in horizontal succession, the said pipes and loops being spaced above each other in pairs and in parallel relation.

In said drawings *a* and *d* are the supply and discharge pipes respectively, serving as headers, *b* are the upper and *c* the lower series of loops and pipes of U-form in general outline, the same being arranged in zigzag form, viewed in plan. The upper series of pipes are provided with intermediate bowed portions *B'*, *B*² and *B*³ and the lower series with similar portions *C'*, *C*² and *C*³, the receiving and discharging end portions of said pipes or leg members being secured to the headers in any appropriate manner. The leg members are formed with right angular extended portions *b'*, *b*² and *b*³ correspond-

ing to the upper series of pipes of U-form and *c'*, *c*² and *c*³ for the lower series of said pipes, the corresponding right angular extensions of each series alternating in direction upwardly and downwardly, each alternate right angular extension being off-set to permit its attachment to the headers and to make room for such attachment, as shown in the drawings.

As may be seen from the drawings the characteristic feature of my construction is that the superheating pipes, of which there may be one or as many as the particular case may require are looped in successive file and all of said coils are parallel to each other. The loops may be circular or of other appropriate shape, it being the principal idea to have the coils arranged in zigzag form so that the same may be spaced apart or not and either position may be parallel with or inclined to the axis of the pipe.

Over the shapes and constructions heretofore in use, the efficiency of my new construction is considerably greater, the steam or gas in passing the pipes, being forced to alternately proceed and return again, with a centrifugal movement and come in closer contact with the pipes than is the case with cylindrical coils of the old type. In the former case the steam or gases passed from one coil to the other and without any direct return movement, while in my case the centrifugal movement in the loops forces the cooler, heavier and partially moist parts against the heating surfaces an increased transmission of heat and a cooling of the pipes being attained thereby.

While I have shown my device as arranged so that the discharge and supply pipes are placed one above the other in position, I wish to have it understood that the same may be placed in a standing position or otherwise, as desired, it being my object in so describing the same as shown, to facilitate the understanding thereof, and it will thus be seen that I have provided a construction which, while proving advantageous in operation will be cheap and economical to manufacture.

I claim:

1. A superheater, comprising a plurality of heaters, an upper and a lower series of pipes of U-form in general outline, with intermediate bowed portions, said pipes having leg members formed with a plurality

of coils arranged in zigzag form viewed in plan and right angular extended portions communicating alternately with the headers, each alternate angular extension entering
5 each header being off-set.

2. A superheater comprising an upper header, a lower header, an upper and lower series of U-tubes connecting said headers, the legs of each tube extending between the
10 headers and being bent at right angles for attachment thereto, and the end of each tube of one series which enters the header adjacent the other series being off-set in the direction of the length of said headers to
15 make room for the opposite tube of said other series.

3. A superheater comprising upper and lower pipes serving as headers, an upper and lower series of pipes of U-form in general outline, the receiving and discharging
20 end portions of said pipes being extended at right angles upwardly and downwardly and alternately communicating with the upper

and lower headers respectively, each of said alternate right angular extended portions 25 of each pipe of one series being off-set to make room for the opposite pipe of the other series.

4. A superheater comprising a pair of headers, two series of U-tubes connecting 30 said headers, the tubes of said series being arranged in pairs, the leg members of each tube being bent at right angles for attachment to the headers, said U-tubes being formed with coils and the end of each tube 35 of a pair belonging to one series which enters the header adjacent the other series being off-set longitudinally to make room for the other tube of said pair.

In witness whereof I have hereunto signed 40 my name in the presence of two subscribing witnesses.

HEINRICH GÖHRIG.

Witnesses:

JOHANN WEBER,
HULGAR WUMBOLD.