

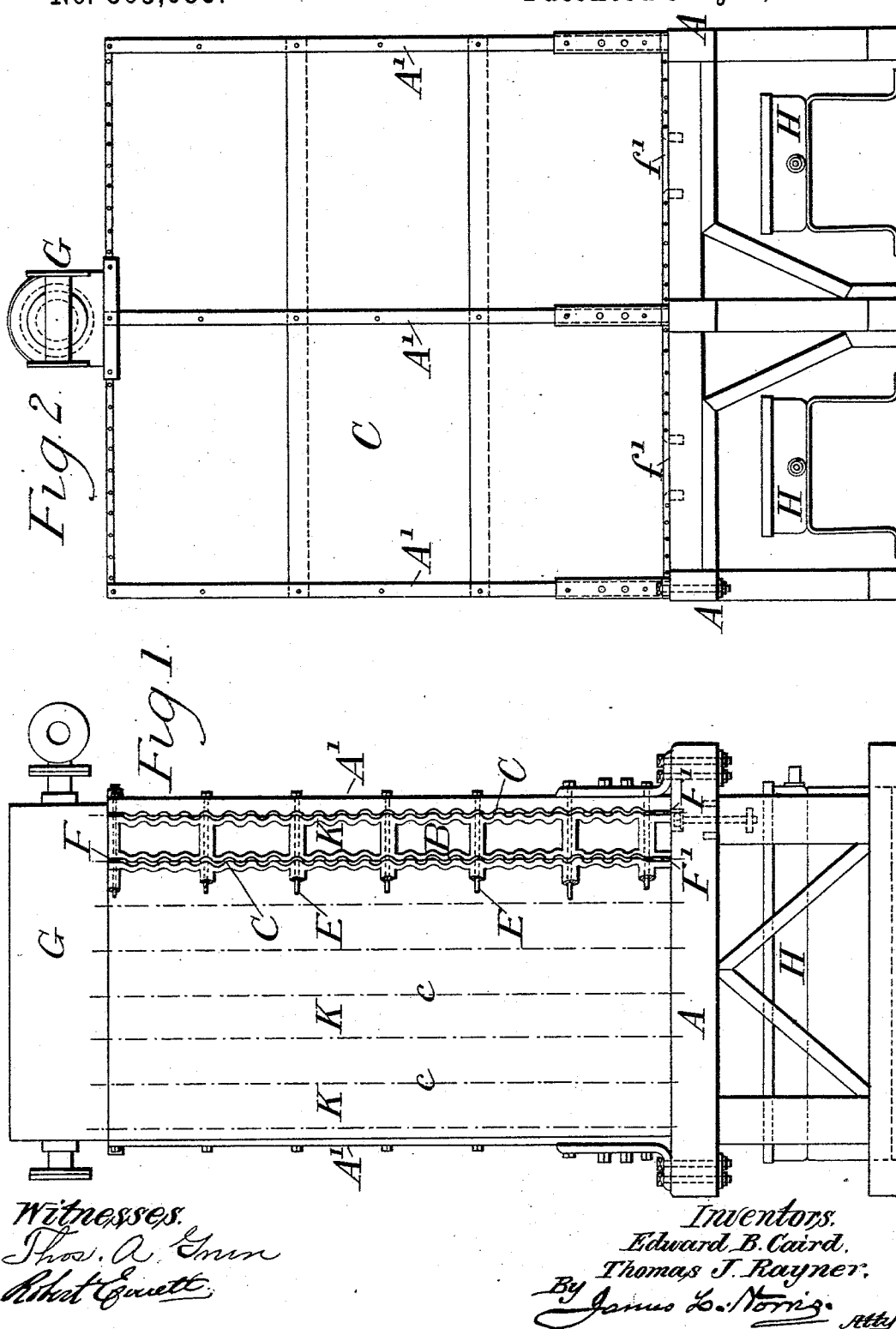
(No Model.)

2 Sheets—Sheet 1.

E. B. CAIRD & T. J. RAYNER.
AIR COOLED CONDENSER.

No. 563,655.

Patented July 7, 1896.



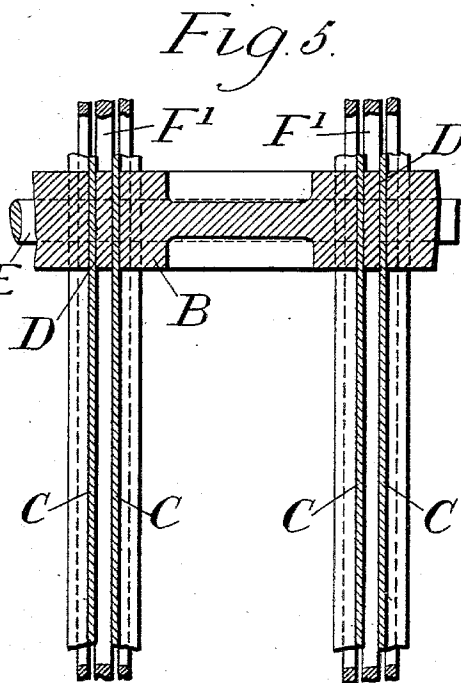
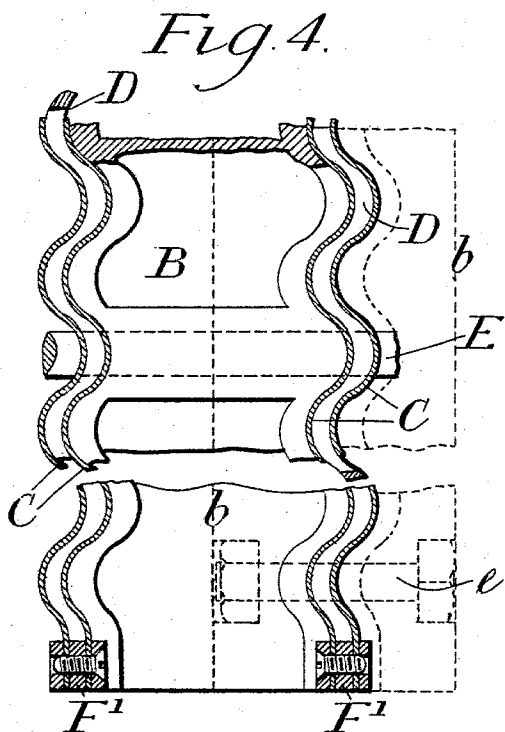
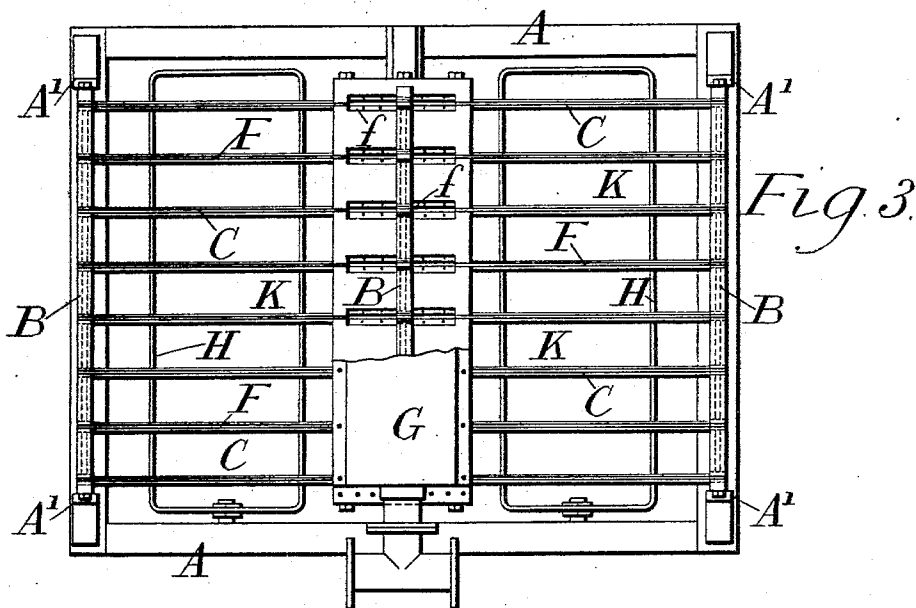
(No Model.)

2 Sheets—Sheet 2.

E. B. CAIRD & T. J. RAYNER.
AIR COOLED CONDENSER.

No. 563,655.

Patented July 7, 1896.



Witnesses.
Thos. A. Gunn
Robert Everett

Inventors.
Edward B. Caird.
Thomas J. Rayner.
By James L. Norrie.
Atty.

UNITED STATES PATENT OFFICE.

EDWARD B. CAIRD AND THOMAS J. RAYNER, OF LONDON, ENGLAND.

AIR-COOLED CONDENSER.

SPECIFICATION forming part of Letters Patent No. 563,655, dated July 7, 1896.

Application filed February 17, 1896. Serial No. 579,638. (No model.)

To all whom it may concern:

Be it known that we, EDWARD BONAR CAIRD and THOMAS JAMES RAYNER, citizens of England, residing at 777 Commercial Road, in the city of London, England, have invented a certain new and useful Improvement in Air-Cooled Condensers, of which the following is a specification.

This invention relates to the construction of a condenser presenting large surfaces of thin metal to currents of air which pass along channels between these surfaces, so arranged as to promote the flow of the air and the consequent cooling of these surfaces.

Figure 1 of the accompanying drawings is an end view, partly sectional, of a condenser according to this invention. Fig. 2 is a side elevation. Fig. 3 is a plan, part of the steam-box being broken away. Fig. 4 is a part transverse section, and Fig. 5 is a part sectional plan, both these figures being drawn to an enlarged scale.

On a suitable frame and base A, which may be of wood, as shown, there are fixed at each side three upright pieces A', one at each end and one in the middle, and between each pair of these a number of upright pieces B.

The inner faces of the pieces A' and both faces of the pieces B are undulated uniformly and equally, but the undulations are so arranged that the ridges on the one side are level with the hollows on the other side. Between each pair of these undulated faces there are held two corrugated sheets C of thin copper or other suitable metal. These are kept a little distance apart from each other by strips D of lead or other flexible metal interposed between them at the ends and in the middle.

At each end and in the middle bolts E are passed through the pieces A' at each side and through bosses formed on the intervening pieces B, the sheets C, and strips D, clamping all firmly together and thus tightly joining together the ends and the middles of the thin spaces formed between the corrugated sheets C. Between the upper edges of the corrugated sheets C are fixed metal strips F, but these strips do not extend to the middle, so that where they are omitted there are at free passages into the thin spaces between

the corrugated sheets from a steam-box G, which is fixed on the top of the condenser. Between the lower edges of the sheets C are also fixed metal strips F', which are intercepted at two places *f'*, so as to provide passages from the thin spaces between the sheets C. Under these passages are placed vessels H to receive the liquid of condensation.

It is to be understood that though in Fig. 1 only two pairs of the corrugated plates C are shown, each of the dotted lines *c* is intended to indicate the middle line of a like pair, of which there may be any desired number.

The condenser operates as follows: Steam or vapor supplied to the box G finds its way down by the passages *f* into the thin spaces between the corrugated sheets C, in which it becomes condensed by the cooling influence of air which freely ascends the spaces K between the pairs of sheets C, the ascent of the air being promoted by its becoming heated as it ascends. The liquid of condensation descends between the sheets C to the bottom and issues by the openings *f'*.

Instead of clamping the pieces A' B and the corrugated sheets C by long bolts E, the pieces B may be made in two halves, being vertically divided along the middle, as indicated by the dotted line *b b* in Fig. 4, and a single pair of the corrugated sheets C may be clamped by short bolts *e* between a pair of the pieces formed by halving the pieces B. The condenser in that case consists of a number of independent sections placed side by side, but all communicating with the steam or vapor supply box G.

Having thus described the nature of this invention and the best means we know of carrying the same into practical effect, we claim—

1. The combination of the corrugated sheets C, the uprights A', the pieces B, the strips D, F and F' and the bolts E adapted to clamp all these parts firmly together, substantially as described.

2. In a surface condenser, the combination with a suitable frame A, of the uprights A' at each corner of the frame, a plurality of upright pieces B secured to the frame and up-

rights and each having their side edges uniformly undulated, a pair of vertically-arranged and horizontally-corrugated plates C, secured between each pair of upright pieces, 5 spacing-strips D placed between each pair of corrugated plates so as to provide a narrow space between them, a steam-box G, located above the condenser and having communication with the several narrow spaces formed 10 by the pairs of corrugated plates, and exit-passages f'' at the bottom of the condenser

for the escape of liquid of condensation, substantially as described.

In testimony whereof we have signed our names to this specification, in the presence of 15 two subscribing witnesses, this 7th day of February, A. D. 1896.

EDWARD B. CAIRD.
THOMAS J. RAYNER.

Witnesses:

OLIVER IMRAY,
JNO. P. M. MILLARD.