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MEANS FOR COOLING TURBO COMPRESSORS OR BLOWERS.

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1,038,200. Patented Sept. 10, 1912.

Fig. 1

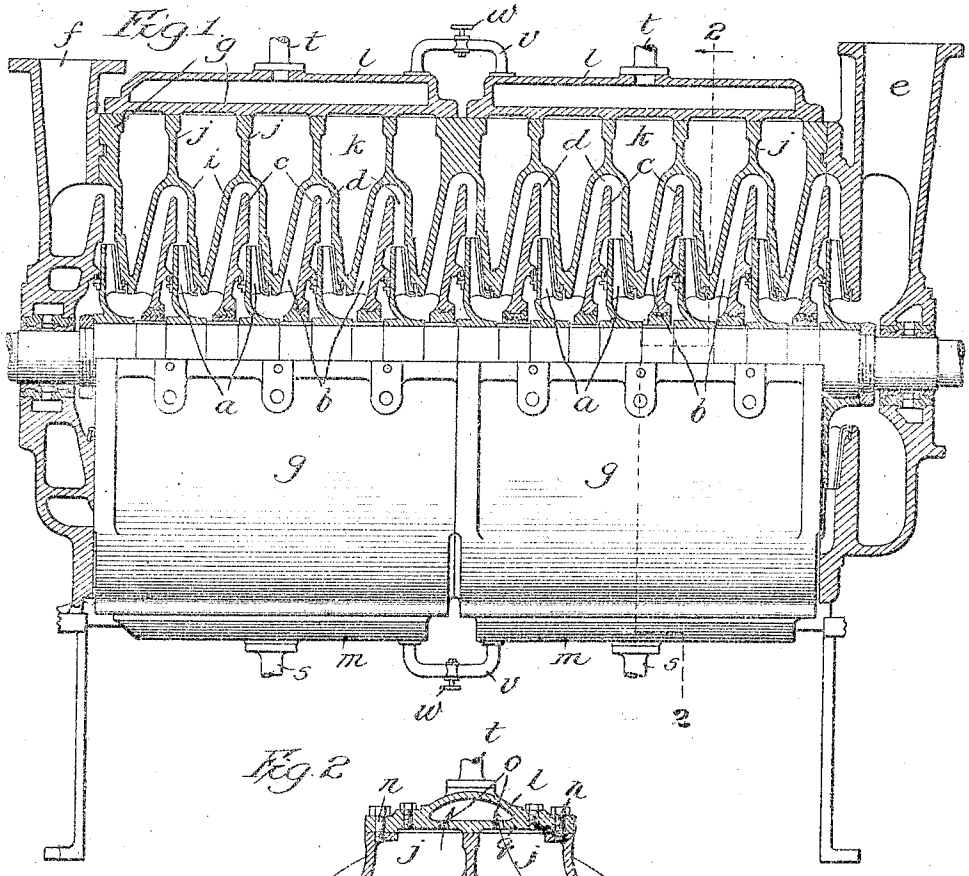
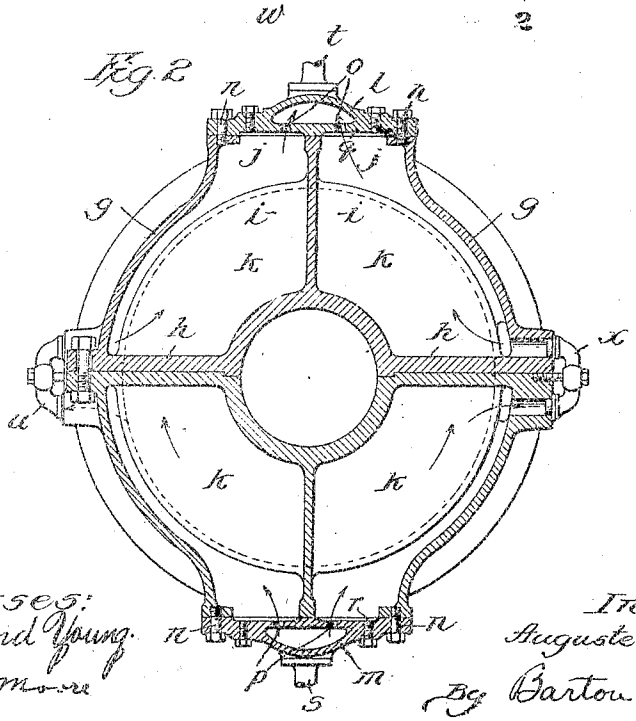


Fig. 2



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UNITED STATES PATENT OFFICE.

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MEANS FOR COOLING TURBO COMPRESSORS OR BLOWERS.

1,038,200. Specification of Letters Patent. Patented Sept. 10, 1912.

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To all whom it may concern:

Be it known that I, AUGUSTE CAMILLE EDMOND RATEAU, citizen of the Republic of France, residing at Paris, France, have invented a certain new and useful Improvement in Means for Cooling Turbo Compressors or Blowers, of which the following is a full, clear, concise, and exact description.

My invention relates to means for cooling turbo compressors or blowers.

It comprises an arrangement for the circulation of water in chambers arranged between the casing and the air conduits.

When the water is calcareous, it has been found that the interior walls of the chambers become covered with adherent calcareous deposits, and it is necessary to clean the walls of such deposits in order to preserve the effectiveness of the cooling by the water. The particular structure which I preferably employ permits of this cleaning without dismantling the machine. It is characterized by boxes or movable panels which cover orifices cut in the casing, and by their removability permit of the introduction of instruments for scraping off the incrustations from the walls of the water chambers.

Other features of my invention relate to arrangements for uniting, in series, in parallel or otherwise, any number of these panels, employed as collectors of water, and of isolating any one or more of them, thereby permitting of the cleansing of the isolated panels and the chambers covered thereby without disturbing the operation of the rest of the cooling apparatus.

These and other features of my invention may be readily understood by reference to the accompanying drawings, in which—

Figure 1 represents a longitudinal section of the multicellular compressor, provided with the arrangement of my invention; Fig. 2 is a transverse section on the line 2—2 of Fig. 1.

The compressor illustrated in the drawing is of a well-known type. The air enters at *e*, passes through the conduits *d* formed between the diaphragm *c* and the casing *i*, and is discharged at *f*. Within the conduits *d* are the usual wheels *a* and distributer vanes *b*. The chamber for the circulation of water is constituted by a hollow casing *g*, which is preferably made of two shells united by horizontal yoke *h* (Fig. 2) and of which the interior wall *i* is in the form of a labyrinth to produce the requisite contour of the conduits *d*. Partitions *j* can be arranged in such a manner as to divide the shell into isolated cells *k*. Boxes or hollow longitudinal panels *l*, *m*, are fixed on the interior of the casing by means of bolts *n*, said boxes or panels serving as collectors of the water. The panels *l*, *m*, are provided with holes *o*, *p*, respectively, and they cover large openings *q*, *r*, arranged in the casing. The panels are provided, moreover, with an entrance tube *s* and a discharge tube *t*, respectively, for the circulating water. The two halves, lower and upper, of the cells *k* are united by unions *x*, *u*, spanning the yokes *h*. These unions are represented as straddling the partitions *j* and in communication with two neighboring cells, but it is evident that unions could be used for each cell.

The operation is as follows: The cooling water is introduced by the tube *s* to the interior of a panel *m* and divides by the holes *p* and the openings *r* in the different cells *k* of the lower half of the casing, where it divides in two currents, which pass by the right hand unions *x* and the left hand ones *u* into the cells of the upper half. The two currents come together again by the openings *q* and the holes *o* in the upper panel *l* and pass out by the tube *t* from which the water can be led to any sort of cooling apparatus to be used again if need be. The circulation of water within the casing *g* is indicated by arrows in Fig. 1. If the walls of the cells become incrusted, the water is shut off and the panels, *l*, *m*, dismounted. This uncovers the cleaning openings *q*, *r*; the latter are of sufficiently great dimensions to permit access to the interior of the hollow casings for the purpose of cleansing the same.

The panels have been represented by way of example on the upper part and on the bottom of the casing, but evidently other arrangements thereof could be provided. These panels, instead of covering the whole length of the casing, could equally well be divided in two or more sections, covering a single cell or a number of cells. In the drawings the panels are shown as divided into two sections. The different sections are preferably united above and below by means of unions *v*. The water after having traversed the lower half of all the cells, then passes into the upper half. It is evident that any convenient method of connecting the panels can be adopted, as, for example, in parallel or otherwise, and the method of

connection by these unions v can be arranged with reference to the connection of the two halves by the unions x, u, in such a manner as to make the water circulate in the desired path. By arranging cocks or valves w on the unions v, one or more of the panels and the corresponding cells can be isolated at will in such a manner that it is possible to clean the isolated cell or cells without disturbing the operation of the compressor, the compressor continuing to be cooled by the other cells. The same arrangement is applicable to several distinct bodies or sections of compressors, each one furnished with panels subdivided or not and united by unions with or without valves.

I claim:

1. A compressor having a hollow casing divided into a series of cells, said casing having openings for permitting access to the interior of said cells, removable panels each covering the opening to a plurality of cells, unions for interconnecting said cells, and means providing for a continuous circulation of water through the interconnected cells.

2. A compressor having a hollow casing divided into a plurality of cells, said casing having openings for permitting access to the interior of said cells, and removable panels each coverng the opening to a group of cells, whereby access may be had to the group of covered cells by one of said panels without uncovering the remainder of said cells.

3. A compressor having a hollow casing divided into a plurality of cells, said casing having openings for permitting access to the interior of said cells, removable panels each covering the openings to a group of said cells, means for interconnecting all of said cells or for interconnecting a portion thereof only while isolating the remainder, as may be desired, and means providing for a continuous circulation of a cooling fluid through the interconnected cells.

4. A compressor having a hollow casing providing a system for the circulation of water, the exterior wall of said casing having one or more openings for permitting access to the exterior of the casing, and a removable cover for each of said openings, said cover consisting of a hollow panel which serves as a water collecting box.

5. A compressor provided with a hollow casing divided into a plurality of cells for the circulation of water, the exterior wall of said casing having openings each of which permits access to a group of said cells, and removable covers for said openings, said covers consisting of hollow panels which serve as water collecting boxes.

6. In a compressor, a hollow casing therefor providing a system for the circulation of water, said casing being formed into two halves each of which consists of longitudinal sides united at the base by a yoke and having a longitudinal opening opposite said base, unions spanning said yokes to provide for the circulation of water between the two halves of said hollow casing, and removable covers for said longitudinal openings, said covers consisting of hollow panels which serve as water collecting boxes.

7. In a compressor, a hollow casing therefor providing a system for the circulation of water, said casing being formed into two halves each of which consists of longitudinal sides united at the base by a yoke and having a longitudinal opening opposite said base, each of said halves being subdivided into a plurality of cells, unions spanning said yokes to provide for the circulation of water between the two halves of said hollow casing, and removable covers for said longitudinal openings, said covers being formed into sections which cover a group of cells, and each of said sections consisting of a hollow panel which serves as a water collecting box.

8. A compressor casing formed of hollow sections detachably jointed together and each having an imperforate wall separating the interior of the section from the interior of the casing and from the joint forming surfaces of the section, and having provisions for passing a cooling fluid into and out of the interior of the section through the outer wall thereof at a distance from the joint forming margins of the section.

9. A compressor casing formed of separable hollow sections meeting at joints extending longitudinally of the compressor axis and each having an imperforate wall separating the interior of the section from the interior of the casing and from the joint forming surfaces of the section, and having said wall corrugated transversely to the axis of the compressor, the corrugations of the meeting sections uniting to form a series of circular wheel receiving spaces, each section having provisions for passing a cooling fluid into and out of the interior of the section through the outer wall thereof and at a distance from the joint forming margins thereof.

In witness whereof, I hereunto subscribe my name this 11th day of February, A. D. 1909.

AUGUSTE CAMILLE EDMOND RATEAU.

Witnesses:

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