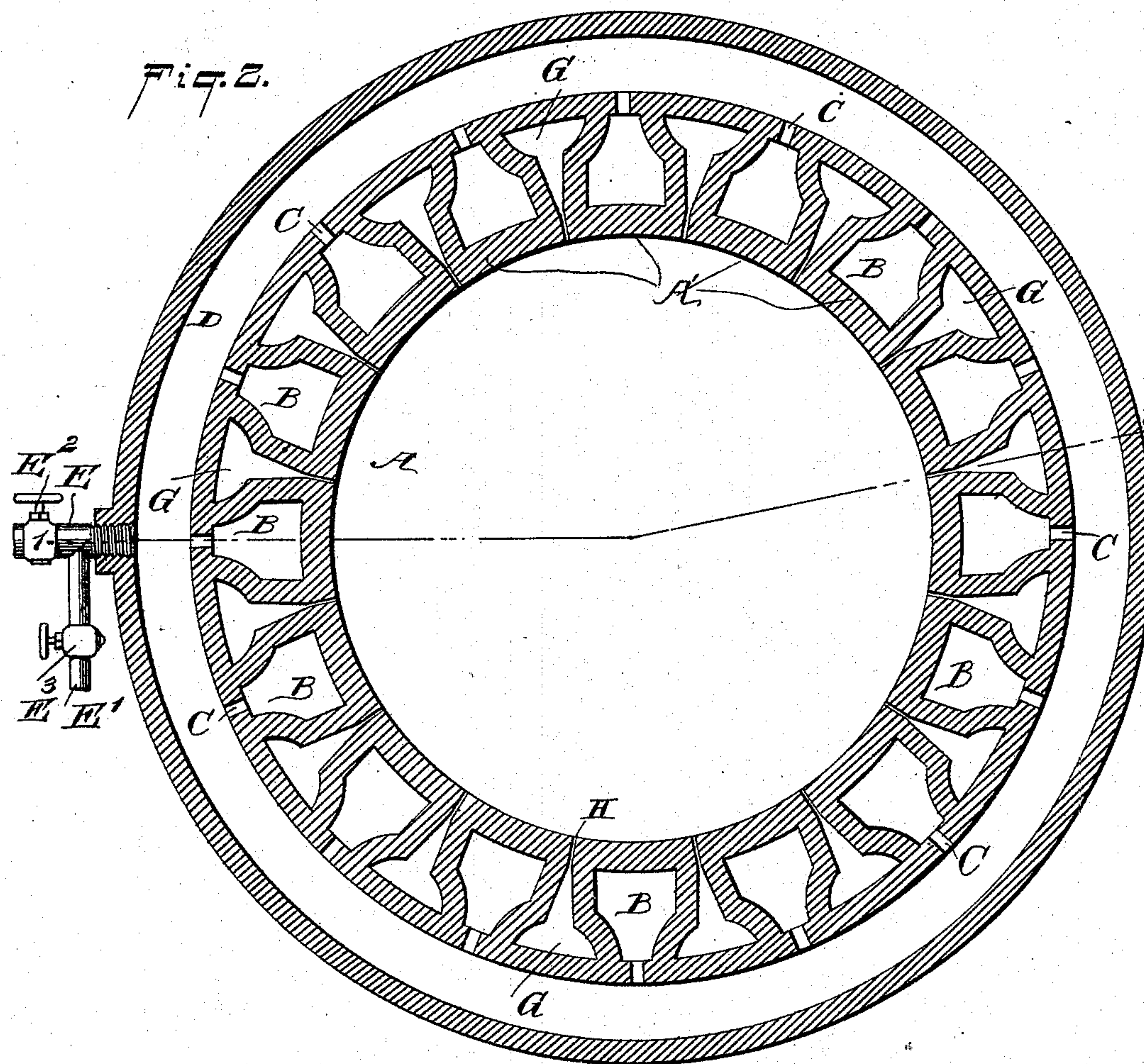
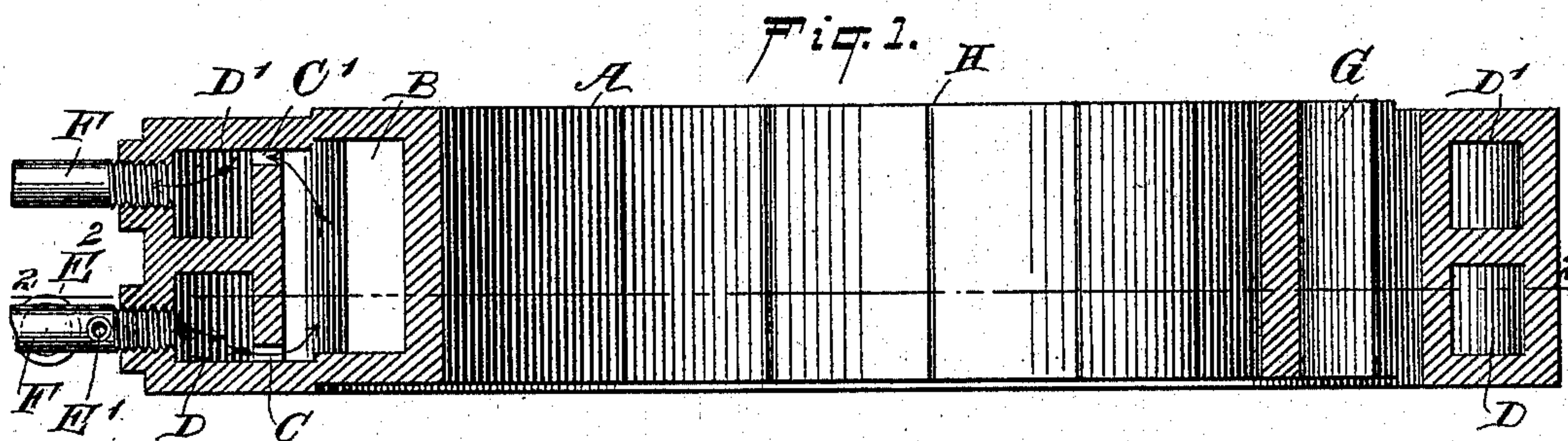


(No Model.)

H. SCHON.  
CHILL FOR MAKING CHILLED CASTINGS.

No. 528,034.

Patented Oct. 23, 1894.



WITNESSES:

William Gaebel.  
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INVENTOR

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# UNITED STATES PATENT OFFICE.

HUBERT SCHON, OF APOLLO, ASSIGNOR, BY DIRECT AND MESNE ASSIGNMENTS, TO HIMSELF, NEVILLE C. DAVISON, OF PITTSBURG, AND GEORGE MUTH AND JAMES P. SIPE, OF ALLEGHENY, PENNSYLVANIA.

## CHILL FOR MAKING CHILLED CASTINGS.

SPECIFICATION forming part of Letters Patent No. 528,034, dated October 23, 1894.

Application filed March 15, 1894. Serial No. 503,760. (No model.)

*To all whom it may concern:*

Be it known that I, HUBERT SCHON, of Apollo, in the county of Armstrong and State of Pennsylvania, have invented a new and Improved Chill for Making Chilled Castings, of which the following is a full, clear, and exact description.

The object of the invention is to provide a new and improved chill for making chilled castings, in such a manner as to obtain more uniform chilling of the metal throughout, and to prevent tearing or bursting of the castings or chills.

The invention consists of certain parts and details of the chill, and combinations of the said parts, as will be fully described hereinafter, and then pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in both the figures.

Figure 1 is a sectional side elevation of the improvement on the line 1—1 of Fig. 2; and Fig. 2 is a sectional plan view of the same on the line 2—2 of Fig. 1.

The improved chill shown in the drawings is arranged for forming chilled solid rolls, but other articles can readily be made by changing the form of the mold.

The improved chill is provided with the chilling surface A, of any desired shape or form corresponding to the article to be cast. This chilling surface A is formed by a series of hollow chill blocks A', which constitutes a series of cooling chambers B, each connected at its lower end by a port C, with an annular water-way D, into which discharges a pipe E, connected with a suitable source of water supply and provided with a branch pipe E', connected with a source of steam supply, so that either cold water or water and steam can be passed through the pipe E into the said annular water-way D, and from the latter through the ports C into the chambers B. Each of the latter is connected at its upper end, by a port C', with a second annular water-way D', located directly above the water-way D, and provided with an outlet pipe F, for carrying off the water and steam after it has circulated through the chill.

The cooling chambers B are separated from each other by cored spaces G, extending from the top to the bottom of the chill, so that air can circulate or pass through the same. The inner walls of the chill are sawed or otherwise cut, as at H, so that the cut extends into the corresponding spaces G, from the top to the bottom of the chill. By this arrangement the chill is prevented from bursting, as it can readily expand and contract between the individual cooling chambers B.

Now, in using the chill the operator first opens the valve E<sup>2</sup> in the water supply pipe E, and also a valve E<sup>3</sup> in the steam supply pipe E', to permit water and steam to pass into the lower water-way D, the water becoming heated by the steam, and the water can pass from the annular water-way through the several ports C into the chambers B, to finally pass out through the ports C' into the annular water-way D', and from the latter through the pipe F to a discharge receptacle.

It will be seen that by circulating hot water and steam through the chill as described, the latter is heated, and then the molten metal is poured into the chill to form the casting, after which the operator closes the valve E<sup>3</sup> to shut off the steam and to permit only cold water to circulate through the chill in the manner above described.

It will be seen that as the chill had been filled with hot water, the incoming cold water gradually displaces the hot water and steam, so that the chill is gradually cooled by the circulation of the cold water through the chill. Now, as the entire chilling surface is surrounded by the chambers B, the molten metal in the mold A will be gradually cooled and chilled throughout, so as to produce a uniform chilled casting. It will further be seen that the degree of hardness of the casting can be readily regulated by the operator manipulating the valves E<sup>2</sup>, E<sup>3</sup>, so as to gradually change the temperature of the water circulating through the chill.

If it is desired to chill the molten metal very strongly, then the steam is shut off suddenly by totally closing the valve E<sup>3</sup>, but when it is desired to produce a casting of a less chilled degree, then the steam is gradually



shut off by the operator manipulating the valve E<sup>3</sup> accordingly.

Having thus fully described my invention, I claim as new and desire to secure by Letters  
5 Patent—

1. A chill comprising a chilling surface surrounded by a series of cooling chambers, annular water-ways connected by ports with the said cooling chambers to circulate water  
10 through the latter, and air spaces or channels for separating the cooling chambers from each other, substantially as shown and described.

2. A chill comprising an annular series of hollow chill blocks each forming a cooling 15 chamber provided with an inlet and an outlet, and two annular water-ways one of which is connected with the inlet ports of the cooling chambers, while the other connects with the outlet ports of the said chambers, substantially as described. 20

HUBERT SCHON.

Witnesses:

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C. SEDGWICK.