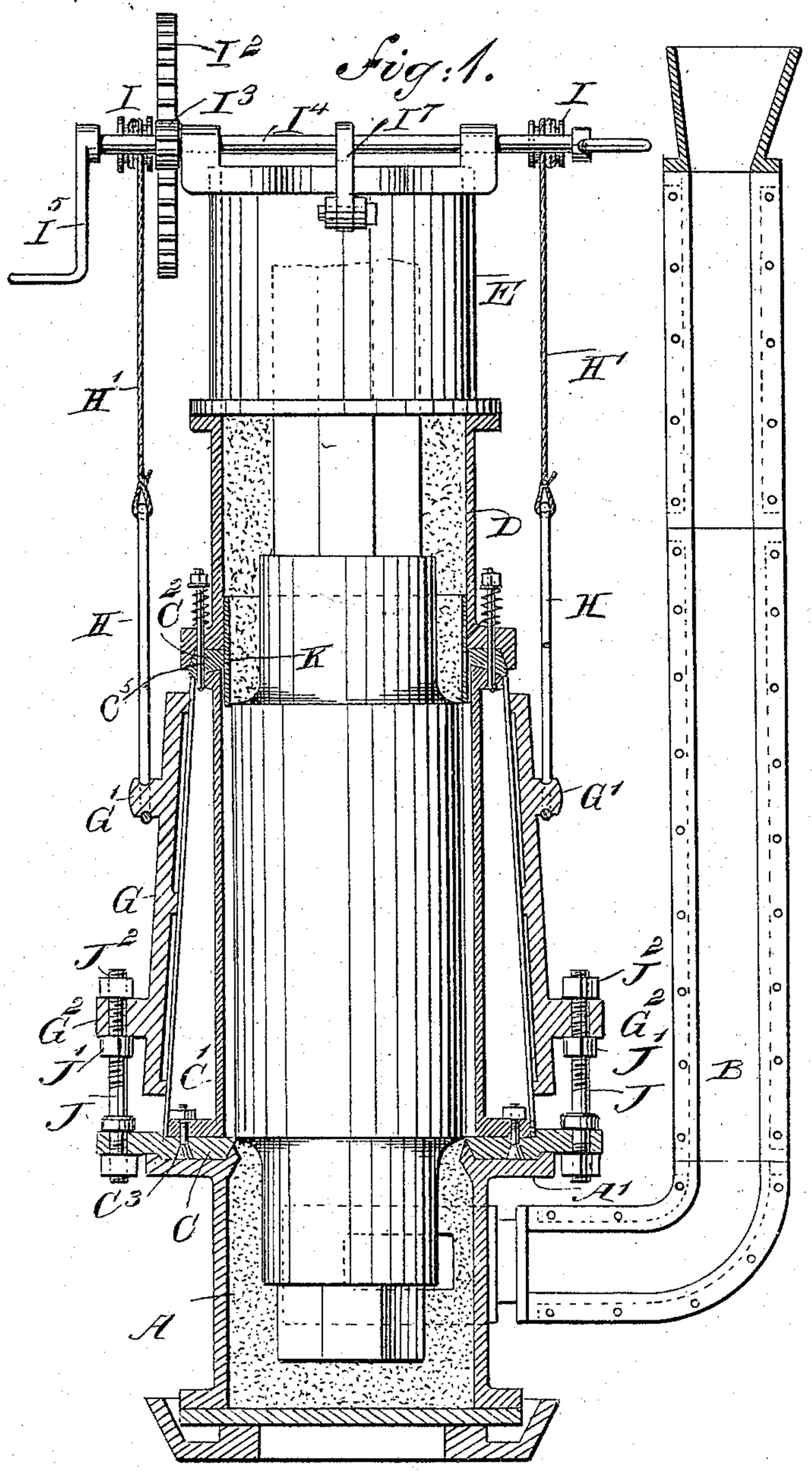
(No Model.) 2 Sheets—Sheet 1.

A. McLENNAN.

MOLD AND FLASK FOR CHILL ROLLS.

No. 533,313. Patented Jan. 29, 1895.

Fig: 1.



WITNESSES:

Chas. Nida.

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(No Model.) 2 Sheets—Sheet 2.

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Fig: 2.

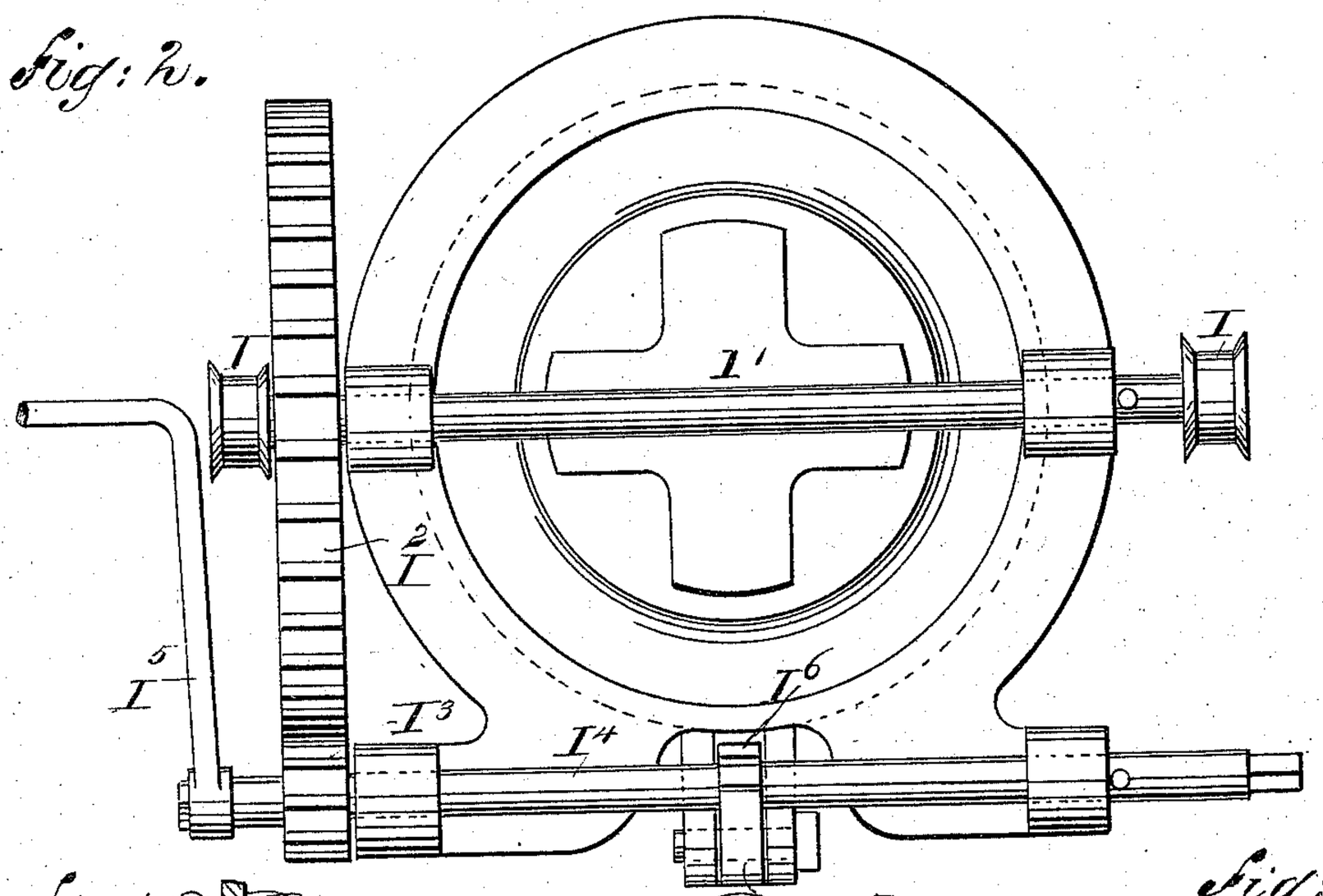


Fig: 4.

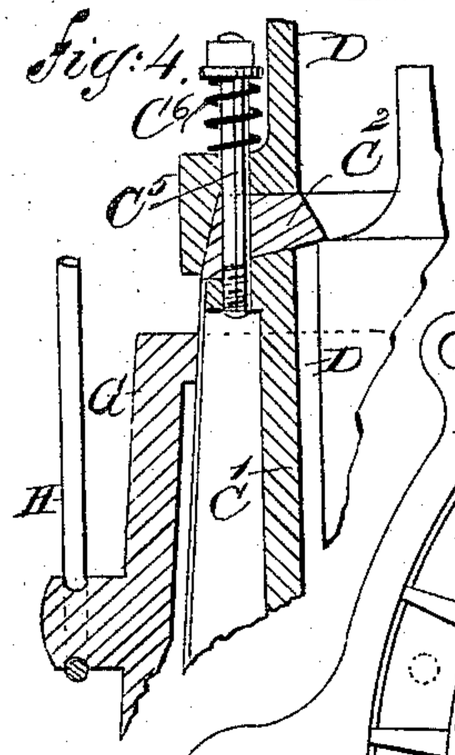
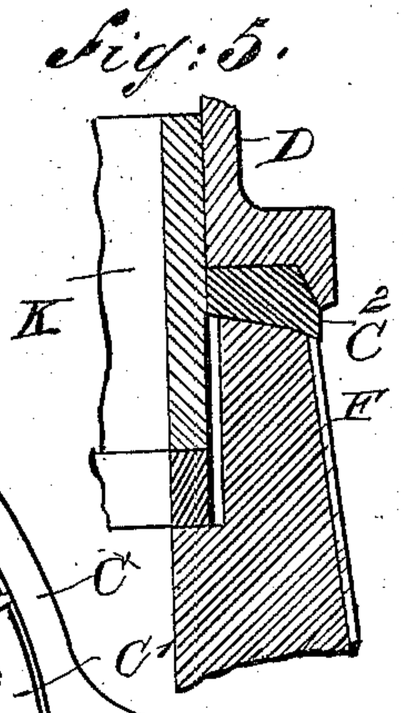


Fig: 3

Fig: 5.



WITNESSES:

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C. Sedgwick

INVENTOR

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UNITED STATES PATENT OFFICE.

ALEXANDER McLENNAN, OF NEW YORK, N. Y.

MOLD AND FLASK FOR CHILL-ROLLS.

SPECIFICATION forming part of Letters Patent No. 533,313, dated January 29, 1895.

Application filed March 30, 1894. Serial No. 505,701. (No model.)

To all whom it may concern:

Be it known that I, ALEXANDER McLENNAN, of the city, county, and State of New York, have invented a new and Improved Mold and Flask for Chill-Rolls, of which the following is a full, clear, and exact description.

The object of the invention is to provide a new and improved mold and flask for manufacturing chilled rolls and similar castings, and which is simple and durable in construction, and arranged to readily permit of adjusting the chills to compensate for the contraction of the metal, to obtain a better chill and to prevent the metal from cracking.

The invention consists principally of a series of single chills adapted to form the mold for the roll, and adapted to be moved inward to follow the contraction of the poured metal so as to form a tight joint around the casting.

The invention also consists of certain parts and details, and combinations of the same, as will be hereinafter described 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 all the figures.

Figure 1 is a sectional side elevation of the improvement. Fig. 2 is an enlarged plan view of the same. Fig. 3 is an enlarged plan view of the chills and the frame supporting the same, with the top ring partly removed. Fig. 4 is a detail sectional view of the same, and Fig. 5 is a similar view of the ring for forming different lengths of rolls.

The improved mold and flask for manufacturing chilled rolls and other castings, is provided with the usual pit A having a runner pipe B through which the molten metal is introduced into the mold and flask at the pit. On the flange A′ of the pit A is fitted a ring C forming part of a frame provided with uprights or bars C′, and a top ring C^2 and the flanges of the uprights C′ are fastened by bolts C^3 to the ring C and the top ring C^2 is fastened by dowel pins to the top flange of the uprights, several of the dowel pins being extended as indicated at C^5 in Fig. 4, to pass through flanges in the lower flange of the neck D, supporting the cap E, as indicated in Fig. 1.

The long dowel pins C^5 are provided with springs C^6 at their upper ends, as plainly illustrated in Fig. 4.

The inner edges of the rings C and C^2 are beveled to form the bottom and top edges of the body portion of the roll to be cast, as will be readily understood by reference to Figs. 1 and 4. Now, in this frame formed by the rings C, C^2 and the uprights C′ are set a series of chills F one chill being set between two adjacent uprights or bars, as plainly indicated in Fig. 3, and each chill is made T-shaped in cross section, with the horizontal cross bar F′ formed at its inner face like a segment of a circle, to correspond to the peripheral surface of the roll to be cast. The ends of the bars F′ of two adjacent chills are arranged in close proximity and are slightly beveled so that they diverge from the inside outwardly, as will be readily understood by reference to Fig. 3. The chills F have the outer edges beveled or inclined, as plainly shown in Fig. 5, and the said outer edges are arranged in a circle and are adapted to be engaged by a truncated conical ring G provided on opposite sides with lugs G′ held on rods H connected with ropes H′ adapted to wind on drums, I, secured on a shaft I′ journaled in suitable bearings on the upper end of the cap E.

On the shaft I′ is a gear wheel I^2 in mesh with a pinion I^3 secured on a shaft I^4 mounted to turn in suitable bearings on the upper end of the cap E, as shown in Figs. 1 and 2, and on this shaft I^4 is fastened a crank arm I^5 under the control of the operator for conveniently turning the said shaft I^4, so that the pinion I^3 rotates the gear wheel I^2 and the shaft I′ to wind up the ropes H′ on the drums I or to unwind the same, to raise or lower the truncated cone-shaped ring G. Now, it will be seen that when the said ring is passed downward over the outer edges of the chills F, then the latter are securely held in place and are adapted to move inwardly against the peripheral surface of the cast roll, so that

as the latter contracts, the chills advance inwardly to at all times remain in contact with the roll. On the lower end of the said ring G are arranged four or more lugs G^2 engaged by stay bolts J, each secured on the lugs of the ring C forming part of the frame containing the chills F. Each bolt J is provided on its upper end with two nuts J′ and J^2 engaging the bottom and top of the respective lugs G^2, so that on screwing the nut J′ downward and then screwing the nut J^2 in a like direction, the ring G is forced downward so as to press the chills F inwardly uniformly and simultaneously to form a complete band around the cast roll, as the metal of the latter contracts. The spaces between the inner ends of the chills F are coated and dressed in the usual manner and with suitable material, so that when the metal is poured the body of the roll is formed by the inner faces of the chills F forming the mold. The necks are formed in the usual manner in the pit A and the neck D.

The pit A and neck D are filled with sand around the reduced ends of the roll-pattern, so that when the latter is withdrawn and the metal is poured in, the necks or ends of the roll or other article are formed.

Now, in order to enable the operator to use the same mold and flask for rolls of different lengths, I provide a ring K, see Figs. 1 and 5, fitting into recesses in the upper ends of the chills F, the said recesses being sufficiently deep to permit of adjusting the chills readily by the ring G, as previously described, without touching the said ring K. The latter is fitted on the inside of the ring C^2 and and the neck D, as plainly shown in Fig. 1.

When the mold is coated and dressed and placed in the pit, with the neck, flask, runner pipe and all other parts connected as shown in the drawings, then the weight of the truncated cone-shaped ring G is held up by the hoisting device, as previously described, the said hoisting device being provided on its shaft I^4 with a ratchet wheel I^6 then engaged by a pawl I^7. When this is secure, each nut J′ on the bolts J is screwed down, say about two or three inches, after which the metal is poured in the usual manner through the runner pipe B to fill the pit A, the space between the chills F and the space in the neck D, so as to form the roll. See Fig. 1. After the metal is poured, then the pawl I^7 is disengaged from the ratchet wheel I^6 so as to permit the weight of the ring G to act on the exterior edges of the chills F, so as to force the same readily inward against the peripheral surface of the casting, at the body portion of the roll. As the metal contracts, the chills F are forced inward by the action of the downwardly-moving ring G until the lugs G^2 rest on the previously screwed down nuts J′, as above mentioned, thus arresting farther downward movement of the said ring and supporting the same. The roll or other casting is then sufficiently hot and will still contract such an amount as to leave the chills F loose enough to readily slip from the roll. Thus, it will be seen that by the arrangement described the chills are gradually forced against the peripheral surface of the casting by the weight of the ring G, to compensate for the contraction of the metal, until the downward motion of the ring is interrupted by the lugs G^2 seating themselves on the nuts J′. By this arrangement a very even contraction of the metal is obtained, as the chills form a tightly fitting band around the poured metal whereby a better chill is obtained and cracking of the metal is completely avoided.

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

1. A mold and flask for chill rolls and other articles, comprising a frame, a series of single chills set loosely in the said frame and adapted to form the mold for the roll, the said chills being adapted to be moved inward to follow the contraction of the poured metal, so as to form a tight band around the casting as the metal contracts, and means, substantially as described, for gradually moving the said chills inward, as set forth.

2. A mold and flask for chill rolls, and other articles comprising a frame, a series of single chills set loosely in the said frame and adapted to form the mold for the roll, the said chills being adapted to be moved inward to follow the contraction of the poured metal, so as to form a tight band around the casting as the metal contracts, and a truncated cone-shaped ring adapted to engage the outer beveled edges of the said chills to uniformly and simultaneously move the latter inward as the metal contracts, as set forth.

3. A mold and flask for chill rolls, and other articles comprising a frame, a series of single chills set loosely in the said frame and adapted to form the mold for the roll, the said chills being adapted to be moved inward to follow the contraction of the poured metal, so as to form a tight band around the casting as the metal contracts, a truncated cone-shaped ring adapted to engage the outer beveled edges of the said chills to uniformly and simultaneously move the latter inward as the metal contracts, and means, substantially as described, for limiting the downward movement of the said ring or cylinder, substantially as shown and described.

4. A mold for the purpose described, comprising a series of chills whose inner ends are set close to one another so as to form a continuous surface, while the outer ends of the chills are spaced, a ring surrounding the chills and engaging the outer ends thereof and a frame provided with bars arranged between the outer ends of the chills, substantially as described.

5. A mold for the purpose described, comprising a pit, a mold frame rigidly connected thereto, chills within the frame, and a top ring yieldingly mounted on the said frame, substantially as described.

6. A mold for the purpose described, comprising an annular series of chills, each having a recess at one of its ends, a frame in which the said chills are loosely set, and a ring fitted into the recesses of the chills, as and for the purpose set forth.

ALEXANDER McLENNAN.

Witnesses:
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C. SEDGWICK.