

(No Model.)

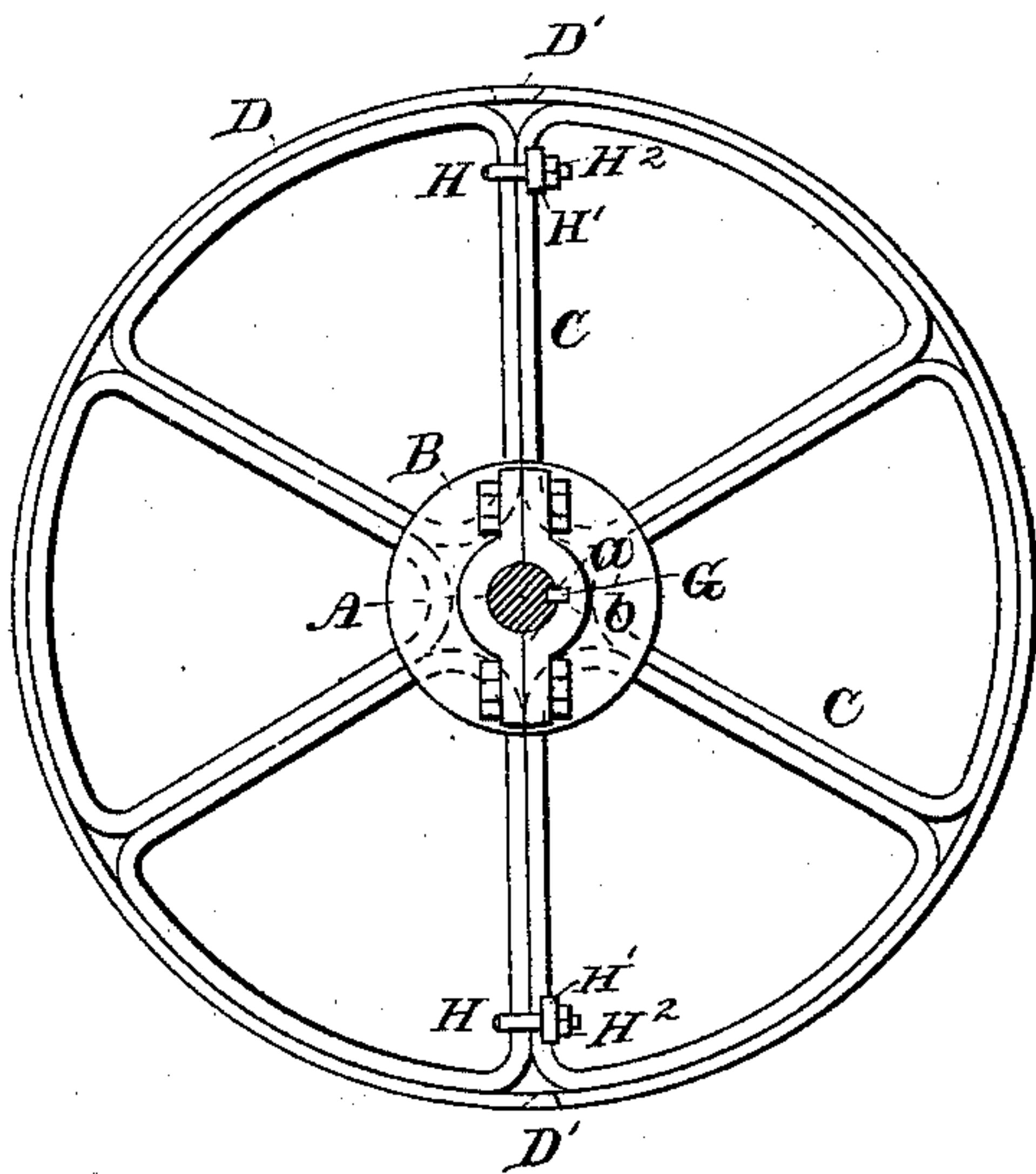
G. S. LONG.

PULLEY.

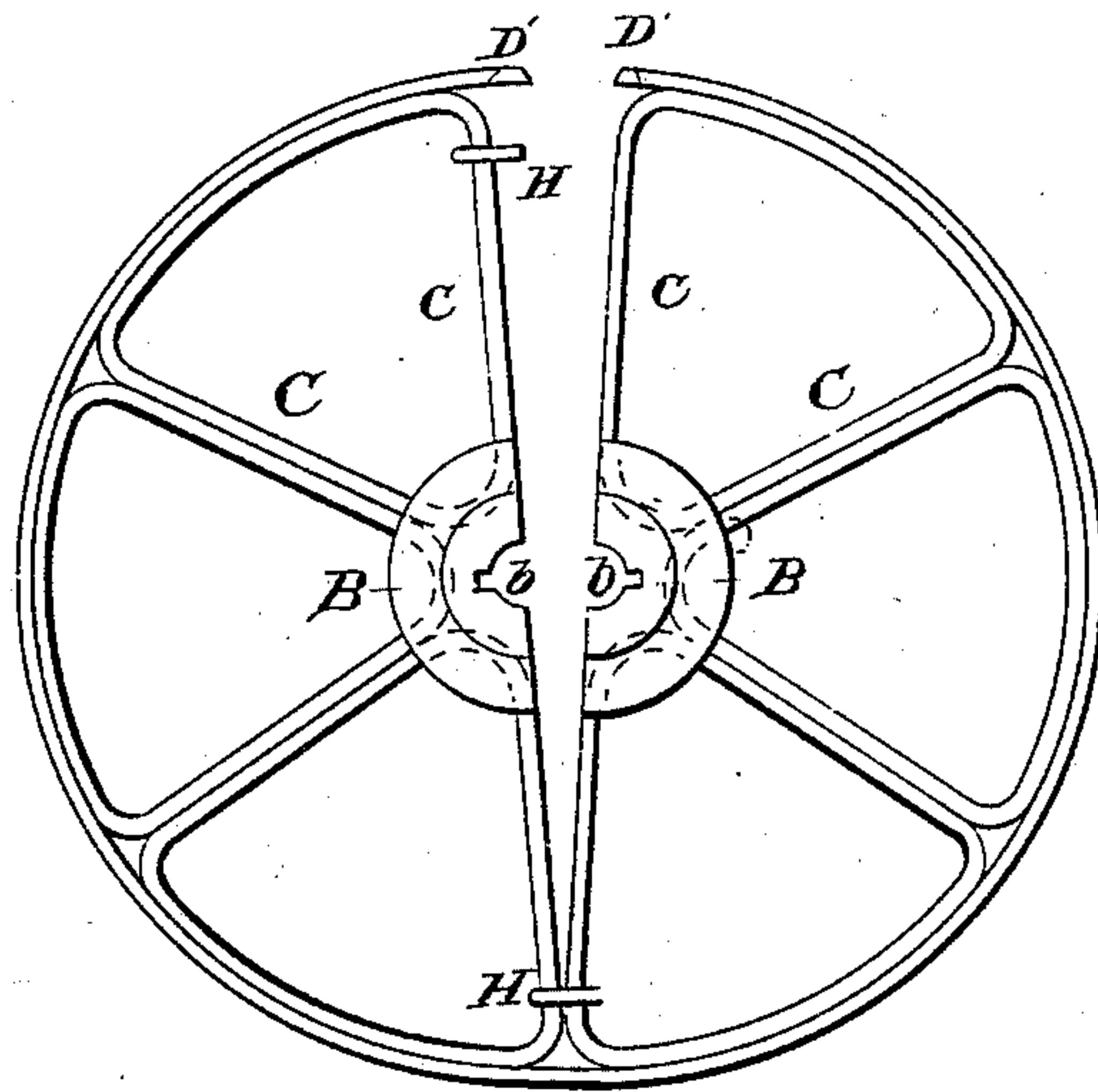
No. 285,635.

Patented Sept. 25, 1883.

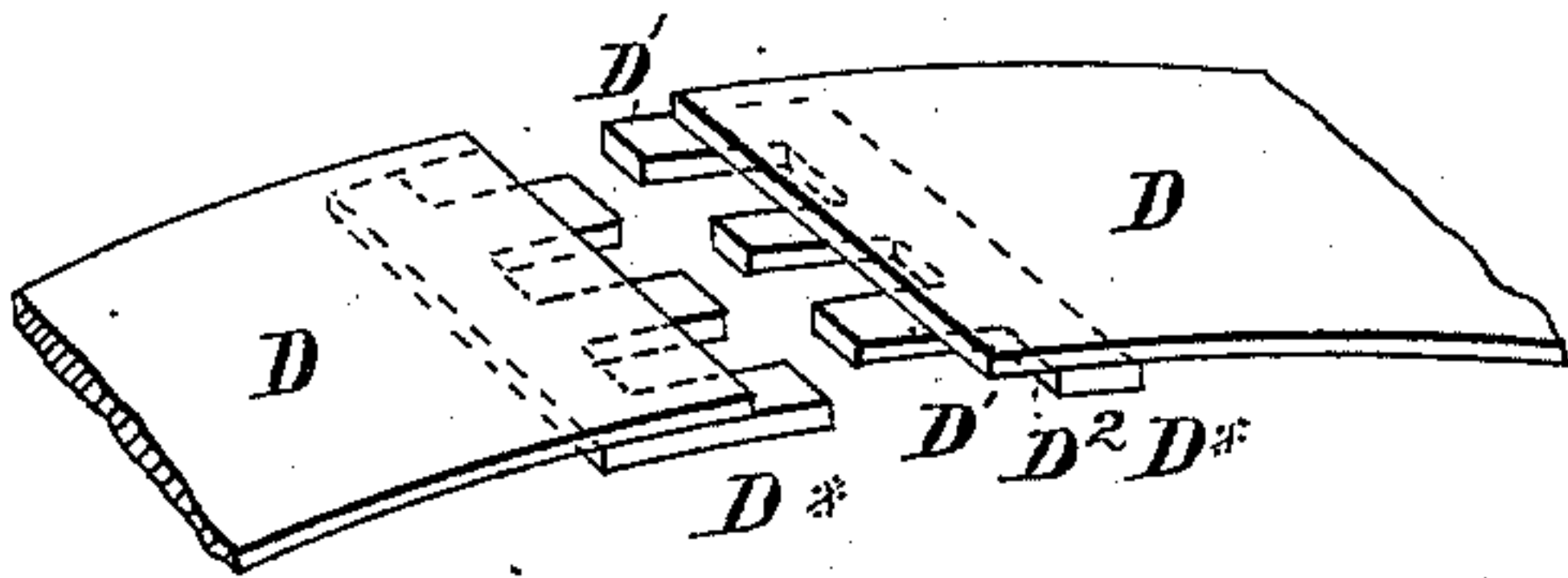
*Fig. 1.*



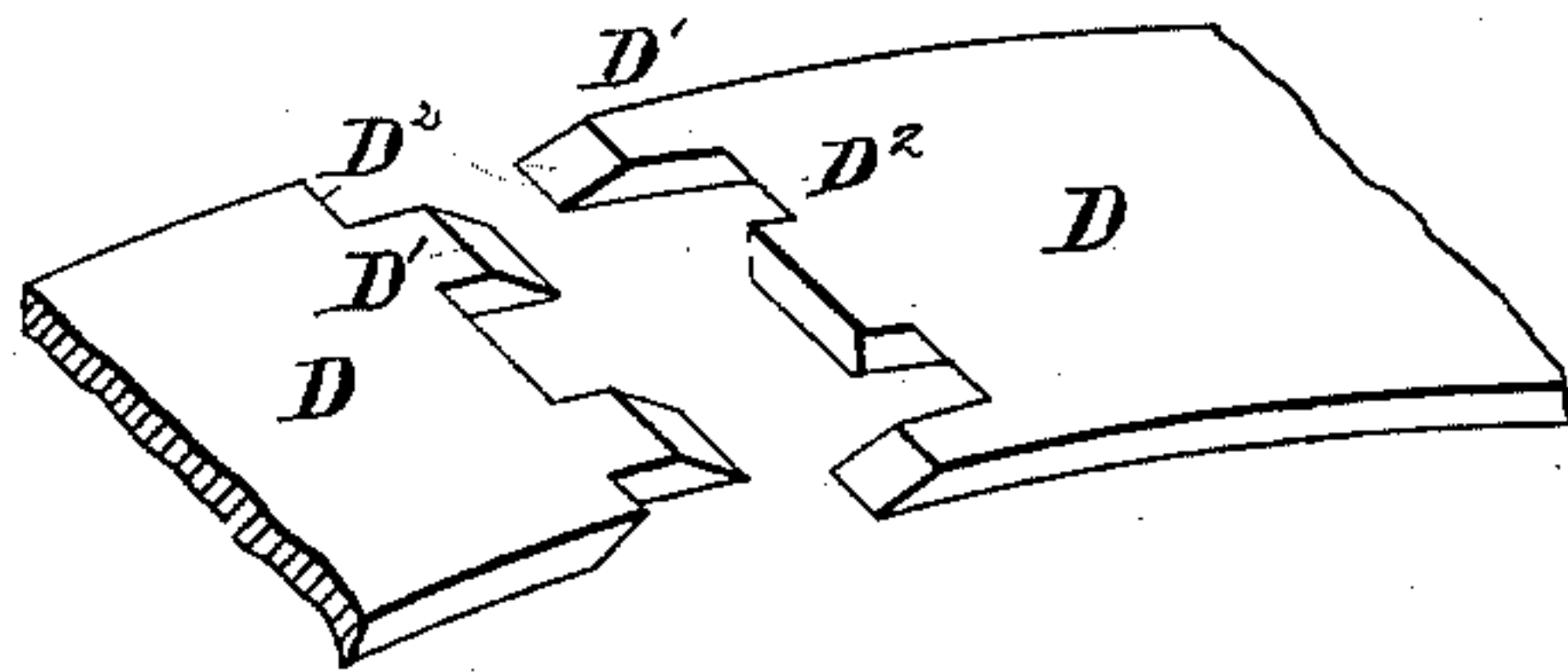
*Fig. 2.*



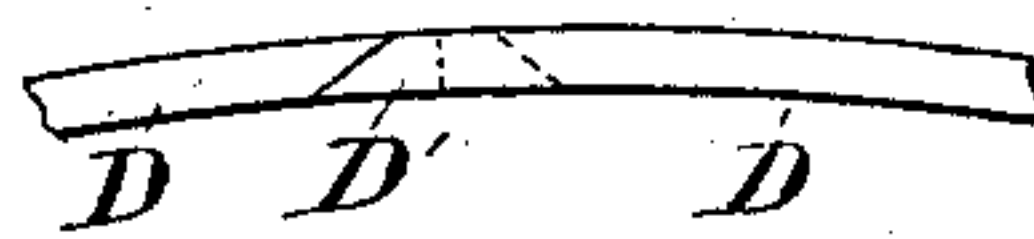
*Fig. 5.*



*Fig. 3.*



*Fig. 4.*



Witnesses:

*A. G. Putnam*  
*W. C. Day*

Inventor.

*George S. Long*  
*His attorney*



# UNITED STATES PATENT OFFICE.

GEORGE S. LONG, OF HARTFORD, CONNECTICUT.

## PULLEY.

SPECIFICATION forming part of Letters Patent No. 285,635, dated September 25, 1883.

Application filed October 18, 1882. (No model.)

*To all whom it may concern:*

Be it known that I, GEORGE S. LONG, of Hartford, in the county of Hartford, in the State of Connecticut, have invented certain new and useful Improvements in the Construction of Pulleys, of which the following is a specification.

The pulley is made in two halves, which, being applied together in proper position on the shaft, are firmly and rigidly secured together. The junctions of the periphery are strongly guarded against any disturbance of position of the one part relatively to the other under any circumstances by being tongued and grooved, or perhaps it should be termed "joggled," together. At the place where the wheel or pulley divides, the two parts of the arms are joined by yokes, which firmly embrace and secure them without the weakening which would be caused by making holes to insert bolts.

The following is a description of what I consider the best means of carrying out the invention.

The accompanying drawings form a part of this specification.

Figure 1 is a side view, showing the construction when the pulley is made in two entirely separable parts or halves. Fig. 2 is a side elevation, showing a form in which the pulley is partly separable. Either of these forms allows the pulley to be conveniently applied and removed from a shaft. Fig. 3 is a perspective view, showing the joint or junction of the peripheral metal open. Fig. 4 is an edge view, showing the same closed. Fig. 5 is a perspective view, showing a modification.

Similar letters of reference indicate corresponding parts in all the figures.

A is a shaft, and *a* a splined groove or key-seat therein. B is the cast-iron hub; C, the several peculiarly-bent bars which form the arms, and D the thin wide metal which forms the periphery.

In Fig. 1 the hub is made in two parts, joined by stout bolts and nuts E. A key-seat, *b*, matching to the key-seat *a* in the shaft, is adapted to receive a spline-key, G, fixing the hub firmly on the shaft.

The bars C are accurately bent by hand or by machinery. In my experiments I have used bars of half-round or nearly half-round section, and given them the proper form by applying them by hand around a carefully-shaped "former." (Not represented.) The portions which are to apply against the interior of the broad thin portions D are arcs of a circle. The portions which form each one-half of an arm are straight. The ends which are cast into the hub should be bent a little inward, especially those ends which come close to the joint where the two halves of the hub join each other. These ends are previously heated and tinned, and, being placed in the mold in proper position, on pouring the casting for the hub B, are embraced and welded or strongly and permanently united thereto.

The arms of the wheel, each formed of the adjacent portions of two of the bars C, applied with their flat faces together, are permanently united, except along the line where the two halves separate. Along this line they are united by removable yokes H with cross-pieces H' and nuts H<sup>2</sup>. These yokes are made a little narrower than the full width of the bars C, and the latter are narrowed a little, by a file or other suitable tool, at the points where the yokes are to apply. This aids to determine the places for the yokes and holds them against displacement. The junctions of the bars C to constitute the other arms may be effected by riveting, or they may be united simply by their union with the hub and periphery, respectively.

The curved portions of the several bars C are united to the periphery D by riveting. At the points where the ends of the peripheral sheets D D abut together, especial care is taken to insure and maintain an exact coincidence of position. The metal is provided of sufficient length to project somewhat beyond the mean line of junction, and is notched or joggled and beveled, so that each part will brace the other very firmly. Referring to Figs. 3 and 4, the portion of each which projects beyond the mean line is marked D'. The corresponding recess in the opposite portion which matches thereto is marked D<sup>2</sup>. The ends of these portions are beveled, certain portions of



each end being beveled inward, and other portions of the same end being beveled outward. Care must be taken to match these beveled ends together, so that they shall lock perfectly, and the periphery of the pulley at that portion is secured thereby with unusual firmness of position. One side cannot yield by springing, or otherwise, so as to move outward or inward, or, in other words, axially, without compelling the adjacent part of the other portion of the wheel to move with it.

In the form shown in Fig. 2 the periphery is in a single piece; but the hub and arms are capable of separating. The periphery being made of steel, or hard and elastic iron, with an opening coinciding with an opening between the two halves of the interior work, it may be sprung open to be applied upon or to be removed from the shaft. The ends may be equipped as shown in Figs. 3 and 4, and the two halves may be fastened by yokes and bolts, as above described. The yoke on one side may be dispensed with in small and light pulleys, the junction on that side being maintained by the continuity of the peripheral metal D.

The proper degree of crown on the exterior of the pulley is attained by rolling the steel or iron D in properly-formed rolls, so as to produce the required swell, by making the middle thicker than the edges. The inner face of each peripheral piece D is a perfect cylinder. The exterior face is swelled. The edges, which are likely to come rough from the rolling-mill, are finally removed by turning or other means. The whole or any portion of the entire outer surface may be coated with any required paint, paper-stock, or other surfacing material. I prefer for general purposes a steel surface highly polished.

My pulleys may be made of various sizes and adapted for various conditions in regard to strains and velocities.

By the employment of the yokes H, I am able to unite the wheel very strongly at a point near the periphery, and avoid weakening the bars by producing any holes therein.

Instead of the peculiar joint described for the junctions of the peripheries, the ends of the sheets may be finished squarely, and on the inner face of each end may be riveted toothed plates D\*, so placed that the end of the sheet D shall come over the mid-length of each tooth. In other words, each tooth lies with its root against the interior of the piece D to which it is riveted, and with its point projecting beyond and lying against the inner face of the opposite piece D. When the parts thus equipped are applied together, the point of each tooth matches into the recess between the roots of the teeth in the opposite piece D. This modification is shown in Fig. 5.

Although I have referred to this wheel simply as a "pulley," by which will be generally understood a device to give or receive motion by a belt, I consider it also useful for carriage-wheels, wheelbarrow-wheels, and for various other uses.

I consider the yokes H important in assisting to hold the parts together, and thus relieve the other fastening devices.

I claim as my invention—

The pulley herein described, having the hub B, the bars C, bent in such manner that the arms of each bar form one-half of each spoke, while the intermediate part supports the rim D, the said pulley being made in two parts, and the rim D having interlocking points and recesses D' D<sup>2</sup>, and the semicircular parts being locked together by means of threaded yokes H, plates H', and nuts H<sup>2</sup>, the whole arranged, constructed, and combined to operate as and for the purposes set forth.

In testimony whereof I have hereunto set my hand, at New York city, this 22d day of September, 1882, in the presence of two subscribing witnesses.

G. S. LONG.

Witnesses:

THOMAS D. STETSON,  
H. A. JOHNSTONE.