

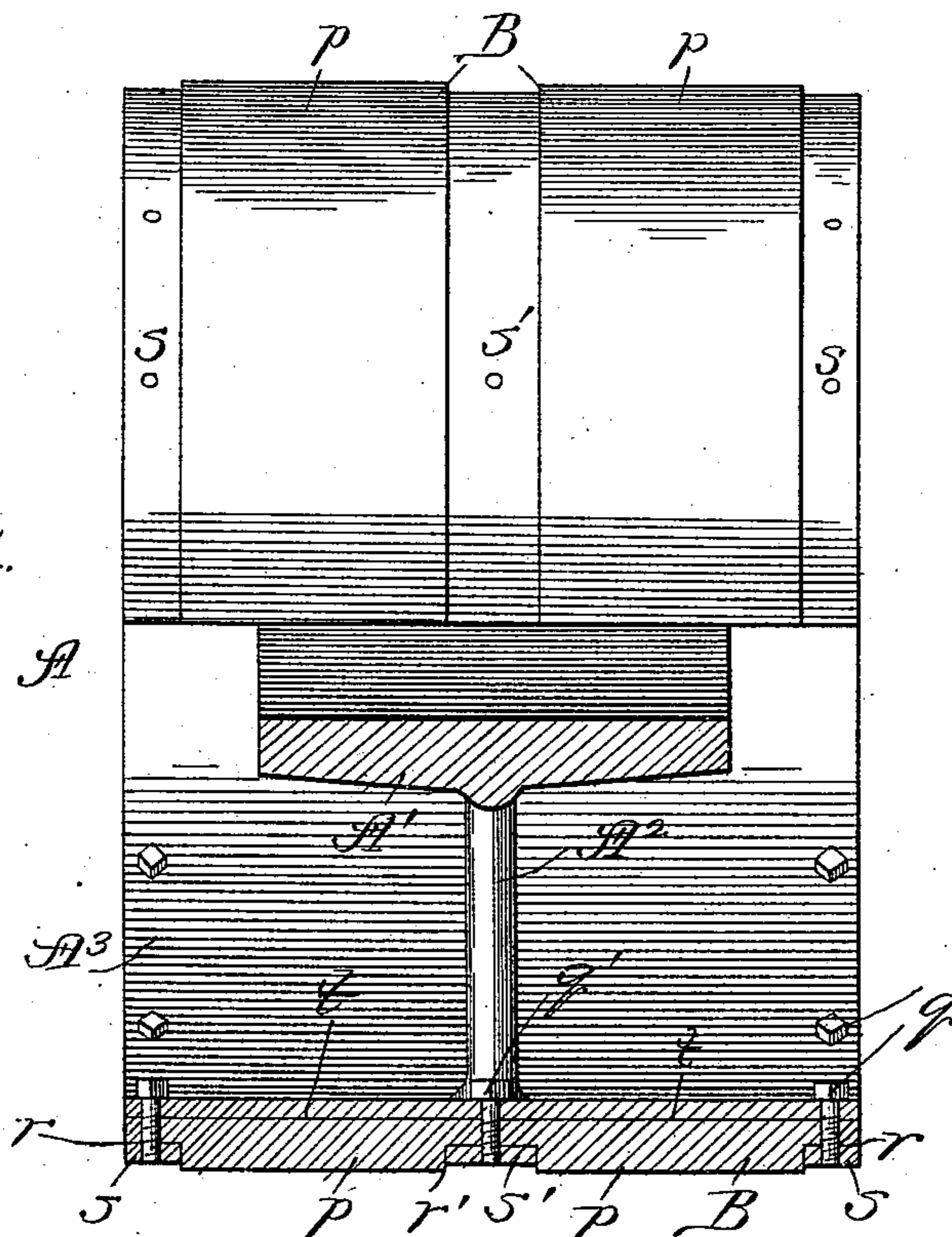
(No Model.)

C. H. WILMERDING.  
WHEEL.

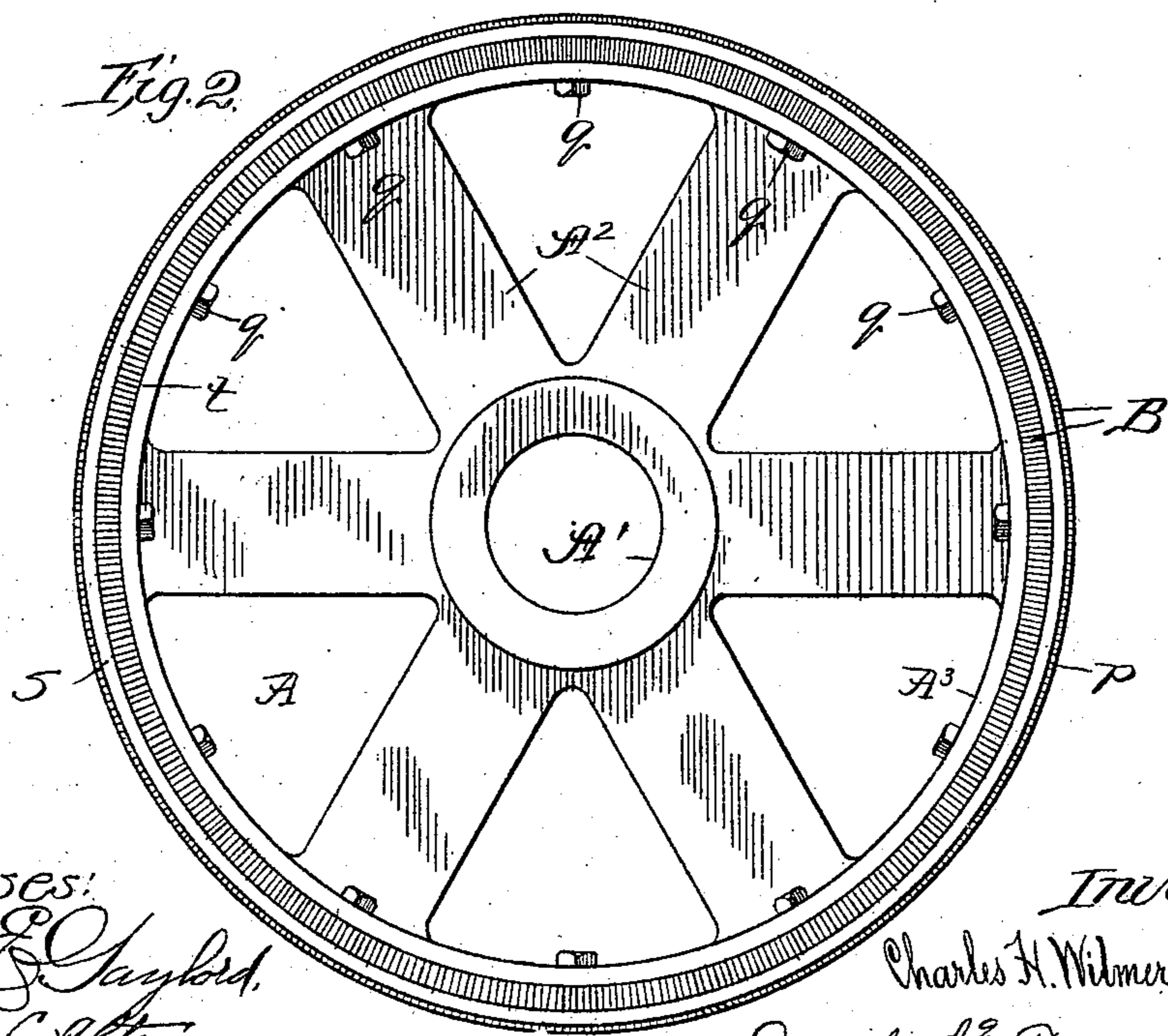
No. 551,609.

Patented Dec. 17, 1895.

*Fig. 1.*



*Fig. 2.*



Witnesses:  
Eas. & Gaylord,  
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Charles H. Wilmerding,  
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# UNITED STATES PATENT OFFICE.

CHARLES H. WILMERDING, OF CHICAGO, ILLINOIS.

## WHEEL.

SPECIFICATION forming part of Letters Patent No. 551,609, dated December 17, 1895.

Application filed January 21, 1895. Serial No. 535,633. (No model.)

*To all whom it may concern*

Be it known that I, CHARLES H. WILMERDING, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Wheels, of which the following is a specification.

My invention relates to improvements in wheels of the class known as "compress-wheels," in which the tire or rim portion is formed of flatwise-abutting sections extending crosswise of the circumference of the wheel and compressed and secured in place. Patent No. 455,277, granted June 30, 1891, shows and describes a wheel constructed upon this principle, and the said wheel as constructed is adapted more especially for buffing and polishing purposes.

My object is to adapt the same principle to the construction of powerful high-speed belt-pulleys. The construction shown and described in the aforesaid patent is adapted only to comparatively narrow faced wheels, the flatwise-abutting sections being held only by clamping-plates engaging shoulders at the ends. To adapt the compress-wheel rim to pulleys, and especially comparatively wide faced pulleys, a different means for fastening the sections in place when compressed is necessary.

In carrying out my object I employ improved means for holding the flatwise-abutting sections, whereby they are held with great security against centrifugal force and the strain of a belt, and at the same time afford a comparatively light and inexpensive pulley having especially great gripping power upon the belt.

To the above ends my invention consists in the general construction of my improvement as well as in details of construction and combinations of parts, all as hereinafter set forth and claimed.

In the drawings, Figure 1 is a front or face view of a pulley constructed in accordance with my improvements, half the view being in section and the other half in elevation; and Fig. 2, a side elevation of the same.

A is a pulley formed with a hub portion A', spokes A<sup>2</sup> and a comparatively-thin metal rim or bed A<sup>3</sup>. The rim A<sup>3</sup> forms the annular bed for an outer compressed rim B formed

of flatwise-abutting sections, of leather or other desirable friction material, extending crosswise of the rim.

The preferred method of forming compress-rims B is shown and described in Letters Patent of the United States No. 503,360, granted August 15, 1893, and consists in assembling the rim-sections in proper annular relation in a form of comparatively-large diameter, and then forcing them laterally through a gradually-diminishing aperture, whereby they are compressed centripetally, and then discharging them into a temporary retaining form of comparatively small diameter.

In constructing the rim B strips of leather or the like, of approximately the same width throughout, are assembled in a metal ring or form, the leather sections being crowded together around the ring until the latter is completely filled. From the said ring the rim is forced laterally through a gradually-diminishing aperture (the mechanism employed being, if desired, the same as shown and described in the said Patent No. 503,360) into a retaining form or ring. In passing through the gradually-diminishing aperture the leather sections are compressed centripetally to the degree desired, the second ring or form being just large enough to receive the compressed rim as it is discharged from the gradually-diminishing aperture. While in the second ring or form the rim may be placed upon a lathe and its inner circumferential face smoothed and given the diameter necessary for it to pass over and fit tightly upon the rim A<sup>3</sup> of the pulley. The second or retaining form described may be constructed of several laterally-abutting rings, the outer rings being approximately of the width of the permanent retaining-rings s s. (Shown in Fig. 1.) When the said outer temporary retaining-rings are removed, the pulley may be revolved in a lathe, or otherwise, and cut away to produce the annular end recesses r. The rings s are then with a suitable power appliance slipped upon the opposite end portions of the rim and fastened in place preferably by means of screw-bolts q, which pass through openings formed in the inner rim A<sup>3</sup>, rim B and rings s, as shown. The intermediate temporary confining-rings of the form may then be removed, as the rim B will be held against any possibility of expan-

sion by the retaining-rings  $s$ . As it is desirable that the pulley shall be as light as possible, the strips of which the rim  $B$  is formed are made comparatively narrow; and as where  
 5 the pulley-face is of more than a certain width the leather sections will tend to bulge out at the center under centrifugal force if the pulley is revolved at a high speed, it is desirable to provide a third confining-ring  $s'$  around the  
 10 middle of the rim. For this purpose a central annular recess  $r'$  may be cut in the face of a single wide rim, and of a size just large enough to receive the ring  $s'$ , the latter being held securely in place by means of screw-  
 15 bolts  $q'$  passing through the rims  $A^3 B$  and into the ring  $s'$ . In practice the annular faces of the rim  $B$  may project slightly beyond the outer circumference of the rings  $s s'$ , as indicated.

20 Experience has shown that a pulley having its rim portion formed of flatwise-abutting strips or sections of a more or less yielding and tough material, such as belting-leather, has enormous gripping power upon a belt,  
 25 and it is for that reason particularly desirable in connections where the transmission by a belt of great power at high speed is required.

My improved pulley is especially well adapted to use in connection with dynamo-  
 30 electric machines where any slipping of a belt interferes with the steadiness of the electric current, and my improvement permits both a narrower belt and narrower pulleys to be employed than would otherwise be possible,  
 35 and also permits, where economy in space is an object, a driven pulley to be placed more closely to the driving-pulley, when the pulleys are of integral diameters, than may be desirable in the use of other pulleys.

40 In constructing a rim  $B$  of more than a certain width, I prefer to provide the rim of two or more annular compressed rim members  $pp$ , each constructed of short strips of leather or the like, as described, to extend around the  
 45 bed  $A^3$  and be held at their inner annular edges by means of a ring  $s'$ .

While I have described the rim  $B$  as being formed preferably of strips of leather, other desirable material may be employed. When  
 50 leather or other tough fibrous material is employed, the outer circumference of the rim may be turned off in one direction in a lathe and present a comparatively smooth surface when rubbed upon in one direction and the

edges great frictional resistance to rubbing 55 in the opposite direction. The pulley should in practice be mounted to rotate in the direction which effects the greatest friction, and consequently the greatest gripping power, and the strain of the belt being always across 60 the grain of the strips any wear would tend to increase the roughness, and therefore the gripping power, of the rim. Owing to the fact that the danger of slipping of the belt upon the pulley is reduced to the minimum, 65 there is little, if any, material wear upon the pulley.

Though I prefer to construct my improved wheel in every way as shown and described, the construction may be modified in the mat- 70 ter of details without departing from the spirit of my invention as defined by the claims.

What I claim as new, and desire to secure by Letters Patent, is—

1. In a wheel, an annular bed, an annular 75 rim fitting around the said bed and formed of flatwise-abutting centripetally-compressed sections of flexible material extending crosswise of its circumference and forming a continuous and even peripheral surface, the rim 80 being provided in the corner portions formed by the lateral edges of its outer circumferential face, with annular recesses, retaining rings, fitting the said recesses and holding the sections in their compressed condition, 85 and bolts extending at intervals through the bed, rim and rings and fastening said parts securely together, substantially as described.

2. In a wheel, an annular bed, an annular rim fitting around the said bed and formed of 90 annular adjacent lying members  $p$  each constructed of flatwise abutting centripetally compressed sections of flexible material, extending crosswise of its circumference, and forming a continuous and even peripheral 95 surface, the rim being provided in its outer circumferential face with annular end recesses  $r$ , and an annular intermediate recess  $r'$ , formed by cutting away the adjacent members  $p$ , retaining rings  $s$  fitting the recesses  $r$ , 100 a retaining ring  $s'$  fitting the recess  $r'$ , and bolts extending at intervals through the bed, rim and rings and fastening said parts securely together, substantially as described.

CHARLES H. WILMERDING.

In presence of—

J. H. LEE,

J. N. HANSON.