

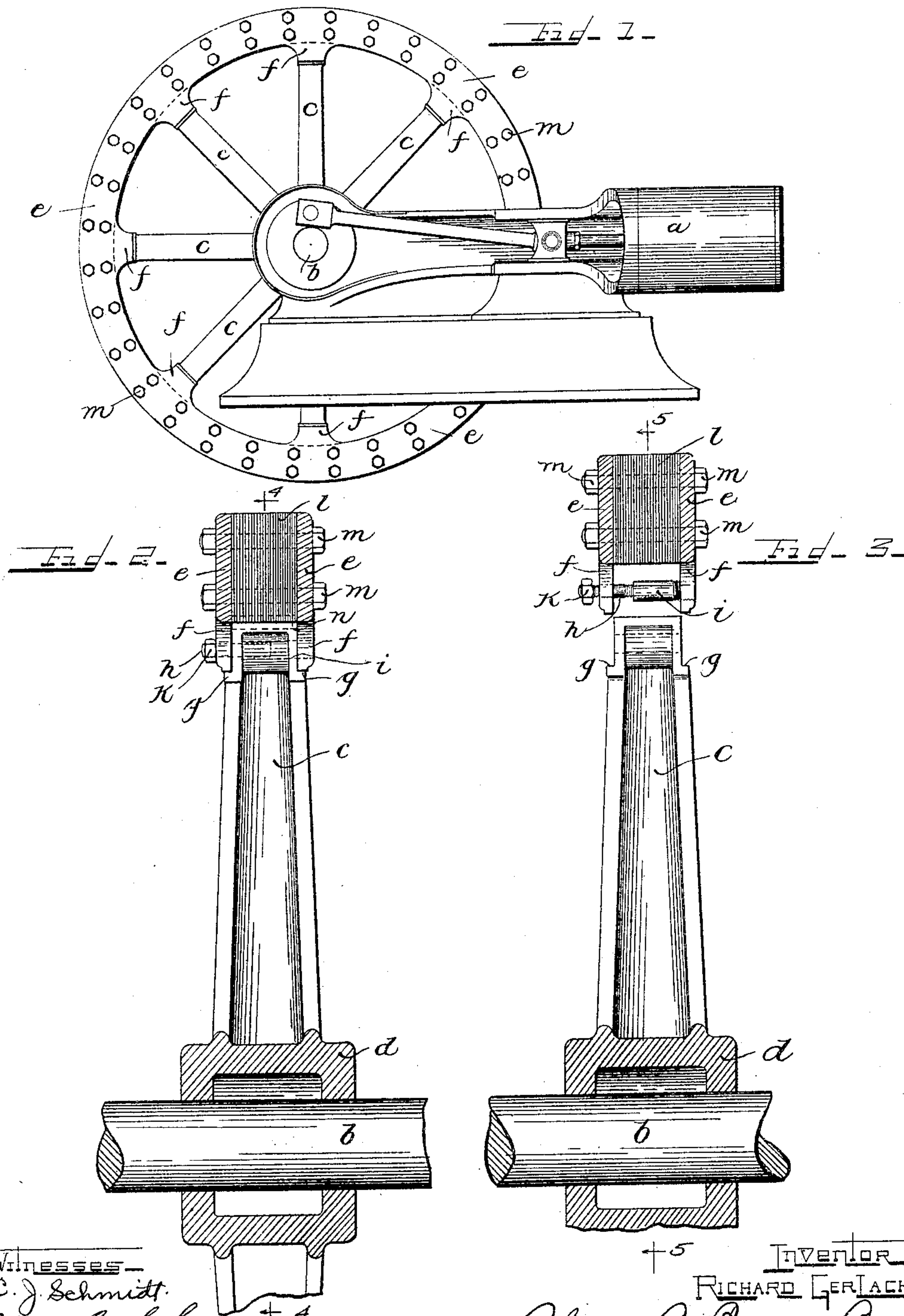
No. 804,806.

PATENTED NOV. 14, 1905.

R. GERLACH.
FLY WHEEL.

APPLICATION FILED OCT. 20, 1899.

2 SHEETS—SHEET 1.



WITNESSES—
C. J. Schmitt.
May Label.

BY

Charles A. Brown & Cragg

ATTORNEYS

INVENTOR
RICHARD GERLACH.

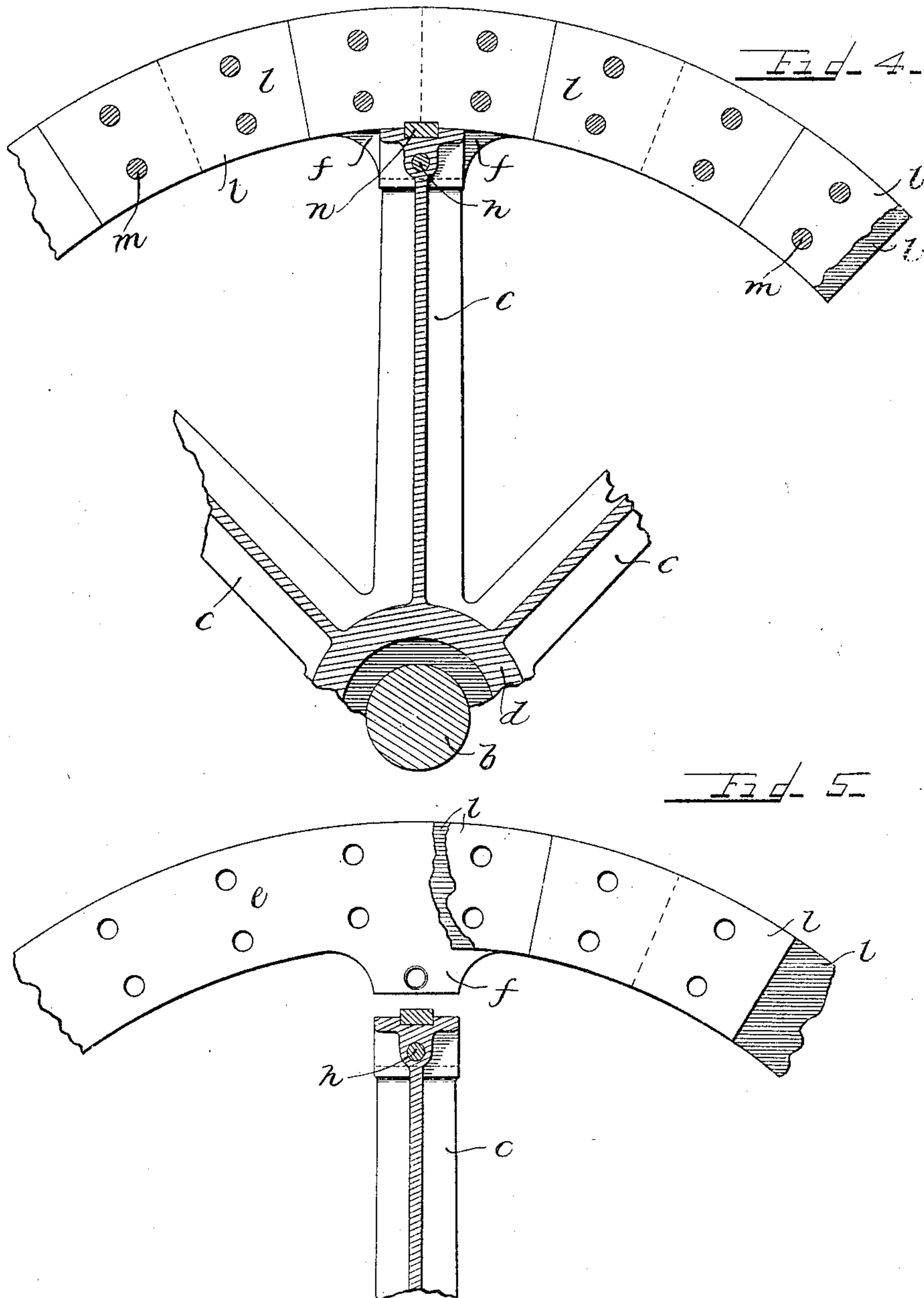
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INVENTOR
RICHARD GERLACH
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UNITED STATES PATENT OFFICE.

RICHARD GERLACH, OF BERLIN, GERMANY.

FLY-WHEEL.

No. 804,806.

Specification of Letters Patent.

Patented Nov. 14, 1905.

Application filed October 20, 1899. Serial No. 734,190.

To all whom it may concern:

Be it known that I, RICHARD GERLACH, a subject of the Emperor of Germany, residing at Berlin, Germany, have invented a certain new and useful Improvement in Fly-Wheels, of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

My invention relates to fly-wheels, and has for its object the construction of fly-wheels whereby the objectionable features hitherto present in such structures are eliminated.

The metal of which fly-wheels are composed is frequently subjected to severe local strains, due to casting, especially when the fly-wheels are massive. When fly-wheels are rotated at rapid rates of speed, especially when they are of large size, they are frequently incapable of withstanding the severe action of the great centrifugal force to which they are subjected. No satisfactory material or combination of materials has heretofore been employed in constructing fly-wheels of solid metal, although it has been proposed to remedy the evil by casting the fly-wheels with a deep peripheral groove in which a coil of wire is disposed to afford the necessary weight and to remove or decrease the local strains. This method is objectionable, first, on account of the great cost of the wire, and, secondly, for the reason that the grooved wheel for supporting the wire may still be subject to local strains.

In accordance with my invention I construct the rim and spokes of the fly-wheel separately, the spokes being preferably formed in one integral casting having a hub portion through which the shaft may be passed, and as the rim portion is not cast integral with the spokes shrinkage in the metal may occur without giving rise to injurious local stresses. I secure a rim about the spider thus formed, the rim being constructed of laminæ which are held together by means of end or face plates and bolts passing through the said face-plates and the laminæ, the said face-plates being preferably provided with ears extending radially toward the hub of the wheel, which ears are directly secured to the spokes by means of bolts.

I will explain my invention more particularly by reference to the accompanying drawings, showing the preferred embodiment thereof, in which—

Figure 1 is a side view of an engine with

the fly-wheel of my construction in place. Fig. 2 is a cross-sectional view of the fly-wheel, the rim and spokes being assembled. Fig. 3 is a similar view with the rim and spokes disengaged. Fig. 4 is a view on line 4 4 of Fig. 2, showing a segment of the fly-wheel. Fig. 5 is a sectional view on line 5 5 of Fig. 3, showing a segment of the fly-wheel with the spokes and rim separated.

Like parts are indicated by similar letters of reference throughout the different figures.

In Fig. 1 I have shown a prime mover in the form of a steam-engine *a*, to the shaft *b* of which is secured the improved fly-wheel. The spokes *c* of the fly-wheel are preferably formed in one integral casting with the hub *d*, to which hub the shaft *b* is secured. The outer ends of the spokes are preferably formed as shown, the portions of the spokes that are engaged with the face-plates *e* being reduced in a direction transverse to the plane of the wheel to form seats for the ears *f*, the inner peripheral edges of which ears are engaged with shoulders *g* upon the spokes.

To secure the spokes in place between the ears upon the face-plates, I employ pins *h*, passing through one face-plate, and sleeves *i*, having threaded engagement with the remaining face-plate, the said pins having threaded engagement with the said sleeves, nuts *k* being employed upon the pins *h* to secure the desired clamping action between the face-plates and the spokes. Laminæ *l* are disposed between the face-plates and are secured between the same by means of rivets or bolts *m*, passing through the face-plates and the laminæ.

Inasmuch as the laminæ are of large diameter, I form the same into segments of short length, whereby the laminæ may be cut out of blanks without much waste. In order to cause the laminated segments to have interlocking or chain action upon each other, I so arrange the same that they break joints, as indicated clearly in Figs. 4 and 5, and arrange the holes for the bolts *m* in the overlapping ends of the segments. The inner peripheral face of the rim and the opposed ends of the spokes are recessed to receive transversely-disposed keys *n*, which serve to transfer the tangential force.

I do not wish to be limited to the construction wherein the laminated segments are arranged to form continuous rings, nor do I wish to be limited to other precise features of construction shown; but,

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

1. In a fly-wheel, the combination with a hub portion *d*, of spokes *c c* integral with the hub portion, face-plates *e e* provided with ears *f f*, laminated segments secured between the face-plates and arranged in the plane of the wheel, means for interlocking and securing the laminated segments between the face-plates, pins *h* for securing the ears *f f* to the spokes, and keys *n* engaging opposed recesses in the rim and spokes, substantially as described.

2. In a fly-wheel, the combination with a hub portion *d*, of spokes *c c* integral with the hub portion, face-plates *e e* provided with ears *f f*, laminæ secured between face-plates and arranged in the plane of the wheel, clamping means for securing the laminæ between the face-plates, pins *h* for securing the ears *f f* to the spokes *c c*, and keys *n* engaging opposed recesses in the rim and spokes, substantially as described.

3. In a fly-wheel, the combination with a hub portion *d*, of spokes *c c*, face-plates *e e* provided with ears *f f*, laminæ secured between face-plates and arranged in the plane of the wheel, means for interlocking and securing the laminæ between the face-plates, pins *h* for securing the ears *f f* to the spokes *c c*,

and keys *n* engaging opposed recesses in the rim and spokes, the said spokes being provided with shoulders *g g* for engaging the inner peripheral edges of the ears *f f*, substantially as described.

4. A fly-wheel having a continuous rim made up of segmental metallic laminæ arranged to break joints and with bolts or rivets passing transversely through said segmental laminæ at points intermediate their joints, substantially as described.

5. A fly-wheel comprising a hub, spokes, a continuous rim supported by said spokes and laminated in planes transverse to the axis of rotation, and transverse keys interposed between the rim and spokes for locking them against relative movement.

6. A fly-wheel comprising a hub, spokes, a continuous rim made separate from the spokes and laminated in planes perpendicular to the axis of rotation, and keys extending parallel to the axis of rotation and confined in recesses formed in adjacent portions in the rim and spokes.

In witness whereof I hereunto subscribe my name this 19th day of September, A. D. 1899.

RICHARD GERLACH.

Witnesses:

HENRY HASPER,
WOLDEMAR HAUPT.