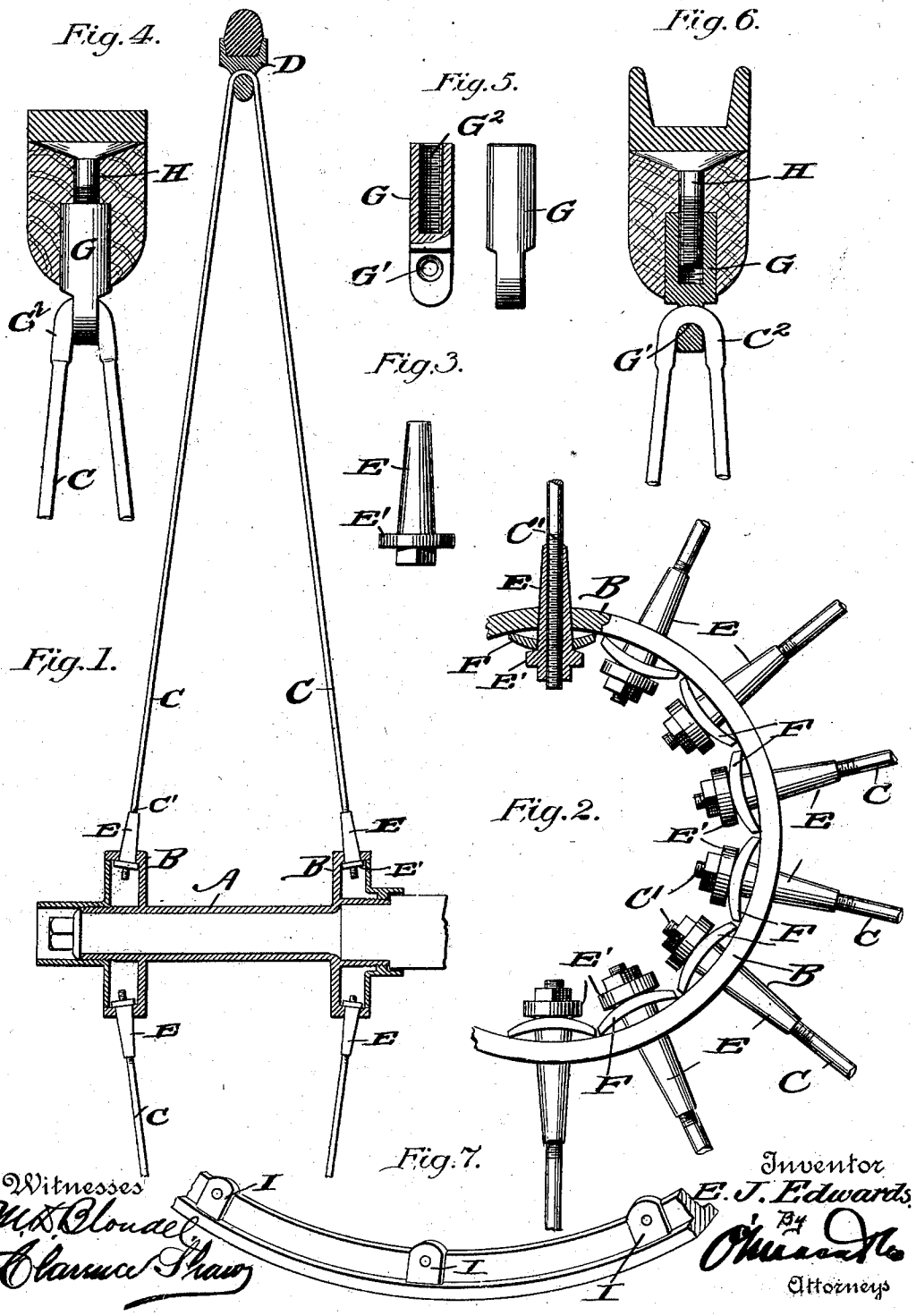
No. 705,567. Patented July 29, 1902.

E. J. EDWARDS.

WHEEL.

(Application filed May 11, 1901.)

(No Model.) 2 Sheets—Sheet 1.



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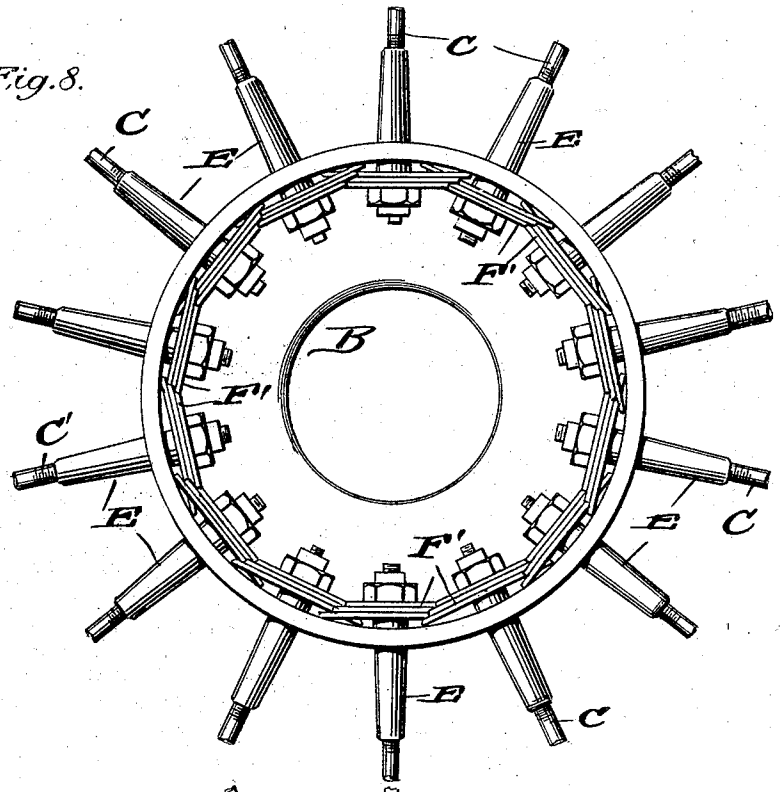
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Fig. 8.



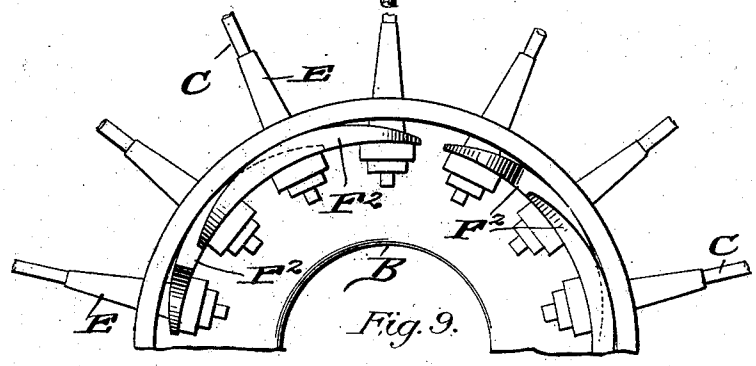
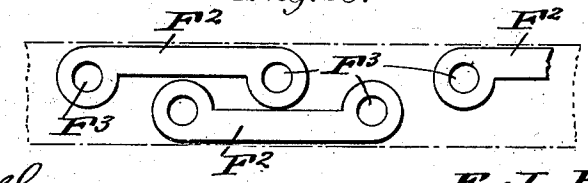


Fig. 9.

Fig. 10.



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UNITED STATES PATENT OFFICE.

ELLSWORTH J. EDWARDS, OF ASPEN, COLORADO.

WHEEL.

SPECIFICATION forming part of Letters Patent No. 705,567, dated July 29, 1902.

Application filed May 11, 1901. Serial No. 59,841. (No model.)

To all whom it may concern:

Be it known that I, ELLSWORTH J. EDWARDS, a citizen of the United States, residing at Aspen, in the county of Pitkin and State of Colorado, have invented a new and useful Wheel, of which the following is a specification.

This invention relates generally to wheels, and more particularly to the peculiar construction of the spokes and the manner of attaching the same to the hub, the object of the invention being to provide a highly-elastic wheel which shall at the same time be exceedingly strong and durable.

With these objects in view the invention consists, essentially, in providing a hub with flanged collars at each end and to which the ends of the spokes are attached through the medium of flanged nipples, said nipples resting upon springs interposed between their flanges and the flanged collars of the hub.

The invention consists also in the peculiar manner of connecting the central portion of the spokes to the rim or felly of the wheel.

The invention consists also in certain details of construction and novelties of combination, all of which will be fully described hereinafter and pointed out in the claims.

In the drawings forming part of this specification, Figure 1 is a sectional view of the wheel embodying the broad principles of my invention. Fig. 2 is a sectional elevation showing a portion of the hub and illustrating the manner of attaching the spokes to the hub. Fig. 3 is a detail view of the tapering and flanged nipple. Fig. 4 is a sectional elevation showing the manner of connecting the central portion of the spokes to the wheel rim or felly. Fig. 5 is a detail view illustrating the threaded sleeve. Fig. 6 is a sectional view of the spoke connection. Fig. 7 is a slightly-modified form of wheel-rim. Fig. 8 is a view showing the interior of the hub and illustrating a slightly-modified arrangement of the springs. Fig. 9 is a detail view showing a still further modification, and Fig. 10 is a plan view illustrating the construction of the springs shown in Fig. 9.

In carrying out my invention I employ a sleeve-hub A, having annular vertical flanged collars, from which project annular horizontal collars B, formed adjacent to each end, the inner surface of the horizontal flanges being beveled and formed with tapered openings to receive tapered internally-threaded nipples through which the ends of the spokes are attached, said spokes being bent centrally to form diverging spokes, their central portion being connected to the rim of the felly D, as hereinafter described. The ends of the spokes are threaded, as shown at C′, and pass through the flanged collars B within the internally-threaded nipples which are secured upon the end C′ from the interior of the hub, said tapering sleeves or nipples having flanges or collars E′, adapted to bear upon the spring-plates F, surrounding the tapering nipples, which are arranged between the collars of the nipples and the inner surface of the hub. The inner end of the sleeve or nipple is made polygonal to receive a wrench. The spring-plates F may consist of a single plate of spring metal, as shown in Fig. 2, or they may consist of a series of layers, as shown at F′ in Fig. 8, and in Fig. 9 I employ one spring for each pair of nipples or sleeves, as shown at F^2, said springs F^2 being bow-shaped and perforated at their ends, as shown at F^3, and through which the sleeves or nipples pass, the flanges or collars bearing upon the ends of the springs, the central or bow portions of said springs bearing against the inner faces of the hub-collars. The ends and the central portion of the spokes are swaged or thickened, as shown, in order to give greater strength. The central portion of the spoke is passed through the eye G′ of a sleeve G, which sleeve is adapted to fit into a socket produced in the rim or felly and secured therein by means of a screw H, passing through the rim or felly from the outside and entering the threaded socket G^2, produced in the sleeve G. In Fig. 4 I have illustrated a wheel having a flat tire, while in Fig. 6 I have illustrated a construction adapted to receive a rubber tire. In Fig. 1 I have shown a rubber tire arranged in connection with the wheel-rim illustrated in Fig. 7, formed of metal and essentially T-shaped in cross-section, with flanges for retaining the rubber tire, the inner flange of said rim being reinforced at definite points, as shown at I, and through which the spoke passes, said rim being reinforced to provide a firmer bearing and also increase the strength of the tire at these points.

The outer ends of the annular flanged collars B are closed by means of annular horizontal and vertical caps, as shown in Fig. 1, and when in place produce a uniform outer surface on both sides of the flanged collar.

It will thus be seen that I provide an exceedingly simple and efficient construction of spring-wheel which shall have a maximum amount of elasticity and at the same time be exceedingly strong and durable.

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

1. In a wheel, the combination with a hub having flanged collars, of spokes having their ends extending through the said flanged collars, the tapering sleeves or nipples having flanges of collars, secured upon the ends of the spokes, and springs interposed between the flanged collars of the hub and the flanges or collars of the sleeves or nipples, substantially as set forth.

2. In a wheel, the combination with a hub having flanged collars, of the spokes having threaded ends passing through the said flanged collars, the tapering sleeves or nipples having flanges or collars, screwed upon the ends of the spokes and extending through the collar of the hub, the springs arranged between the hub-collar and the flanges or collars upon the sleeves or nipples, said sleeves or nipples passing through the said spring substantially as described.

3. In a wheel, the combination with a rim, of an internally-threaded sleeve arranged in said rim and having an eye at its end, a screw passing through the rim from the outside and arranged in the threaded sleeve, and a U-shaped spoke passing through the eye of said sleeve, substantially as described.

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