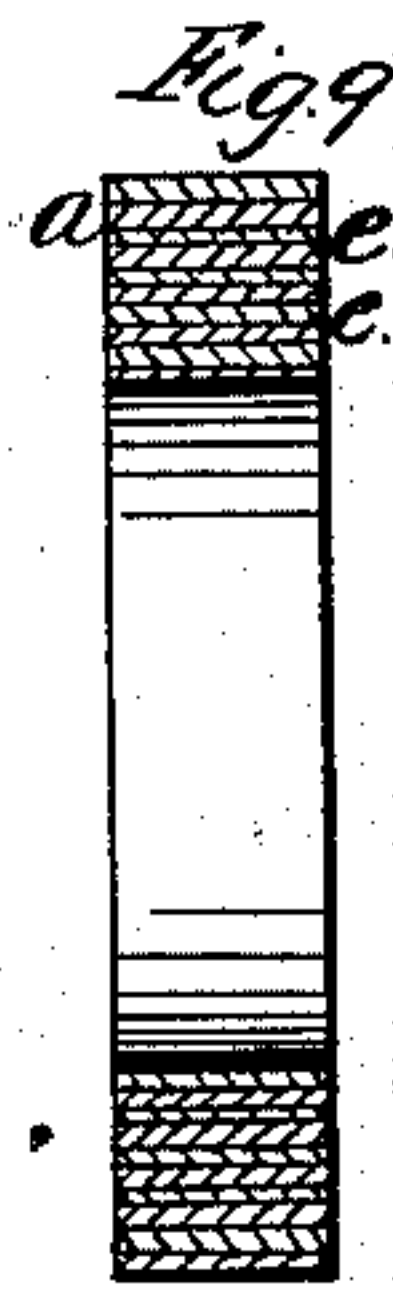
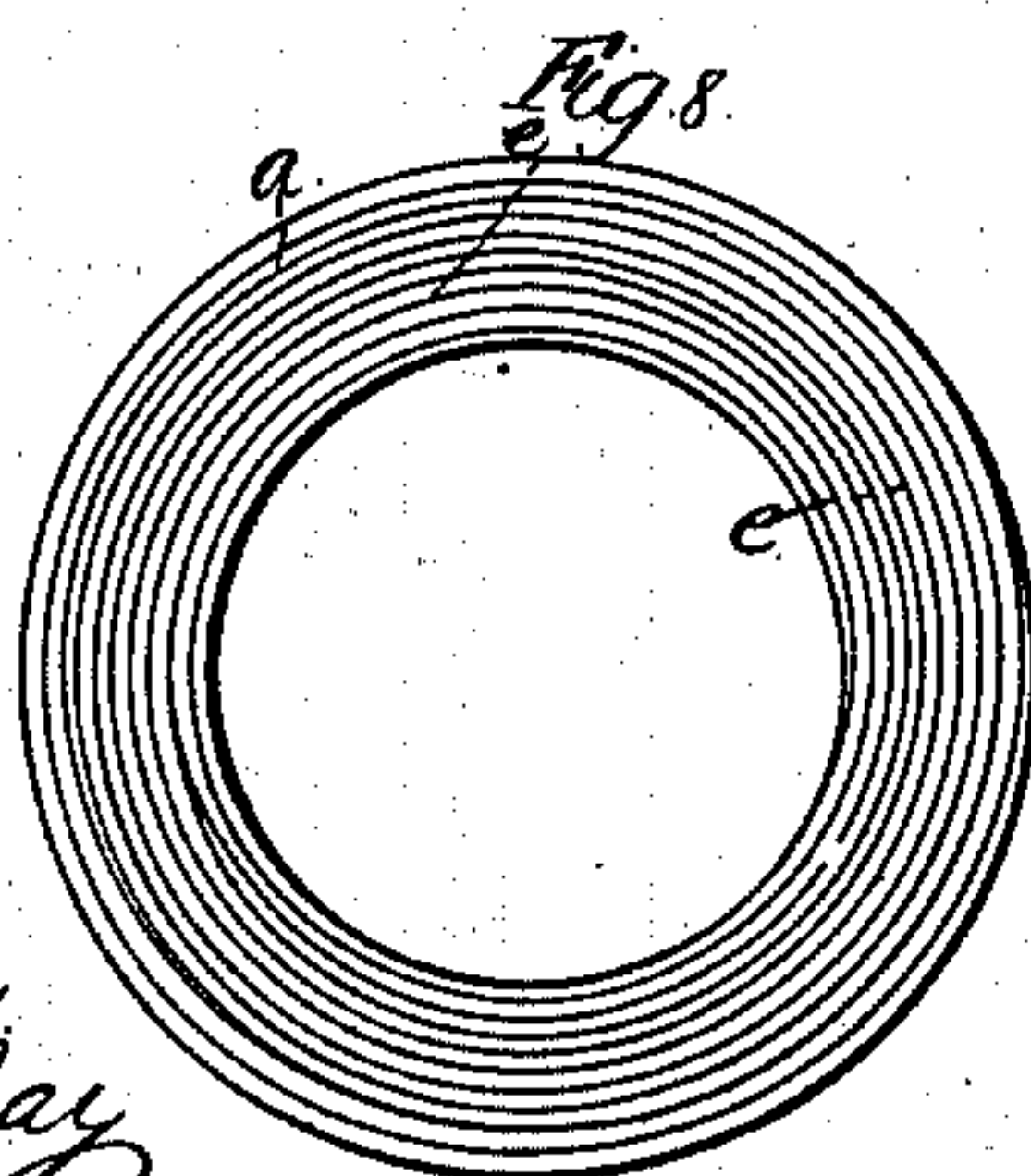
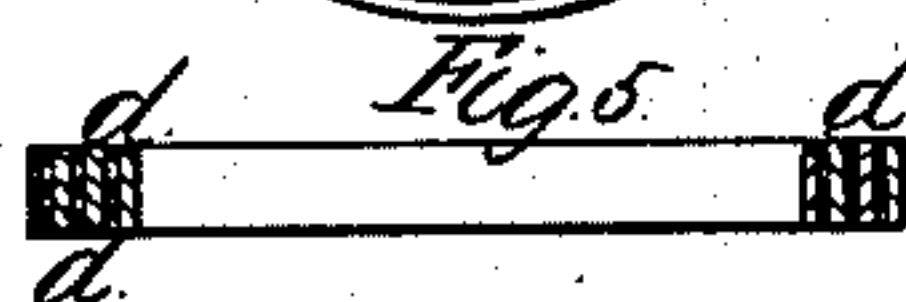
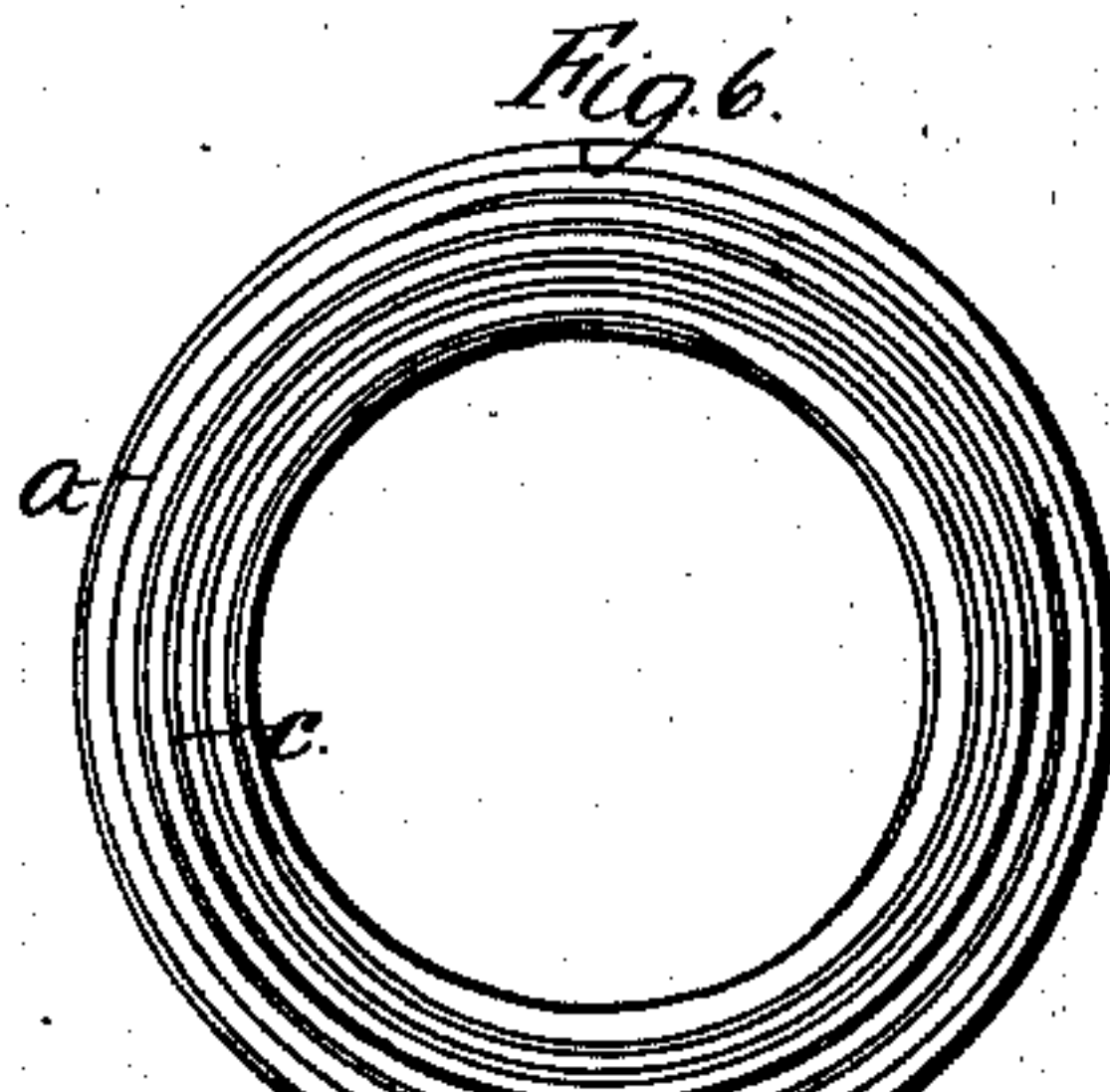
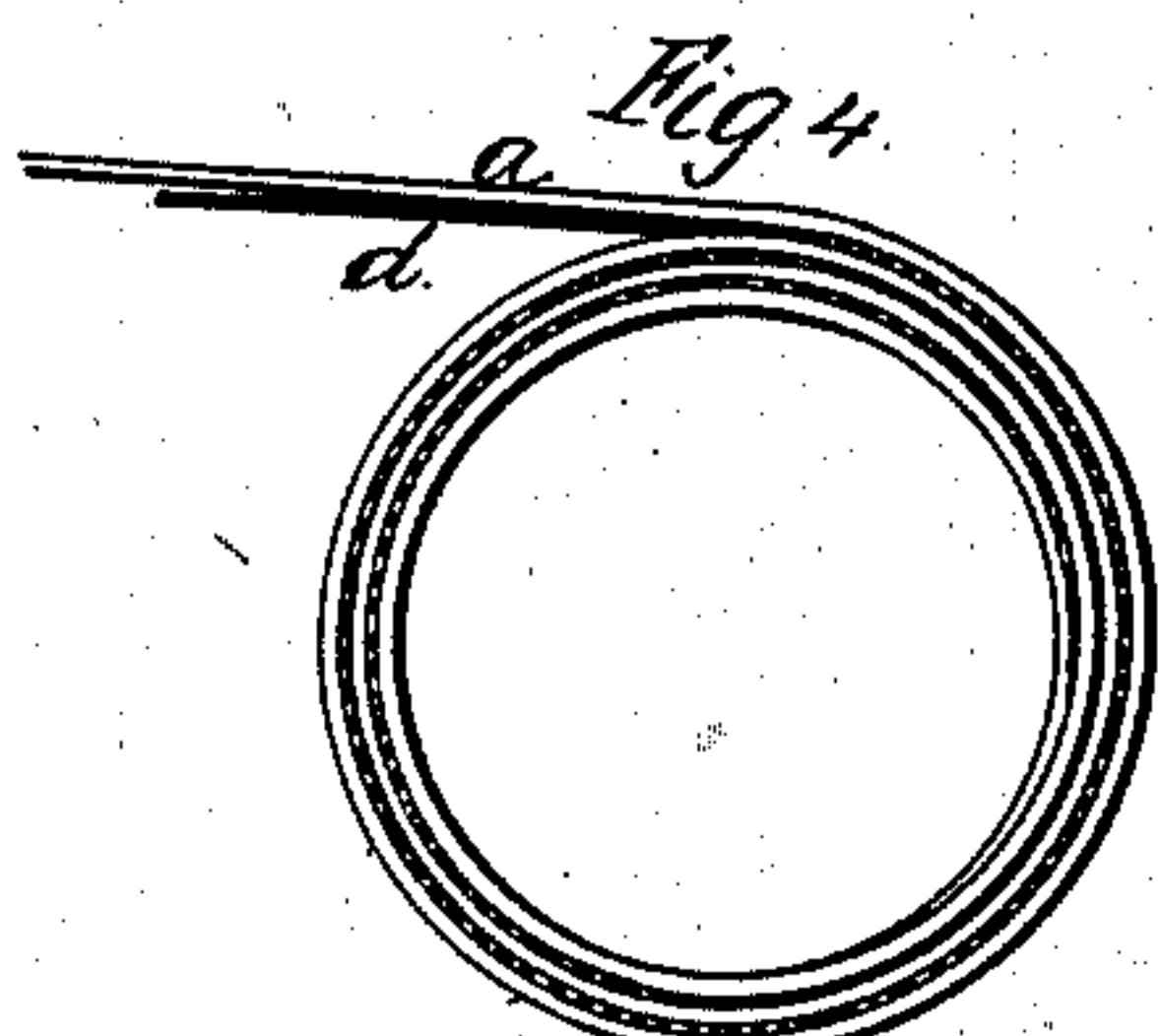
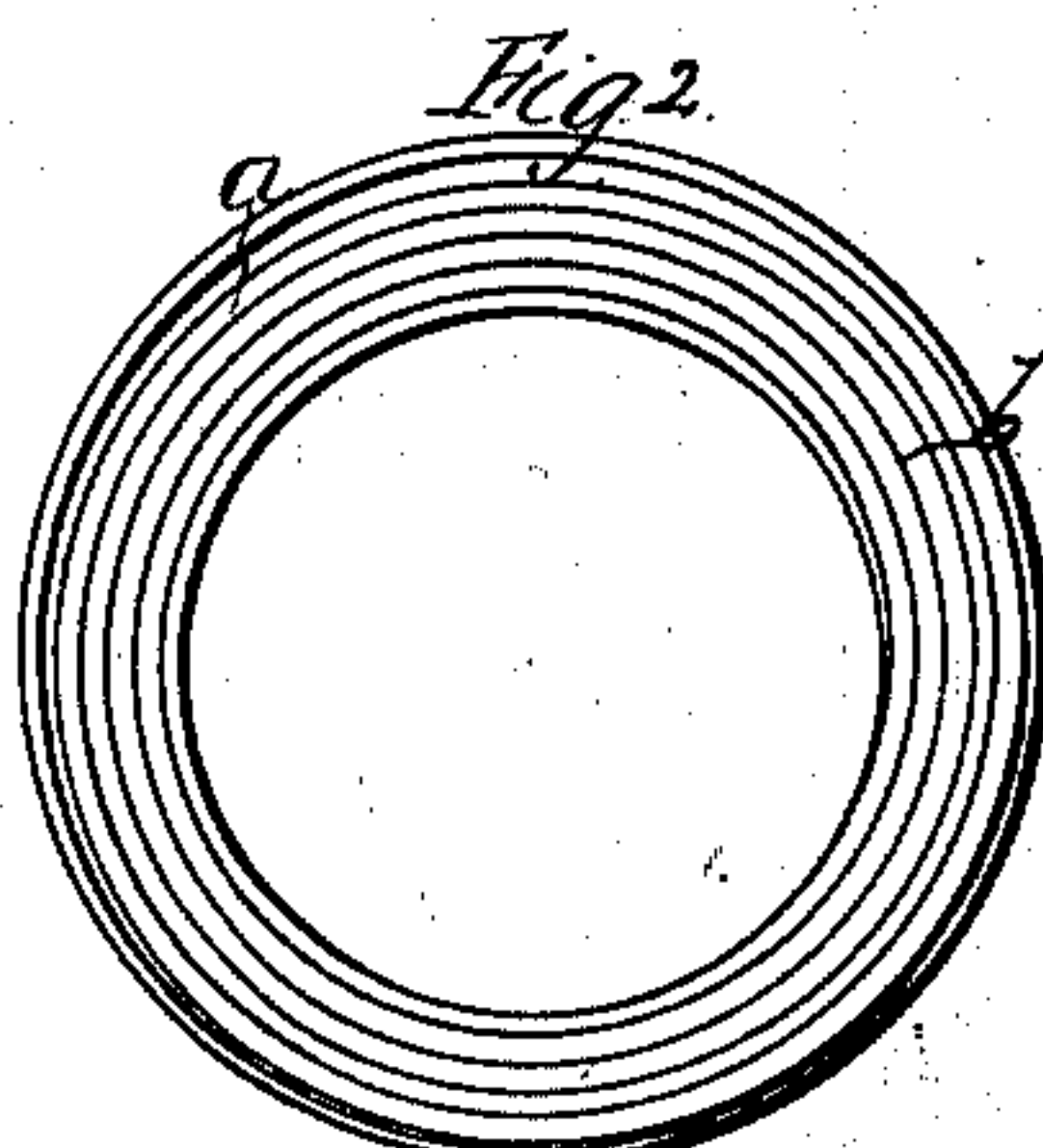
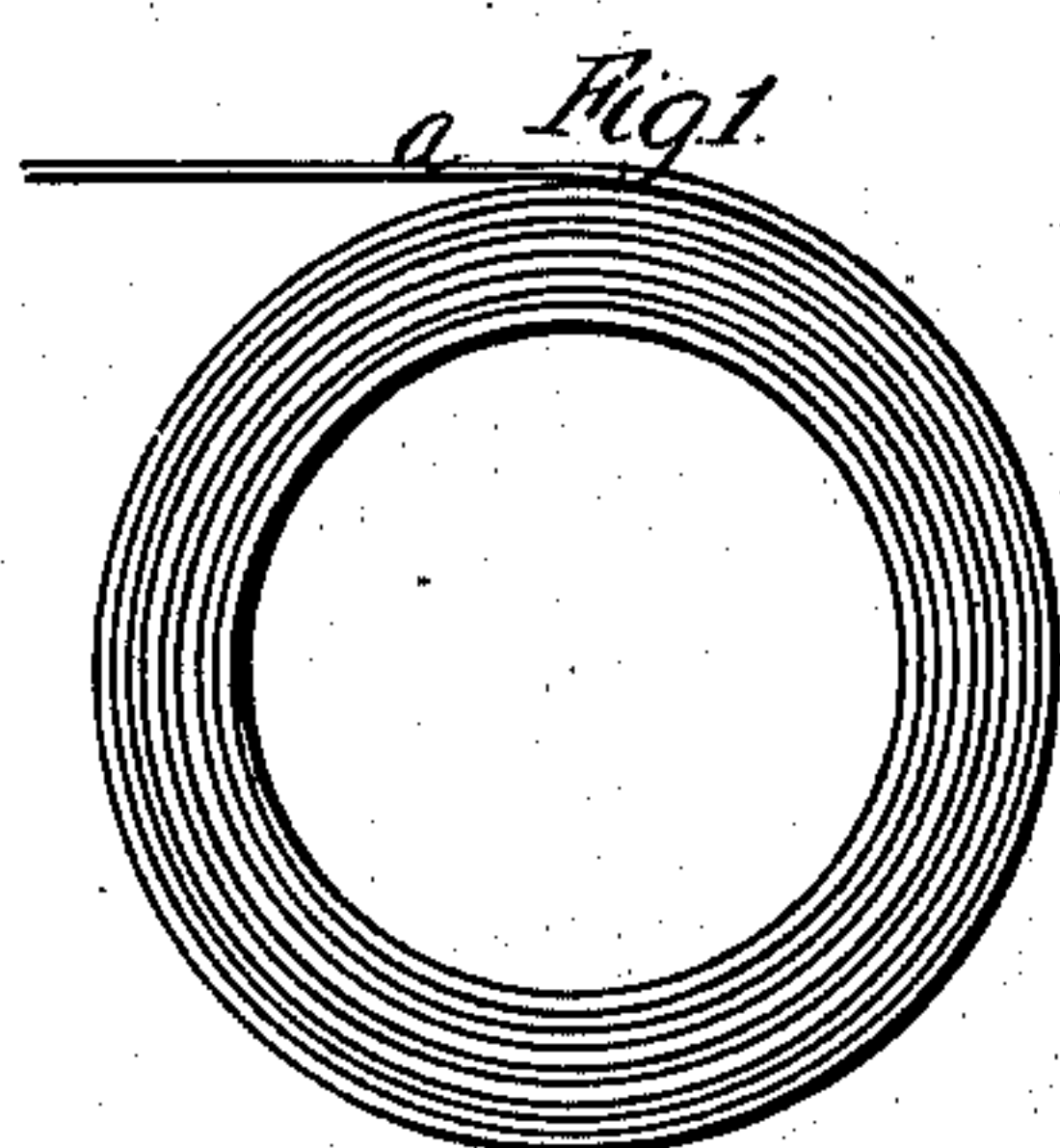


Miller & Andrews,

Hose Washer,

N^o 26,510.

Patented Dec. 20, 1859



Witnesses
Alden C. Ray
Robert Knight

Inventors
George Miller
Caleb H. Andrews

UNITED STATES PATENT OFFICE.

GEO. MILLER AND C. M. ANDREWS, OF PROVIDENCE, RHODE ISLAND.

LEATHER WASHER.

Specification of Letters Patent No. 26,510, dated December 20, 1859.

To all whom it may concern:

Be it known that we, GEORGE MILLER and C. M. ANDREWS, both of Providence, in the county of Providence and State of Rhode Island, have invented a new and useful Improvement in Leather Washers; and we do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the annexed drawings, making a part of this specification, in which—

Figures 1, 2, 4, 6 and 8 are side views of washers constructed according to our invention. Figs. 3, 5, 7 and 9 are central sections of ditto, the planes of section bisecting their axes longitudinally.

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

The object of this invention is to render leather washers much more efficient and durable than those of usual construction and also to economize in the working up of the stock.

The invention consists in forming the washers by winding leather strips of any convenient width in coil-form, as hereinafter fully described, whereby the sides or faces of the washers present the grain or fiber of the leather endwise to the running or working surfaces to which they are applied. The convolution of the leather may be connected by cement and, in certain cases where necessary, soft metal plates or other suitable substance may be interposed between the convolutions in order to protect the leather from wear.

To enable those skilled in the art to fully understand and construct our invention we will proceed to describe it.

A strip of leather *a*, of any suitable width is wound in coil-form as shown in Figs. 1, 2, 4, 6 and 8. The strip *a* may be attached at one end to a mandrel of any suitable diameter, the mandrel being made to rotate and thereby wind the strip in coil-form, the outer end of the strip having a weight attached, connected to a spring or arranged in any suitable way so that the strip while being wound in coil-form will be subjected to a certain degree of tension requisite to insure a proper state of compactness of the coil. In winding the strip cement is applied to it, or, the strip may have a coat of

cement applied to it at one side previous to the winding, in order to form the whole into a compact solid mass when finished. Ordinary glue, or fish glue, will answer very well as a cement. When the strip is entirely wound up it may be secured at its periphery by a metallic band, or by a wire or cord *b*, wound circumferentially around it, see Figs. 2 and 3.

When the strip *a*, is removed from the mandrel a hollow leather cylinder is obtained, the length of which is equal to the width of the strip, the diameter being greater or less according to the length of the strip. Washers may be cut from this cylinder of any desired thickness.

In ordinary cases the leather alone may be sufficiently durable as it will be seen that the fiber of the leather will be presented endwise to the running or working parts to which the washer is applied. This alone will render the washer far more durable than those cut out direct from the leather, as in the latter case, the fiber or grain is presented sidewise to the running or working parts, and is consequently more readily worn. In certain cases however where washers are applied to rapidly running or working surfaces, a plate *c*, of soft metal, a composition for instance similar to what is known as Babbitt metal, may be interposed between the convolutions of the strip *a*, as shown in Figs. 6 and 7, the width of the plate *c*, and strip *a*, being equal so that their edges will be flush with each other as shown clearly in Fig. 7. A canvas or cloth strip *d*, as shown in Figs. 4 and 5, may also be interposed between the convolutions of the strip *a*, or a composition of saw-dust and glue *e*, as shown in Figs. 8 and 9. Various substances however may be employed as circumstances may require.

By this invention it will be seen that washers may be made with but little or no waste of stock as quite narrow strips may be wound in the form specified, whereas in the old mode of cutting them out direct from the leather, there is a great waste. By our invention therefore the washers are not only rendered more durable but may be also manufactured at a less cost, and in consequence of being constructed as described, they are rendered more compact and retain

the lubricating material better than those in common use. The invention is applicable in all cases where the interposition of a soft substance is required between comparatively
5 hard and moving substances, in fact in all cases where the ordinary washers are necessary.

We do not confine ourselves to any material interposed between the convolutions
0 of the leather strip, for various substances may be used and in many cases none may be required, the leather alone being sufficient.

Having thus described our invention what

we claim as new and desire to secure by Letters Patent, is,

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A washer constructed of a leather strip wound in coil-form, and with or without the interposition of other substances between its convolutions, substantially as herein set forth.

GEORGE MILLER.
CABEL M. ANDREWS.

Witnesses:

ALDEN C. PRAY,
ROBERT KNIGHT.