

C. T. GRILLEY.  
Leather Washers.

No. 164,446.

Patented June 15, 1875.

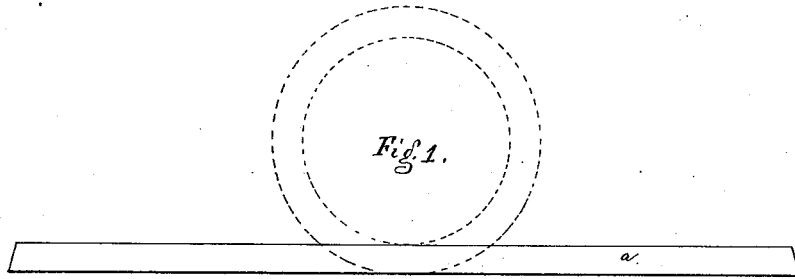


Fig. 2.

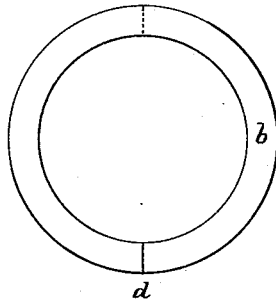


Fig. 3.

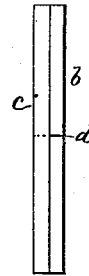


Fig. 4.

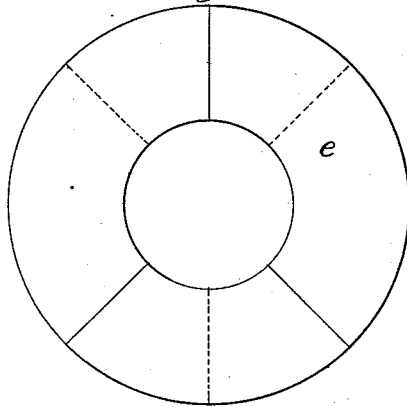


Fig. 6.

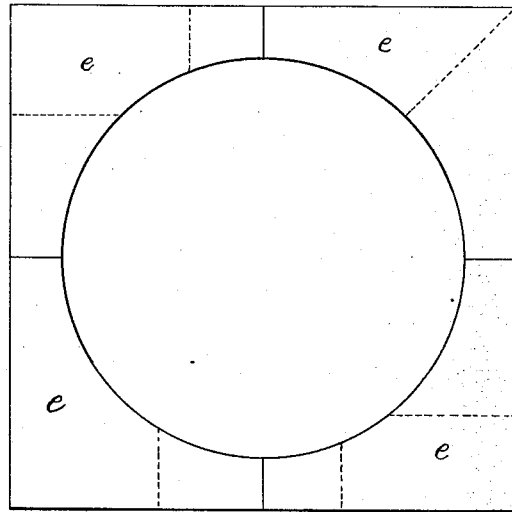


Fig. 5.

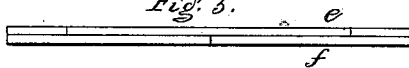
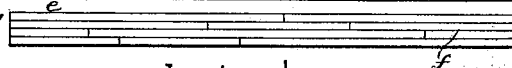


Fig. 7.



Witnesses.

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# UNITED STATES PATENT OFFICE.

CHARLES T. GRILLEY, OF BOSTON, MASSACHUSETTS.

## IMPROVEMENT IN LEATHER WASHERS.

Specification forming part of Letters Patent No. **164,446**, dated June 15, 1875; application filed May 15, 1875.

*To all whom it may concern:*

Be it known that I, CHARLES T. GRILLEY, of Boston, county of Suffolk, State of Massachusetts, have invented an Improvement in Leather Washers, of which the following is a specification:

This invention relates to leather washers for use in connections, and with bearings, as in carriage-axles, locomotives, &c., and for packings for connections, cylinders, pumps, and other purposes where leather washers are commonly employed.

The invention consists in a washer made of two or more layers or thicknesses of leather connected together, and with the ends of one piece forming a layer lapped or abutted together, and placed with relation to the lapped or abutted ends of the other or adjacent layer so as to break joints, the unbroken or solid leather of each layer serving as a holding-surface for the abutted ends of the other layer. It is well known that there is, in connection with manufacturing establishments using leather, a very large quantity of leather which, from the small size of the pieces, is denominated waste, and my object is to utilize this waste. In the manufacture of washers, as commonly practiced, leather of good quality, and of a thickness to correspond with the thickness of the desired washer, is cut up into annular rings, washers of large size furnishing from their interiors washers of smaller sizes, and from every large washer there are formed many smaller washers, and in this way it becomes necessary, in getting out an order, say, for washers of two inches inside diameter, to manufacture other washers of sizes which may not then be wanted, and in the manufacture of washers in this way it is well known that large washers are usually required to be thicker than small washers, and therefore, when a large washer is cut from a side of leather of proper thickness, the smaller washers made from the leather cut from the interior of the large washers are too thick, and have to be wasted or cut thinner by the consumer, wasting valuable stock as well as time, and the washer so cut thin is not evenly cut. It is also well known that a washer cut as an annulus most always varies in thickness according to the thickness of the leather,

which varies at different portions of the side or hide, and they also vary in density or hardness, as nearly every side of leather has hard and softer spots. Either of these defects renders a washer imperfect, because such a washer will not form as even or tight a joint as it would were the leather of uniform thickness and hardness. It is not practical to skive a side of leather evenly by machinery to uniform thickness, and it would not be practiced, for it would result in a great waste of the thickest and best part of the leather. In a washer of not uniform density, it will be apparent that when met by metallic or other surfaces which it is to pack, that portion of the washer the most dense will regulate the distance between the metallic surfaces, and the other portion, less dense, will permit the passage of air or liquid, provided the washer is used to pack a liquid or air joint. It will also be apparent that the thickness of the washer depends on the thickness of the leather, and that a washer cut from a side of leather as an annulus cannot be thicker than the leather forming the side, and that for thick washers the best grade of leather is necessarily employed. It will also be apparent to persons conversant with leather that an entire side of leather, if cut into as many annular washers having an interior diameter of two inches as possible, would result in the production of washers many of which would vary in thickness from the others. By this my new method of manufacturing washers, I am enabled to produce washers of any desired thickness and size, using such strips or waste pieces as I may have.

Figure 1 represents a strip of leather from which I preferably form small washers. Fig. 2 represents such a strip bent into annular form and placed over a second similar strip; Fig. 3, a side view of Fig. 2. Fig. 4 shows a top view of a circular washer made up in layers; Fig. 5, an edge view thereof; Fig. 6, a top view of a washer of quadrangular exterior made up in layers, and Fig. 7 an edge view thereof.

For washers of small diameter for carriages and pumps, I select strips of leather, preferably skiving each strip to a uniform thickness, and of a length corresponding with the size

of the washer to be produced. Such a strip, *a*, I bend into annular form, as at *b*, and place beside it a second similar strip, *c*, or a sufficient number of such strips to form a washer of the desired thickness, in all cases using two or more layers. The ends of each strip *a* are lapped by skiving, or are abutted together, as at *d*, and each abutting or lapped end is placed opposite a solid or unbroken part of its adjacent piece of leather, such adjacent piece, by the interposition of a suitable cement, serving as a holding-surface or binder for the lapped or abutting edges, each joint or weak part being strengthened by a solid part of the leather forming the adjacent layer of the washer. Washers very large, say several inches in diameter, may be made of pieces; but, instead of using long strips for each layer, I may use sections, as seen in Fig. 4, where *e e* represent two or more sections or segments, according to the size of the washer or scrap-leather being used, and these segments *e* are placed over segments *f*, two or more, the joint between the edges of the segments being placed or made so as to meet between the ends of other segments, to break joints, as shown by the dotted and full lines, Fig. 4, and these segments, united by a suitable cement, are united under pressure, forming washers of the desired size, and any number of layers *e f* may be used, according to the thickness of the washer or packing which it is desired to make.

In Fig. 6, the sections may be as shown at the right or left hand corners, or of any other suitable shape, according to the size of the scrap or waste leather being used, and the joints of the layers composing the washer are broken, as shown, so as to make a compact, strong washer when the layers are united by means of cement or otherwise. These sections and layers will preferably be united in a press or between dies of a size and shape to

correspond with the size and shape of the washer, and the ends of the pieces composing the washer are abutted together as shown, the layers under the joints acting as binders or covers at the joints; but the ends might be skived a little where the sections are lapped. These pieces of scrap-leather may be selected as to thickness and rolled or consolidated, and then, if desired, skived to uniform thickness, so that when completed the washers will be of uniform thickness and hardness, and it is evident that a washer of any desired size or thickness can be easily, quickly, and cheaply made in this way at very little expense, when compared with their cost as now produced.

It is evident that the washer of layers may be completed and be subsequently evened or made of uniform thickness in any well-known way. Were the sectional washer of but one thickness, the joints would all have to be skived, resulting in a waste of material, and the washer would not be as strong and the joints could not be made as impervious to the passage of steam as is the case with my washer in two or more layers, having the ends joined and covered by other layers of solid leather.

I claim—

A washer composed of superimposed layers of leather, united by means of cement, and with the abutting or free ends of each piece or layer placed opposite a solid or unbroken portion of its adjacent layer, all substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

CHARLES T. GRILLEY.

Witnesses:

G. W. GREGORY,  
L. H. LATIMER.