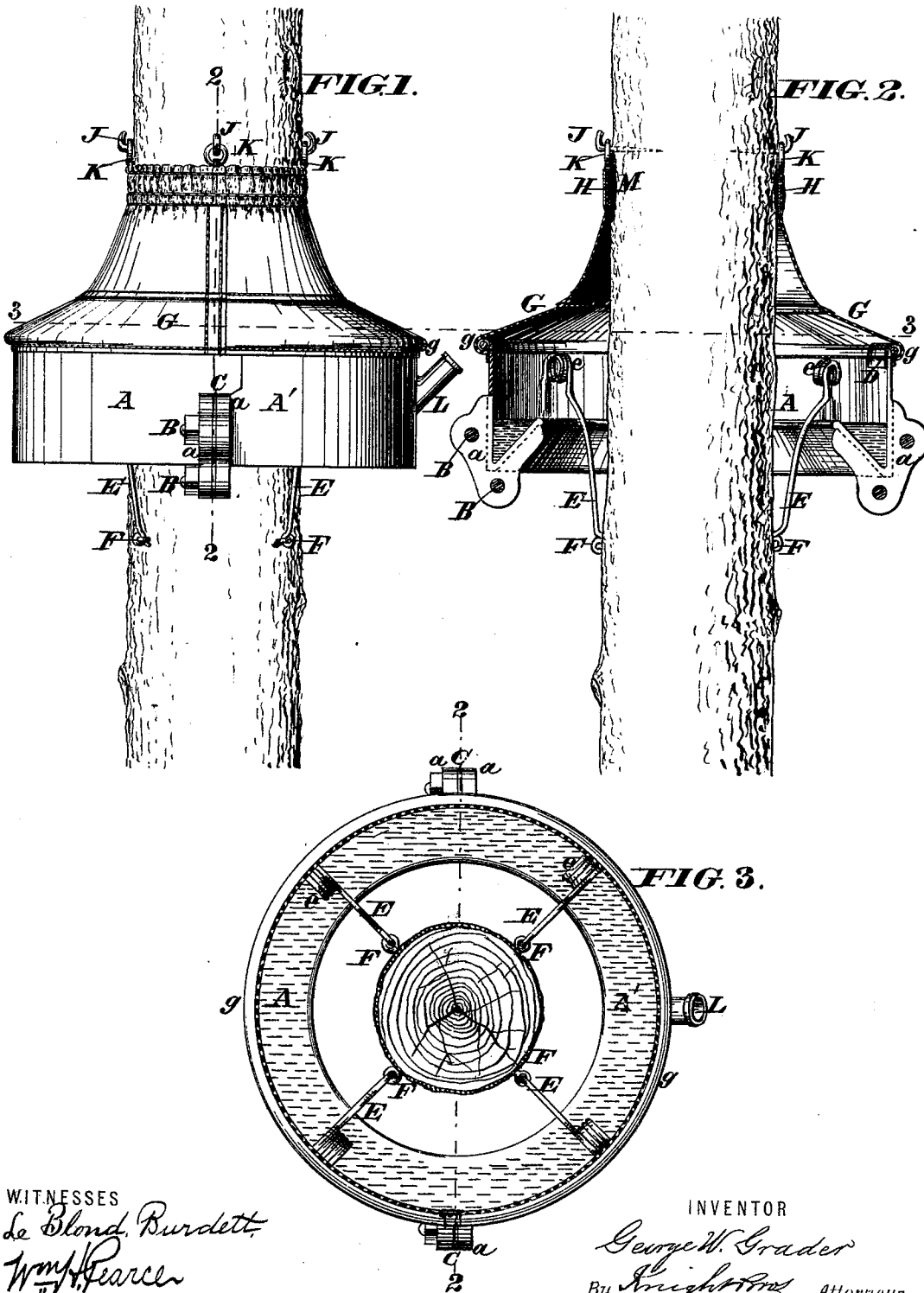


G. W. GRADER.
TREE-PROTECTOR.

No. 176,468.

Patented April 25, 1876.



WITNESSES
Le Blond Burdett
Wm. H. Pearce

INVENTOR
George W. Grader
By *Knights* Attorneys.

UNITED STATES PATENT OFFICE

GEORGE W. GRADER, OF MARBLEHEAD, MASSACHUSETTS.

IMPROVEMENT IN TREE-PROTECTORS.

Specification forming part of Letters Patent No. **176,468**, dated April 25, 1876; application filed February 1, 1876.

To all whom it may concern:

Be it known that I, GEORGE W. GRADER, of Marblehead, in the county of Essex and State of Massachusetts, have invented a certain new and useful Improvement in Tree-Protectors, of which the following is a specification:

My invention consists in an annular trough, constructed in sections, with packed joints, of larger size than the diameter of the tree with which it is to be used, supported from below by springs, which yield as the tree increases in size, so as to prevent any violence to the trough or other parts of the protector. A covering of painted cotton cloth or other suitable material protects the trough from the weather, and prevents the passage of insects. To form a tight closure around the trunk of the tree without interfering with the expansion of the latter, the upper edge of the cover is provided with an elastic band set in a hem or pocket, and stitched to the cloth while the band is stretched, so as to cause a uniform contraction of all parts in contact with the tree when the cover is drawn around the same. The meeting edges of the cover are connected by sewing or other means.

In the accompanying drawing, Figure 1 is an elevation of the apparatus applied to a tree. Fig. 2 is a vertical section on the line 2 2, Figs. 1 and 3. Fig. 3 is a horizontal section on the line 3 3, Figs. 1 and 2.

A A' represent the two parts of an annular trough, made separate to admit of passing them around the tree, and formed with flanges *a*, for the reception of bolts B, by which the ends of the trough-sections are securely clamped together. Between the flanges *a* a packing, C, is introduced, so as to form tight joints and permit the use of an endless trough. The upper edge of the joint on one side of the trough is covered by a strap, D, of rubber or other flexible material, so that, the bolts B being removed, the two parts of the trough may be opened on the hinge formed by the strap D, for placing the appliance around the tree, or removing it therefrom. The protector is supported by four or any desirable number of wires, E, formed with coiled springs *e*, and attached at their upper ends to the trough A,

and at their lower ends to the tree, by means of eyes F, which are driven into the tree.

The elastic construction of the supporting-wires E permits the tree to expand with its growth until it reaches the internal diameter of the trough, without any violence to the latter, and at the same time retains the trough equidistant from the tree on all sides.

G is a cover or bonnet of painted cloth or other suitable material, stitched at its margin to the projecting upper and outer edge of the trough A, as shown at *g*, and formed at its upper edge with a hem or pocket, within which is inserted an elastic band, H, of rubber or rubber tape, applied in the following manner: The rubber band placed between the cloth is tightly stretched, and so held while it is stitched through and through the cloth, the stitches passing through the elastic band near its edges. The stretched band, being then released, will gather the cloth uniformly at all parts of its upper edge.

The protector thus constructed being passed around a tree of sufficient size to cause a slight stretching of the band H on the upper edge of the bonnet, the meeting edges of the bonnet are connected by sewing, or by buttons, or any other suitable means. The elastic band draws or gathers the upper edge of the bonnet in close contact with the tree, (the gathers being uniform at all points around the same, so as to prevent the passage of insects,) and will permit the free growth and expansion of the tree without injurious pressure.

To more effectually fill up the inequalities around the tree, a loose packing, M, of cotton, oakum, or other material, may be inserted, if desired.

J J represent hooks driven into the tree, and K K eyes attached to the upper edge of the bonnet, and caught over the said hooks, to retain the said upper edge at the proper height. The upper part of the bonnet or cover is treated with oil or other material, to render it more flexible. L represents the spout for introducing oil or other fluid into the trough.

Having thus described my invention, the following is what I claim as new therein and desire to secure by Letters Patent:

1. The combination, with the flexible hood

or bonnet G, of the elastic band H, applied to the upper edge of said bonnet, and connected thereto by stitching through and through the material of the bonnet and the band while the latter is in a stretched condition, so as to cause it, in contracting, to gather the upper part of the bonnet uniformly around the tree, as herein represented and explained.

2. The sectional endless trough, with packed joints at opposite sides, and a flexible strap, D, to form a hinge when the clamp-bolts B are loosened, as explained.

3. The combination of the endless trough A A', the bonnet G, to shelter said trough and prevent the passage of insects, and the supports E E, sustaining the trough from below, and provided with springs e, to retain said trough in concentric position as the tree expands.

GEO. W. GRADER.

Witnesses:

OCTAVIUS KNIGHT,
CHAS. J. GOOCH.