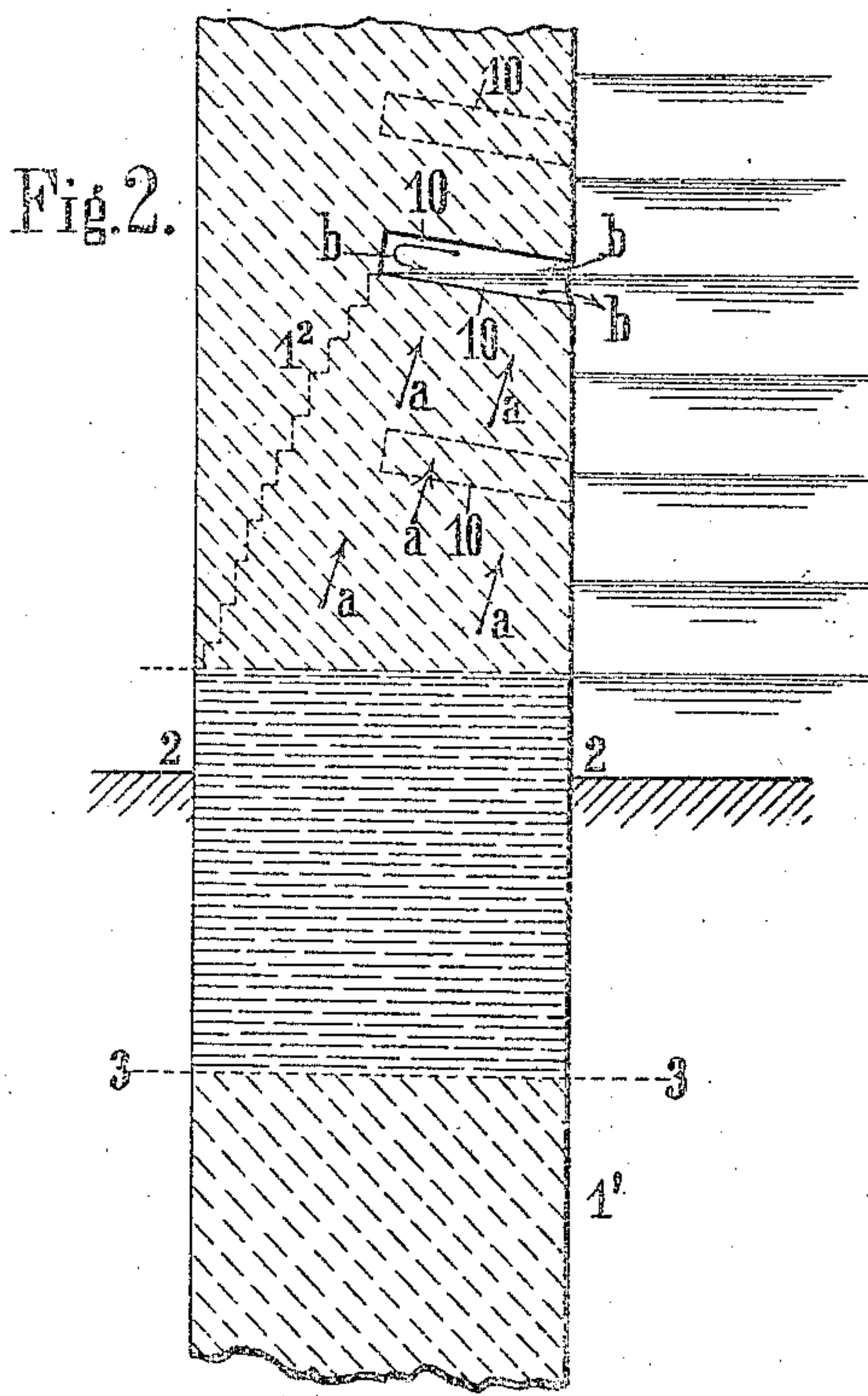
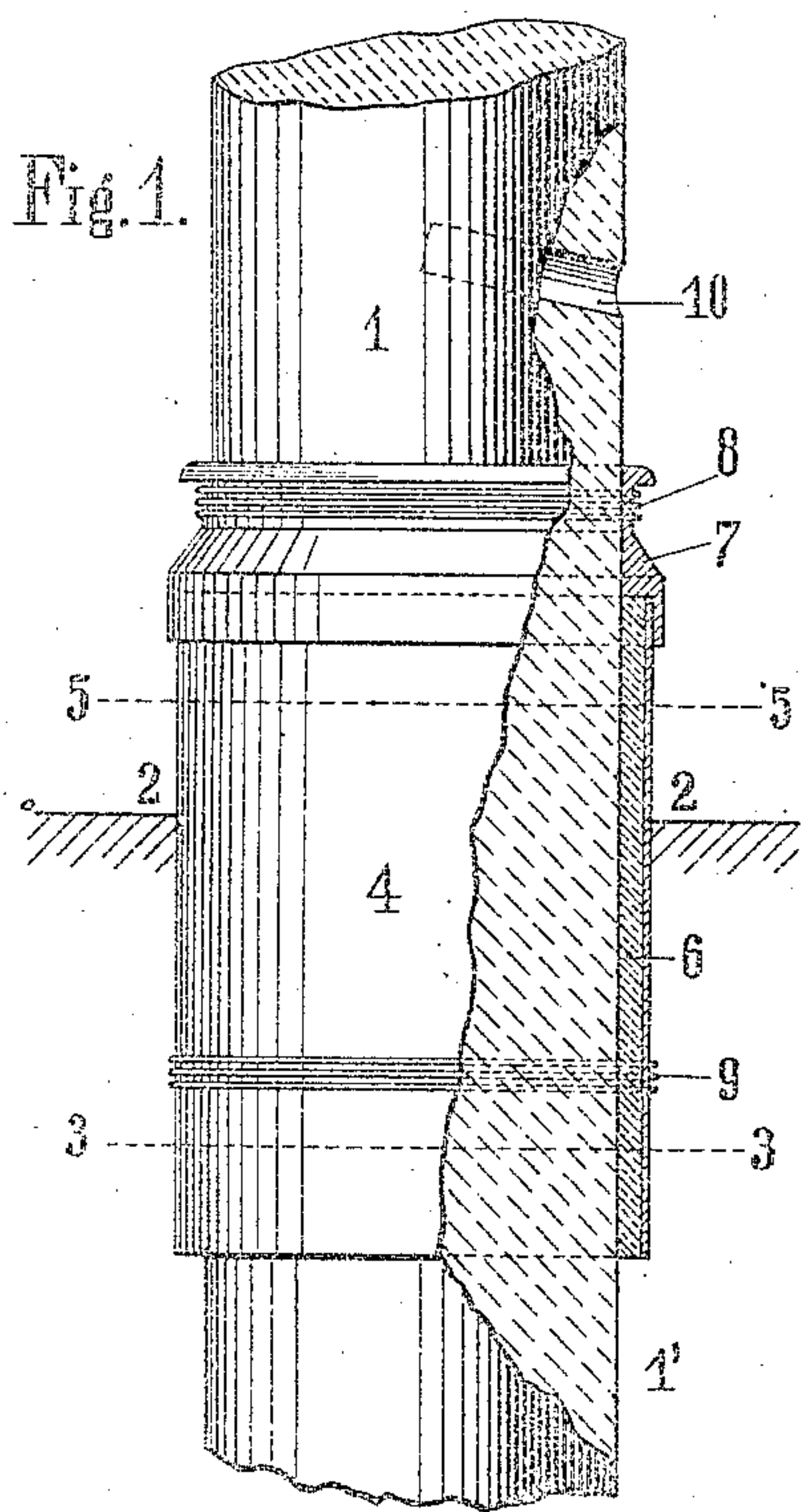


A. KNAPEN.
 MEANS FOR PRESERVING STRUCTURAL PARTS.
 APPLICATION FILED FEB. 15, 1909.

931,318.

Patented Aug. 17, 1909.



Witnesses:

E. O. Hildebrand
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his attorney

UNITED STATES PATENT OFFICE.

ACHILLE KNAPEN, OF BRUSSELS, BELGIUM.

MEANS FOR PRESERVING STRUCTURAL PARTS.

No. 931,318.

Specification of Letters Patent.

Patented Aug. 17, 1909.

Application filed February 15, 1909. Serial No. 477,944.

To all whom it may concern:

Be it known that I, ACHILLE KNAPEN, a subject of the King of Belgium, residing at Brussels, in the Kingdom of Belgium, have
5 invented new and useful Means for Preserving Structural Parts, of which the following is a specification.

My invention relates to means for preserving structural parts, and, in particular,
10 structural parts of wood against decay or deterioration due to moisture.

In carrying out this invention I avail myself of the fact that the durability of wood is greatly enhanced if the same is either kept
15 completely dry or continually submerged in water or in a wet medium, whereas the same is quickly destroyed if exposed alternately to dryness and to moisture, or if a portion of the same projects into the atmosphere while
20 the remaining portion is permanently submerged in water or embedded in permanently moist ground or soil. If a portion of a wooden structural part which projects into the atmosphere is protected from rain by a
25 roof, for example, the lowermost portion of the same being embedded in moist ground, there will be an endangered zone in the structural part between the permanently dry upper portion and the permanently wet or
30 moist lowermost portion of the same. There will be established by this state of things a continuous current of moisture rising from the wet zone toward the dry zone, and this moisture will gradually evaporate in the
35 intermediate endangered zone leaving behind it there, in the pores of the wood the salts from the ground dissolved in the liquid thus carried upward, such salts being precipitated as the liquid evaporates. These
40 deposits of the ground salts will gradually clog up the pores of the wood in this endangered zone and when they have been completely clogged up, the further deposits will result in abnormal expansive or explosive
45 forces leading to cracks and fissures.

In order to overcome these objections and to avoid the injurious effects recited, my invention consists in surrounding or inclosing the structural part with a sheathing or
50 mantle of suitable material which completely incases the same along the entire dangerous zone and extends some distance above and below said zone. The space between this mantle and the structural part is
55 filled with porous material which is a poor conductor of heat, such as asbestos, said

porous material permitting the circulation of air.

The mantle is made of suitable water and airtight material and is preferably provided
60 at its top with a suitable cap or cover for excluding rain or water from other sources from the porous filling, and for preventing the access of frost to the moist wood of the endangered and sheathed zone in winter.
65 The current of moisture thus prevented from escaping by the mantle is directed upward in the structural part and into its upper portion which is provided with a number of outwardly and downwardly inclined cavities or channels from which cavities the
70 moisture, as it rises, will be taken off by the circulation of the air therein as explained herein below.

My invention also consists of such further
75 features and combinations of parts as will be set forth below and pointed out in the claims.

In the accompanying drawing I have represented what I consider the preferred manner of practicing the same, it being illustrated as applied to a wooden pillar.

In this drawing Figure 1 represents an elevation, partly in section, of a wooden pillar protected according to the invention and
85 Fig. 2 a vertical section of the same unprotected mantle and filling.

The pillar 1 is represented as embedded in the ground from the line 2—2 downward, the ground being moist from the line 3—3
90 downward. Between the moist or wet lower portion 1¹ of the pillar and the dry upper portion, 1² of the same there will be formed what I term the endangered zone through which the ground moisture will pass, if not
95 protected, leaving behind it deposits of ground salts as it evaporates. This zone is designated by the horizontal hatching in Fig. 2. In order to prevent this deposit of solid matter in the pores of the wood in this zone I
100 surround the pillar with a mantle or sheath 4 of water and air-tight material said mantle extending somewhat above and somewhat below said endangered zone as shown in Fig. 1, where the upper limit of this zone is indicated
105 by the line 5—5. The annular space between the mantle 4 and the pillar 1 is filled with porous material 6 which is a poor conductor of heat, such as asbestos, said material permitting the free circulation of air.
110

In order to prevent the admission of rain or moisture or of frost into the annular space

between the mantle and the pillar, I close the top of the mantle with a cap or bushing 7 fitting snugly around the top of the mantle and around the pillar.

5 In most cases it will be convenient and desirable to form the mantle and the cap or bushing in sections. In this case the sections may be united by wire rings 8, 9, as shown in Fig. 1. The protecting mantle
10 thus constructed and arranged serves to prevent the evaporation of the ascending current of moisture through the sides of the pillar at the endangered zone, and said current is caused to proceed upward as indicated by
15 the arrows *a* in Fig. 2. In order to prevent the aforesaid injurious deposits in the section of the pillar above the endangered zone and at the same time to keep the said section dry I provide the said section with a series
20 of outwardly and downwardly inclined cavities or channels 10, open at the surface of the pillar, preferably in the form of tubular channels. The mode of operation of these channels has been explained in my concurrent application, Serial Number 425,735, filed
25 April 7th, 1908, but for the purposes of a complete disclosure it will be repeated here as far as necessary. The lighter slightly warmer and comparatively drier air enters
30 these channels 10 at the top and, proceeding in the direction of the arrows *b* absorbs the moisture collecting in the channels and descends, into a lower stratum of the circum-ambient air. By these means, in connection
35 with the protecting mantle, the deposition of solid matter in the pores of wood is avoided, such deposits forming in the cavities. At the same time the pillar above the endangered zone is maintained in a dry condition.
40

Although I have described the downwardly and outwardly inclined cavities for the purposes of a complete description I do not claim them herein *per se*, since they are
45 claimed in my aforesaid application, Serial Number 425,735.

What I claim and desire to secure by Letters Patent is:

1. An exposed structural part in combination with a mantle of water and air-tight material surrounding the same along a portion of its length and leaving a space between
50 itself and the structural part, porous material which is a poor conductor of heat arranged within said space, the said mantle
55 being closed at its top.

2. An exposed structural part, in combination with a mantle of water and air-tight material surrounding the same along a portion
60 of its length and leaving a space be-

tween itself and the structural part, porous material which is a poor conductor of heat arranged within said space, and a cap filling around the top of said mantle and around the structural part. 65

3. An exposed wooden pillar, in combination with a mantle of water and air tight material surrounding the same along a portion of its length and forming an annular space around the pillar, said space being
70 packed with porous poor heat conducting material, and a bushing fitting around the pillar and closing the top of the annular space formed by the mantle.

4. An exposed structural part provided
75 at its upper portion with open downwardly and outwardly inclined cavities, and embedded in the ground for a portion of its length, in combination with a mantle of water and air tight material surrounding
80 said structural part at an intermediate portion of its length extending upward into the dry zone and downward into the moist zone and forming a space around the structural part, said space being filled with porous material which is a poor conductor of heat, said
85 mantle being closed at its top.

5. An exposed structural part, provided at its upper portion with open downwardly and outwardly inclined channels and embedded in the ground for a portion of its length, in combination with a mantle inclosing the same for a portion of its length, extending into the ground beyond the endangered zone and above the ground beyond
90 the endangered zone, and forming a space around the structural part, said space being filled with porous, poor heat conducting material, and a cap fitting around the structural part and over the top of the
100 mantle.

6. An exposed wooden pillar provided at its upper portion with open downwardly and outwardly inclined channels and embedded in the ground, in combination with
105 a mantle of water or air tight material surrounding the same, extending into the ground and above the ground beyond the endangered zone, and forming a space around the pillar, a porous poor heat conducting filling packed into said space, and a bushing fitting around the pillar and closing
110 the top of the mantle.

In witness whereof I have hereunto set my hand in presence of two witnesses.

ACHILLE KNAPEN.

Witnesses:

GREGORY PHELAN,
JAMES M. FAY.