

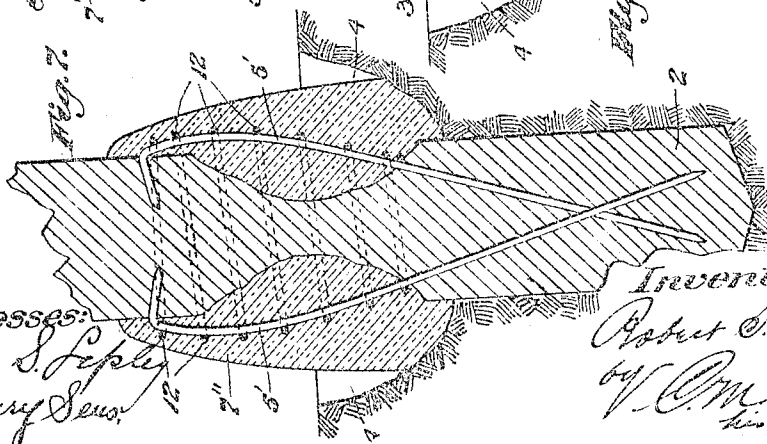
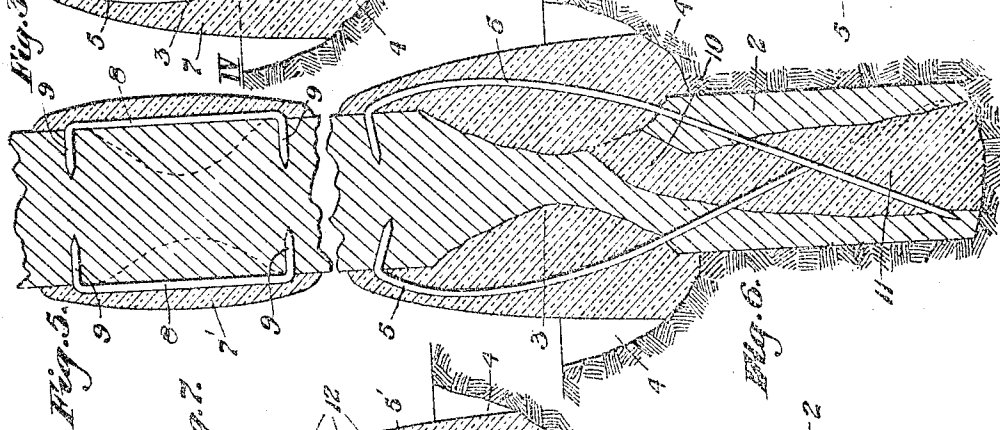
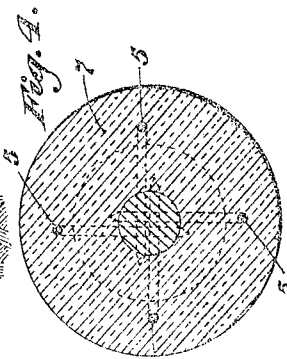
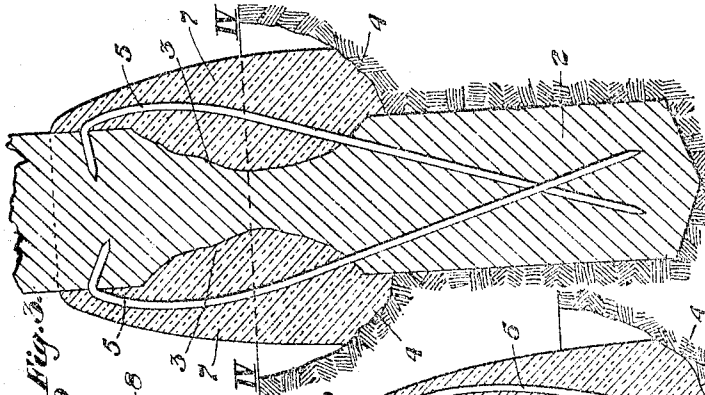
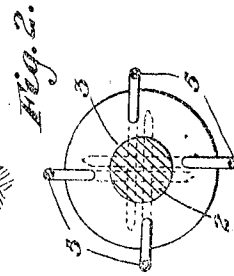
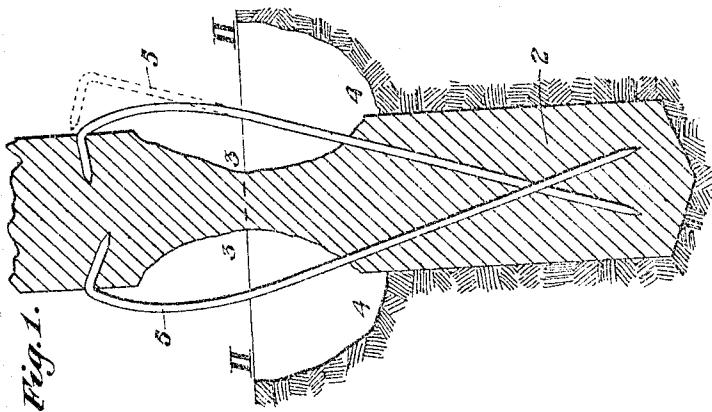
No. 892,880.

PATENTED JULY 7. 1908.

R. S. ORR.

POLE.

APPLICATION FILED FEB. 24, 1908.



Witnesses:

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UNITED STATES PATENT OFFICE.

ROBERT S. ORR, OF PITTSBURG, PENNSYLVANIA.

POLE.

No. 892,880.

Specification of Letters Patent.

Patented July 7, 1908.

Application filed February 24, 1908. Serial No. 417,267.

To all whom it may concern:

Be it known that I, ROBERT S. ORR, a citizen of the United States, residing at Pittsburgh, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Poles, of which the following is a specification, reference being had therein to the accompanying drawing.

My invention refers to improvements in the art of reinforcing old, worn or partially worn or decayed wooden poles by means of metallic tension members connected with portions of a continuous pole, and an enveloping outer shell of concrete.

The invention is particularly applicable to wooden telegraph, telephone, electric light or other poles which are set in the ground and which become weakened by decay or other causes at or about the ground line. As is well known, wooden poles usually fail after a period of a few years due to the destructive action of the elements at and immediately above and below the ground level, or to abrasion by vehicles or other causes, requiring the removal and renewal of the entire pole at considerable work and expense.

My invention is designed to reinforce and strengthen the pole at the weakened point and to effectually protect it from further decay or abrasion without removal or in any way interfering with its continued use, and is accomplished in the following manner.

Referring to the drawings, Figure 1 is a vertical sectional view of a pole showing the strengthening elements incorporated with the pole. Fig. 2 is a cross section on the line II. II. of Fig. 1. Fig. 3 is a view similar to Fig. 1 showing the process complete. Fig. 4 is a cross section on the line IV. IV. of Fig. 3. Figs. 5, 6 and 7 are views similar to Fig. 3 illustrating modifications.

2 is the base of the pole inserted as usual in the ground, the decayed portions around the pole at or about the ground line having been cleaned away down to the sound wood as indicated at 3. To facilitate such operation the ground around the pole is first removed sufficiently to expose the decayed area and provide ample clearance for the work, as indicated at 4.

5 represent metallic rods or bars which are driven into the base of the pole at any suitable angle as shown, having inwardly turned securing extremities 6 which are then driven into the body portion of the pole at any suit-

able points, preferably above the decay cavity 3, whereby the base 2 is firmly connected with the upper pole section by such bracing elements crossing and inclosing the weakened section. Any desired number of such strengthening members may be employed, depending on the size or condition of the pole, within the judgment of the workmen.

After reinforcing members 5 have been secured in position the reinforcing members and the entire exposed base of the pole, preferably from the bottom of the temporary excavation 4 to a point somewhat above the point of attachment of terminals 6, are surrounded by and embedded in a body of plastic material as concrete or cement 7, as clearly shown in Fig. 3. It will be understood that the attaching terminals 6 may be located at varying heights or on the same level as desired, and the concrete covering may be applied within any suitable mold or shell to any height desired.

The specific form or method of attachment of the reinforcing metallic elements may be changed or varied to suit the condition and the construction may be as shown in Fig. 5 wherein the rods 8 may be attached at each end by means of inwardly bent spike terminals 9. 9. of any suitable number desired, and inclosed within the covering 7 of plastic material. It is also obvious that any portion of the pole may be reinforced by my improved process, whether weakened from any other cause than decay, as by splitting, and such an application is also indicated in Fig. 5, although the principal value of the invention is in its application to decayed poles, as above described. The invention may also be applied to new poles, thereby preventing any weakening by decay and permanently reinforcing and strengthening the pole at the point of greatest strain, and protecting it at the ground level. A further application of the invention is in the case of hollow poles or those having a rotted or partly rotted interior, as indicated in Fig. 6. In such case the interior cavity is opened up as by a hole 10 communicating with the outer cavity and both cavities are thus filled with the cement, providing a solid central core 11 which entirely fills the inner cavity. When hardened, the pole will be permanently reinforced and strengthened both outside and inside, while also preventing any further possible deterioration. A material advantage of such construction is that the wooden shell of the pole

is not depended on to hold the reinforcing rods, they being firmly and rigidly anchored in the central core 11 thus permanently holding them and binding the entire structure together in a most efficient manner.

Whenever it is desired to provide additional reinforcement for the tension members 5 or the concrete shell 7, or both, I employ surrounding encircling bands or other suitable devices adapted to embrace all of the members 5 and to be embedded annularly within the covering 7, so as to more firmly bind and hold these elements in fixed relation to the pole to further counteract breaking strains in any direction. In providing such supplemental reinforcing elements, I may employ one or more bands or straps of any suitable construction or design, or the same object may be accomplished by wrapping strands 12 of heavy wire around the longitudinal reinforcing members 5 from top to bottom or at any point desired, and when thus secured, applying the outer body of plastic material 7, completely embedding all of the metallic members and the weakened portions of the pole, as clearly shown in Fig. 7. The advantage of such supplemental surrounding strengthening devices is that they firmly hold the reinforcing members 5 together so as to prevent any possible movement or loosening under bending strains, while at the same time greatly reinforcing the concrete and supplying to it tensile strength. It will be understood that such supplemental reinforcing elements 12 are not necessarily essential and may be used or not according to the condition of the pole or the probable strain to which it is to be subjected. By this construction also, the process becomes available for application to poles which are needed for continuous use without necessarily depending on the ultimate hardening of the surrounding shell.

The exterior surface of the protecting shell 7 may be made smooth or ribbed or in any desired form, and when treated as I have described, the entire pole will be greatly and permanently strengthened and will be provided with an enduring, hard resisting base capable of protecting the inner wood of the pole from any damage or further decay. As thus reinforced the pole will be practically stronger and more durable than originally, and will be rendered capable of further service for an indefinite period.

The advantages of the invention will be readily appreciated by all those familiar with the use of poles of this character, while the process is simple and inexpensive and can be performed by an ordinary workman without the exercise of any especial skill.

Having described my invention what I claim and desire to secure by Letters Patent is:

1. A reinforced continuous wooden pole

having metallic tension members connected with the pole at their terminals, and an inclosing sheathing of concrete or the like surrounding the pole and said tension members substantially as set forth.

2. A reinforced continuous wooden pole having metallic tension members connected with the pole at their terminals, additional surrounding tension members embracing said members, and an inclosing sheathing of concrete or the like surrounding the pole and said tension members substantially as set forth.

3. A reinforced continuous wooden pole having metallic tension members connected with the sound portions of the pole at each side of a weakened or decayed portion, and an inclosing sheathing of concrete or the like surrounding the pole and said tension members substantially as set forth.

4. The combination with a continuous pole having its base inserted in the ground, of reinforcing strengthening elements driven into the pole below the ground line and connected with the pole above the ground line, and a surrounding body of plastic material embracing the pole and said tension members at above and below the ground line, substantially as set forth.

5. The combination with a continuous pole having its base inserted in the ground, of reinforcing strengthening elements driven into the pole below the ground line, extending outwardly beyond the pole and connected therewith above the ground line, and a surrounding body of plastic material embracing the pole and said outwardly extending portions of the tension members, substantially as set forth.

6. The combination with a continuous wooden pole, of metallic tension members having their ends driven into the pole and flanking an intervening space, and a surrounding sheathing of concrete or the like surrounding and embedding the pole and said tension members and extending beyond their ends, substantially as set forth.

7. The combination with a continuous pole having a weakened portion of reduced diameter, of metallic tension members driven obliquely into the pole at one end of the weakened portions, and a surrounding covering of concrete or the like inclosing the weakened portion of the pole and the exposed portion of said tension members, substantially as set forth.

8. The combination with a continuous pole having a weakened reduced portion and a hollow center, of metallic tension members driven into the pole at one end of said weakened portion, bowed inwardly and attached to the pole at the other side of said weakened portion, and a surrounding covering of concrete or the like covering the weakened portion of the pole and the exposed portions of

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said tension members, and filling the hollow portion of the pole, substantially as set forth.

9. A reinforced continuous wooden pole having metallic tension members inserted by their terminal ends into the body portion of the pole, and an inclosing sheathing of concrete or the like surrounding the pole and said tension members, substantially as set forth.

10. A reinforced continuous wooden pole having metallic tension members inserted by

their terminal ends into the body portion of the pole at each side of a weakened portion, and an inclosing sheathing of concrete or the like surrounding the pole and said tension members, substantially as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

ROBERT S. ORR.

Witnesses:

S. B. STEWART,

A. E. STANICK.