

No. 626,060.

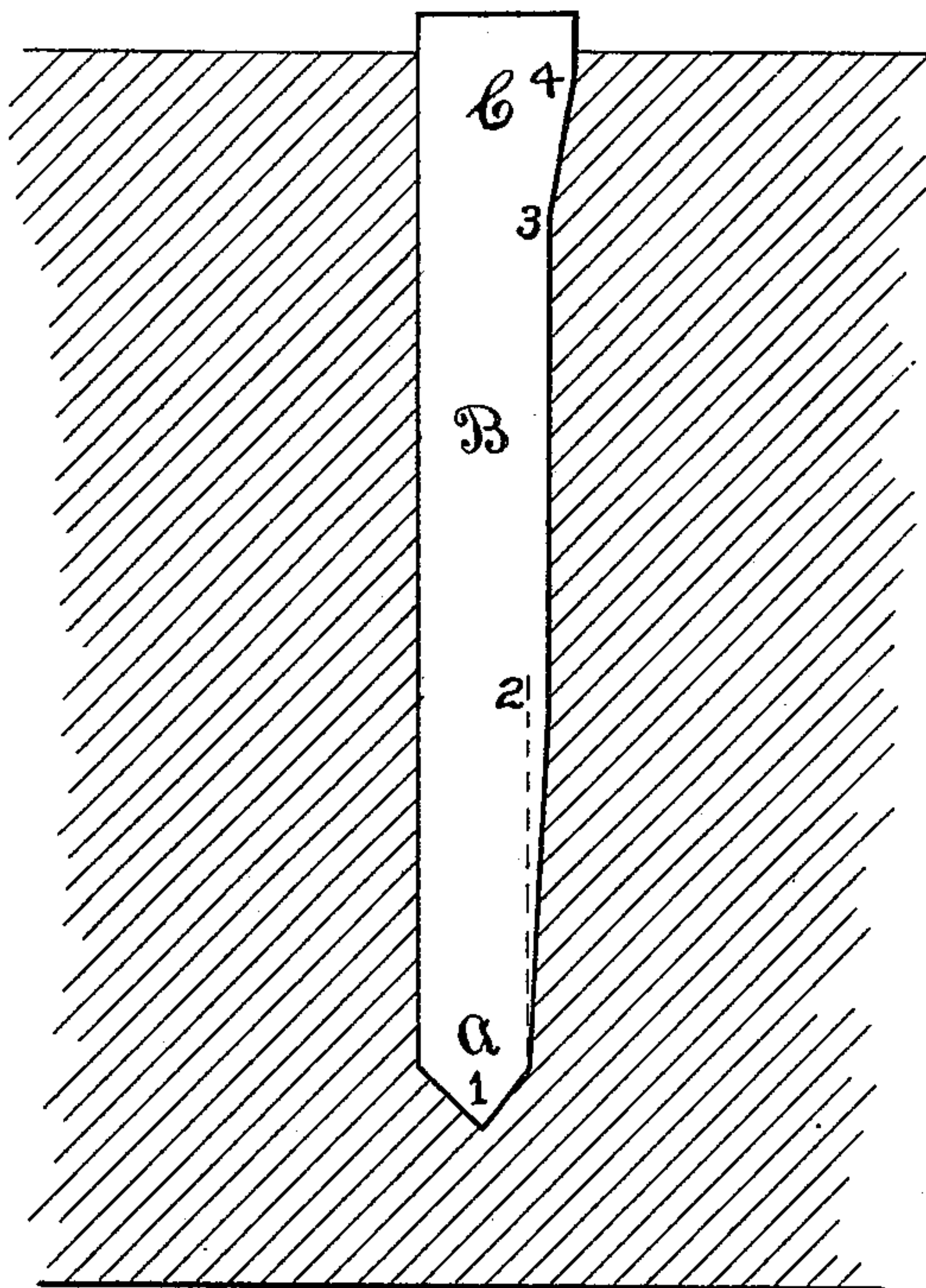
Patented May 30, 1899.

W. GOLDIE.

TIE PLUG.

(Application filed July 13, 1898.)

(No Model.)



Witnesses

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TIE-PLUG.

SPECIFICATION forming part of Letters Patent No. 626,060, dated May 30, 1899.

Application filed July 13, 1898. Serial No. 685,851. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM GOLDIE, a citizen of the United States, residing at Wilkinsburg, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Tie-Plugs; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to plugs for filling holes left in railway-ties by the removal of spikes therefrom; and the improvement consists in certain arrangements of bearing-surfaces and distribution of the material of the plug to best adapt it to the purposes for which tie-plugs are used.

The objects of my invention are, first, to produce a tie-plug that can be readily started into the hole; second, to so form the body of the plug that it will completely fill the hole without undue compression of the plug itself and not require undue force for driving, and, third, to provide a tie-plug that will not be liable to break while being driven.

Heretofore tie-plugs of various forms have been used, one form having a V-shaped point and parallel sides, such as shown in United States Letters Patent No. 519,553, dated May 8, 1894, to H. G. Rounds, assignor to myself, another form having a V-shaped point and sides diverging from the point to the head, giving a uniform taper throughout the length of the plug. In railway practice such forms are objectionable for the following reasons: The plug with parallel sides must by reason of its bluntness be held in place and subjected to a blow to start it into the hole, and inasmuch as the hole at the top is usually oblong in the direction of the grain of the tie, owing to the tendency of the rail to spread under moving loads, the plug with parallel sides does not fill the hole at the top. Moreover, plugs of this form are hard to drive because of the point being blunt and the sides having no taper to conform to the tapered hole made by the spike.

It is found in practice that a plug with uniform taper throughout its length does not completely fill the hole at the bottom and crowds the hole at the top, requiring undue force to drive it and tending to shear off the

plug near the top parallel with the grain. Such plugs are necessarily made of soft compressible wood, otherwise they could not be driven into the small parallel-sided aperture left by the spike, and soft wood is objectionable on account of its compressibility and small holding power.

It is essential that plugs for railway-ties be of such form as to completely fill the hole left by the spike, for it is frequently necessary in regaging a track to drive a new spike into the plug, and unless the plug is firmly in contact with the sides of the hole the spike loosens. It is also essential that the top of the plug fit tightly to prevent access of moisture.

The problem of satisfactorily plugging a spike-hole in a railroad cross-tie consists of something more than simply stopping it up so as to keep the water out. To understand this fully, the functions that a spike performs in railway maintenance must be recognized. The two important functions of a railway-spike are to preserve gage and to control the vertical movement of the rail produced by its deflection and recovery caused by the weight of the train passing over it. Owing to the general use of heavier rails in recent years the vertical movements are not so great as they used to be with lighter rails, but the outward thrust of the wheel-flanges, which widens the gage, is much greater, owing to heavier trains and higher speeds, and most large and busy roads now regage their tracks once a year. This of course makes it necessary to extract the spikes, move the rail in, and drive the spikes in again closer. If the spike is driven in a new place, the tie is weakened in the part where it should have the greatest strength and is soon destroyed.

The practice is now almost universal among railroads to properly plug the hole and then drive the spike into the plug. Since the lateral thrust of the wheel-flange against the head of the rail is communicated through the flange of the rail to the neck of the spike close to the surface of the tie, it is readily seen that the plug into which the spike is driven must solidly fill the hole at the surface of the tie. This part of the hole is always of oblong section, caused by the spike being bent or forced back, thereby widening the gage, which must be corrected. The action of the

thrust or pressure on the rail is to force the neck of the spike back, and the same force tends to force the point inwardly. To properly brace the point of the spike so that it will resist this tendency, it should be embedded in the solidly-compressed wood of a tie-plug so constructed as to be uniformly supported by the fibers of the tie. If from any fault in its shape the plug fails to fill the bottom of the cavity, the point of the spike that is driven into the plug is left unbraced, and the neck of the spike yields back just so much more easily. Moreover, the spike lacks the adhesive force it would otherwise have if all its body were solidly in contact with the wood.

The parallel-sided square plugs above referred to having wedge-shaped points cannot be driven to the bottom of the hole, as they have not the proper taper at their lower body portion and, furthermore, are loose at their upper ends. Such tie-plugs are nearly always broken off when about two-thirds driven. Plugs that are made with uniform taper have the same defect. They do not properly fill the hole at the bottom, for they do not reach it in driving on account of being too tight at the top. They are also broken off before being fully driven, and the spike is thus deprived both of the bracing effect and the holding power.

To overcome the defects of former plugs and to conform to the requirements of modern railway practice, I have devised the plug shown in the accompanying drawing, in which the figure is a vertical section of a portion of a tie, showing a side view of my improved plug.

The plug is preferably made of wood, and, as is clearly shown in the drawing, it consists of a point portion A, body B, and head C. The point portion A is provided at the bottom with the usual wedge-shaped part 1 and has one face slightly beveled from the wedge 1 up to the body portion B of that part, as is indicated by the dotted line at 2, thus decreasing the sectional area of the plug. The body portion B has its opposite faces substantially parallel from the point 2 to the beginning of the head at 3, where the plug is so enlarged as to fill the space wedged out by the spike in withdrawing from the hole. From the point 4 on the head to the top of the plug the opposite sides are substantially parallel. Thus, as shown, the plug is constructed with a rectangular body portion B, the opposite sides of which are substantially parallel, while its wedge-shaped lower end A and its enlarged head C each has one or more faces of unsymmetrical contour, whereby the tie-plug is better adapted to serve the purposes for which it is designed.

It is evident that decreasing the size of the plug by tapering the part A, as shown from 2 to 1, enables me to produce a plug that can be entered into the hole and prepared for driving without preliminary blows, thus sav-

ing time and labor. The part A also conforms in shape to the hole produced by the common forms of railway-spikes. The straight body portion B completely fills the space cleared for it by the part A and insures uniform intensity of pressure from the tie fibers throughout its length. The enlarged part 3 4 of the head portion C serves to completely fill the top of the hole, which may have become enlarged by the vibration of the spike in use or during its withdrawal from the tie. The straight portion at the top of the plug serves to prevent burring while the plug is being driven.

With this invention I am enabled to use very dense and hard woods, whereby the compression necessary to hold the plug firmly occurs in the fibers of the tie rather than in the plug itself, as is the case where soft plugs are used. I thus secure a more uniform pressure on the sides of the plug, and consequently a more perfect closure of the hole left by the spike, at the same time deriving the additional advantages attending the use of a plug into which a new spike may be driven, the plug, owing to its hardness, having great adhesive power to hold the new spike in position against the vertical and horizontal stresses, tending to loosen it when subjected to vibration produced by a moving load.

As has been stated above, the tie-plug involved in this application has a point portion that is thicker somewhat than the point of the spike and of a shape to completely fill the hole at the bottom. It has a parallel body portion the size of the spike, and an upper portion considerably larger in one direction than the body portion to completely fill the hole at the top. It satisfies a want in railroad practice that has not been heretofore filled, for it is easily entered in the tie, a part of its length is driven in readily with a fair amount of force, and it is then set down solidly by heavy blows when it is nearly home. There is not enough of it projecting above the tie to buckle and break off, as do other shapes. Since this plug has been placed on the market the demand for it by railroads has been unprecedented, and it is rapidly displacing all other forms of tie-plugs that have heretofore had large sale, among them being the tie-plug shown in the patent to Rounds, No. 519,553, issued May 8, 1894, which patent is owned and operated by the inventor of the present improved plug shown in this application.

What I claim is—

1. In a wooden tie-plug the combination with a rectangular upper body portion and a wedge-shaped lower end, of an enlarged head that is partly beveled on one side, and a wedge-shaped lower body portion beveled on one face from the wedge-shaped lower end up to the upper body portion, substantially as described and for the purposes set forth.

2. In a wooden tie-plug the combination with a rectangular upper body portion and a

wedge-shaped lower end of an enlarged head
that is partly beveled on one side with a rec-
tangular straight top portion above said bev-
eled portion and a wedge-shaped lower body
5 portion beveled on one face from the wedge-
shaped lower end up to the upper body por-
tion, substantially as described.

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

WILLIAM GOLDIE.

Witnesses:

GEORGE B. WILLCOX,
RAY FRALICK.