J. B. JOHNSTON.

Horseshoes.

No. 143,353. Patented September 30, 1873.

Fig. 1.

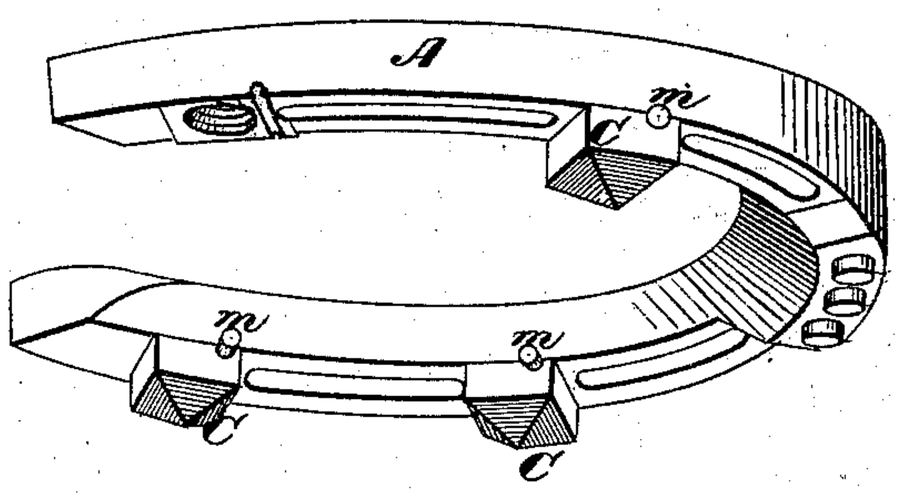


Fig. 2

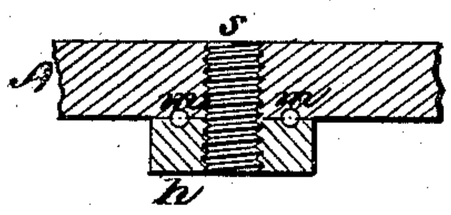


Fig. 3

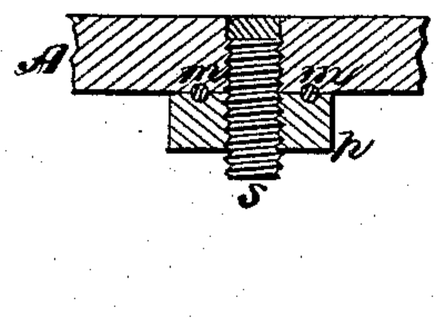
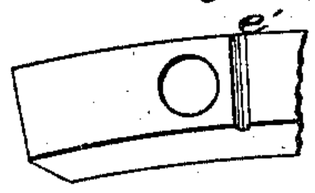


Fig. 4.



Witnesses-

C. F. Brown.

W. G. Ellsworth

Inventor-

J. B. Johnston-

by his Attys-

Hill & Ellsworth

UNITED STATES PATENT OFFICE.

JAMES B. JOHNSTON, OF NEW YORK, N. Y.

IMPROVEMENT IN HORSESHOES.

Specification forming part of Letters Patent No. **143,353,** dated September 30, 1873; application filed May 28, 1873.

To all whom it may concern:

Be it known that I, JAMES B. JOHNSTON, of the city, county, and State of New York, have invented a new and useful Improvement in Horseshoes; and I do hereby declare the following to be a full and exact description of the same, reference being had to the accompanying drawings forming part of this specification, in which—

Figure 1 is a perspective view of the shoe with the removable calks applied. Fig. 2 is a vertical longitudinal section of the calk and shoe. Fig. 3 is a longitudinal section of a portion of the shoe and calk; and Fig. 4 represents a portion of the shoe with the groove for the key.

Similar letters of reference in the accompanying drawings denote the same parts.

The importance of discovering some means by which removable steel calks can be conveniently applied to horseshoes of the common form without materially increasing their cost, and so that when thus applied they will not break off at the face of the shoe, nor work loose and become detached and lost, has long been conceded, and many efforts have been made to produce the desired result; but up to this time nothing of great practical value has been brought into public use for the purpose. Some of the efforts referred to have failed on account of involving too great a cost; others because requiring a material change in the form of the shoe; others for the reason that, as constructed, the calk was liable to break off at the face of the shoe; others because, although the calk might not break off at the face of the shoe, it was, however, liable to unscrew and become detached; and others because they weakened the shoe too much.

The object of my invention is to overcome the various difficulties which have so longstood in the way of success, and to produce for public use a removable steel or iron calk, of the form best adapted for its purpose, and most cheaply and easily made, combined with a shoe of the common form, and constructed in such manner that while the calk can be inserted and removed without difficulty by any person, however unskillful he may be, yet it cannot work loose nor become accidentally detached, nor will either the calk or the shoe be any more liable to break when in use than a non-removable calk or its shoe. To this end my invention consists in three elements, viz: First, a shoe of the ordinary form and construction, provided with a suitable number of screw-holes to receive the stems of the calks; secondly, two or more iron or steel calks, constructed with large heads, which fit flatly upon the face of the shoe, and with small screw-stems, which fit into the screw-holes of the shoe; and, thirdly, a transverse key, lying between the enlarged head of the calk and the face of the shoe, and half embedded in each in a groove provided for that purpose in their proximate faces—all combined substantially, as I will now proceed to describe.

Referring to the drawings, A is the shoe. C C are the removable calks, and *m m* are the fastening-keys, said keys fitting closely into recesses formed between the calks and shoe, by means of grooves *e* in the former and *e'* in the latter, so as to prevent the calks from turning, and thus becoming detached and lost. The recesses referred to are so arranged that the keys will not come in contact with the screw-stem *c* at all, as shown, in order, first, that the screw-stem may not be weakened by being cut away; and, secondly, that the key may throughout its entire length be in contact with the metal of the shoe on one side, and with the metal of the head of the calk on the other side. The calks are inserted into the holes of the shoe, and screwed up till their faces rest firmly against the shoe-plate, and the grooves *e e'* coincide, when the keys are inserted and held in place by means of a head on one side of the shoe and a bent point at the other side, or by having both ends bent down so as to prevent any possibility of their accidental displacement.

The advantages of this construction over the method of securing the calk by means of pins extending through or into the screw-stem, and over the method of dovetailing the calk, and then securing it by keys, are as follows: As compared with the method of securing the calk by pins extending through or into the screw-stem, first, my improved construction does not weaken the screw-stem by boring it, nor the shoe by boring another hole in line with the large screw-hole already made in it;

secondly, the key resists the turning of the calk, not merely with a force equal to the transverse strength of the key, but with a force equal to the transverse strength of a piece of metal corresponding in width to the length of the key—in other words, the power of the key to resist the turning of the calk is increased tenfold, and is practically unlimited; thirdly, the grooves can be made much more easily and cheaply than the holes can be bored, and any person having one of the old forms of screw-calks can, by means of a file, adapt the shoe in a few minutes to the use of my improvement; fourthly, the key can be fitted in place more loosely without danger of its binding and binding, which might prevent its easy removal when necessary; and, fifthly, the transverse key actually re-enforces the screw-stem in the resistance of the latter to any force applied longitudinally along and nearly or quite parallel to the face of the shoe—the direction in which nearly all injurious blows are received upon the head of the calk from the contact of the latter with the pavement when the shoe is in actual use.

As compared with the method of dovetailing the calk into the shoe, and then securing it by keys, my improvement has, in brief, all the advantages which the screw-calk possesses over the dovetail calk, and which may be briefly referred to as follows: First, it does not involve any change in the construction of the shoe, and can be applied to any of the ordinary shoes in common use; secondly, the calk is more easily fitted to the shoe, and fits more tightly when in place; thirdly, the construction is much cheaper; fourthly, the calks can be applied, not only at the heels, but at other points along the side of the shoe, if desired; and, fifthly, the rusting of the parts does not render the calk so immovable as when dovetailed into the shoe.

The key also answers a different purpose, and in a different way. Not being passed through any part, and not holding by merely its transverse strength, it operates mainly to prevent the calk from turning, and it does not weaken the shoe or calk, but rather strengthens them both by distributing the resistance to the heaviest blows, as above set forth.

So, too, the calk may be made in two parts, to wit, a screw-stem, *s*, screwing into the body of the shoe with its extremity projecting below the face of the shoe; a screw-head, *h*, screwing onto the projecting lower extremity, so as to rest firmly against the face of the shoe, and the fastening-keys *m*, as above described. In this case the entire calk may be made of steel, or either part *s* or *h* may be made of steel, the other being made of soft iron. Any equivalent metals may, of course, be used instead of iron and steel.

I am aware that removable calks, provided with screw-stems, have heretofore been employed on horseshoes, the stems of the calks being screwed into corresponding perforations in the shoe, and prevented from turning by keys passing through perforations in the screw-stems and shoes, and I therefore lay no claim to such invention, which weakens materially both the shoe and the stem of the calk, and renders the latter extremely liable to break off near the lower face of the shoe. I am also aware that a calk provided with a roughened or corrugated stem has been driven into a correspondingly-formed perforation in the shoe near a calk forming part of the shoe, so that the two calks will be in contact at their sides, and connected together by a key embedded in both, and I therefore lay no claim to such invention, as my removable calk could not be screwed into the perforation of such shoe, because of the calk, rigidly attached, or forming part of the shoe, and also because the calk thus fastened to the shoe is difficult of removal, and different from my screw-fastening. I am also aware that dovetailed projections on the calk which enter correspondingly-formed sockets or recesses in the shoe, and are prevented from turning by a key passing through the shoe, and the dovetailed projection on the calk have heretofore been employed, and I therefore lay no claim to such invention, as such calk cannot be applied to the ordinary shoe as mine can; and because the above-named construction materially weakens both the shoe and the dovetailed projections on the calk, by reason of the perforations made in them, and renders the latter extremely liable to break off near the lower face of the shoe.

Having thus described my invention, what I claim as new is—

The combination of a shoe, A, with a removable calk, C, attached to the shoe by a screw-stem, and secured from turning by means of a key embedded between the shoe and the lower face of the calk, substantially as described, for the purposes set forth.

JAS. B. JOHNSTON.

Witnesses:

G. W. BASHFORD,

N. W. WEST.