

No. 646,148.

Patented Mar. 27, 1900.

W. J. KENT.
HOOF PAD.

(Application filed July 26, 1899.)

(No Model.)

2 Sheets—Sheet 1

FIG. 1.

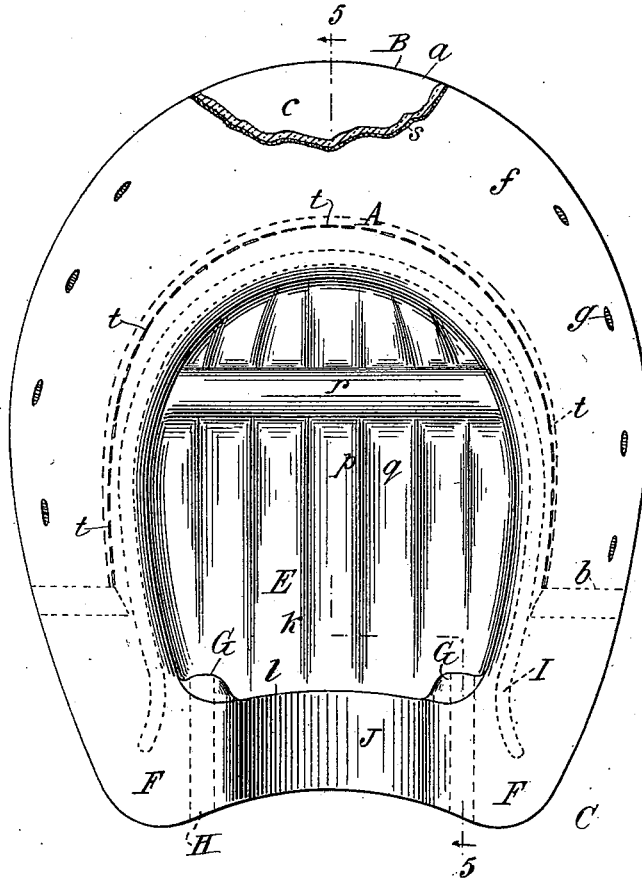


FIG. 2.

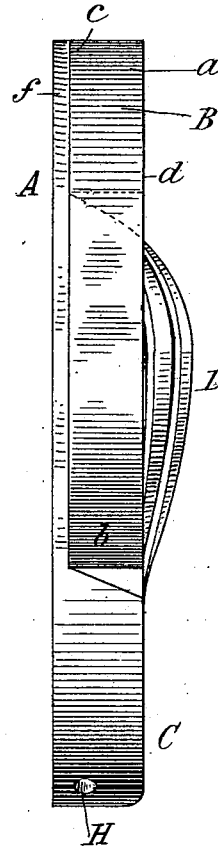
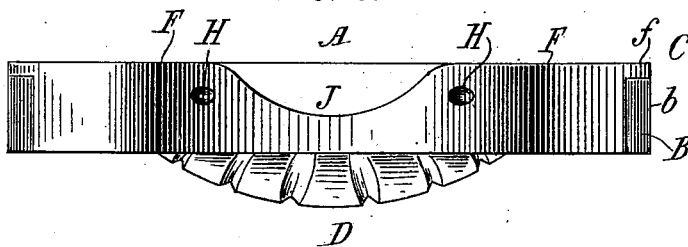


FIG. 3.



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FIG. 4.

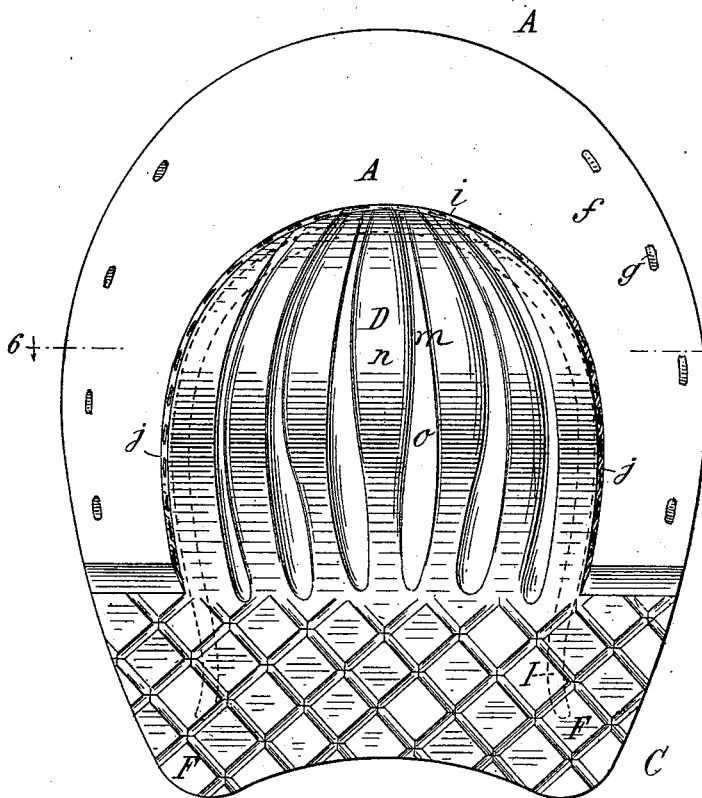


FIG. 5.

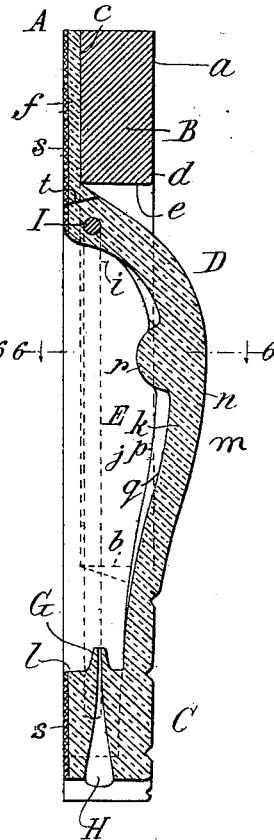
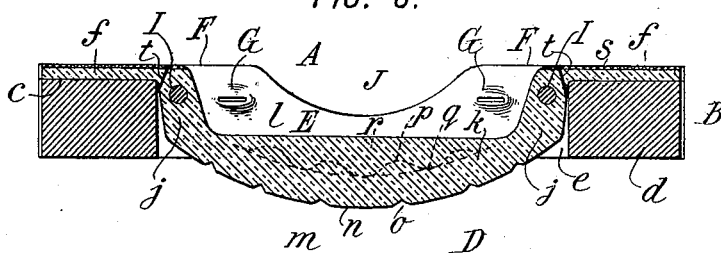


FIG. 6.



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UNITED STATES PATENT OFFICE.

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HOOF-PAD.

SPECIFICATION forming part of Letters Patent No. 646,148, dated March 27, 1900.

Application filed July 26, 1899. Serial No. 725,176. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM J. KENT, a citizen of the United States, residing in the city of New York, borough of Brooklyn, county of Kings, and State of New York, have invented certain new and useful Improvements in Hoof-Pads for Horses, of which the following is a specification.

This invention relates to hoof-pads, and aims to provide certain improvements therein.

Many devices have heretofore been employed for protecting horses' hoofs against shock or against direct contact with the shoe or the roadway. These devices have generally consisted of a cushion-like member of rubber, composition, leather, felt, or several of these in combination, the device being known as a "hoof-pad." A portion of the pad is generally adapted to cover the sole of the hoof, the pad being usually formed with a thin portion to be interposed between the hoof and the shoe and a thick projecting elastic cushion crossing the frog at the heel. These pads are generally used with what is known as a "three-quarters" shoe—that is, one from which the heel and heel-calks are omitted—in which case the rubber cushion of the pad extends outwardly past the heel ends of the shoe and constitutes the heel portion of the footwear. This cushion usually projects flush with or slightly below the level of the shoe and serves to cushion the shock at the heel of the hoof, which is a particularly delicate and sensitive part thereof.

My invention aims to provide an improved hoof-pad and one which, while as effective as those heretofore used in cushioning the shocks of use and preventing direct contact between the hoof and the shoe or the roadway, will preserve a natural and healthful condition beneath the hoof and will be light and comfortable in use.

To this end in carrying out the preferred form of my present invention I provide a hoof-pad comprising a thin yielding portion for intervening between the hoof and shoe, a thick heel-cushion for crossing the frog and also for supporting the heels at the rear of the shoe when a three-quarter shoe is used, a flexible downwardly-extending center for filling the

space within the shoe under the sole of the foot, an air-chamber under the center of the foot, means for supplying air to and expelling it from such chamber, a ring-like leather attacher covering the outer edge of the pad-body and having an aperture opposite to and of approximately the full area of the air-chamber, a socket for fitting the frog of the foot, and a stiffener for resisting expansion or contraction of the hoof or the pad.

In the accompanying drawings, which show the preferred form of my invention as adapted for a three-quarter shoe, Figure 1 is a top plan of the improved pad. Fig. 2 is a side elevation thereof, showing the shoe in position. Fig. 3 is a rear elevation thereof. Fig. 4 is a bottom plan showing the shoe removed. Fig. 5 is a longitudinal section cut in the planes of the line 5 5 in Fig. 1, and Fig. 6 is a cross-section cut on lines 6 6 of Figs. 4 and 5 and looking rearwardly.

Referring to the drawings, let A indicate the improved pad and B a three-quarter shoe with which it is adapted to be used. The shoe is of usual construction, having a toe *a* at front, short heels *b*, a top bearing *c*, a bottom working face *d*, and a hollow center *e*. The pad has a flat thin outer bearing-strip *f* for intervening between the bearing *c* of the shoe and the sole of the hoof and has a thick heel-cushion *C* for crossing the frog and the heels of the shoe at the rear of the hoof. The pad is connected to the hoof by its bearing-strip *f*, which is clamped between the hoof and the shoe when the shoe is nailed to the hoof, the nails penetrating the pad at the points *g*, and thus preventing displacement of the pad should any looseness between the shoe and the hoof occur in use. The pad has a downwardly-projecting central portion filling the hollow center *e* of the shoe beneath the coffin-joint of the hoof. As thus far described the parts may be of any usual or suitable construction and are in their general features well known.

I will now describe in detail the various improvements incident to my present invention.

According to one feature of improvement the pad is constructed with a pneumatic

chamber E beneath the foot. This chamber is preferably under the center of the foot and opposite the hollow center *e* of the shoe and is best formed by forming the central projection D of the pad with a hollow or concave inner face having a front wall *i*, side walls *j*, bottom wall *k*, and rear wall *l*, which walls inclose the chamber on all sides except its upper side, where it is closed in use by the sole of the horse's foot. The bottom wall *k* is a yielding elastic wall, preferably bulging beneath the working face or tread *d* of the shoe and adapted to be compressed inwardly or upwardly by contact with the roadway and to spring outwardly or downwardly as the foot is raised. This elastic bulging tendency of the center D of the pad has a cushioning effect as the pad strikes the roadway, and it also insures that the hollow center of the shoe shall be constantly filled with the pad and that the formation of "balls" or collections of material within the shoe shall be prevented. Locating the wall of the projection D at a point remote from the sole of the foot insures a free air-space between the sole and the center of the pad for ventilation and also frees this portion of the sole of the hoof from contact with the roadway or from subjection to severe impact or pressure at any particular point, and making this air-space a confined pneumatic chamber contains the advantages that should the wall *k* be pressed unduly upward through any cause the upward pressure will be distributed by the air confined in the chamber equally throughout all portions of the center of the hoof, thus practically removing risk of injury to that most sensitive and delicate part of the hoof known as the "coffin-joint."

I prefer to construct the bottom face *m* of the central projection D with forwardly and rearwardly extending ridges *n* and intermediate grooves *o*, which add both to its elasticity and to its protective qualities, greatly facilitating avoidance of side slipping, and I prefer to form the interior of the pad with similarly-disposed ridges *p* and grooves *q*, the interior ridges being opposite the exterior grooves and the interior grooves being opposite the exterior ridges, as best seen in Fig. 6. I also prefer to form the inner face of the wall *k* with a transverse thickening *r*, extending from side to side near its forward part.

According to another feature of improvement I form the heel-cushion C with a frog-socket J, having substantially the reverse contour of the frog of the horse's hoof, so that when the pad is applied to the hoof it will fit the latter with comparative tightness at all points without requiring undue pressure on the frog, which is a very sensitive part of the foot. The heel portions F of the calk will in use receive and transmit to the heel of the hoof practically all of the shocks of use, while the frog-socket will relieve the frog of any undue pressure and still will transmit a portion

of the pressure in use to this portion of the foot.

I prefer to provide means for effecting a circulation of air under the hoof in use. This may be variously accomplished; but I prefer to employ one or more automatic air-valves G, fed by normally-open air-inlets H, which inlets are shown as horizontal passage-ways traversing the heel-cushion at each side of the frog and terminating in flat contracted openings into the air-chamber E, between the lips of the valves G. The valves G act as check-valves, being formed in the inner wall *l* as projecting lips surrounding the inlets H and so arranged that they will separate to permit an inflow of air and will come together to prevent an outflow, the internal pressure in the air-chamber closing the lips together and the vertical pressure on the heel-cushions closing the walls of the inlet together at the inner side of the wall *l* to insure against egress through these passage-ways in use. The result of this construction is that when the protruding center D is pressed inwardly it compresses the air in the chamber E and closes the valve or valves G, the air being confined in the chamber except in so far as it is able to escape between the bearing-strip *f* of the pad and the sole of the hoof. A slightly-continued compression of the air in the chamber, as would occur were the horse standing, would soon suffice to force out enough air between the pad and the hoof to relieve the unusual internal pressure; but this would not occur so soon as to impair the pneumatic-cushion function of the air-chamber, which function is preferably desired only at the instant that the foot strikes the roadway and is best not continued permanently. As the foot is lifted the elasticity of the wall *k* will quickly suffice to bulge it outwardly, thus creating a slight rarefaction within the chamber E, which will be immediately relieved by inflow of air through one or both the air-inlets H. In this way there is a constant supply of fresh air beneath the center of the hoof and a constant ventilation under the hoof, which is very important to the healthfulness of the hoof and to the comfort of the horse.

Another feature of improvement comprises a stiffener or expander I, which is preferably a steel rod or spring embedded and curved in the front and side walls of the pad, near the hoof, and extending parallel with the inner edge of the shoe and terminating in separated ends within the heel portions F of the heel-cushions C. This stiffener elastically tends to resist contraction of the hoof, and this overcomes that tendency to contract which is quite commonly found in horses' hoofs. It also aids in preserving the conformation of the pad.

While the pad may be formed of any desired materials, I prefer to construct it with a bottom face of rubber or rubber composition and with a top face or reinforce of leather,

fibrous, or textile materials to form an attacher cut out at the center, the two being attached by stitches *t*, cement, or otherwise and the stiffener being embedded in the rubber during molding of the latter. The reinforce or attacher *s* covers the outer edge of the pad-body and has an aperture opposite to and approximately the full area of the air-chamber *E*. The pad is thus held against movement relatively to the hoof, but leaves the latter free and exposed to the air.

In use the pad will be applied by placing its upper face on the hoof after the latter has been properly prepared, and the shoe will then be placed with its bearing-face on the bearing-strip of the pad, and both will be secured by nailing the shoe on the hoof, as ordinarily. When thus shod, the animal can be driven or used as ordinarily, but with a greater feeling of confidence in its surefootedness and with much less danger of injury or foot maladies. The heel-cushion will cushion all heel shocks and remove the danger of the formation of corns on this part of the hoof, and the central pneumatic portion will conform to the irregularities of the adjacent portion of the roadway and give a firm grip against either forward or rearward or lateral slipping. All danger of lodgment of gravel or foreign matter against the sole of the hoof will be removed, and this part of the hoof will be constantly ventilated and practically out of contact with any substance, while the bearing-strip between the shoe and the hoof will both protect the latter from shocks from the shoe, and save it from direct contact with the shoe.

It will be seen that my invention provides an improved hoof-pad which can be variously and advantageously availed of, and it will be understood that the invention is not limited to the particular details of construction, arrangement, or combination of features set forth as embodying its preferred form, since it can be employed in whole or in part, according to such constructions, arrangements, or combinations of features as circumstances or the judgment of those skilled in the art may dictate, without departing from the spirit of the invention.

What I claim is—

1. In hoof-pads, the combination with a bearing-strip for receiving the sole of the hoof, of a hollow central portion for covering the sole of the foot inwardly of such bearing-strip, and a reinforce on said bearing-strip extending around said hollow portion and having an open center.

2. In hoof-pads, a body for covering the sole of a hoof having a bearing-strip for contacting with the edges of the sole, a cavity under the center of the sole, and a leather reinforce on said bearing-strip extending around said cavity and having an open center.

3. In hoof-pads, a body for covering the sole of a hoof having a bearing-strip for con-

tacting with the edges of the sole, a downwardly-projecting hollow center forming an air-chamber for protruding within and below the tread of a horseshoe, a heel-cushion crossing its rear, above the lower face of said protruding portion, and a frog-socket in said heel-cushion.

4. In hoof-pads, a body having an outer portion for contacting with the edges of the sole of a hoof, having a cavity surrounded by such portion, said cavity having a wall for extending below the shoe, an air-inlet leading to such cavity, and an automatic valve controlling flow through said inlet whereby in use said wall acts as a pump for forcing air through said valve.

5. In hoof-pads, a flexible body adapted to be fastened to the sole of a hoof, and having a pneumatic chamber open at its upper side beneath the hoof, and a ring-like leather attacher connected to and covering the outer edge of said body, and having an aperture opposite and of approximately the full area of said chamber whereby the air-chamber is in direct communication with the face of the hoof.

6. In hoof-pads, a body for contacting with the sole of a hoof, having an elastic downwardly-bulging portion beneath the center of the hoof, and a confined air-chamber open at top under the hoof and within such portion, and a ring-like leather attacher connected to and covering the outer edge of said body, and having an aperture opposite and of approximately the full area of said chamber whereby the hoof itself constitutes the sole top wall of said chamber.

7. In hoof-pads, a body adapted to be attached to the sole of a hoof, having an elastic downwardly-bulging portion beneath the center of the hoof, and a stiffener carried by said body and surrounding said bulging portion for resisting lateral distortion of the hoof.

8. In hoof-pads, a body having a thin bearing portion for attachment between the sole of a hoof and a horseshoe, a heel-cushion at rear of such portion, a hollow downward centrally-projecting portion having an unobstructed opening at top and surrounded by said bearing portion and said cushion, and having inner and outer longitudinal ribs and grooves for projecting through the center of the shoe, and a ring-like fibrous member attached to said body along its bearing portion and having a central opening opposite and of approximately the same size as its hollow central portion.

9. In hoof-pads, a body having a bearing portion for passing between the sole of a hoof and the top bearing of a horseshoe, a heel-cushion at rear of said portion, a convexo-concave central wall for projecting downwardly through the center of such shoe, and a transverse rib *r* crossing said wall.

10. The improved hoof-pad, having the bearing *f* for contacting with the outer edges of

the sole of a hoof, the heel-cushion C at rear
of such portion, the central cavity E and walls,
the central elastic protuberance D in its bot-
tom face, the frog-socket J crossing said heel-
5 cushion, and the stiffener I embedded within
said body.

In witness whereof I have hereunto signed

my name in the presence of two subscribing
witnesses.

WILLIAM J. KENT.

Witnesses:

GEORGE H. FRASER,
RENÉ BRUINE.