A description of a new horse shoe which expands to the foot : invented by Bracy Clark

A

DESCRIPTION

OF

A NEW HORSE SHOE

WHICH EXPANDS TO THE FOOT.

INVENTED BY

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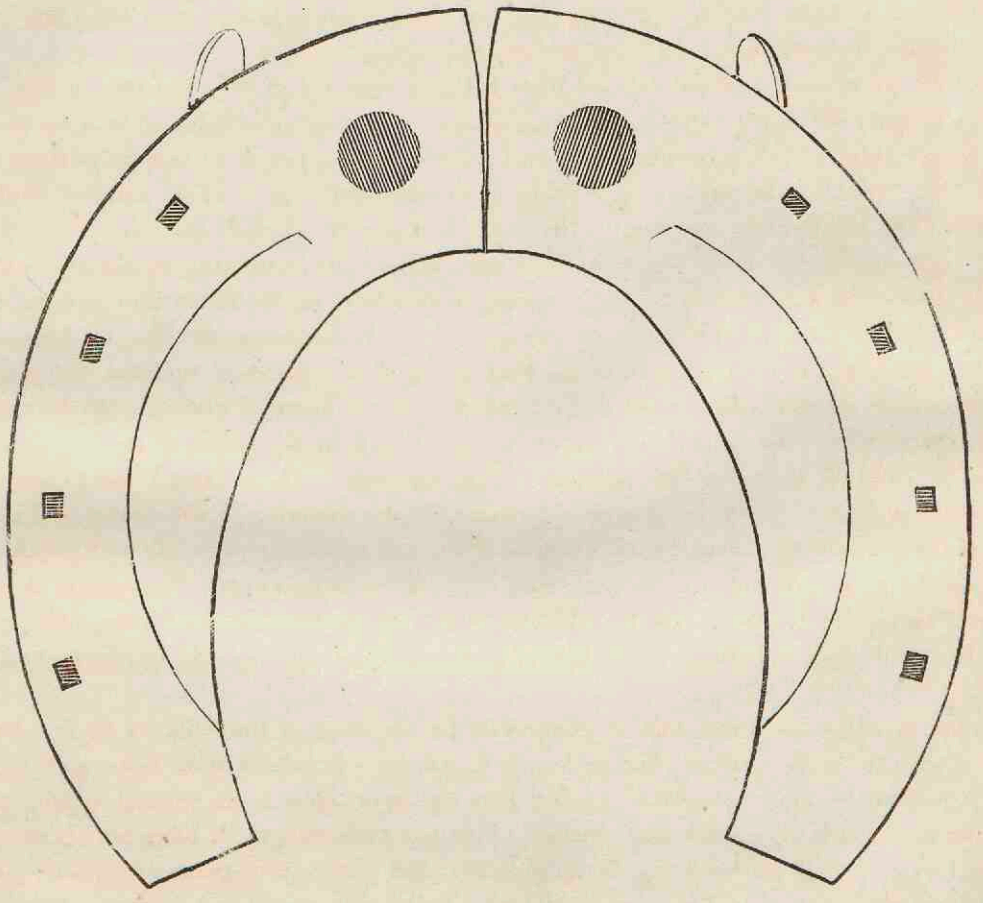
Pl. II.

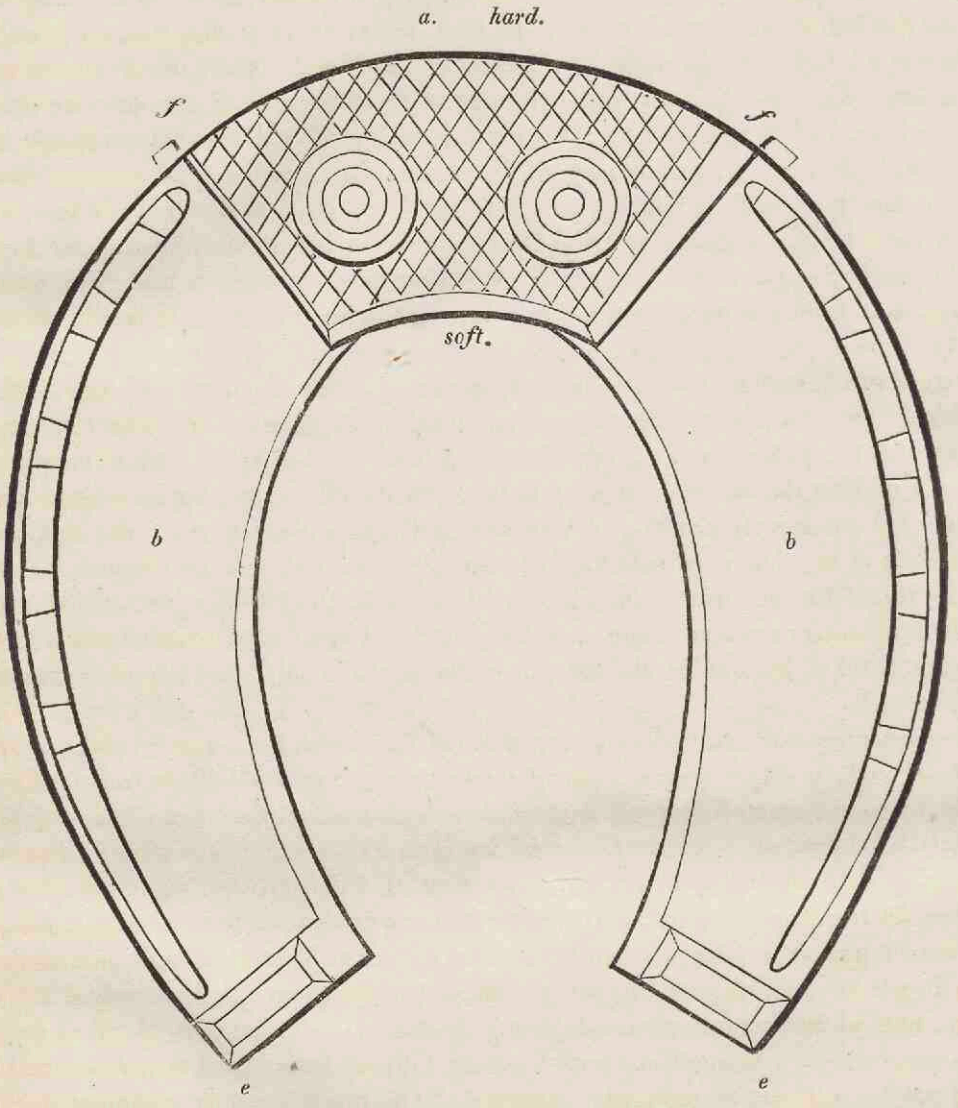
THE EXPANSION SHOE.

a. *a.*



Upper Side.

PLATE III. Fig. I.



The same Shoe much improved, from three months' actual practice with it :—a, the Steel Toe-piece thinned backwards; b, b, the Quarter Pieces, deeply fullered; e, e, the Extremities or Heels, slightly turned up. The Nail Holes also finished with a Pritchel, having a Shoulder gaged to the Head and Shank of the Nail. f, f, the two clips which render a nail less sufficient towards the heels.

ON THE EXPANSION SHOE.

HAVING published some time ago a Treatise on the Foot of the Horse, and demonstrably proved that the unnatural tenderness of the feet, especially of the fore feet, arose from the common shoe embracing the foot too rigidly, and did not admit the play and elastic expansion which is natural to it, and for which an obvious provision is made in the structure of the foot, and which expansion under pressure is necessary to be exerted to preserve it in a sound and healthy state and in good order for use; so after a laborious, painful and expensive conflict with the difficulties of the case during fifteen or more nearly twenty years, it is with a feeling of great joy and satisfaction that I lay before the public this discovery of a shoe which I trust will be found an efficient remedy for this great evil, and I hope be attended with considerable public benefit, and also a grateful offering to humanity by its diminishing the intolerable sufferings of these abused animals, and extending also their valuable services to a much later period of life.

I may here observe, that the alteration of the figure of the foot and its dimensions, on receiving the weight or exertions of the animal, is a property common to all quadrupeds, and most highly necessary and useful for obvious reasons; to break all jar and concussion to the body on the foot meeting the ground, and to save the foot from the destruction which an unyielding point would have occasioned; yet has this property not been attended to, but has been strangely overlooked, and his foot treated more as a senseless block of wood than as a living elastic organ most beautifully constructed to receive without solid resistance the impression of his weight, and assist his advances after yielding by a return to its first state.

This change of figure in the foot we may observe is brought about or effected differently in different animals, and affords matter of very curious speculation; but suffice it to say, that in the horse's foot, to which I confine myself, it is provided for and accomplished by means of the circle of the hoof being broken, with its ends inflected towards the centre of the foot, and the vacuity thus formed being filled in with an elastic soft yielding frog, which then becomes very much a passive organ to the operations of the wall of the hoof. The sole also being arched, flattens and extends itself, under the impression of the weight.*

In the human foot this change of figure, on receiving the weight of the body or its exertions, is produced by the hollow arch of the sole becoming flattened and depressed, which extending it, the upper leathers of the shoe being thin, readily yield and afford the necessary relief.

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* Any one disposed to consider these provisions in the foot more particularly, may consult my Treatise on the Foot, with numerous plates of new objects, price £1. 11*s.* 6*d.*; or a curious pasteboard model of the foot, exhibiting its properties, contained in a neat box, lock and key, and description, &c. price 12*s.*

Having briefly premised these circumstances, I proceed to describe the *New Shoe*, which fully obviates these inconveniences and restraints which are attended with such deplorable effects from their unremitted application in the common shoe.

I have taken out no patent for this invention, though by my friends strongly pressed to do so, and have been offered sums of money for it, that if it is good the public and the horses may have the full benefit of it, for it would have been an ungrateful feeling to have seen any poor crippled horse miserably going along, and to have it stated that the expences of a patent invention precluded the remedy.

To give a name to this shoe and to avoid any circumlocution in speaking of it, I have termed it THE STEEL TABLET SHOE, or STEEL TABLET EXPANDING SHOE, from the plate of steel which occupies its front parts, and forms so essential a character of it.

This shoe consists of three pieces—see Plate I. Fig. I. viz. one of steel and two of iron, which meet nearly upon the upper surface of the steel piece, and are strongly fastened to it by two stout rivets, deeply received into a counter sink, and which impart a power of motion to these lateral pieces. The width of the steel piece or tablet is so considerable as to afford ample room for the rivets and their heads, and protection to the joint, and nearly occupies the whole line of wear, which is principally outside the toe, as any one may perceive by examining an old worn out shoe, and this steel tablet being hardened to the spring temper from its thickness and extent, confers upon it a durability unknown to any former shoe, and vastly surpassing the shoe in common use.

The two lateral pieces which may be seen—Plate 2. Fig. I. *a. a.* fastened upon the steel plate by a single rivet each, permit both to move and extend in a lateral direction whenever the hoof pressed upon by the weight of the animal is disposed to dilate, and by the spring of the hoof it returns again to its original state, on the remission of the pressure. These lateral pieces are deeply stamped out in front to form a recess or lodgement for the reception of the tablet, and the two halves of the shoe though near, do not touch in front, but a free space is allowed admitting of motion on the rivet, and one or both pieces may be made to move as may be thought desirable: if one only moves, we believe it will be sufficient to prevent the mischievous effects of the contraction of the hoof; but if both move the liberty is more perfect, and such is we apprehend more desirable.

This shoe is perforated at the sides or quarters for the insertion of the nails as in the common shoe, and with the same number, that in respect to fixedness it is held on as firm as they can be.

The new shoe is made somewhat stouter than the horse shoe is in general made, from a conviction after much experience and practice, of its many advantages; a more lasting service is performed by it, (which however may be an objection and matter of jealousy with some, whose views are chiefly led to considerations of interest:) its greater width and covering protects the weaker and more sensitive parts of the foot, as the sole and frog; but a greater advantage perhaps than either of these is the extensive bearing it takes upon the ground, which contributes much to the ease of the animal; and practice also confirms it, that it makes him go more agreeably, firmly, and safely, and with less fatigue, a circumstance hitherto not much noticed or understood n the practice of this art, though it must be obvious on reflection to most, that the more points of bearing or division there is of the weight, the more easily will it be borne, and the less severe the pressure on any one point, and hence also is derived in a great measure the advantages and ease of a bar shoe, which often surprizes people unused to it.

A thin light shoe is also apt, with horses of any weight, to bend and lap the edges of the sole, especially after the roads have a little reduced its substance, guarding however against excess on either hand is necessary.

Though there is nothing difficult in the making of this shoe but what a common mechanic can perform, and they have been often well made by those who had never seen them before, yet it will perhaps be found that to make them in the greatest possible perfection, and in great numbers, that they should be the subject of a manufactory expressly, which may hereafter profitably engage some of our towns celebrated for iron work, and very usefully in these times of scarcity of employ, and in this way there is no doubt they would come cheaper to the public.

Whim and caprice have hitherto been too much the guide of the common smith in the form of his shoe, some thinking one form best, some another. In the present system I have endeavoured to reduce it to a rule, and have taken the circle for a general basis or outline of my shoe, which though it is not the figure of all is by far of the greater number of feet, especially in the natural state, and before they have been injured by shoeing. I have also endeavoured for the first time, to bring the other parts of the shoe into certain determinate parts of the circle,—see the diagram for working by, Plate I. Fig. I.

This mode of proceeding will be attended with manifold advantages, as any deviation, whether improvement or otherwise, from the general law laid down which future reasoning or practice may lead into, can be clearly stated and expressed, which, in a shoe made at random, could never be the case; thereby opening a plain road to improvement, which an empirical practice could not give. If however the circle is departed from, it should always be to a shoe somewhat straighter on the sides or quarters, and such shoes should be ever kept in readiness in the magazine of the forge, for it is obviously easier to bend a shoe that is straight over the bick of the anvil, than to straighten one that is already bent; still the circle in the greater number should be adhered to as suiting a very large proportion of feet.*

In order to give more of scientific precision to this art of shoeing horses, I shall next describe the rules by which this shoe, which is allowed even by the smiths themselves to be truly beautiful, may be formed, and although numbers or figures must be used to express these divisions, I have endeavoured to avoid as much as possible fractional parts, though sometimes necessary, and have chosen such as are of easy recollection; but let it not be imagined every time a shoe is made, that the workman is compelled to have recourse to these numbers, that is not necessary, he is only to lay them down to form his first pattern or model from.

The steel piece is made in front to occupy a fifth part of the entire circle; and its width is also a fourth part or quarter of the diameter of the same circle; which is sufficient to afford ample protection to the joint, an extensive bearing on the ground, and good room for the rivets and wear. The thickness of this steel plate is two-thirds that of the iron of the shoe, and is made to project a very little below its inferior surface—see Plate I. Fig. 2. Again, the two extremities or sides of the steel plate have their angle or obliquity determined by a ready law, namely, by simply

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* I may here remark, however, that in scrupulous exactness of description this lower opening of the hoof ought to be of the nature of an ellipse, and for this reason, that a cylinder obliquely cut or truncated must ever present this figure, the length of the ellipse increasing with the increased obliquity of the angle of truncation or slope of the hoof; but, in reality, in the natural good foot this figure is destroyed by the enlargement or bulge of the outside quarter which brings it again more nearly to the circle—see Treatise on the Foot, page 18.

drawing a line to the centre of the circle—see Plate I. *b. b.* By conforming to these rules the fitting of all parts of the shoe is rendered easy, even though the workmen be at a distance from each other, or in different countries; and the diameter of any foot being given, the relative proportions of all the parts of the shoe are immediately known, and for illustration I have taken as the most useful, a foot of exactly five inches diameter, being a very common size. The outside rim or circumference of the shoe being a circle, the figure of the inside also is not left to chance or accident, but is a certain portion of one likewise; for the present however we defer giving this rule, as the heels of the shoe must first be determined which regulate it.

To determine the place of the heel and the angle of its truncation, we divide the diameter of the circle transversely into four equal parts or spaces, *c, d, e, f,* and intersect them by a perpendicular line, *g,* through the centre; if from the last of these tranverse lines where it meets the edge of the circle at *h,* we measure one-third of the space between it and the vertical line, *g,* we get the place of the point of the heel, *i,* and the degree of obliquity of the truncation is determined by a line carried to the concurrence of the longitudinal line at *k;* and for the internal point of the heel, divide the last oblique line into four equal parts, and one of these gives the point, *l,* for the inside angle of the heel. By such rules a beautiful shoe is formed; but ugly as Chaos will be that which is formed without order or method. I find by practice that the shoe must often be made longer than this, in order to take a decided bearing on the strong point or column of the inflexion or duplication of the heels of the hoof, otherwise it may, after it has been on some time, sink in too much, and press upon the intertortional point of the sole or corn place: there is also another reason for its being longer, which is to allow of the shoe being bent or turned down with calkins at the heel, which appears to give evident advantages in his going, and as I apprehend, from its determining the weight towards the front and strongest parts of the hoof; a half therefore of this division, for feet that have been long shod with common shoes, will not be at all too much.

Next, we may observe, that it is a practice universally followed, and not without utility, of making the shoe posteriorly wider than the hoof itself, in order to allow of a small degree of motion of the heels, and to increase the width of its bearing surface. In this shoe this *augmentation* is ascertained by a certain law, for this purpose we measure the fourth part of a quarter of one of these horizontal spaces, and by fixing one limb of the compasses as much below the original centre at *t,* and having the same radius as the original circle, describe an arc till it meets the former circle on each side, which gives the due increment of the shoe; and we then extend the place of the outer heel to the line, at *m.* Being now prepared for forming the *internal rim or margin* of the shoe, we place the compasses first at the point of the inner heel, and continuing the same radius, describe a short segment of a circle at *n;* and next placing the compasses at the inner angle of the steel plate intersect it by another portion of a circle at *o;* and the compasses placed at the point of intersection of these two lines will describe the inner margin or edge of the shoe at *p.*

No determinate figure could be well laid down for a contracted foot, but a parabola straitish on the sides and left long enough, would I found, if slightly altered according to circumstances best accommodate these feet.

On the nail holes.—The first nail hole is brought as near to the steel plate as it conveniently can without disturbing the rebat, and is directed very obliquely inwards or towards the centre of the circle, the others, observing a measured distance of about seven-tenths of an inch from each other, in middle sized shoes, as those of five inches diameter, which space between is sufficient

to prevent the liability of breaking up the horn from one nail to another: the last nail hole is generally smaller than the others, on account of its being inserted in rather thinner horn, and is made straight through the shoe, the quarter or side of the hoof, being nearly perpendicularly placed over it: but for this, and other particulars for the general practice of shoeing, *see the Stereoplea*, where these circumstances are treated more in detail.

This shoe when large will bear five nails on a side, and which will be the more necessary, if no clips are used; as this however extends the nails backwards towards the heels, where there is more danger in their application, I have resorted, to save the use of these as much as may be, to *two clips* in front, which restraining the foot from being forced over the front of the shoe, the way it usually becomes loose, saves nails with great advantage—see Plate 2.

In our early practice with this shoe, we rounded the ends in front to afford more extensive motion, but we soon experienced that they received on being cut in two, nearly enough liberty without this precaution; indeed, in our first essays we made the two halves separately, and afterwards put them together, but found the shoe made entire, and cut afterwards, a much more summary way of proceeding. The shoe formerly had motion both ways, that is inwards as well as outwards; we have latterly fitted the shoe to the foot, before we divided it, and then let it if possible have only one motion, that is outwards, this prevented its closing, as it naturally had a tendency to do in nailing on; if however it was found after division to dispose inwards, we hammered the lower part of the notch together, so as to prevent it, or employed *a Distender*, an instrument we shall hereafter describe, to fix it exactly to the point we wished, whilst it was being put on, removing it afterwards.

I like a shoe that is rather coarsely holed, that is at some distance from the rim, but if such a shoe was put into the hands of a common smith, he would ten to one lame the horse with it, by fixing it on exactly even to the rim of the hoof; whereas my intention is, that it should project beyond it in a reasonable degree, affording ease and bearing surface to the animal; the apprehensions of cutting, so formidable in common shoes, need hardly be regarded in these expansion shoes.

The *notch* or front extremities of the two side pieces,—Plate 2, Fig. I. where they meet over the steel tablet, are bevelled outwards, to prevent dirt lodging in it and choaking the motion; this we did by the file in the early fabrication of the shoe; but of late have been satisfied with the simple impression of the chisel in cutting them, for giving this oblique direction, taking care to cut them always on the upper side, and to make the shoe open outwardly more freely, we make the division wider towards the front or toe with the chisel, which with distending the heels over the anvil bick, by a few blows of the hammer will give them motion enough, as from a quarter to three-eighths of an inch.

The whole *upper surface* of this shoe is a little bevelling or slopeing inwards, which holds and retains the foot better than a mere flat surface would do, and assists the nails, as does also a little beating up of its exterior edge, after the French manner; more internally it is deeply concaved or hollowed out, and made much thinner, beginning at the line *n*, in order to clear the sole well, which is more required in these shoes, and admit of its flattening and depression, and to lighten the shoe, and also extend its bearing surface on the ground, and give the foot more cover, without at all adding to its weight. The common smiths cripple many horses, from not giving the sole room enough, believing if the shoe does not touch it, it is safe, and do not understand the descent of this part, on receiving pressure.

The upper surface of the heels are also bevelling inwards, to prevent any collision with the

bar, or intertortional point of the sole or corn place, as it is called; though I am led to suspect it would be a wholesome practice to bend down the inner heel a little out of the general plane of the shoe, to prevent these frequent bruises of this tender part.

The *Tablet* should not exactly fit its recess, as that would lock the shoe, but be rather smaller; the side edges being bevelled strongly, removes this difficulty in some degree, by giving way.

We learnt also from practical experience that the Tablets in the large shoes should not occupy so much as the fifth of the circle that is in those shoes that were beyond five inches diameter, to which we apply the same toe-pieces. But in the small shoes the tablets could be made more than a fifth without extending them too wide.

The Rivets should be strong, and exactly made, with deep countersink heads, passing nearly through the *Tablet*, and be placed a very little behind the middle of the tablet, that they might be more out of the reach of wear, and endure longer; on their correctness in fitting the countersinks, their proper length and good ordering, success will very much depend. These important parts will be enlarged upon hereafter, this being only intended as a cursory view of the new shoe; and though eminently successful, instead of expressions of triumph after this arduous toil, I am induced to do what appears more to be my duty, that is, to present the reader with a humiliating catalogue of errors and difficulties which attended the first three months public use of this shoe, as the most instructive addition I can possibly make to this part of my labours, and to show how those difficulties were overcome in part or wholly, that others may avoid them in their first trials, and by stepping upon the ladder which I have raised, carry to still higher perfection this rising art.

The first difficulty that occurred in bringing them into use, was their coming off at times, especially the larger and weightier shoes, and this happened one week to such an extent, that I thought I must have declined prosecuting my plan entirely. A chief cause of this error was their being allowed a great deal too much motion, by which the two halves did not afford one another the requisite support, and these shoes were unnecessarily large and clumsy, being made after wooden models, especially at the heels, and were kept on by four nails of a side only; another cause was their being made plain and stamped in the French way without fullering: also, some horses were brought me with thin brittle hoofs, rendered still more so by unnecessary rasping and split by the nails of previous shoeings, so that they broke through by the least expansion of the shoe; the duration of the shoe also induced persons in order to save a trifling expense to use them longer without being fresh nailed or renewed than was proper, and some of them also broke at the shoulders.

To obviate these difficulties I ordered all the larger shoes to be made lighter, especially at the heels, but still a stout spreading strong shoe. To prevent too much motion of the shoe, I gave only a very limited degree of it, as the quarter of an inch or even less, for not expecting such a result I had before given them unlimited motion, for a very small degree of motion gives sensible relief, and serves to remove that solid, dead resistance, of the common shoe. To fix the shoes more firmly, I placed five, instead of four, nails on each side,* and in order to give the nails a better hold, I fullered the shoe deeply, which appeared to have this advantage, that it brought the heads of the nails into a closer approach to the hoof, and, the head of the nail was not so liable to be entangled in the stamp hole, as it would be liable to, if not exactly of the same figure,

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* I have however since, found two clips or stays, one on each side the toe, the best means of obviating the necessity of many nails—see Plate 2. Fig. I.

by altering its direction, the one being generally made square and the other oblong. It now occurred to me that several advantages belonged to our old English custom of fullering, which I had not before comprehended or understood; one was, that the nails ranged more in a line, and the holes could be stamped finer or nearer to the exterior of the shoe without being so liable to burst it out, which in very fine feet would be an advantage, and a greater liberty was also given in pitching and driving the nail, without disturbing its final direction; it also usefully spreads the shoe, and gives it a lighter appearance. The pritchel bumps on the outside of the shoe were also not near so large when the shoe was fullered, nor was there so much trouble in reducing them, which we performed often and we thought advantageously with the pritchel remaining in the hole to prevent it closing. And those horses which were brought to the forge with their hoofs in bad condition and much broken, were rejected entirely, or were laid by till by two or three proper shoeings, without being rasped and shorn of their exterior rind, and with proper nails, they had acquired due solidity and strength:—then the expansion shoe was applied, and with but little motion given to it, for it can be furnished in any degree we wish. The shoe so improved, is seen Pl. 3, fig. 1.

The struggle was long and hard with the shoes breaking at the shoulder, and this knot was considered by the workmen quite an insurmountable one,—a slight crack or fissure close in with the shoulder, was the indication of the mischief: a flat set was used by us, such as is usual with the smiths, for making the *rabat** or recess in the shoe for the tablet, and this occasioned the flaw in a way that did not then appear easy to be understood, but which showed that shoulders so made, especially of any depth, were liable to be defective and unsound on all other occasions, which the workmen till then were in no way apprehensive of, and we may hereafter take an opportunity of explaining this circumstance more fully, and its cause. The invention of the *Crimper Tool*, (see plate 3, fig 2,) by drawing the iron out in one direction only, most happily removed this perplexing obstacle.

Another considerable difficulty also presented itself, and which for a time it did not appear very easy to overcome, which was in making these shoes to suit low and flat feet, for the shoe could not be made hollow enough in the front parts to have a sufficient distance from the sole in feet of this construction, on account of the steel piece, and as also that the sole in these would have more play than in the more upright. To meet this difficulty, I suggested after some consideration, the thinning of the steel piece backwards, or posteriorly, which would not materially injure its wearing properties, and we then found it on trial to yield room enough, and adopted it afterwards in all feet: for the tablets, in the first shoes made, were nearly of equal thickness throughout; nor did this improvement, which now appears so easy and natural, occur for some time. And some who may themselves have been a little dipped in practical mechanics, will have understood but too well the extraordinary inaptitude of common workmen employed upon any new subject, even of what would appear of a truly simple nature, and which distresses and embarrasses not a little the progress of improvement.

The tablets also, from their very irregular figure, caused us a great number of attempts before any thing like facility in making them was obtained. The tools indicated in plate 1, fig. 9, 10—13, were used for a considerable time, but were finally abandoned, for the most satisfactory con-

* From *rabattre*, French, not from *rhabot*, as some have imagined. The carpenters have corrupted this word into Rabbit.

trivance of the Tableteer, hereafter described; which not only makes these, but would form almost any other figure in steel equally easy, at least by the same principle.

Finding the expences enormous of employing master workmen to make these improvements for me, and the delays and mistakes most revolting, I resolved to erect a building on purpose to prosecute my measures; and at a heavy expense for my small means, erected one first in Clay Street, Gloucester Place; and being obliged by the covenants of the lease to pull it down again, from the ill-nature of a neighbour, I erected a second in the Edgware Road, not far from the turnpike and the Yorkshire Stingo; this I continued for about five years, at a considerable expense also, and without it had certainly never accomplished my object.

When the elastic properties of the horse's foot were first perceived and understood upon principle, it became a problem of some difficulty to adapt a shoe to it that should possess such properties, and the apparent necessity of employing some elastic and soft material, seemed to increase the difficulty; it is, however, only a lateral extension that is really wanted, and this the present shoe affords. If any suppose that the lap joint shoe to be seen in Blundville, and other books, which was used as a substitute or temporary resource for a common shoe, on any sudden emergency or loss of a shoe, and to be removed again as they direct, on getting to a smith's forge; if they apprehended this was the prototype or suggester of my shoe, they would be greatly mistaken; for it was the discovery of the elastic principle in the foot, that led to the search for a shoe; and shoes of easy removal, and without nails, were the first I used: these led to the Paratrite, those to the lap jointed shoe, which led to the *Tablet shoe*. Blundville's shoe never, in the two centuries that it lay before the public, did suggest, I apprehend, any such principle; nor could it ever lead to the invention, which must come through quite another course. The feeling of necessity, or of want, must ever precede the search for the thing to relieve it.

The very first shoe of the Tablet kind that ever was used, was put on at Henley-on-Thames, at my brother-in-law Joseph May's, upon a fine blood mare of my own; her action was so improved, that I should hardly have known her to be the same; her step became particularly extensive and free, and with no tripping, which had been her fault; the success of it for several days gave me an indescribable joy and delight, as it appeared to me certain that a new era would soon arrive upon the horse world; and that a very large share of their cruel wrongs and abuses would be done away. This mare travelled with me near fifty miles a day for two days, nor were her feet in the least heated by it, or feverish as in common shoes. Afterwards, in the course of my experiments with her, she was shod in common shoes again, and she fell twice with me in coming out of Essex, and hurt herself very much.

And it was necessary also, in respect to the new shoe, that it should not be very expensive, as the public had been long used to cheap shoes, and however necessary others might be, would not bear it; but fortunately we have brought it to that facility of manufacture, that its expence does not much exceed the common shoe; and if some measures we are taking to procure them of *cast metal* should succeed, (the reader will be startled at the proposition, but it is nevertheless a well considered truth) they will not at all exceed in price the common shoes; though one would suppose the reasonable man, where his neck and a valuable horse's knees are in danger, would not too nicely consider a trifling additional expence; for certainly a more complicated object requires more workmanship, and of course, more price.

Some have objected to the shoe, and nothing is much easier than to raise objections; they stated that it did not open exactly in the middle of the shoe, where the centre of motion ought to be; this is certainly true, but it is of no real consequence, since a little liberty to the quarters of the foot is all that is wanted; and whether obtained by a motion in the centre, or near it, is of no real moment, so it is obtained, which the use of the shoe fully proves; great advantages attend the removal of it from this centre point, which are more than a counterpoise to a small irregularity of this description The lap joint answers the same purpose, but is soon worn out, and if the joint be defended by a thick nob, it is unsightly, and liable to cause tripping. It should be recollected, that this shoe only moves in concert with the foot, when that, from pressure, is disposed to extend, that there is no spring in it, as some have apprehended, but is quite passive. If any should prefer to use the lap joint shoe, and do not care so much about duration, a flattened globe is the best figure I have yet found for the rivet head, of steel, and hardened. The principle and intention is the same in both.

As many may be anxious to know if they can be resorted to for horses that have been long shod, I may state here that I find, from more extensive experience, that my first apprehensions in this respect were groundless, as many very old horses have been lately shod with them, with the most beneficial effects: if too much relaxation is feared, it is only to limit the motion, which can be given to any degree. Even in foundered feet, where the coffin bone had sunk, they have been benefited, most unexpectedly to me, by the application of this shoe, perhaps from the freedom and ease they derive from it; whereas the common shoe, from its constraining, contracting effects, is tending to force down the conical coffin bone more strongly upon the sole.

In cases of *Ring bone* also, it might be naturally expected to be of great relief, and especially in preventing their formation, and cases in proof of this will be given among the testimonies.

For *the Frush* also it is found to be a sovereign remedy, almost without the aid of medicine, imparting to the frog that liberty and freedom from constraint which takes away its fretted, feverish state, and which the compression of the common shoe always induces, more or less.

Practice with it has however taught us, that it is necessary not to depend wholly on the shoe, in very weak, contracted feet, for the expansion; but to use a bar, or stretcher, put between the heels, or quarters of the shoe, to keep them distended, especially whilst resting in the stable; for such feet will draw the shoe in after them, and then there is little benefit from them. The gentle separation of these compressing parts from the sides of the frog, soon gives it a healthy tone, and disposes the horn to grow upon it in a remarkable manner. Sometimes, and especially where the hoof was long and weak at the heels, the compression of the frog would return in spite of the stretcher, from the last nail against which the force of distension was chiefly exerted, becoming imbedded in the horn, permitting the collapse; in this case, the horse would go lame and tender. To overcome this, we added two clips to the extremities or heels of the shoe, to press, not against the bar, but against the solid inflexural column at the end of it,—and these keeping the heels asunder, and away from the frog, made the healing to be very rapid.

It promises the extinction of that dreadful disease, the contracted hoof,—and one most beautiful effect of this shoe is, that in a few weeks after its application, if the old shoe had been previously much used, you see the bars recede from the sides of the frog, leaving it at its natural liberty, without any cutting,—and the freedom that attends this, is delightfully felt in the going of the horse. And in enumerating the advantages of these shoes, not only is the frog set at liberty and preserved fresh and cool, but the sole is at liberty also; and having elastic motion, throws off its flakes of superfluous growth, in due time, and disencumbers itself more readily, instead of their

remaining adhering to the part, and thickening upon the sole, as in the common shoe, which without doubt, must be a great relief to the foot.

The saving to the public by such a shoe will be great and almost incalculable for horses in the army more especially, which no sooner become tender from the compression and contraction of the feet, than they are rejected, or cast, and fresh ones bought in, at expence enough. When the feet also are entirely free from pain, the horse makes more use of them, if I may be allowed the expression, and then the legs and joints suffer less, for they, in saving their feet, are using more muscular force in the way of restraint upon the legs and joints, and hence these parts become weak and fail early. Also several affections and injuries of the foot, and of the attaching apparatus of the hoof to the bone, creating diseases which have never received any proper name are removed by it.

And *canker* also soon gets well by keeping the bars away from the frog by using the shoe with a stretcher in it as will be hereafter described. That ill-temper and vice are many times generated in the horse by his sufferings in these respects it is perfectly natural to believe; I have had proof of it in my own experience, and some of my testimonies will show it has not escaped others.

It is observed by the smiths that the heels grow faster with the expansion shoes, and require the knife more in paring down; that it is so, I do not speak from my own particular observation, but individuals unconnected with each other have often made the same remark, it is probable the whole hoof grows faster and becomes more succulent, by the circulation in it being less embarrassed, and all remark how pleasantly the nails drive through hoofs that have been some time shod with the expansion shoes.

That this valuable new art, from which I am daily experiencing the most delightful results, may not be in danger by perverseness, neglect, or ignorance, to be again lost, having brought these shoes to great perfection and facility of making, I shall give the detail of their manufactory in the best way I am at present able, at the conclusion of this work,—warning the public however against the easy and too often fatal delusion of pretended improvements, which may instead of improvements, be only schemes long since rejected among the past experiments of the inventor; not that I would wish to have it understood to imply that no improvement can ever be made, far from such an idea, but that too easy credulity in this respect should not be entertained.

The beauty of making these shoes, is not to touch them hardly with the file, but to let the hammer, the chissel, and the punch, execute the whole.

I have now used this shoe, at various times, for more than nine years, the recommended period of probation, "*nonum prematur in annum*," and I may say where they have been duly and properly applied, they have been attended with universally a more extensive action of the horse, with greater ease and security from falling,—and some proud feet we can now show that have been preserved in their natural form by the use of it, and frogs also truly beautiful from this mode of shoeing, and from the omission of the scalping knife, by the rules laid down.

Some gentlemen also who are fond of horses, and of cultivating a more refined acquaintance and knowledge of them, have permitted me to add their testimonies to the same effect.