

### Harvester Cutter.

Patented June 21, 1859.



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## IMPROVEMENT IN GUARD-FINGERS FOR HARVESTERS.

Specification forming part of Letters Patent No. 24,461, dated June 21, 1859.

*To all whom it may concern:*

Be it known that we, A. A. HOTCHKISS, of Sharon, in the county of Litchfield and State of Connecticut, and JOHN P. ADRIANCE, of the city, county, and State of New York, have invented certain new and useful Improvements in Guard-Fingers for Harvesters; and we do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the accompanying drawings, forming a portion of this specification, and to the letters of reference denoted thereon, in which—

Figure 1 is a side elevation of our improved guard-finger and a section of the cutter-bar and cutter. Fig. 2 is a plan view of the guard-finger alone. Fig. 3 is a transverse section of the latter on the line S S, Fig. 1. Fig. 4 is a transverse section on the line T T, same figure. Fig. 5 is a plan view of the steel face detached. Fig. 6 is an illustration of the varied forms in which one extremity of the steel face may be constructed; and Fig. 7 is a view of the peculiar jaw or fissure in which the front end of the steel face is held, represented as magnified.

Similar letters of reference indicate like parts in all the drawings.

This invention relates to that style of guard-finger in which the main body and the top guard are cast in one piece.

Our invention consists in making at the inner angle of the main body and top guard an inclined cavity or inclined cavities a little thicker than a steel face-plate which is to be inserted and secured therein, the outline of the steel face-plate and the form of the front of the cavity or cavities being made to correspond each with the other, as will be further explained below, and securing the forward extremity of the steel face in this cavity or these cavities by inserting it in an inclined position and afterward pressing down and securing the rearmost extremity, whereby the forward extremity is caused to press with force against the upper and lower sides of the cavity or cavities and be held very firmly, this angular cavity being necessary to permit the face-plate to be inserted and secured at its rear end in the manner hereinafter stated.

It also consists in securing the other or rear extremity of the steel face at its edges by hammering or otherwise bending the metal of the casting, so as to cause them to overlap

upon the beveled edges of the steel face, and so adapting the form of the casting to a shoulder formed on each side of the steel face that the steel is, without welding, confined very rigidly, and is guarded by the casting against a lateral motion in any direction.

To enable others skilled in the art to make and use our invention, we will proceed to describe its construction and operation.

A is the body, and B is the top guard. These parts are cast in one, as represented. We construct or fabricate our steel faces C in the form represented by Fig. 5. In the throat or inner angle of the casting, at the point where A joins B, is a cavity or fissure, D, of a thickness a very little greater than that of the steel face C, and of a form corresponding to that of the front end thereof. This fissure D stands inclined, the forward end of the fissure being lower than the hinder end, as represented. This important feature of our invention is represented on a larger scale in Fig. 7. The steel face C is flat or plain throughout, and is caused to be held very firmly in D, in the manner explained below.

We cast the body A with two projections on its upper face, as represented by *a a*. The upper surface of A, between these projections *a a*, and also that of all that portion which is to receive the steel facing C, is sunk below the plane of the cutters to an extent equal exactly to the thickness of C, so that when C is properly fixed in its place its upper surface forms a bearing for the cutters. The cutter-bar and a portion of a cutter are shown in section by the darkly-shaded F in Fig. 1. The cutting-edges of C are beveled, as represented in Fig. 4; but we make that portion which fits between the projections *a a* with a shoulder, *c*, on each side, as represented in Figs. 2 and 5, and bevel these shoulders and the edges *c' c'* of the narrower part C'' in the opposite direction. The bevel of *c' c'* is distinctly shown in Fig. 3. The bevel of the shoulders *c c* should be similar thereto.

We propose to produce a conical hole in the steel facing C at the point indicated by E, and in line therewith produce a hole through A, making it conical or countersunk at its lower end, as shown by dotted lines E E' in Figs. 1 and 3; but this is no part of our invention.

The guard-finger A B should be made of annealed cast-iron, commonly known as "malleable iron." In order both to diminish the



weight and increase the strength thereof, we so core it that the portion A is a shell only about one-fourth inch in thickness throughout, the point where the core is supported being the center of the surface to which the facing C is applied. We find that the centers of all guard-fingers heretofore made of malleable iron are hard and brittle. When such a casting is subjected to a shock the white iron in the interior is broken, and the crack thus made extends (by the same law which causes any crack once commenced to extend with very slight forces) through the soft iron, and thus the guard-finger is ruined. In our improved construction the annealing process affects both the exterior and interior surfaces, thus producing an annealed shell of twice the ordinary thickness without any brittle interior. Our guard-finger will for this reason safely withstand blows which would break any of the malleable-iron guard-fingers of equal external dimensions before known. When this casting and the steel face C have been properly shaped and adapted to each other we insert the forked or equivalent-shaped end C' of the steel facing into the inclined fissure or fissures D by thrusting C forward in the inclined position represented by the dotted blue line in Figs. 1 and 3 until its forward end is in fair contact with the front edge of D. We then press down the rear extremity, C'', thereby causing the other extremity, C', to "bind," and thus to be held very firmly in D. We then, while holding the parts in this their proper position, firmly secure them by hammering down the projections *a a*, or by otherwise causing the metal thereof to lap upon and confine the beveled edges *c' c'*, as shown in Fig. 3. We subsequently remove any surplus metal, so as to smooth the upper surface of A. The steel face is now firmly and very rigidly fixed to the guard-finger, being at one extremity held so tightly in the fissures D D that it is subjected to a considerable transverse strain, and is consequently very firm and not liable to work, while the other extremity is embraced and partially covered by the metal *a a* at both edges. The beveled shoulders *c c*, at the point where C'' joins C, are fitted tightly into corresponding shoulders in the casting, (see Fig. 2,) and being covered by the metal of *a a*, as before described, prevent any possible end movement of C, while the forked form of the other extremity, C', and its contact with the casting, which is in a similar form, renders it impossible to produce any side movement of the parts at that point until the other end, C'', is released.

The forked form of C' and the corresponding form of the fissures or fissure D are adopted by us on account of the great facility afforded thereby for filing or otherwise finishing the interior of D. Any other form which will guard in a substantially similar manner against any movement of that end of C may be adopted in its stead without impairing the effect of our invention. Fig. 6 shows examples of several forms which might be used, except for the diffi-

culty of giving an accurately-corresponding form to the outline of the fissure D.

The shoulders *c c* might be made flush with the front face of the finger-guards A' A', in which position they would be as effective in preventing any end movement of the steel as in the locality where we have represented them; but we place them at the point indicated in the drawings in order to prevent the entrance of grass, &c., at the joint.

We give to the steel face C, previous to securing it to the guard-finger, any temper which may be desired, (we prefer a spring temper,) and the temper thus given is permanently retained.

We make the bearing H, which sustains the cutter-bar, only about one-fourth the width of the said bar, and place it at the extreme rear edge thereof. In consequence of this reduction and novel location of the bearing-surface under the cutter-bar the friction is diminished, less filing or other labor is required in fitting the work, and a larger proportion of the weight of the bar and cutters is thrown upon the steel face, thereby resisting more efficiently the tendency of the cutters to rise in meeting with obstructions, and rendering the joint action of the edges of the cutters and of the steel faces more closely analogous to that of the blades of shears.

The fact that the body A of the guard-finger and the top guard, B, form a single inflexible casting, with the throat or re-entering angle between them, near their junction, so narrow as to be inaccessible for riveting or bolting, has heretofore rendered it impracticable to attach any steel face to the cutting-edges of such fingers, except by the process of welding, or by the nearly-equivalent method of causing pieces of steel to be partially embraced by the iron while the latter is in a fluid condition. Either of these processes are objectionable on account of their destroying the temper and burning the steel, and on account of the labor and expense, as also of the injury both of the steel and of the casting, necessarily incident to any subsequent hardening process.

Having now fully described our improved guard-finger, what we claim as our invention therein, and desire to secure by Letters Patent, is—

1. The angular cavity D for the free admission of the front end of the face-plate C, to permit its shoulders at the rear end to be inserted, whereby the ends of said plate are firmly secured, substantially in the manner and for the purpose specified.

2. Confining the back end, C'', of the steel face-plate C by bending down the metal of the finger at *a a* upon the reversely-beveled edges of C'', in the manner and for the purposes above explained.

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JOHN P. ADRIANCE.

In presence of—

THOMAS D. STETSON,  
BENJ. T. HILLING.