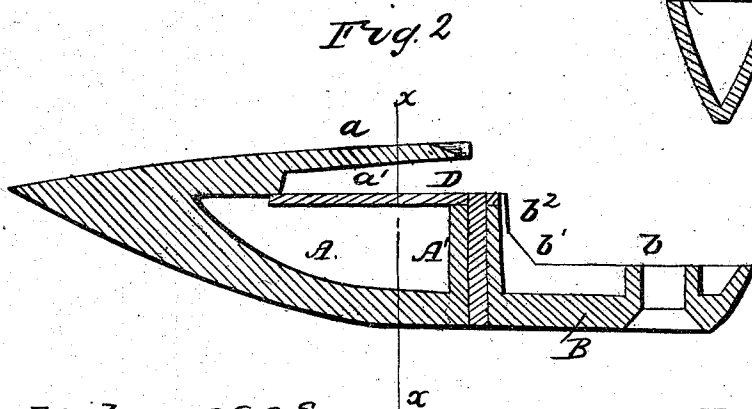
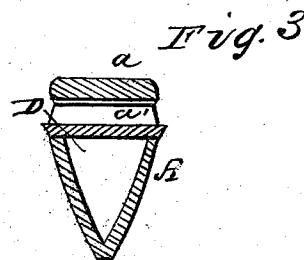
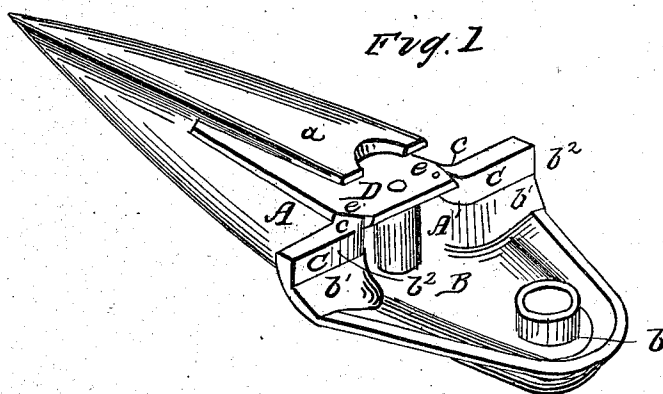


J. BIRCH.
Harvester Guard.

No. 95,187.

Patented Sept. 28, 1869.



Witnesses
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Inventor
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UNITED STATES PATENT OFFICE.

JAMES BIRCH, OF CORRY, PENNSYLVANIA.

IMPROVEMENT IN HARVESTER-GUARDS.

Specification forming part of Letters Patent No. 95,187, dated September 28, 1869.

To all whom it may concern :

Be it known that I, JAMES BIRCH, of Corry, county of Erie, and State of Pennsylvania, have invented a new and useful Improvement in Harvester Guards or Fingers, of which the following is a full, clear, and exact description, reference being had to the accompanying drawing, making a part of this specification, in which—

Figure 1 is a perspective view of my improved guard or finger. Fig. 2 is a longitudinal section of the same, and Fig. 3 is a transverse section of the same, taken in line *x x*, Fig. 2.

Similar letters of reference denote corresponding parts in all the figures.

In the various malleable or cast guards or fingers heretofore in use, in order to secure a firm support for the stationary cutter, riveted thereto, it has been deemed essential to make it solid, or to bridge it over between the wings or shoulders of the guard, to form a base for the heel end of such stationary cutter to rest upon, and through which it was usually riveted to the guard. By this arrangement the difference in the thickness or deposition of the metal was such as to produce unequal shrinkage in cooling, according to the thickness of the metal, and as in such construction the greater thickness or bulk was just at the bridge or heel end of the stationary cutter, the shrinkage of the metal at that point frequently produced a shrink hole or flaw in the metal just where it was required to drill the guard for the rivet. This has been found to be not only a serious defect in the guard itself, but it is also one that has been very destructive to the drill employed to perforate it.

Another defect was the sudden change in the thickness of the metal at the junction of the body of the guard with the shank, through which it is secured to the bar, such difference having appeared indispensable from the fact that while the plane at the bottom of the guard is necessarily continuous, to enable it to pass easily over the ground, it is requisite that at the upper face there should be an offset between the shank and the cutting-surface of the guard equal to the thickness of the finger and sickle-bars, (one or both,) and thus, by the unequal shrinkage of the metal at this point, the guard is greatly weakened just

where the greatest strain comes and the greatest strength is required, and consequently many guards are broken at this point, and destroyed in the process of securing them to the finger-bar, and also in use in the field.

Another effect of shrinking in the construction referred to has been that, owing to the rounding or bracing form of lower surfaces and the flat or plane upper face given to the guard, the surface cooling first from the bracing relation of the lower faces which prevented their yielding the upper face was almost invariably drawn in or "dished," thereby necessitating the milling or cutting away of considerable metal from the upper face of the guard, in order to give it the required plane surface, and adding materially to the cost of manufacture.

Still another defect has arisen from the difficulty of properly annealing the guards, where constructed in the usual way, on account of the bulk or thickness of metal at certain points, as above referred to, it having been found practically impossible to properly anneal metal exceeding one-quarter to three-eighths of an inch in thickness.

The object of my invention is to overcome the defects referred to, and to combine the advantages of the solid guard, affording a firm base or support for the fixed cutter, with the lightness and advantages in annealing peculiar to a hollow or skeleton guard, while at the same time dispensing with the usual form of bridge and the heavy bulk of metal at the heel end of the fixed plate, usually found in such skeleton-guards; and to this end my invention consists in making the guard in skeleton form, and providing it, at or near the junction of the shank and body of the guard, with a stud or post, or its equivalent, forming a support to the heel of the stationary cutter, and through and by means of which said cutter is secured to the guard; also, in the manner of combining the stationary cutter with said stud or post and the wings or sides of the guard.

In the annexed drawing, A represents the body of the guard, which is made or cast in a hollow or skeleton form, substantially as represented in transverse section, Fig. 3. B is the shank, through which the guard is secured to the finger-bar, said shank being made concave on its upper face, and provided with

a cylindrical stud, *b*, rising to the same height as the side of the shank, and through which the guard is secured to the bar. *C C* are the wings or shoulders of the guard, against which the forward edges of the finger and cutter bar abut, the arrangement of such bars, by preference, being about as follows, viz: the finger-bar, or, as it is usually called by manufacturers, the "cutter-bar," is made of a thickness corresponding to the distance between the face of the shank and the junction of inclined plane *b'* with the vertical plane *b''*, or rising slightly above the same, and the sickle-bar filling up the space between said last-named point and the face of wings *C* and stationary plate *D*. The wings *C*, when the guards are properly bolted to the finger-bar, are thus made to form a continuous shield to the cutter and sickle bars, protecting them from obstructions in the path of the machine. Any usual arrangement of the bars relative to the guards may, however, be used.

By reference to Figs. 1 and 2 it will be seen that the bottom of the concavity in the body of the guard is in the same, or about the same, plane as the bottom of the concave in the shank thereof, and opens directly into said concave in the shank on both sides of an upright stud or post, *A'*.

D represents the stationary steel cutter, which is made to conform substantially in shape to the shape of the face of the guard on the lower side of the slot *a'*, between the body *A* of the guard and cap *a*. The face of the guard on which said cutter rests, as also of the stud or post *A'*, is slightly below the face of the wings *C*, the difference being equal to the thickness of the cutter *D*. The forward end of plate *D* is made slightly wedging, so that when pressed firmly into place the forward end projects slightly into the concavity in the finger, and, resting firmly against the sides thereof, entirely prevents lateral play of said end. At the rear end the corners *e e* of the plate are cut at an angle of forty-five degrees, more or less, and are beveled outward from the upper face in such manner that the adjacent ends of the wings *C*, which are slightly raised for the purpose, may be riveted upon the inclined and

beveled corners *e*, thereby crowding the plate or cutter *D* forward, and dovetailing the rear end firmly in place.

Instead of beveling the corners the faces thereof may be made vertical, and the rear end of the plate of slightly greater width than the distance between the shoulders *c c* of wings *C*. Then, when the plate is to be secured in place, after it is properly arranged relative to the guard, by the use of a "set" the plate may, by a slight blow, be forced into its socket, the skeleton form of the guard allowing the wings to yield slightly to receive the same, and the elasticity of the guard, after the plate is thus inserted, causing the wings to close upon the plate, crowding it forward, and holding it firmly in place as against lateral or endwise movement. After the plate has been thus placed in position, it is firmly secured, by riveting or otherwise, to the stud or upright *A'*, and is thereby held firmly down in its seat.

The post *A'*, by preference, is made in a cylindrical or an elliptical form, having its greater diameter longitudinally of the guard; but other forms may be employed, the object being to dispense with the great bulk of metal usually found in the guard at the heel end of the stationary cutter, while at the same time a suitable central support is provided at said point to which to secure said cutter.

This point attained, the other advantages, such as a more perfect annealing and a greater elasticity of the guard referred to, will be understood without further description.

What I claim as new, and desire to secure by Letters Patent, is—

1. A skeleton-guard, provided with the central stud or post, or equivalent device, forming a support for the heel end of the stationary cutter, substantially as described.

2. A guard or finger, provided with the stud or post *A'*, and angular shoulder *c* of wings *C*, for securing the stationary cutters *D* in place, substantially as described.

JAMES BIRCH.

Witnesses:

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