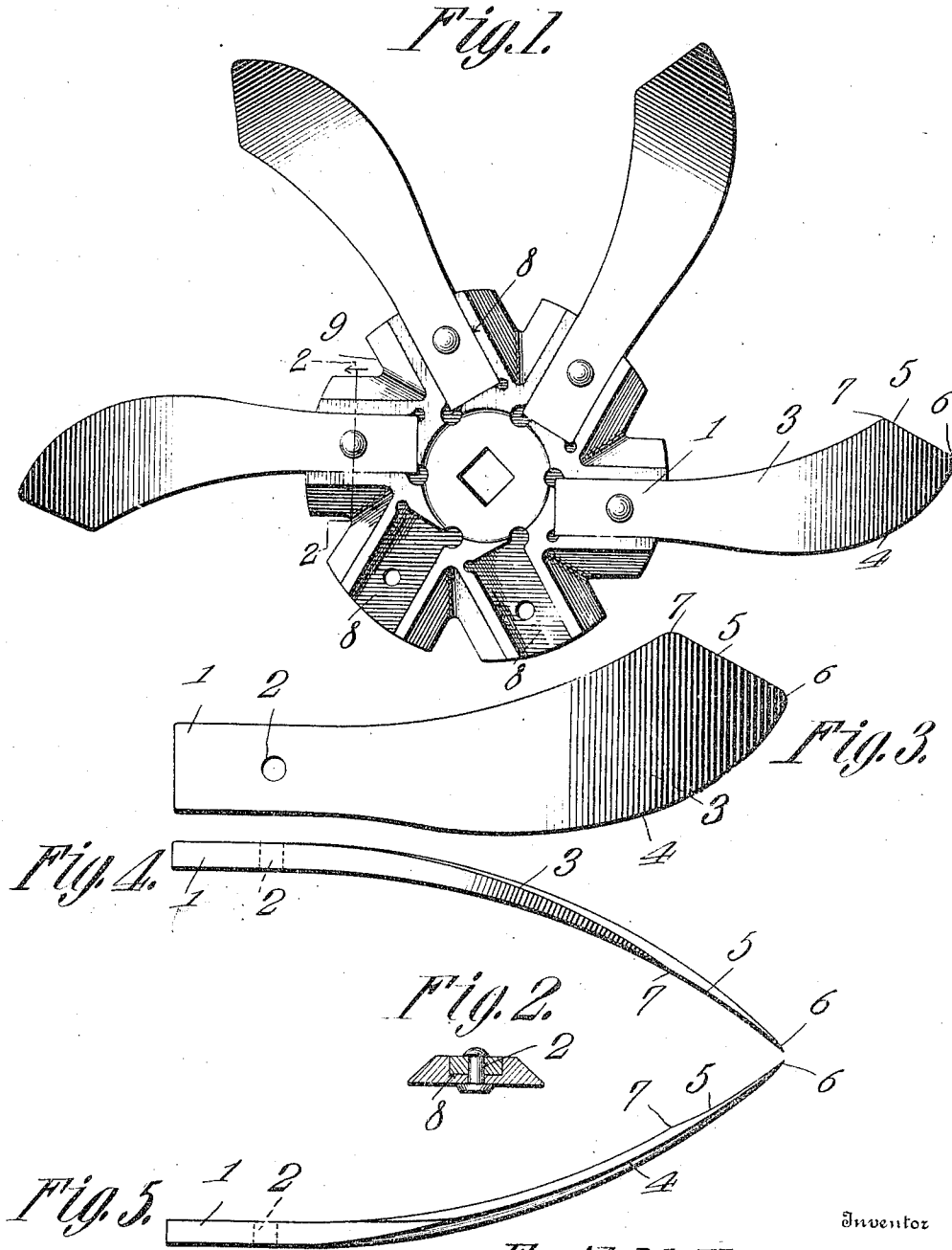


E. M. KRAMER.
 SOIL ENGAGING BLADE FOR HARROWS AND THE LIKE.
 APPLICATION FILED SEPT. 24, 1908. RENEWED JUNE 8, 1910.

963,716.

Patented July 5, 1910.



Witness:
E. J. [Signature]
E. Daniels.

Emil M. Kramer

Cashnow & Co.
 Attorneys

UNITED STATES PATENT OFFICE.

EMIL M. KRAMER, OF PAXTON, ILLINOIS, ASSIGNOR TO E. M. KRAMER COMPANY, A
COPARTNERSHIP.

SOIL-ENGAGING BLADE FOR HARROWS AND THE LIKE.

963,716.

Specification of Letters Patent.

Patented July 5, 1910.

Application filed September 24, 1908, Serial No. 454,496. Renewed June 6, 1910. Serial No. 565,381.

To all whom it may concern:

Be it known that I, EMIL M. KRAMER, a citizen of the United States, residing at Paxton, in the county of Ford and State of Illinois, have invented a new and useful Soil-Engaging Blade for Harrows and the Like, of which the following is a specification.

This invention has relation to soil engaging blades for harrows and similar implements and it consists in the novel construction and arrangement of its parts as hereinafter shown and described.

The object of the invention is to provide a blade of a special and peculiar configuration which is especially adapted to be effectually used for pulverizing and slightly spading the soil and at the same time cleaving the same below the surface whereby the top soil may be aerated.

With the above object in view a blade is provided which in side elevation is substantially scimitar shaped and which is provided at its forward edge with a sharpened or cutting edge and at its outer rear end portion with a sharpened or cutting edge the said cutting edges coming together and terminating at a point at the outer extremity of the blade. The said blade is curved laterally and a heel is formed at the rear edge of the blade and at the inner end of the said rear cutting edge which heel is adapted to accomplish the spading of the soil as will hereinafter appear.

In the accompanying drawings, Figure 1 is a side elevation of several of the blades showing the manner in which they may be applied to a disk or hub. Fig. 2 is a transverse sectional view of a portion of the hub cut on the line 2-2 of Fig. 1. Fig. 3 is a side elevation of the blade. Fig. 4 is a rear edge elevation of the blade, and Fig. 5 is a front edge elevation of the blade.

The blade consists of the shank 1 which is preferably rectangularly shaped and which is provided with a rivet perforation 2. The said shank 1 merges into the blade proper 3 which is curved along its longitudinal axis and is also curved laterally. The blade proper 3 is provided with the sharpened or cutting edge 4 and which is designated as the front or forward cutting edge. The said blade 3 is also provided at the outer portion of its rear edge with a cutting edge 5. The said edges 4 and 5 come together at the point

6 which defines the outer extremity of the blade as an entirety. The inner rear end of the cutting edge 5 terminates at the heel or shoulder 7. Thus it will be seen that the general configuration of the blade as an entirety is in the form of a scimitar in side elevation or oblongate; that is, narrowing toward the point of attachment more than toward the apex and that it is provided with a forward cutting edge and a rear cutting edge which come together at the pointed outer extremity of the blade.

The blades may be applied to a disk of any desired pattern but preferably such a disk is formed as shown in Fig. 1 of the drawings in which the disk is provided with the grooves or channels 8 which are disposed tangentially with relation to a circle struck from the center of the disk. The metal of the disk between the channels 8 is cut away as at 9 whereby a light and durable structure of the disk is effected.

When in use the disks are placed upon a shaft (not shown) and usually the disks are pitched at an angle to the line of draft. Thus as the blades come in contact with the soil the edges 4 thereof cleave the soil and the pointed outer extremities 6 are projected down into the soil. During the projectory movement the edge 5 also cleaves the soil so that the resistance of the blade entering the soil is reduced to a minimum. As the blades successively move up or out of the soil the sides of the clefts made by the extremities of the blade are slightly spaded or turned by the heel portions 7 and thus the soil is pulverized, spaded and aerated at one operation. By reason of the fact that the blades are curved laterally the spading operation of the soil is augmented or facilitated and is more pronounced than if the blades occupied the same plane throughout their length. The blades are arranged upon the disk in a manner much similar to that of the arrangement of spokes upon the hub of a wheel, and, as the disk rotates in the direction indicated by the arrow in Fig. 1, the blade which is directly under the center of the disk, (theoretically) for an instant assumes a state of rest, while those blades mounted at the forward portion of the disk are advancing. Consequently, as each blade enters the soil it is moving in a forward direction, and its edge 5 will cleave the soil, and not plow as would be the case if a blunt

surface were provided at that portion of the blade occupied by the said edge 5. When the blade 5 arrives at a position in vertical alignment with the center of the disk, and begins to move upward out of the soil, the heel portion 7 thereof operates upon the soil and spades the same in the manner as above indicated. Thus it will be seen that as each blade enters the soil it is, at all times, cleaving the same by reason of the cutting edges provided, and, as it is leaving the soil, it is spading the same.

Having described my invention what I claim as new and desire to secure by Letters Patent is;—

1. A soil working blade broadest at a point intermediate its ends and having at one side of its long dimension a relatively long convex cutting edge and at the other side of said long dimension a relatively short straight cutting edge, said cutting edges converging to a point at the outer extremity of the blade.

2. A soil working blade of narrow ensiform shape having at the forward edge of

its long dimension a convex cutting edge, a shorter rear edge, and a straight cutting edge joining the two said edges and returned sharply from the end of the forward edge and forming an acute point at the extremity of the blade.

3. A rotary harrow member having a series of soil-working blades, the outer extremity of each of said blades co-inciding only at a single point with a circle whose center is the axis of the member, said blade having a forward convex cutting edge extending along its longer dimension, the curve of which edge intersects said circle, said blade having a rear concave edge along its longer dimension and having a short end cutting edge forming a secant of said circle and joining the ends of the other edges.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

EMIL M. KRAMER.

Witnesses:

A. V. ROZENE,
J. W. KAUFMANN.