2 Sheets—Sheet 1.

U. BLICKENSDERFER.

Ditching-Machines.

No. 227,209. **Patented May 4, 1880.**

FIG 1

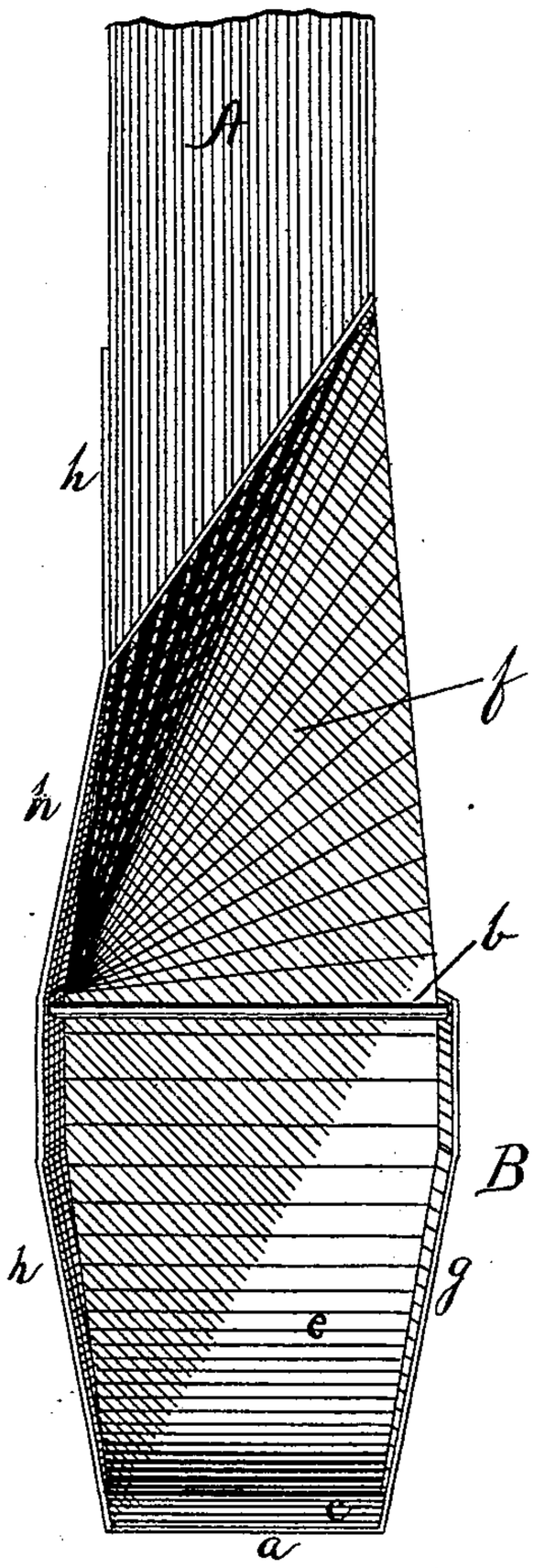
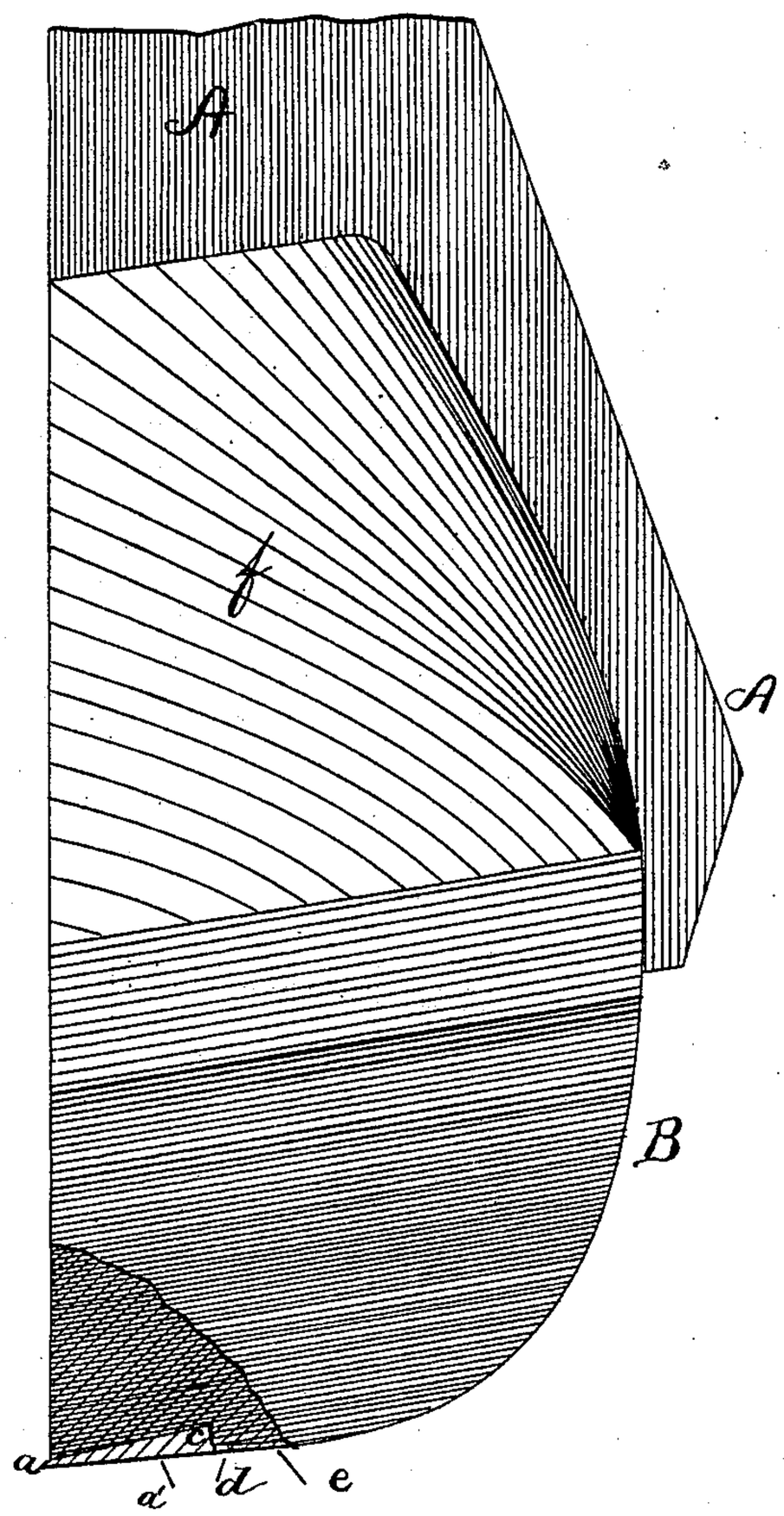


FIG 2



WITNESSES

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2 Sheets—Sheet 2.

U. BLICKENSDERFER.
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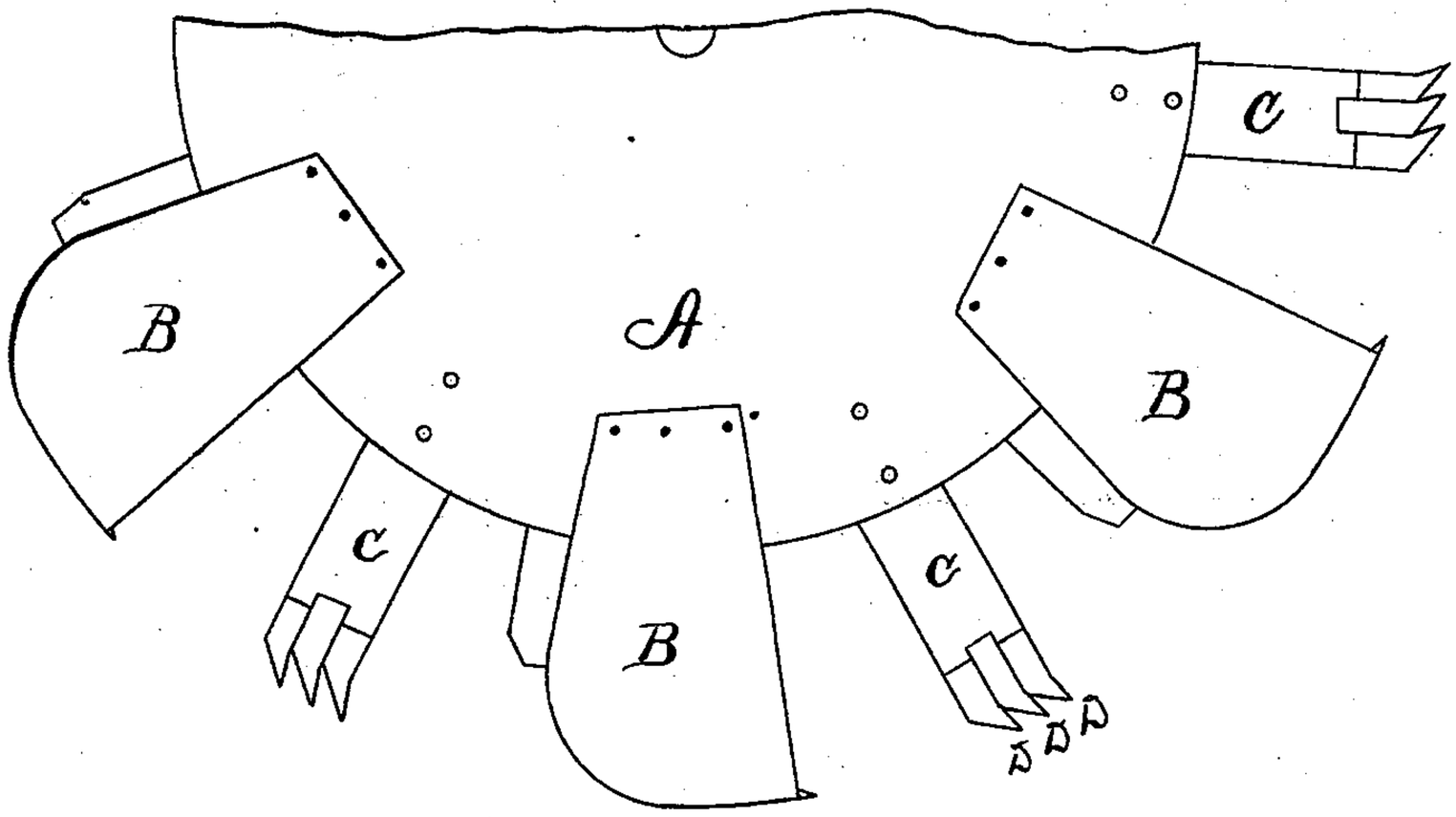

FIG 3

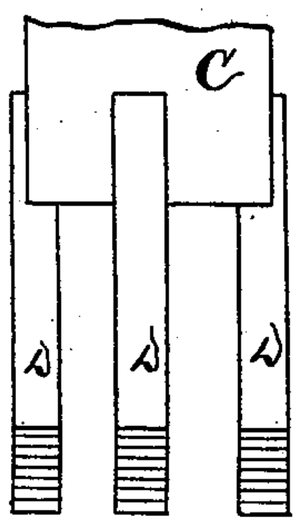

FIG 4

WITNESSES
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UNITED STATES PATENT OFFICE.

ULRIC BLICKENSDERFER, OF ERIE, PENNSYLVANIA.

DITCHING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 227,209, dated May 4, 1880.

Application filed July 16, 1879.

To all whom it may concern:

Be it known that I, ULRIC BLICKENSDERFER, of Erie, in the county of Erie and State of Pennsylvania, have invented a new and useful Improvement in Ditching-Machines; and I do hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to the construction of machines for ditching and draining land; and it consists in improvements on a machine for that purpose which was patented by me August 23, 1870, Patent No. 106,653.

These improvements are in the form of the ditching-buckets, in additional means for preventing the earth from clinging or sticking in the buckets, and in means for facilitating the discharge of the earth from the back of the bucket.

The general form of the buckets, as expressed in the second claim of the patent referred to above, is not changed—that is to say, the buckets still have "a gradually-increasing area from their cutting-edges to their backs, for the purpose of facilitating the discharge of the earth therefrom and relieving their outer sides from friction" inside; but the detail of form is changed in several particulars, and the outer sides are relieved from friction outside as well as inside.

My device is illustrated in the accompanying drawings, as follows:

Figure 1 is a front view of one of the ditching-buckets. Fig. 2 is a side view of the same with a part of the side broken away. Fig. 3 is a side view of a fragment of the bucket-wheel, and shows the reverse side of the bucket from that shown in Fig. 2, and also shows the manner of applying the devices for loosening the earth in advance of the bucket. Fig. 4 is a detached front view of the dirt-loosening device or pick.

As my present invention does not relate in any way to means for operating the buckets and picks, no such means are shown. They may be supposed to be the same as shown in the patent above referred to.

My improved bucket, herewith presented, may, however, be applied to various forms of ditching-machines.

In the drawings I show the buckets B attached to a form, A, which may be considered the same as the conical hub F in the patent referred to, and the picks are attached to arms C extending therefrom.

The buckets B consist of a bottom, *e*, sides *g* and *h*, and back *f*. The bottom of the bucket is curved, and runs from the bottom of the sides at the mouth of the bucket to the top of the side *g* at the back or rear end of the bucket.

The sides *g* and *h* are made with a cutting-edge in front. The side *h* extends up and attaches to the form A, while the side *g* is left open, so as to provide an escape for the loosened earth.

The bucket in its movement is not intended to excavate more than a comparatively thin slice of earth. This is effected, of course, by timing the feed mechanism of the machine.

In Fig. 1 the view is directly into the mouth of the bucket, and it will there be seen that the mouth is wider than any part directly back of it on the line of vision there given; but it will also be seen that the bottom of the bucket *e* grows wider as it runs back. The sides of the bucket converge toward the bottom both vertically and rearwardly; but the vertical convergence is more decided than the rearward convergence. Hence, as the bottom curves from the point of greatest vertical convergence in front to the point of greatest convergence at the rear, and at the same time follows up the diverging rear edges of the sides, it grows constantly wider toward the rear, in order to take up or fill the difference between the vertical and rearward convergence of the sides.

The object of this form is twofold: first, to give free clearance to the loosened earth within the bucket; and, second, to give free clearance to the exterior of the bucket in the trench. In other words, no part of the bucket except the cutting-edges comes in contact with the trench, and the excavated earth, as it passes back in the bucket, finds a widening space in which to move, or, as above expressed, free clearance within and without the bucket is provided.

The back of the bucket, *f*, is a continuation of the bottom *e*, but with such a change of curve as to give it a form similar to the mold-board of a plow, thus giving it the power to turn the moving earth and discharge it from the bucket at the side. The bottom *e* and the back *f* are

one continuous variously-curved surface, and the slice of excavated earth entering the mouth of the bucket glides down it as, by the revolution of the bucket, it drops below the cutting-edge or mouth.

In working in wet clay or other tenacious soil the excavated slice of earth will adhere to the smooth flat surface of the bottom. To overcome this there may be placed in the bottom, near the cutting-point *a*, a false bottom or incline, *c*, which loosens the hold of the sticky clay as it passes from it onto the real bottom *e*. To further insure against this sticking there may be provided holes *d* in the bottom, back of the incline, for the admission of air between the slice of clay and the bottom.

The upper outer corner of the side *g* is stiffened by a binding rod or brace *b*, which connects it with the side *h* opposite.

The advantages of this bucket over the one shown in my former patent are as follows: The bottom, back, and inclined surface over which the dirt passed in its passage through and out of the bucket in the former case were angularly connected together, forming corners for the dirt to clog up in, while in the present case the dirt passes over one continuous regularly and gently curved surface from the time it enters until it discharges from the buckets. By reason of the combination of the curved bottom and the sides made converging, as described, freer clearance both inside and outside the bucket is obtained. The raised part *c* on the bottom *e* loosens the hold of tenacious or sticky soil upon the bottom. The placing of air-holes in the bottom also aids the passage of the dirt over the bottom.

The cross-rod *b* serves to very much strengthen the mouth of the bucket.

The buckets may be made of wrought sheet-iron, and the cutting-edges of steel or of cast-iron with chilled or steel cutting-edges, and when made of cast-iron the bottom and mold-board may be chilled, as is common in plows.

The picks serve to loosen up the soil ahead of the bucket. They are attached to arms which lie between the buckets, as seen in Fig. 3.

There are three of the picks on each arm, and they set obliquely—that is, in a row which is oblique—so that one tooth follows the other at a short distance to the rear and to one side. They are pointed sharp one way and are flat the other way, giving a chisel form, and they are slightly curved forward at the point.

What I claim is as follows:

1. A ditching-machine bucket having its sides converging rearwardly at one angle and vertically at a greater angle, and its bottom curved so as to pass from the point of greatest vertical convergence to the point of greatest rearward convergence, whereby the said bucket shall have free clearance in the trench and afford free clearance for the excavated earth passing through it, as set forth.

2. A ditching-machine bucket having a curved bottom and a mold-board-shaped back, substantially as and for the purposes set forth.

3. A ditching-machine bucket having at the discharging-point thereof a back formed in the manner of a mold-board, substantially as and for the purposes set forth.

In testimony whereof I, the said ULRIC BLICKENSDERFER, have hereunto set my hand.

ULRIC BLICKENSDERFER.

Witnesses:
JNO. K. HALLOCK,
SELDEN MARVIN.