No. 645,597. Patented Mar. 20, 1900.

F. KELLER & A. KEIL.

PLOW.

(Application filed Aug. 10, 1899.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.

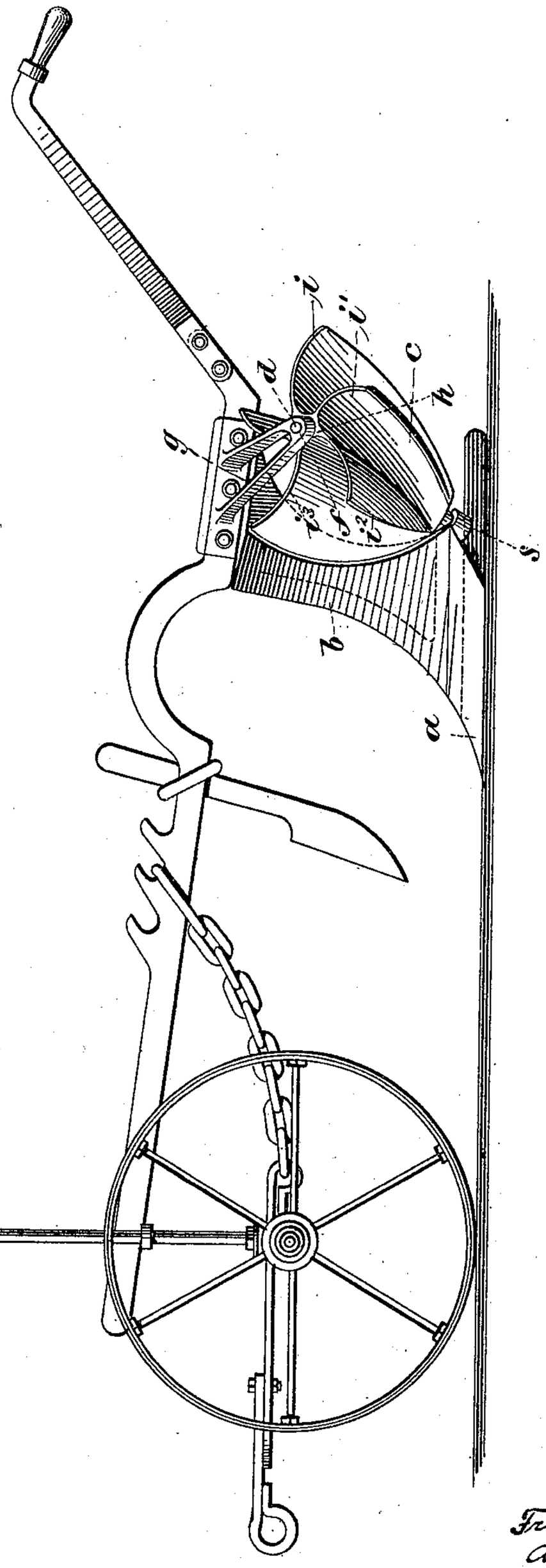

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Fig. 2.

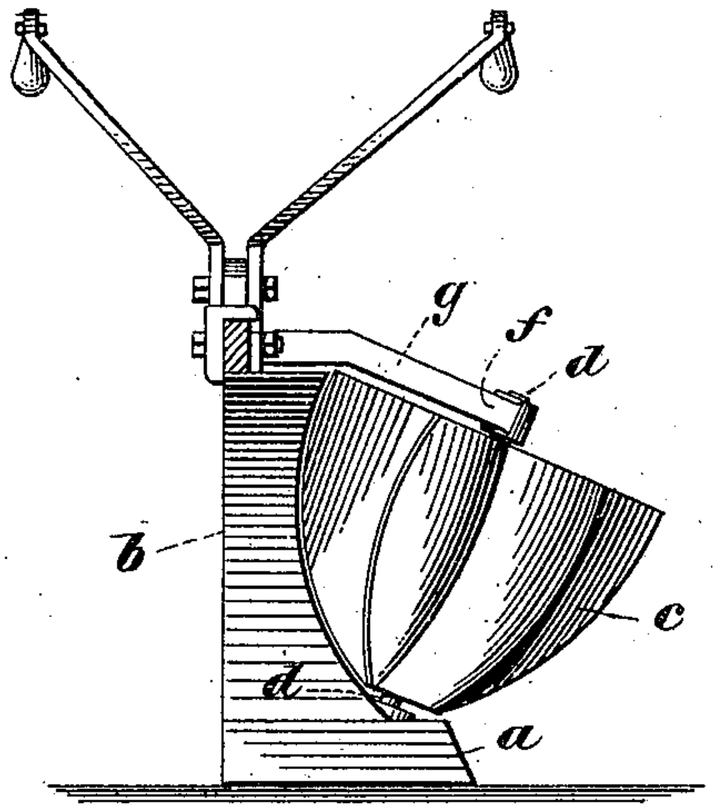
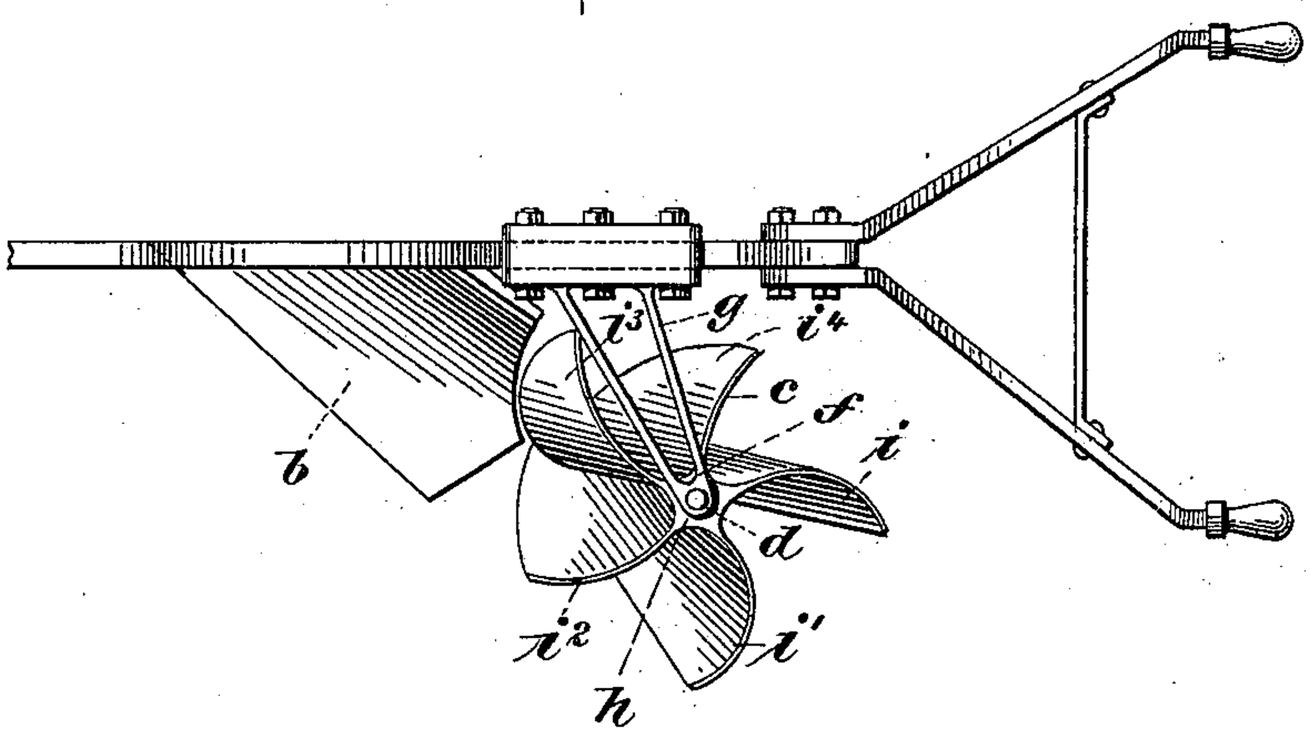


Fig. 3.



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PLOW.

SPECIFICATION forming part of Letters Patent No. 645,597, dated March 20, 1900.

Application filed August 10, 1899. Serial No. 726,754. (No model.)

To all whom it may concern:

Be it known that we, FRIEDRICH KELLER and ANDREAS KEIL, residents of Lampertheim, bei Worms-on-the-Rhine, Germany, have invented certain new and useful Improvements in Plows, of which the following is a specification.

This invention relates to plows; and one of the objects of said invention is to provide a simple and efficient plow with a rotary moldboard which is set in rotation during the progress of the plow through the rising mass of earth in order to turn over and thoroughly mix, disintegrate, and cleanse the same.

Further objects of the invention will be pointed out in the following description.

To these ends our invention consists in the novel arrangement of parts to be hereinafter described and claimed.

It is known that the share and colter in a plow have for their object the cutting up or turning over and loosening of the rising earth in a horizontal and vertical direction.

According to the present invention a newly-arranged rotary multiblade screw-body may perform the same work in place of the fixed or immovable moldboard only, with the essential difference that it also simultaneously effects a mixing and cleansing of the ground to be cultivated, which with the fixed moldboard had to be especially performed by other field implements, such as the harrow and scarifier. The invention is illustrated in one form or adaptation thereof in the accompanying drawings, wherein—

Figure 1 is a side elevation of one form of plow embodying our invention. Fig. 2 is a front view of the same with parts broken away for the purposes of clearer illustration. Fig. 3 is a plan view of the same.

Referring to the drawings, it will be seen that the plow embodies the standard *b*, carrying the steel share proper, *a*, and the rotary multiblade screw-body *c*, which may take the place of the rigid moldboard. The axle *d* of the screw-body *c* has an inclination of about thirty degrees to the horizontal and is stepped at the lower end in a bearing *e* and above in an eye *f* of a bracket *g*. The screw-body proper, *c*, consists of an upper and lower five-pointed star *h*, formed of a tempered casting or the like and attached to the shaft *d*, upon the points of which star-piece the concavo-convex helical tapering blades *i*, *i'*, i^2, i^3, and i^4, which are stamped out of sheet-steel, are riveted, and in such a manner that they form, in connection with one another, a spiral rotary body widening from below toward the top, which in the following specification will be designated the "screw-cultivator." This so-called "screw-cultivator" in an ordinary plow has a central diameter of thirty to forty centimeters and a height of forty-five to fifty centimeters, while it is self-evident that these dimensions must be correspondingly increased for deep-cultivating plows. The fastening edge of each of the blades. *i*, *i'*, i^2, i^3, and i^4 forms a helical line whose end relative to the beginning is displaced about a quarter-turn.

The inclined position of the screw-cultivator *c* is shown in Fig. 2 and corresponds substantially to the inclination of the furrow-crest which is produced by the improved cultivator in a surprising manner.

The remaining parts of this plow—such as colter, wheels, lever, and handles—are taken for granted as known and therefore need not be described in the specification.

It will be understood that the quicker the forward movement of the plow the more rapid is the rotation of the screw-cultivator, and it will likewise be understood that any suitable number of such screw-cultivators may be employed.

The deposition of the mass of earth during the working of a plow provided with screw-cultivators appears as if it had been worked with the spade, and whole earth clods are completely excluded. A better structure is thus given to the ground and the growth of plants is essentially promoted, which of course leads to an increase of the harvest produce.

The new plow-body can be adapted without any appreciable cost also to any ordinary field-plow now in common use, so that every farmer at small cost can enjoy the advantages of the new construction. In the construction of the screw-cultivators it is to be noted that right-turn plows require right-threaded screw-cultivators and left-turn plows left-threaded screw-cultivators.

In reference to other similar existing constructions—as, for example, the German Patent No. 85,252 and the American Patent No.

396,397—the present improved arrangement is essentially different in that the separate tapering helical blades *i*, *i'*, *i*^{2}, *i*^{3}, and *i*^{4}, comprising the rotary multibladed screw-body *c* of the present invention, effect a complete disintegration of the earth sliced off by the share and colter, while in the two arrangements previously mentioned only an entire rough-broken furrow is made.

The new plow-body is designed to take the place of the usual fixed moldboard, if desired, so that the moldboard can be dispensed with. In the known constructions, however, with rotary spiral knife or rotary arm a fixed moldboard must be used for setting up the furrow-slices, which during the forward movement of the plow are first roughly broken, but not completely disintegrated and mixed.

In the new plow by its forward movement the earth stream produced strikes continually upon the concave surfaces of the screw-cultivator blades, thus setting the latter in rotation. During this rotation the convex forward portion of the winged surfaces then effects a perfect shattering or disintegration and turning over of the cut-off furrow-slices.

By entirely doing away with the moldboard any stopping or sticking fast of the rotating plow-body, as is the case with the well-known similar constructions, is completely avoided, as here the stream of earth can flow continuously and regularly through the screw movement of the plow-body and strikes directly on the latter, while in the old constructions the plow-body was fixed too far to the back, and the stream of earth was only cut up by the helical knives or pointed instruments and prongs.

It will thus be seen that we bring about such a working of the earth with the aid of our improved plow as not to require the assistance of other field implements, such as the harrow and scarifier, as in consequence of the peculiar construction and mode of action of the screw-cultivator during the plowing the soil is simultaneously mixed and purified.

What we claim, and desire to secure by Letters Patent, is—

In a field-plow, the combination of a plowshare a freely-movable screw-cultivator which acts as a moldboard for the plow and is rotated by the action of soil thereon to thoroughly disintegrate and mix the soil passing from the plowshare, said screw-cultivator comprising a plurality of concavo-convex blades rotatable around a shaft mounted at an angle of substantially thirty degrees to a horizontal plane, and arranged spirally around said shaft, each of said blades being tapered from the upper to the lower end thereof, substantially as and for the purposes specified.

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Witnesses:
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