May 24, 1949. T. MÖHL 2,471,164

PLOWSHARE

Filed June 26, 1941

Fig. 1.

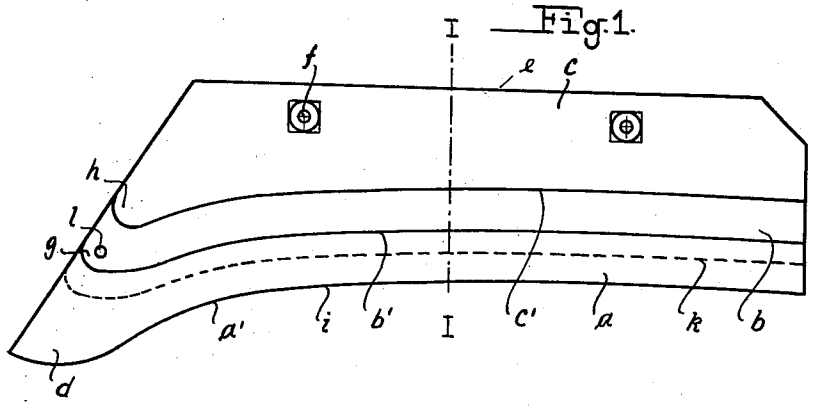
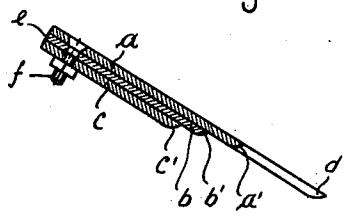


Fig. 2.



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PLOWSHARE

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Sections 1, 3, 14, Public Law 690, August 8, 1946
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1 Claim. (Cl. 97—125)

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This invention relates to a plough share.

As is well known, the commonly employed plough shares consist either of a very heavy and accordingly rigid plate having a sharpened leading edge, or of one or more thinner plates—the so called self-sharpening shares—having ribs, beads or bent edges for reinforcing the share at such places, particularly at the plough tip which are exposed to breakage in use. These reinforcements, however, require that the reinforced portions of the share shall be rigid and are therefore easily subjected to breakage during use by striking stones or other obstacles, and further these shares—like the first named shares—will contain a considerable quantity of material after the share has become worn and must be replaced by a new one. Accordingly, a rather considerable quantity of material is lost. Also, plough shares having reinforcing ribs, beads or bent land side edges are expensive to produce because they necessitate the use of special machinery for their production.

In order to reduce the quantity of material in a plough share it has been proposed to manufacture the share of a relatively thin share plate and a narrower reinforcing plate arranged at the under side of the share plate and produced from relatively soft material, and—in order to obtain sufficient rigidity of the plough tip of such a share, being integral with the share plate—to bend the edge of the share plate lying in the land side. However, such shares are liable to deformation by striking stones or like obstacles, and, like the shares mentioned above, they suffer from the drawback that their capacity, i. e. their tendency to dig into the ground when ploughing, varies from hard, heavy soil to soft soil. Another disadvantage of these shares is that wear makes the reinforcement dull and therefore no longer sharp.

The present invention has for its purpose to provide a plough share which obviates the above named drawbacks of the previously known plough shares and which—like some of the known ones—will remain sharp until it is practically worn out.

More particularly my invention has for its purpose to provide a share that is cheap and very resistive to breakage and bending stresses in use and the replacement by a new one will cause a considerable less loss of material than with the previously known shares, and the ability to maintain a uniform depth in the soil during ploughing is considerably greater than that of the previously known shares.

With these and other objects in mind, according to the invention the plough share is made resilient, being made from two or more layers of relatively

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thin steel plates of uniform thickness without bent edges, ribs or beads for reinforcing the share, and the width of these plates measured from the trailing edge of the share to the leading edge of each individual plate is of unequal value and in such a manner that the width decreases from the uppermost to the lowermost of the plate layers lying tight together and held together by means of fastening bolts of the plough share. By this arrangement there is obtained the advantage that the plough share, and in particular the projecting plough tip constituted in known manner by an integral part of the uppermost plate, will have a rather considerable resiliency so that, when, e. g. striking a stone, it will yield and thereby to a very considerable degree reduce the danger of deformation of the plough share.

As a result of the resiliency of the plough share and particularly the tip thereof the share will tend to dig in deeper when ploughing in hard and heavy soil than when ploughing in loose soil, because under the influence of resistance of the soil the share tip is subjected to a greater or smaller, non-permanent deflection according as it works in harder or softer soil and will therefore have more tendency to dig into the soil the harder the latter. This increase of the ground digging ability when working in hard soil will counteract the well known tendency of the plough share, from other causes, to dig the less into the soil the harder the latter. By suitable adjustment of the share tip it will, therefore, be possible to work at a more uniform depth in the soil than with known shares, irrespective of the quality of the soil.

I am aware that it is known to provide a plough share of two plates one above the other to be interexchanged so that sometimes one and sometimes the other of these plates may be used as the share plate. These plates, however, are provided with reinforcing ribs and therefore have substantially the same drawbacks as the known plough shares mentioned above.

As mentioned, the uppermost plate of a plough share according to the invention constitutes the proper share plate while the other layers of the share substantially serve to support and resiliently reinforce the share plate. When the share plate is worn down substantially to the leading edge of the adjacent share plate, it is replaced by a new one but it is not necessary therefore also to replace the reinforcing plates. Hereby the advantage is attained that the quantity of share material lost when replacing the share is only a fraction of the waste material when replacing the known shares.

As mentioned, when renewing the share it is only necessary to replace the uppermost of the steel plates of 3 to 5 mm. thickness, the replacement being cheap, and the share as a whole will be considerably cheaper than previously known shares because the steel plates, which are smooth, plane or slightly arcuate plates having a uniform thickness, can be manufactured by simple punching of bigger plates and subsequent sharpening of the leading edges of the plates.

But in order that my invention shall be better understood reference will now be made to the accompanying drawing illustrating, by way of an example only, an embodiment of my invention.

Fig. 1 being a plan view of the plough share from below, and

Fig. 2 a section through same on the line I—I in Fig. 1.

a, *b* and *c* are three plates made from spring steel having a uniform thickness of, e. g. 3 to 5 mm., and as is apparent from Fig. 2, having unequal widths, the uppermost plate *a* having a considerably greater width than the intermediate plate *b*, and the latter in its turn having a somewhat greater width than the lowermost plate *c*. At one side the uppermost plate is formed with a tip *d*, the plough tip. The leading edges *a'*, *b'* and *c'* of the plates are sharpened and, on account of the unequal widths of the plates, will lie in different distances from the trailing edge *e* of the share. By this arrangement is attained that the share will yield resiliently—in similar manner as a multilayer carriage spring—when working in the soil, and particularly the plough tip will be very resilient and will therefore be able to yield to stones or like obstacles so that the risk of breakage and deformations of the plough shares in use is reduced to a minimum.

The three plates are held together by means of two bolts *f* serving in known manner for the attachment of the share to the mould plate of the plough.

As is apparent from Fig. 1, the plates *b* and *c* also have a somewhat projecting lug *g* and *h* respectively in the land side of the plough, these lugs extending towards the plough tip and resiliently supporting same. The leading edges of the plates *b* and *c* and the corresponding lugs *g* and *h* are preferably shaped acording to such curves as the share plate is known to tend to follow in proportion to wear. By this means is attained that the share plate *a* may be worn approximately to the leading edge of the plate *b*, and that, if desired, the plate *b* may then be removed, and the share employed with the plate *a* as share plate and the plate *c* as resilient supporting plate for the same, a narrow plate strip of same thickness as the plate *b* being then arranged in place of the one on the plate *c* along the bolts *f* in order to facilitate tightening by means of the bolts *f*. The removed plate *b* is kept ready for use, when the share plate *a* is replaced by a new plate. In this manner the material of the share may be utilized in a very economical manner.

Even if the share plate *a* is only employed until worn approximately to the leading edge of the plate *b*, or more correctly, approximately to the position indicated by the dotted line *k*; the quantity of share material not used again, when the plate is replaced by a new one, will only be a relatively small fraction of the total quantity of share material, as a rule between 30 and 35%, while with the previously known shares the quantity of lost material will lie between 75 and 90%.

As is apparent from Fig. 2, the leading edges of the plates *a*, *b* and *c* are sharp. The leading edge of the plate *a* will, on account of its small thickness, keep sharp, until the plate is practically worn out.

In order to avoid penetration of earth between the plates *a* and *b* at the land side of the share, it will be advantageous to connect the lug *g* of the plate *b* with the plate *a* by means of a rivet 1, Fig. 1, for instance of soft iron, extending through the two plates. The diameter of the hole, in which this rivet is placed, may suitably be made slightly greater than the diameter of the rivet, so that the rivet will not injure the resiliency of the share.

Having now particularly described and ascertained the nature of my invention and in what manner the same is to be performed, I declare that what I claim is:

A plough share composed of two or more layers of relatively thin steel plates, of which the uppermost plate constitutes the proper share plate and also the plough tip of the share, characterized in that each layer of the plough share consists of a plane or slightly arcuate hardened steel plate of uniform thickness, and that the width of these plates measured from the trailing edge of the share to the leading edge of each plate is of unequal value and decreases from the uppermost to the lowermost of the plate layers, said plate layers being secured adjacent each other, whereby the plough share, and the projecting plough tip of the uppermost plate, are given a considerable resiliency.

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