

(No Model.)

2 Sheets—Sheet 1.

M. M. ROBERTS.

HARROW.

No. 388,222.

Patented Aug. 21, 1888.

Fig. 3.

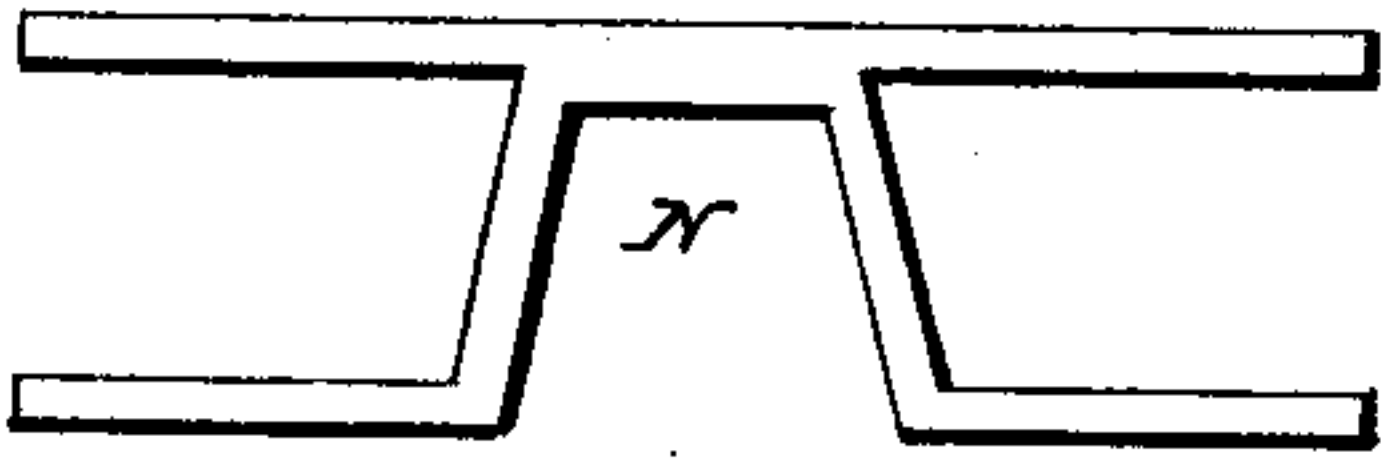


Fig. 4.

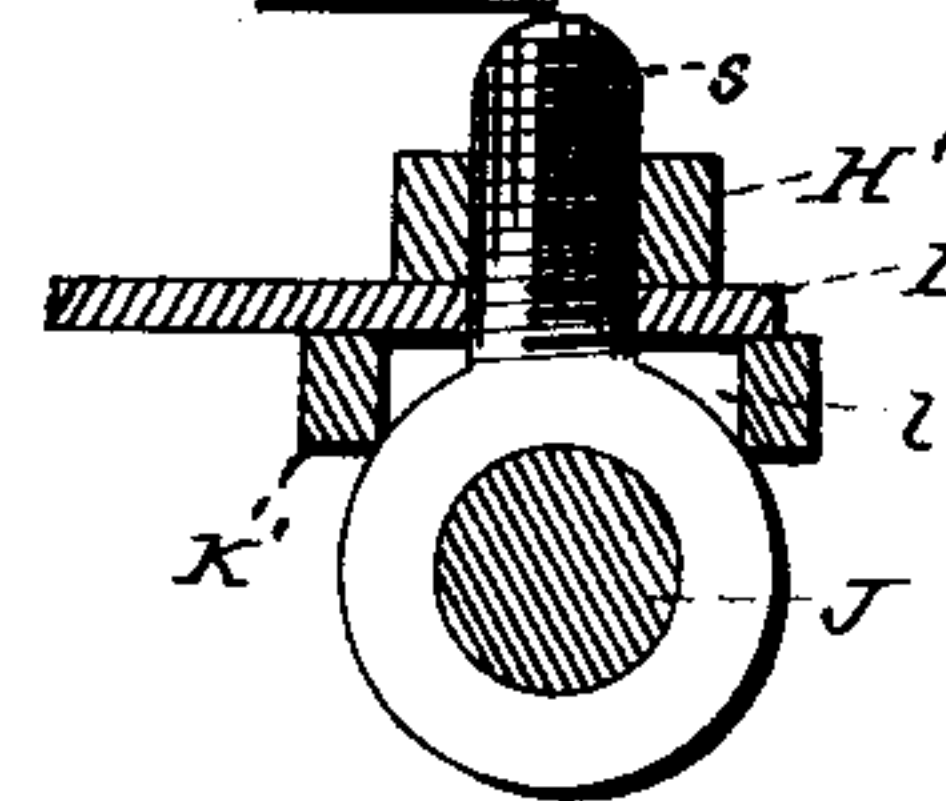


Fig. 5.

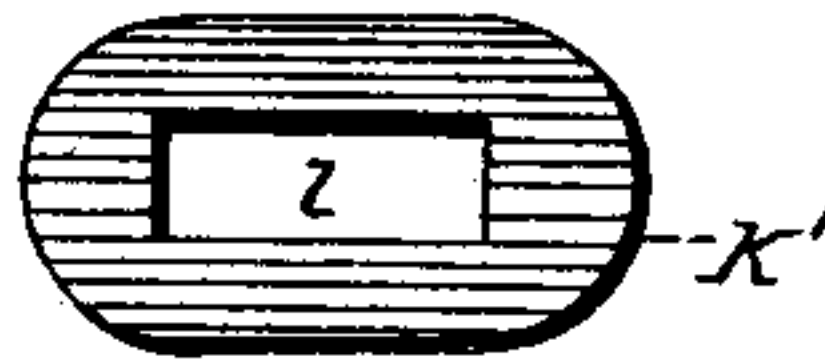


Fig. 6.

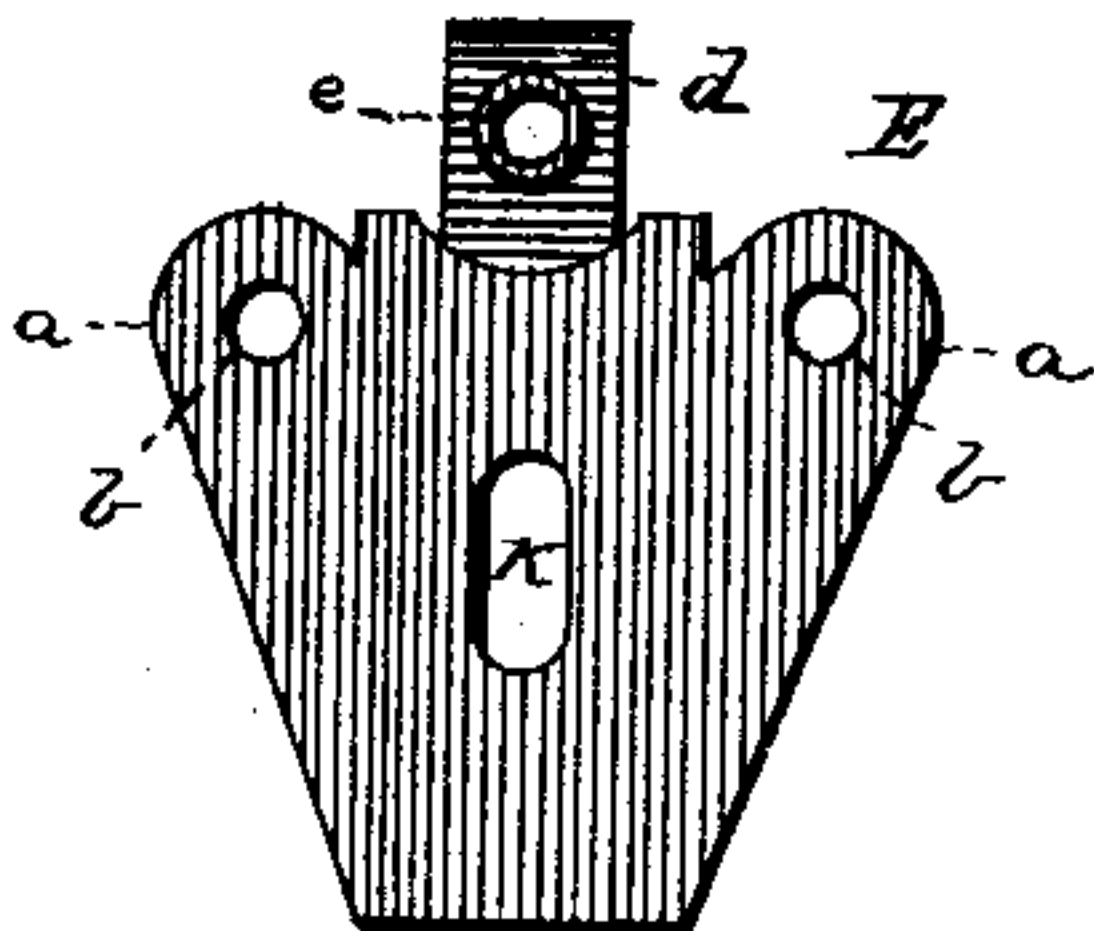


Fig. 7.

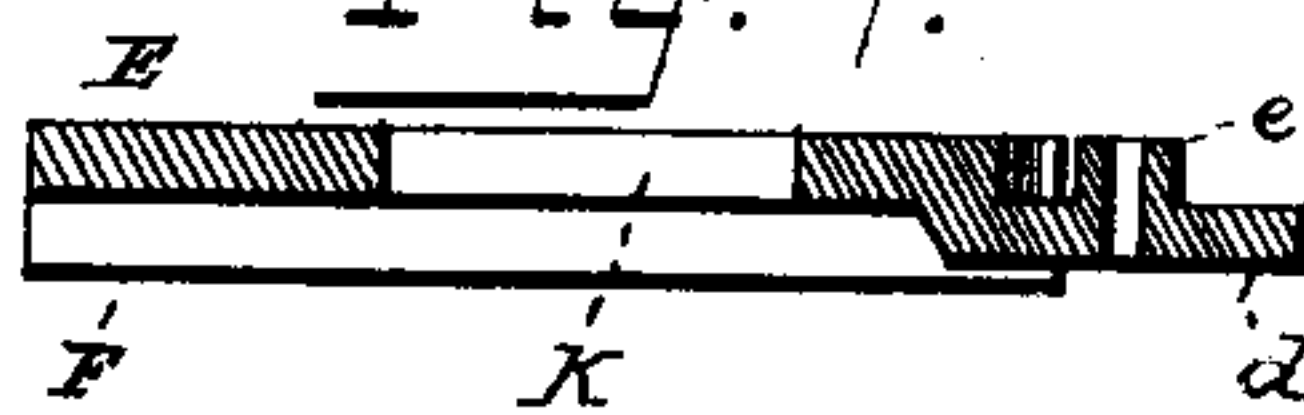


Fig. 8.

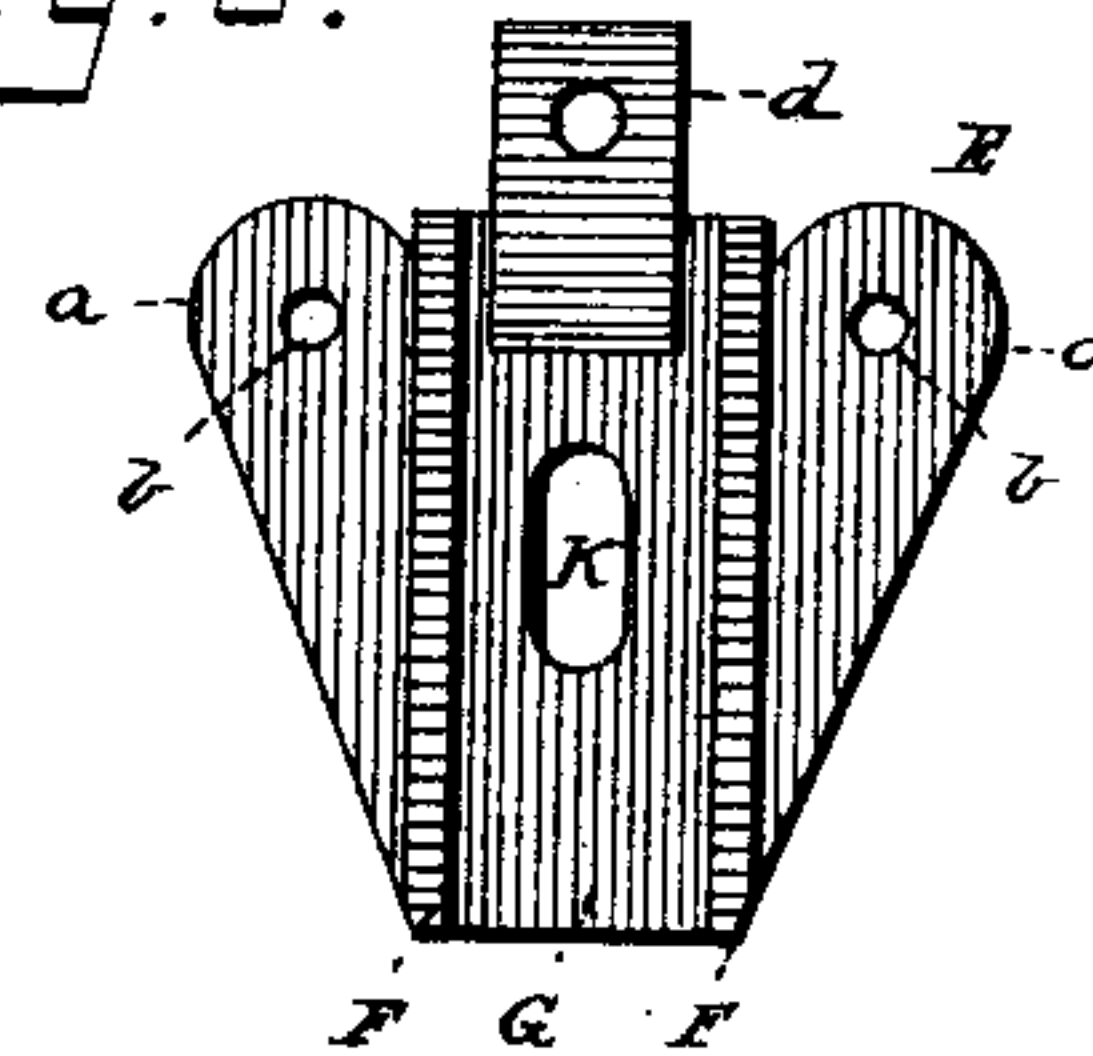
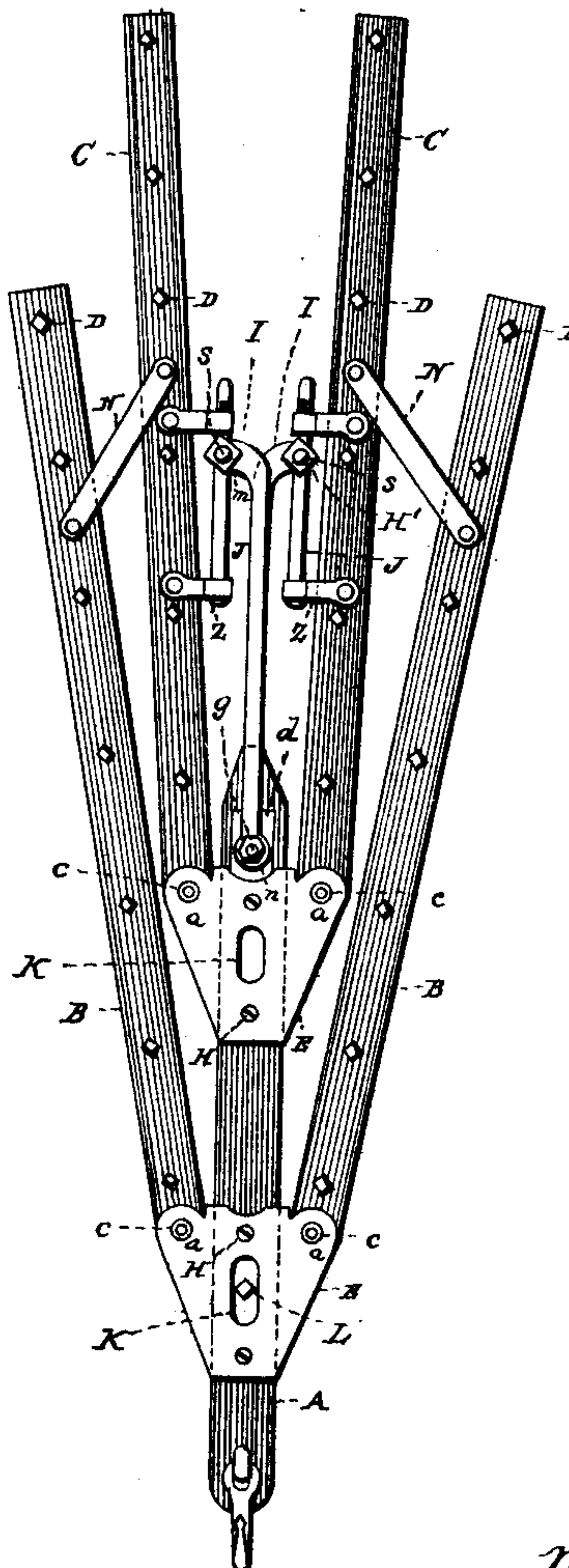


Fig. 1.



WITNESSES.

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(No Model.)

2 Sheets—Sheet 2.

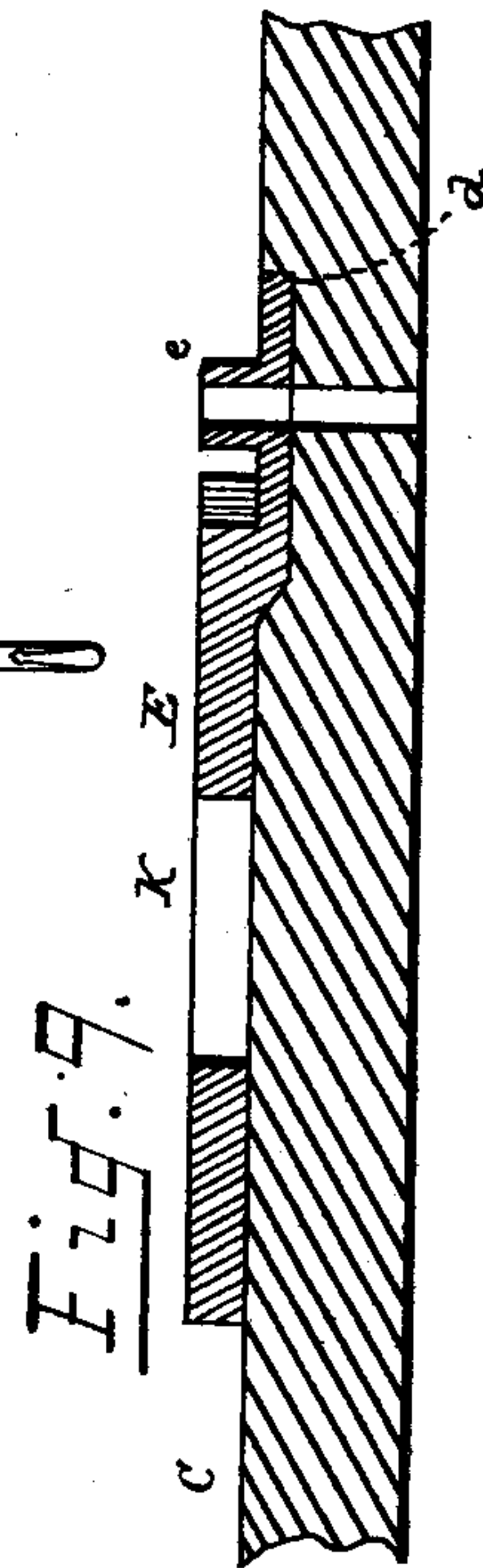
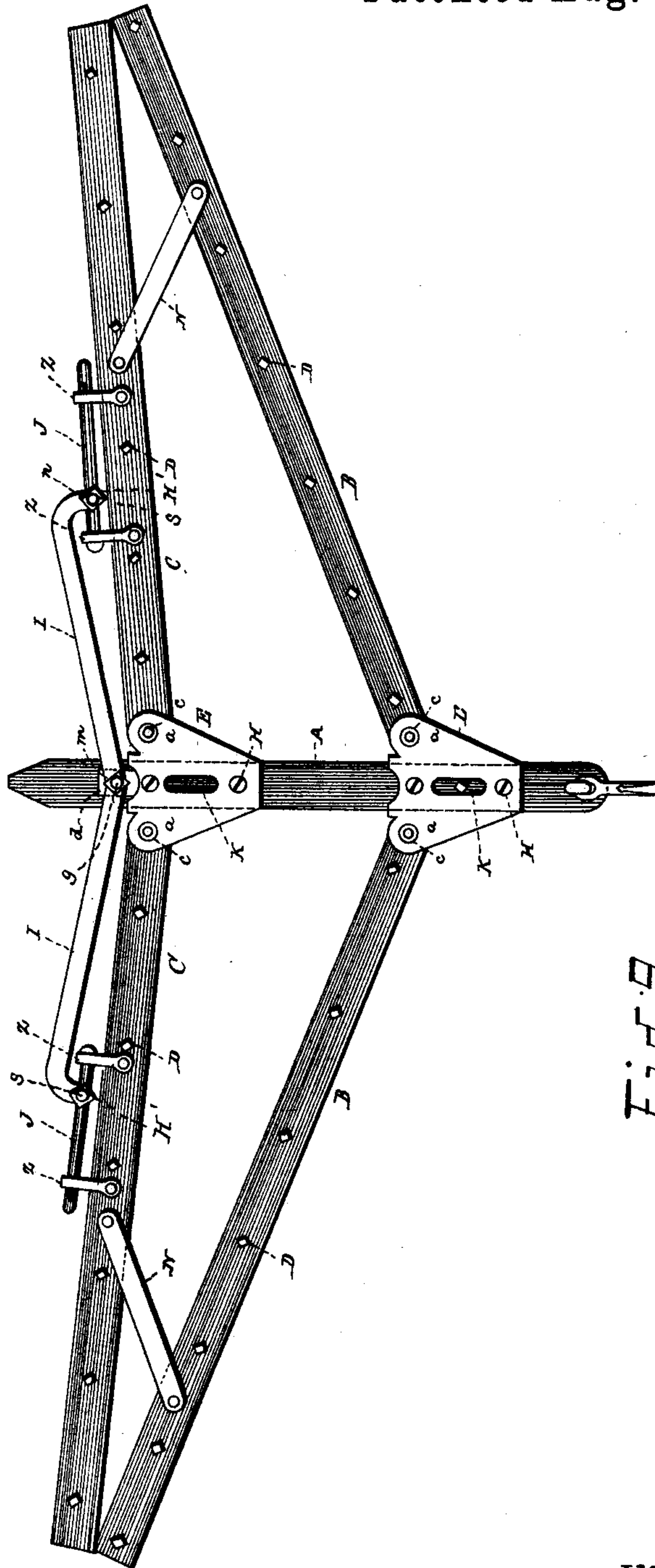
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Fig. 2.



WITNESSES,

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UNITED STATES PATENT OFFICE.

MARION M. ROBERTS, OF GOSSETT, ILLINOIS.

HARROW.

SPECIFICATION forming part of Letters Patent No. 388,222, dated August 21, 1888.

Application filed March 20, 1888. Serial No. 267,841. (No model.)

To all whom it may concern:

Be it known that I, MARION M. ROBERTS, a citizen of the United States, and a resident of Gossett, in the county of White and State of Illinois, have invented certain new and useful Improvements in Harrows; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

Figure 1 of the drawings is a representation of the harrow, being a top view thereof. Fig. 2 is the same in open or spread position. Figs. 3, 4, 5, 6, 7, 8, and 9 are detail views.

This invention has relation to folding harrows; and it consists in the construction and novel combination of devices, all as herein-after set forth.

The object of the invention is to provide a V-form harrow which is easily adjusted to span any desired breadth of ground within its limits and is readily adapted to operate on soils of varying character.

In the accompanying drawings, the letter A designates the main beam or stem of the harrow, to which are pivoted the front set of wing-beams, B B, and the rear set of wing-beams, C C. These wing-beams are provided with teeth D, which are preferably arranged at the same distance apart in the various wing-beams.

E represents a form of coupling-plate which has the general shape of an arrow-head, its inner surface being provided with the parallel longitudinal ribs F, extending the entire length of the plate, and between which is the bearing portion G of said plate, which fits neatly on the upper or lower face of the central beam, A, said beam being therefore embraced between the ribs of the plate. Fastening-screws H are employed to secure the plates to the beam. The wings *a a* of the plates extend beyond the main beam on each side, and are provided with perforations *b b* for the pivot-bolts *c*, which pass through the ends of the wing-beams. These plates are used in pairs, those of each pair being placed on the upper and under faces of the main beam and secured thereto, the vertical intervals between

the wings *a a* forming seats for the pivotal ends of the beams. Usually a central slot, K, is made in each plate to facilitate the application of a central draft-tooth, L.

One pair of plates is placed in rear of the other pair, as indicated in the drawings, and the upper plate of the rear part is provided with a rear offset or tail-lug, *d*, which is depressed or cast below its general level, in order that it may be let into a recess cut for its reception in the main beam A. This lug is provided with an upwardly-projecting cylinder-stud, *e*, which is centrally perforated, the perforation extending downward through the main beam for the passage of the bolt *g*. The front and rear wing-beams are of similar or nearly similar length, and are connected near their rear ends by oblique links N, which are shorter than the distance between the pivots of the front wing-beams and those of the rear wing-beams. The object of this construction is to avoid parallelism of the wing-beams, and it will be observed that they will be parallel only at one point of their angular adjustment. When spread outward from this position, they will approach each other at their outer ends, and when contracted from their parallel position toward the main beam they will have their rear ends divergent. In this manner the effect of the teeth with which the wing-beams are provided will vary, because in some positions the teeth of the rear beams will follow in the tracks of those of the front beams more or less accurately, while in other positions the rear teeth will operate between the tracks of the front teeth. The adjustment of the wing-beams of the harrow may thus be made to suit soil of varying degrees of hardness. When the wing-beams are spread outward to their fullest extent, they span a breadth which may readily include a transverse surface of fourteen feet, and they may be contracted to a span of two feet, if necessary.

In order to hold the wing-beams to their adjustment, the braces I I are provided. These braces have at their inner ends the eyes *m*, which are pivoted on the stud *e* of the tail-lug *d*, and are secured by the bolt *g*.

The outer ends of the braces I I are provided with eyes *n*, through which pass the stems of the eyebolts S, which receive the nuts H'. On each eyebolt is a washer, *k'*, which has an elon-

gated opening, *l*, which spans the upper portion of the eye, as indicated, this washer being located under the end of the brace *I*. The eyebolt is adjustable on a rod-bearing, *J*, which
5 is secured to the rear wing-beam of each side by the brackets *Z*, this rod-bearing having proper length to allow of the full spread of the harrow. When the wing-beams are adjusted to the spread desired, they are securely fast-
10 ened in position by turning the nuts *H'* of the eyebolts forcibly home. Then the harrow is adjusted to its greatest spread, the wing-beams nearly touch each other at their outer ends, and diverge toward the central main beam.

15 Having described this invention, what I claim, and desire to secure by Letters Patent, is—

1. In a harrow, the combination, with the central beam, the front and rear pairs of wing-
20 beams, and the braces *I*, of the coupling-plates having the parallel longitudinal ribs provid-

ing the bearing portion and having the lateral wings, and the plate having the parallel ribs, the lateral wings, and the rear lug, *d*, provided with the upwardly-projecting cylinder-stud *e*, the said plates placed in pairs above
25 and below the beam, substantially as specified.

2. In a harrow, the combination, with the central beam and the wing-beams, of the coupling-plates, the links shorter than the distance
30 between pivotal points of the front and rear wing beams, the bearing-rods secured in the brackets *Z*, and the adjustable braces having the eyebolts *S*, the nuts *h*, and the washers having the elongated opening, substantially as
35 specified.

In testimony whereof I affix my signature in presence of two witnesses.

MARION M. ROBERTS.

Witnesses:

WILLIS CARLISLE,
BENJ. L. JONES.