No. 787,011. PATENTED APR. 11, 1905.

O. TOWER.

HARROW.

APPLICATION FILED OCT. 8, 1903.

Fig. 1.

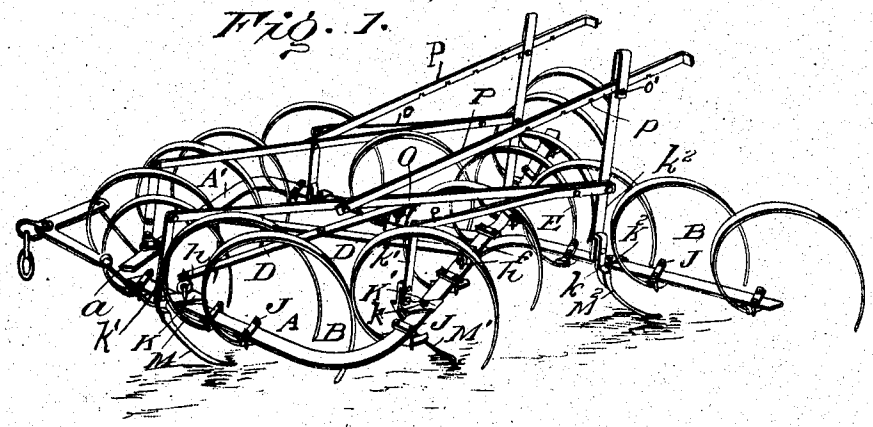


Fig. 2.

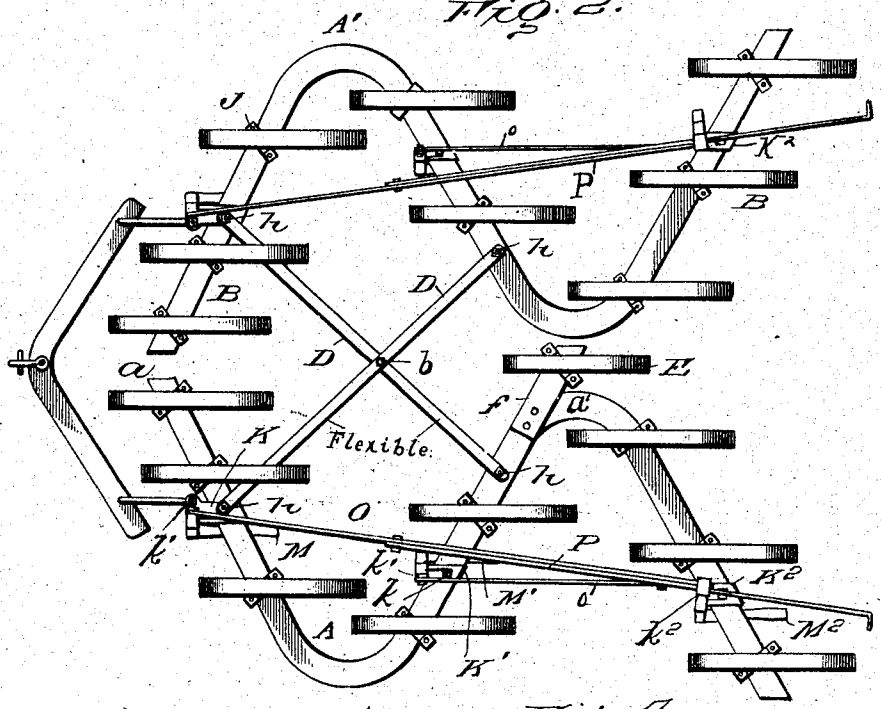


Fig. 3.

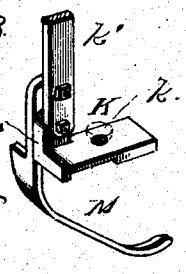
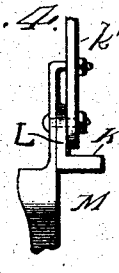


Fig. 4.



Witnesses

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No. 787,011. Patented April 11, 1905.

UNITED STATES PATENT OFFICE.

OSCAR TOWER, OF WILSON, NEW YORK.

HARROW.

SPECIFICATION forming part of Letters Patent No. 787,011, dated April 11, 1905.

Application filed October 8, 1903. Serial No. 176,271.

To all whom it may concern:

Be it known that I, OSCAR TOWER, a citizen of the United States, residing at Wilson, in the county of Niagara and State of New York, have invented new and useful Improvements in Harrows, of which the following is a specification.

My invention relates to improvements in harrows, and pertains to a harrow which is constructed of two independent S-shaped frames which are flexibly connected, all of which will be fully described hereinafter.

The object of my invention is to provide a harrow which is composed of two frames, the said frames preferably being essentially S-shaped in plan view, and these two frames are so connected that they have a flexible or hinge movement for the purpose of following the inequalities of the ground.

Another object of my invention is to provide a harrow of this character which is adapted to be raised or lowered in order to regulate the depth the teeth are to enter the ground.

In the accompanying drawings, Figure 1 is a perspective view of my improved harrow. Fig. 2 is a top plan view of Fig. 1. Fig. 3 is an enlarged perspective view of the shoe and its operative connection. Fig. 4 is an enlarged end view of Fig. 3.

Referring now to the drawings, A and A′ indicate two harrow-frames which are preferably constructed of flat metal bars, the said frames being, as shown, S-shaped in plan view. These frames A and A′ have independent movement and are situated in relation to each other as herein shown. The relative position of these two S-shaped frames is with their front ends *a* placed adjacent to but out of contact with each other and their intermediate rear double portions placed adjacent to but out of contact with each other, as also illustrated.

My invention aside from consisting of the two S-shaped frames connected in any desired manner also pertains to an improved means for connecting these frames together in a manner whereby they have a hinge movement and also a flexible movement, owing to the flexibility of the connecting members themselves. This part of my invention I will now explain. The connecting members consist of flat flexible bars D, which have their forward ends connected with the forward portions of the S-shaped frames and their rear ends connected with the inwardly-extending rear portions of the said frames. The connections are preferably of the hinge type and consist, as here shown, of the eyebolts *h*, the lower ones of which are bolted to the S-shaped frames and the upper ones of which are bolted to the flexible members D. A bolt *b* passes through both of these flexible bars at their point of intersection or crossing, as indicated, and this means of connection serves to hold the harrows in their relative positions, while at the same time the hinge connections and the flexibility of the members or bars D themselves serve to make a harrow which is very flexible and easy as it passes over the surface and very adequately and thoroughly follows the inequalities of the ground. Also by means of the hinge connection here shown it will be seen that these connecting members are supported considerably above the frame, and thus are so situated that they do not tend to collect any of the trash or debris, and thus avoid clogging of the machine.

The harrow-teeth B, which are preferably of the spring type, as here shown, and which are adjustably clamped to the frames A and A′ by suitable clamping members J, are so situated as to thoroughly cover and to thoroughly harrow the ground over which the machine is passing. It will be noted, however, that the front ends *a* of the frames being some distance apart there is left a space which is not covered by the teeth, and in order to cover this space I provide the inwardly-bulged portion *a′* of one of the frames with an inwardly-extending bracket *f*, to which is connected a spring-tooth E, which closes in and fills the space left between the ends *a*. In order to limit the distance the said teeth will enter the ground, I provide each of said frames A and A′ with the brackets K, K′, and K^2, which are removably held thereon by bolts *k*, said brackets being provided with upwardly-extending portions L, to which are intermediately pivoted the shoes M, M′, and M^2. While I have shown three brackets and

three shoes for each of the two sections of the harrow, I do not care to limit myself to any number, as two or more may be used. Pivoted to the opposite side of the brackets K and K^2 are the upwardly-extending arms k' and k^2, which are connected by the horizontal bar O. The bracket K′ has pivoted thereto an upwardly-extending arm k', which is connected at its upper end to the bar O by an arm o, and the lower end of said arms k, k', and k^2 is pivoted to its respective shoe, and thus it will be seen that the backward or forward movement of the bars O and o will throw the shoes up or down, and thus raise or lower the main body of the harrow. The rear arm k^2 extends considerably above the horizontal bar O and has its upper end turned downwardly and has a pin o' passing through the same. Pivotally connected to the horizontal member O intermediate its ends is a bar P, which extends through the doubled portion of the member k^2, and the lower face of said bar P is provided with notches p, which are adapted to rest upon the pin o', and thus the forward or backward movement of the bar P will throw the shoes at a different angle, and thus the harrow is raised or lowered. It is understood that the construction and arrangement of this raising and lowering mechanism is precisely the same for each section, and the two sections are independent of each other.

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

1. A harrow, consisting of two opposed essentially **S**-shaped frames, the forward ends of said frames approximately abutting and forming a bulged-forward portion, and the rear ends of said frames extending outwardly forming a fan-tail rear portion and teeth carried by the said frames.

2. A harrow consisting of two essentially **S**-shaped frames having their front ends adjacent to each other but disconnected, and their rear inwardly-extended double portions adjacent to each other but disconnected, teeth carried by the said frames, and flexible connections between the frames, substantially as described.

3. A harrow consisting of two opposed essentially **S**-shaped frames, the forward ends of said frames approximately abutting and forming a bulged-forward portion, and the rear ends of said frames extending outwardly forming a fan-tail rear portion, flexible bars having their rear ends connected respectively with the two frames, said bars crossing at a point intermediate their ends and pivoted together at said point, and their forward end connected respectively to the two frames.

4. A harrow consisting of two opposed essentially **S**-shaped independent frames, connecting-bars having their forward ends loosely connected to the front ends of said frames, said bars crossing and pivoted together at said point, and their rear ends connected to the respective frames.

5. A harrow consisting of two essentially **S**-shaped frames, the front ends of the frames being separated, teeth connected with the said frames, connections connecting the said frames, the rear inwardly-double portion of one of the frames provided with an inwardly-extending bracket, and a harrow-tooth connected with the said bracket, substantially as described.

6. A harrow comprising a frame, teeth carried by said frame, upwardly-extending ears rigidly carried by said frame, a transverse bolt passing through said ears, a lever having its lower end mounted on said bolt on one side of said ears, a shoe intermediately mounted on said bolt on the opposite side of said ears, and a laterally-extending member carried by the upper end of said shoe and passing loosely through said lever.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

OSCAR TOWER.

Witnesses:
MAUD HAMLIN,
F. A. SANFORD.