

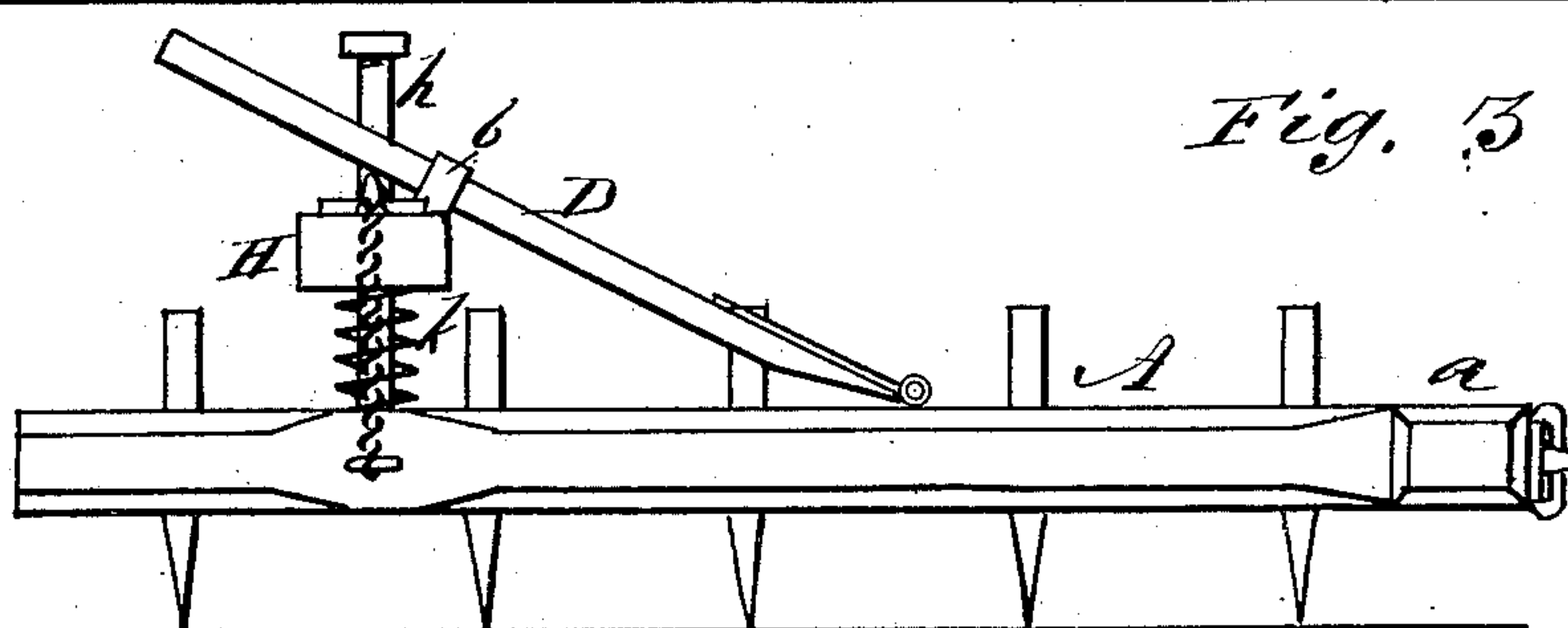
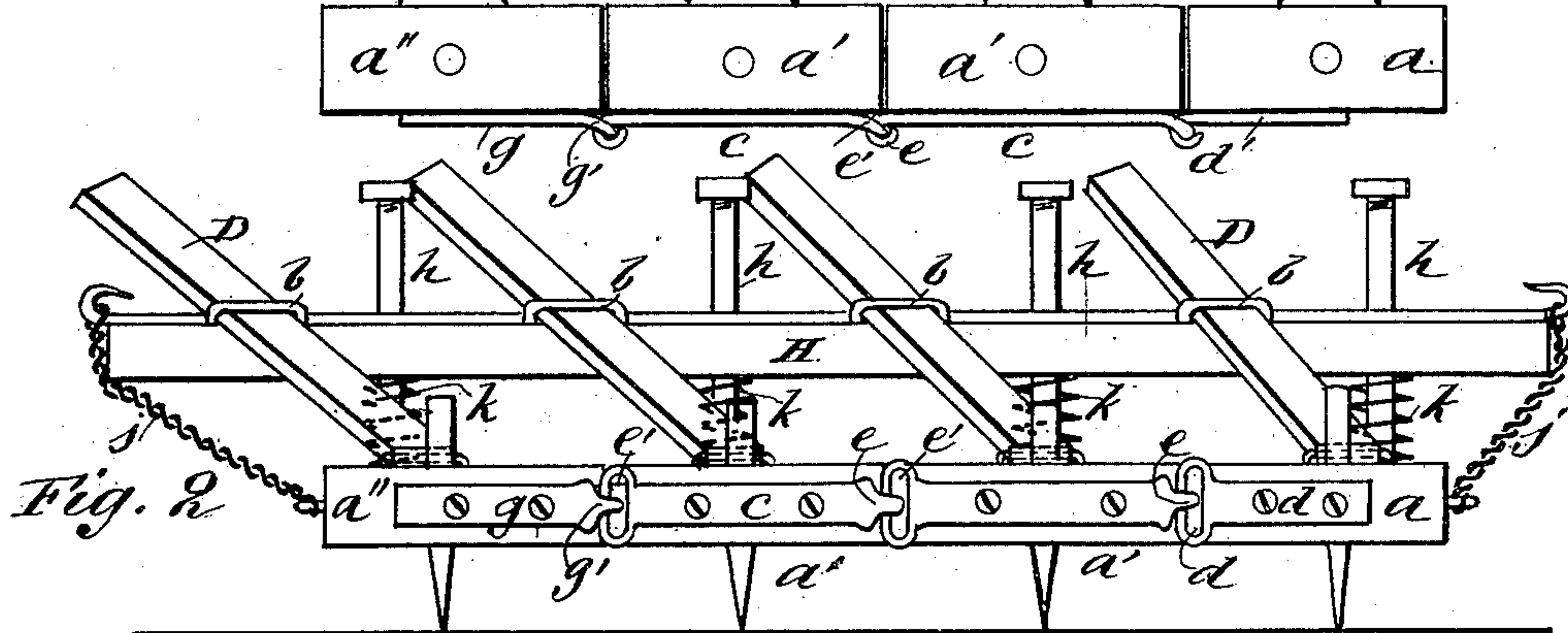
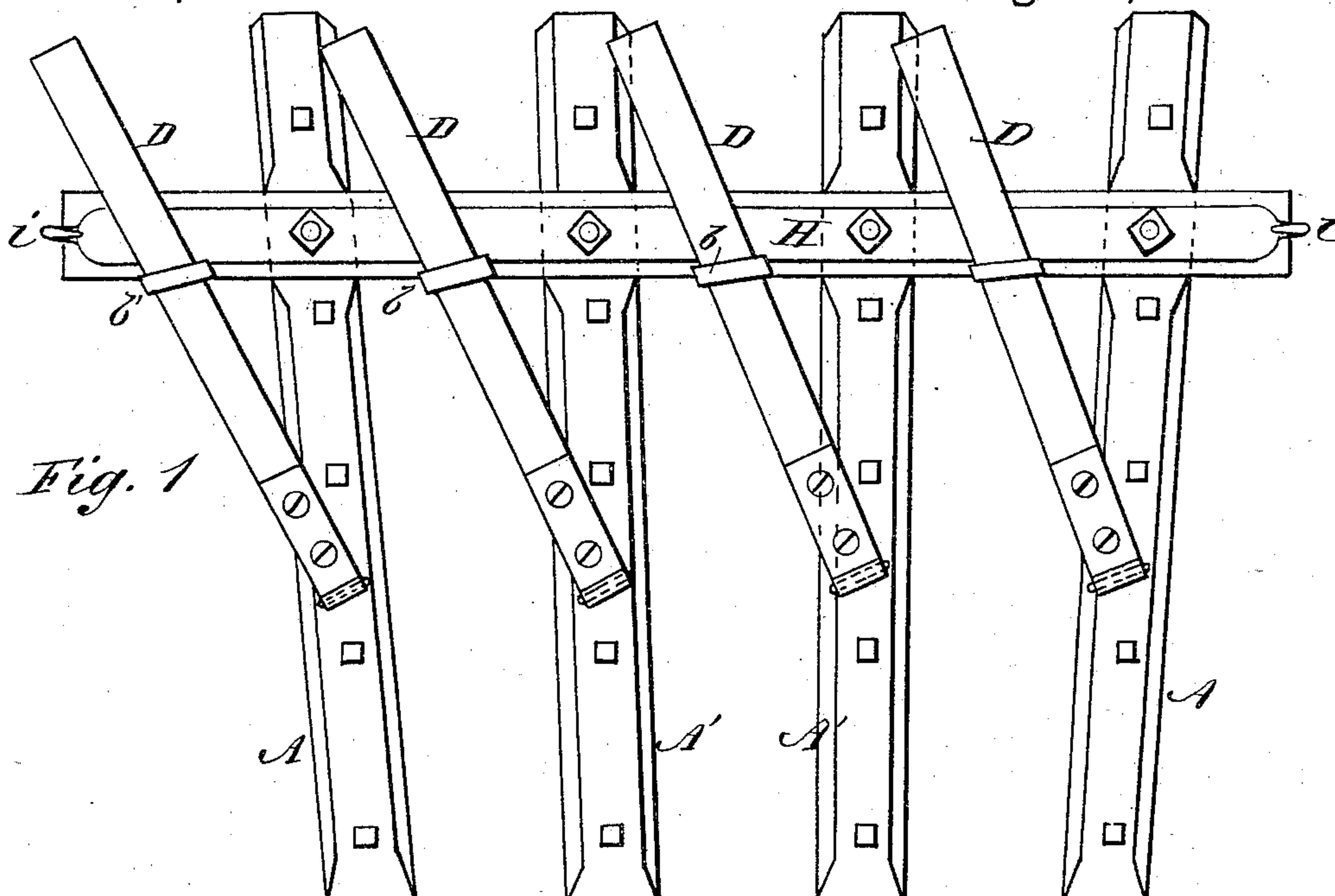
(Model.)

W. J. CAMPBELL.

HARROW.

No. 246,076.

Patented Aug. 23, 1881.



WITNESSES:

C. Veroux
C. Sedgwick

INVENTOR:

W. J. Campbell
BY *Munn & Co*
ATTORNEYS.

UNITED STATES PATENT OFFICE.

WILLIAM J. CAMPBELL, OF REED'S GAP, PENNSYLVANIA.

HARROW.

SPECIFICATION forming part of Letters Patent No. 246,076, dated August 23, 1881.

Application filed June 2, 1881. (Model.)

To all whom it may concern:

Be it known that I, WILLIAM JAMES CAMPBELL, of Reed's Gap, in the county of Juniata and State of Pennsylvania, have invented a new and useful Improvement in Harrows, of which the following is a specification.

The object of my invention is to provide means whereby the center bars of the harrow may be weighted by the side bars, and thus caused to make deeper cuts; and also to provide a harrow the teeth-bars of which may be readily detached from each other for convenience in transportation and stowing away.

In the accompanying drawings, Figure 1 is a plan view of my invention. Fig. 2 is a front elevation, and Fig. 3 is a side elevation.

Similar letters of reference indicate corresponding parts.

The teeth-bars A A and A' A' are preferably provided at their forward ends with the cross-heads *a*, *a'*, *a'*, and *a''*. To the front faces of the cross-heads *a'* *a'* are secured the metal plates *c c*, which are each formed at one end with a hook, *e*, and at the other end with an elongated loop, *e'*. To the front face of the cross-head *a* is secured the plate *d*, which is provided at one end with the loop *d'*, and to the forward end of the cross-head *a''* is secured the plate *g*, which is provided with the hook *g'*.

In putting the bars together the hooks of each of the plates are placed into the loops of each of the other plates, and thus each bar may have vertical movement independent of the other bars to the extent of the length of the loops, so that in passing over clods or over uneven ground all of the bars will not be lifted up, as heretofore, by the knoll or clod and leave a considerable ground unharrowed, but the bars not immediately upon the knoll or clod will still rest upon the ground and perform their work.

In order to tie the rear ends of the bars together and keep them the proper distance apart, I place upon the vertical rods *h h*, which rods pass through the bars, the cross-bar H, which fits loosely upon the rods, and upon each of the rods *h h*, between the bar H and the teeth-bars, I place the spiral springs *k k*.

The ends of the bar H are provided with the hooks *i i*, into which the chains *j j*, attached to the staples driven in the outsides of the bars A A, are adapted to be placed.

By this construction the springs may be compressed by the bar H, and the bar held by the chains, in which condition the springs cause the central teeth-bars to take deeper cuts in the ground than they otherwise would.

To prevent the teeth-bars from tipping laterally, I hinge to the top of each bar the bars D D, which are secured to the upper side of the cross-bar H in a diagonal position by the staples *b b*, which fit the bars D D loosely, admitting longitudinal movement of the bars D, so as not to interfere with the vertical movement of the teeth-bars or the cross-bar H, but which hold the teeth-bars against too much lateral tipping.

In order to separate the teeth-bars, the bar H must first be taken off the rods *h h*. Then the bars will be free to be unhooked from each other and the whole packed in a small space.

Having thus fully described my invention, I claim as new and desire to secure by Letters Patent—

1. The plates *c c*, formed with elongated loops and with hooks, and the plate *d* formed with the loop *d'*, and the hooked plate *g*, secured to the front faces of the cross-heads *a a' a''*, in combination with the independent teeth-bars of the harrow, substantially as and for the purposes specified.

2. The teeth-bars, in combination with the bar H, rods *h*, springs *k*, and the chains *j*, substantially as and for the purposes specified.

3. The hinged teeth-bars, in combination with the bars D and the cross-bar H, substantially as and for the purposes specified.

4. The harrow herein shown and described, consisting of the hinged and vertically-movable teeth-bars A and A', hinged bars D, cross-bar H, rods *h*, and springs *k*, substantially as and for the purposes specified.

WILLIAM JAMES CAMPBELL.

Witnesses:

R. J. ANDERSON,
WILLIAM C. MAGILL.