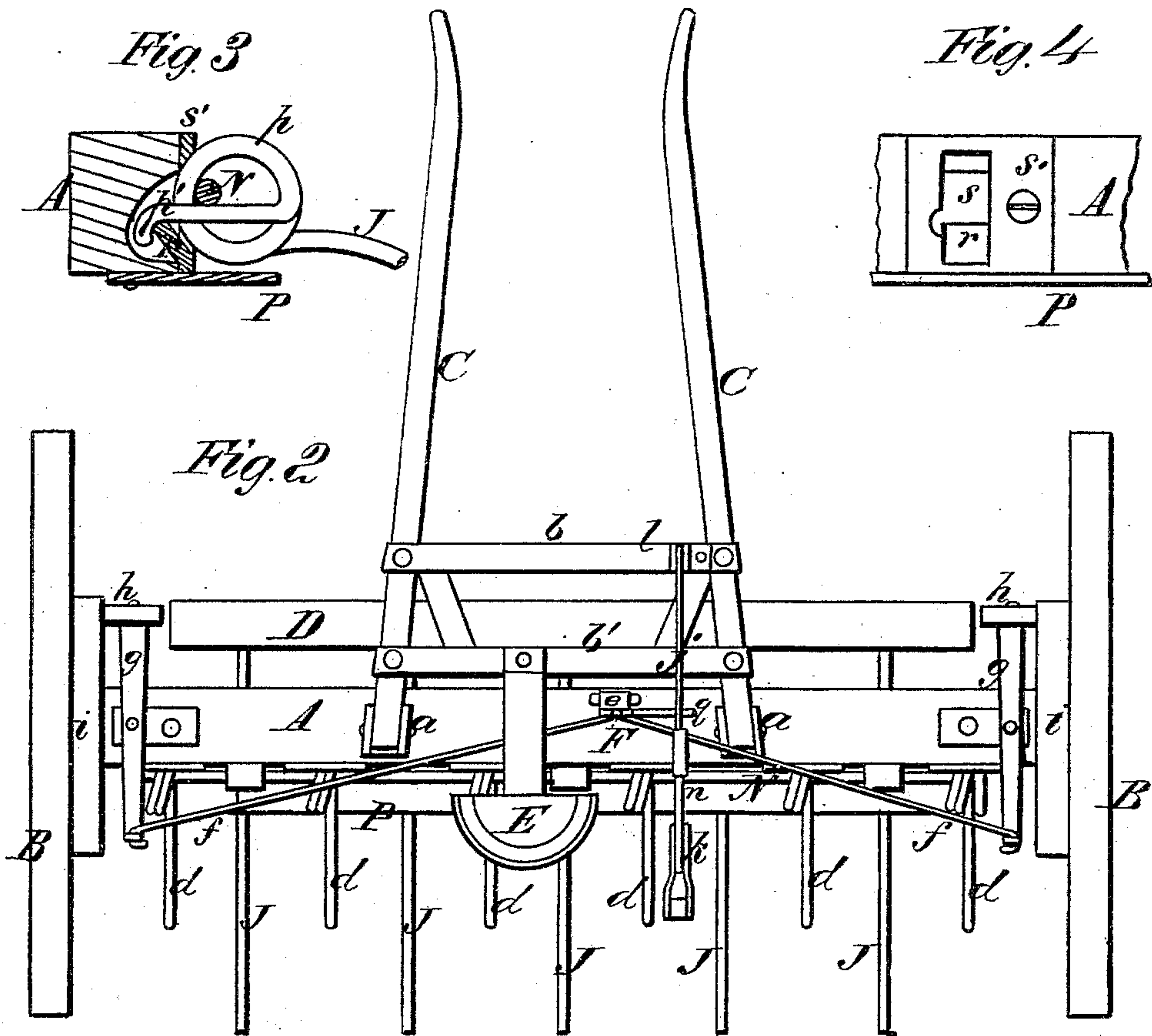
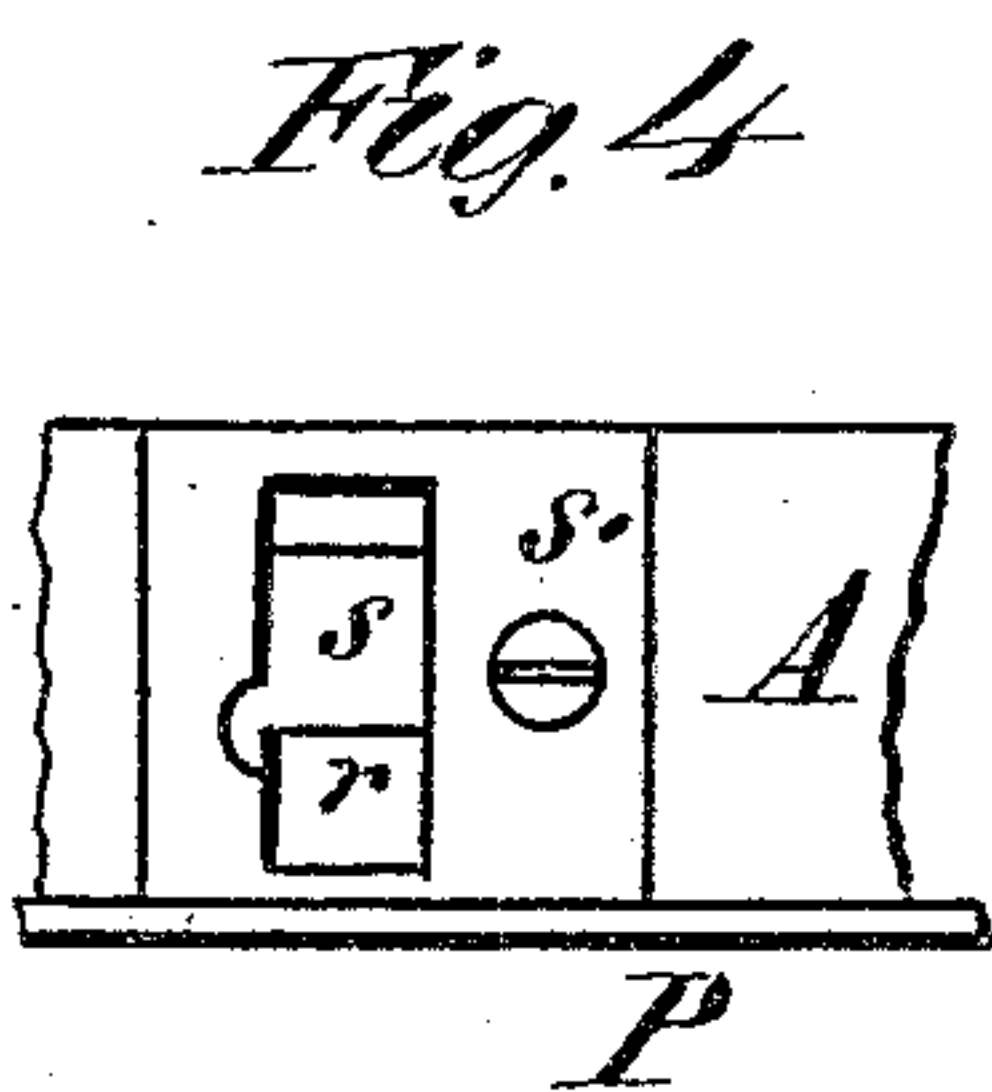
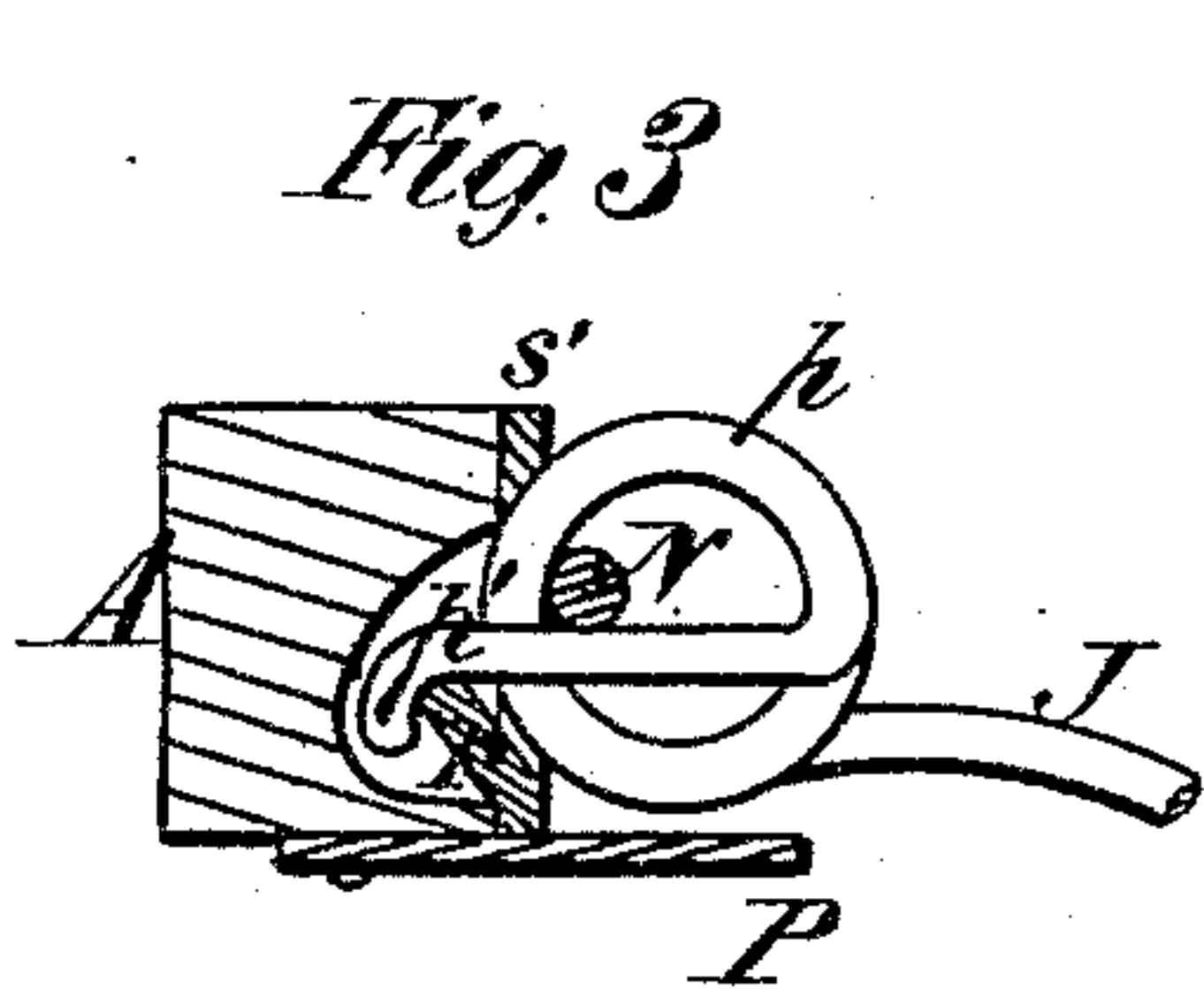
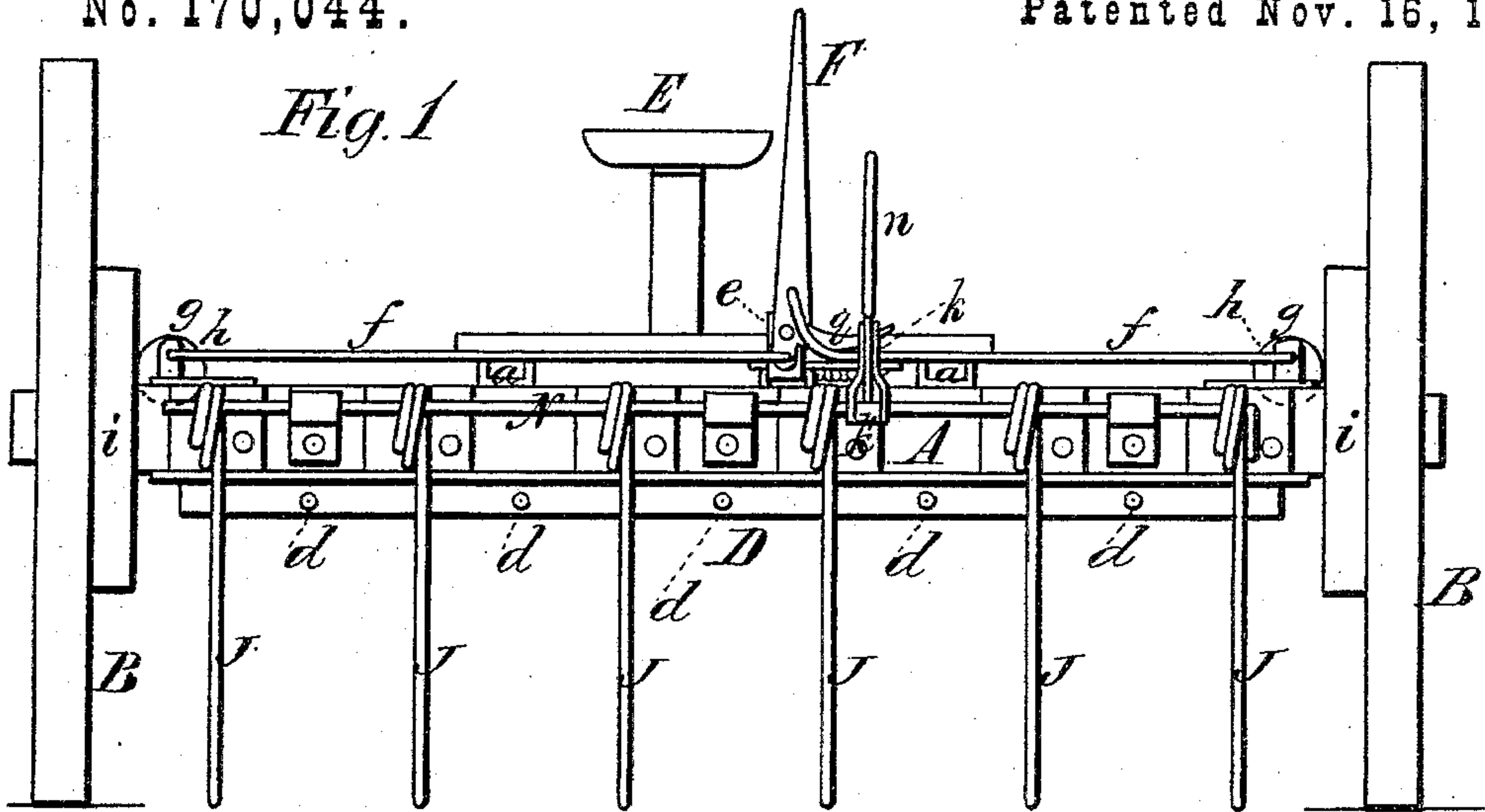


J. BADGER.  
HORSE-RAKE.

No. 170,044.

Patented Nov. 16, 1875.



WITNESSES  
*E. H. Bates*  
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By

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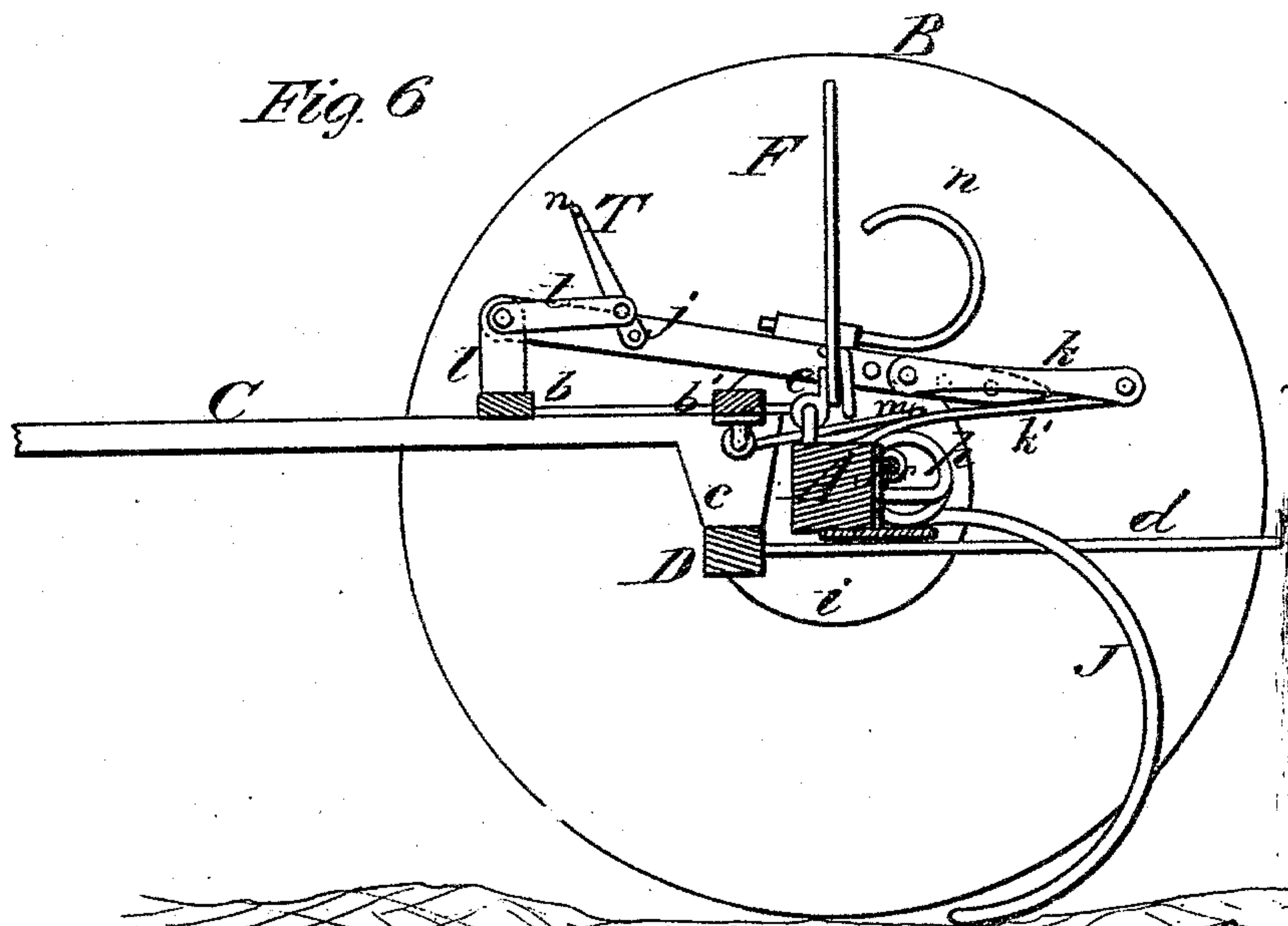
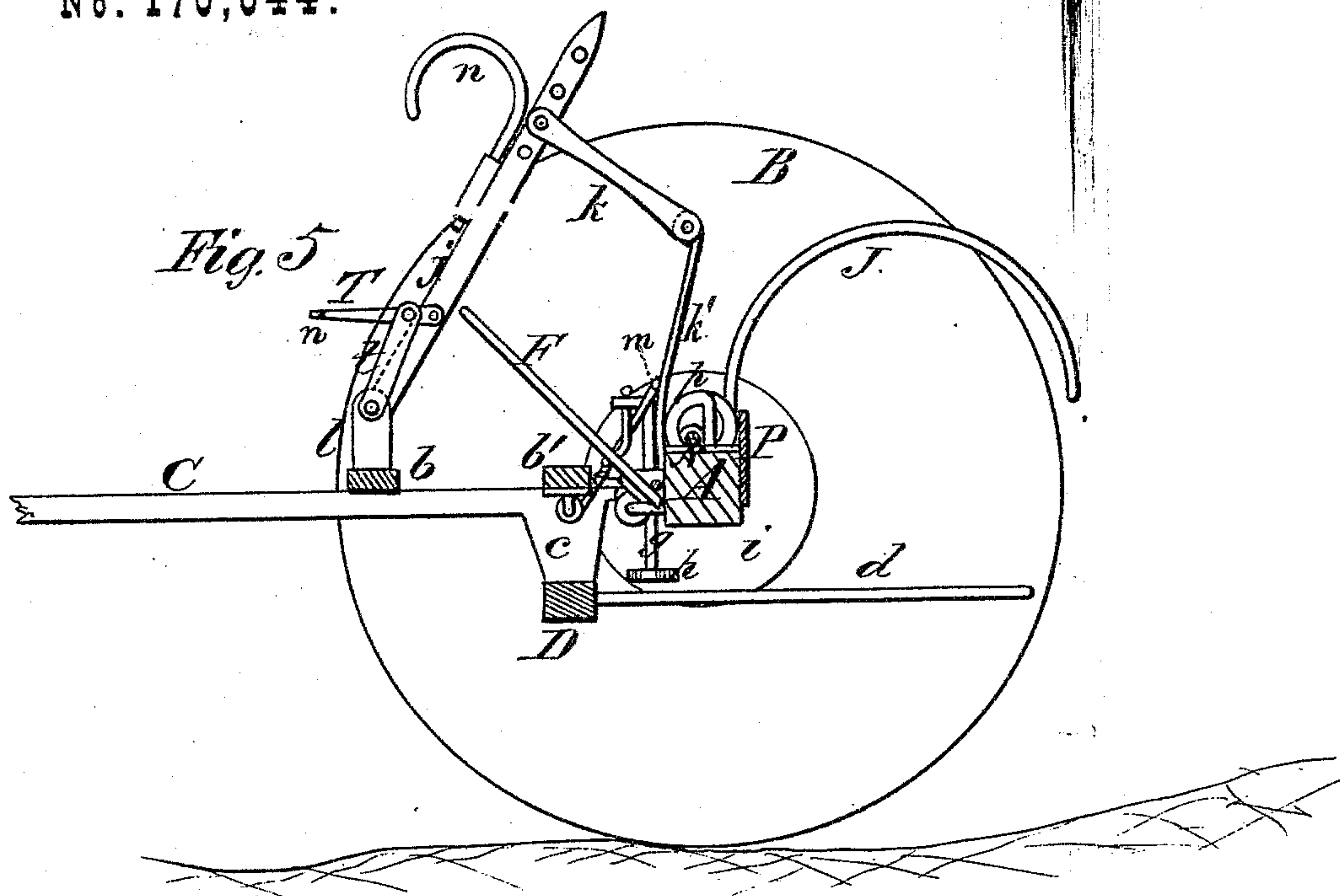
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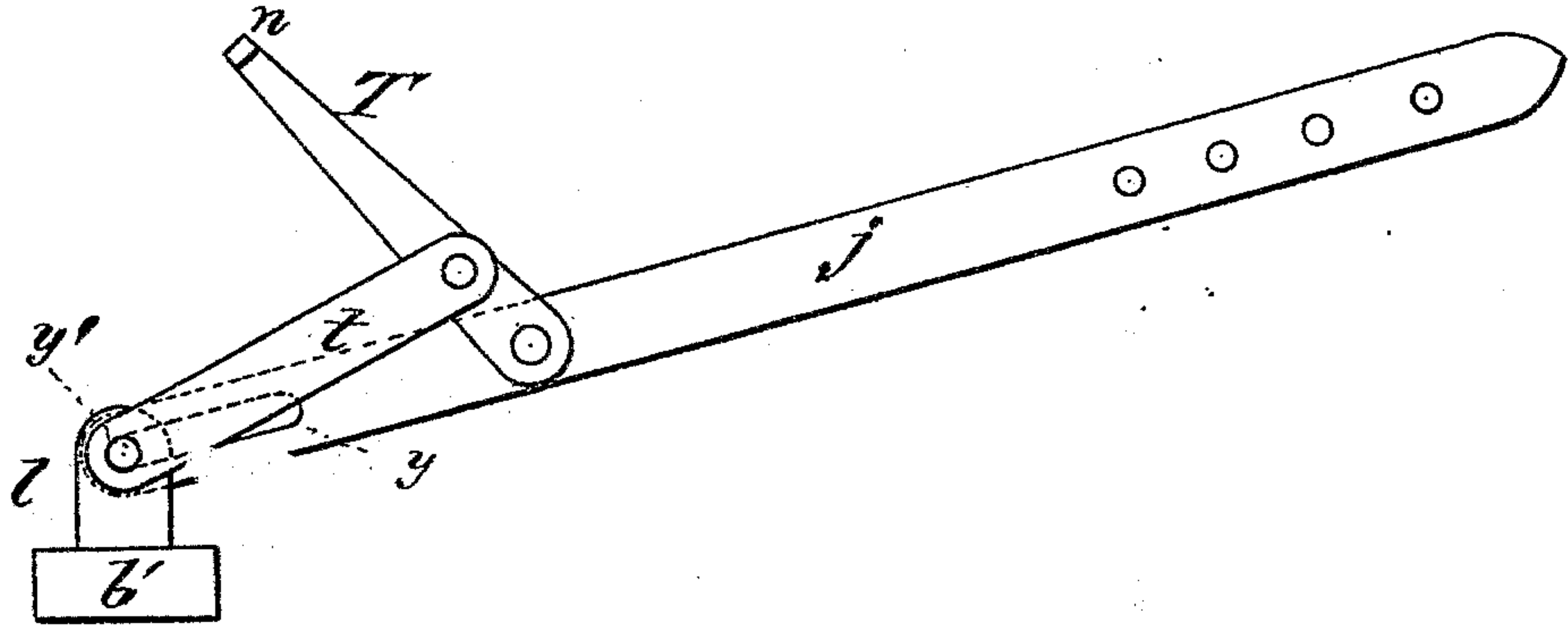
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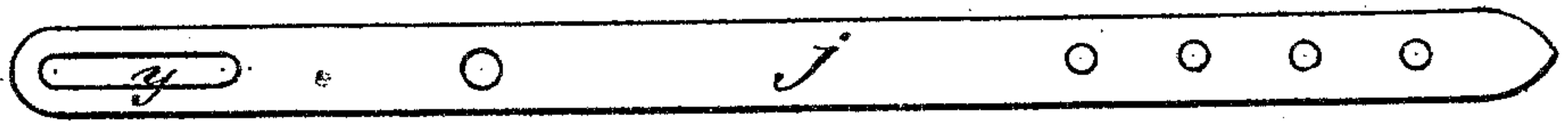
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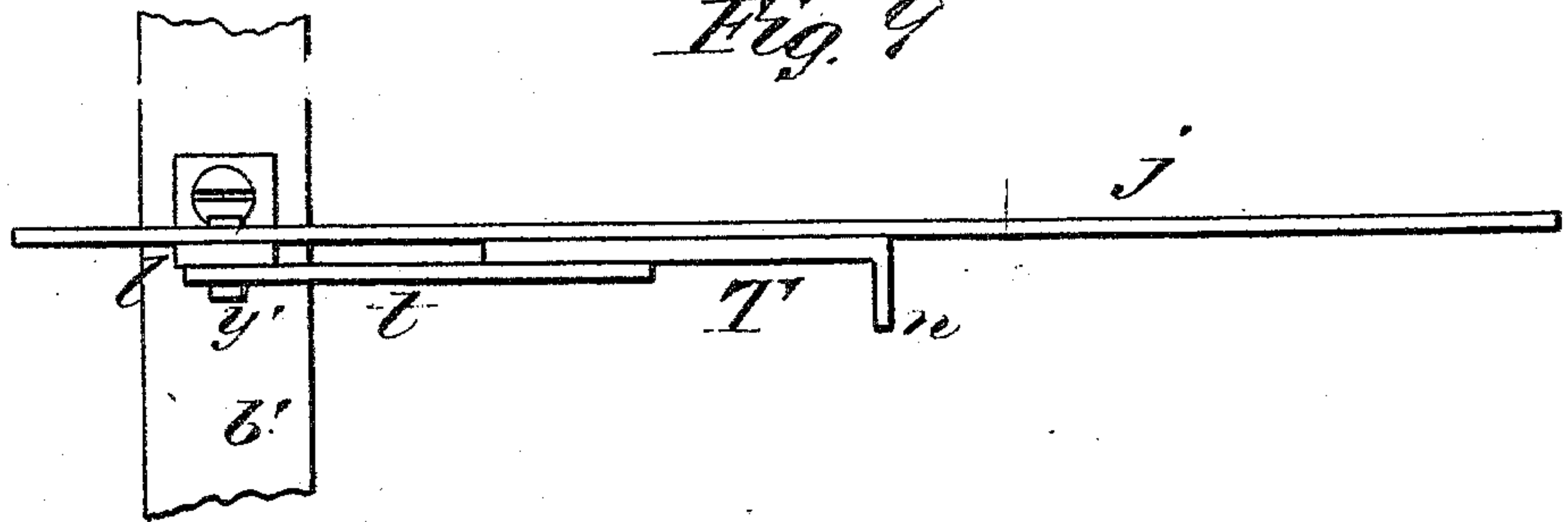
*Fig. 7*



*Fig. 8*



*Fig. 9*



WITNESSES

*George E. Upham.*  
*Robert Everett.*

*George E. Lamon*

*John Badger*

INVENTOR

ATTORNEY



# UNITED STATES PATENT OFFICE.

JOHN BADGER, OF BELVIDERE, ILLINOIS.

## IMPROVEMENT IN HORSE-RAKES.

Specification forming part of Letters Patent No. 170,044, dated November 16, 1875; application filed September 27, 1875.

*To all whom it may concern:*

Be it known that I, JOHN BADGER, of Belvidere, Boone county, Illinois, have invented a Horse Hay-Rake, of which the following is a specification:

This invention has relation to horse hay-rakes which are so constructed that the draft of the horse is utilized for raising the rake-teeth and discharging the gathered loads; and the nature of my invention consists, mainly, in novel devices for enabling the driver, while sitting in his seat, to cause the pull of the horse to tilt forward the axle and raise the rake-teeth, at the same time depressing the clearing-teeth and discharging the gathered load, as will be hereinafter explained.

The invention further consists in a combination of levers worked by hand, by which the rake-teeth can be locked and unlocked with facility and quickness, the locking being obtained by passing with one lever below the center of motion of the other, and the unlocking by raising the first lever above the center of motion of the other.

The invention also consists in novel means for attaching the spring-coils of metallic rake-teeth to the axle or rake-head, whereby any one or more teeth can be readily detached from its place by moving a single rod or key applied to the back of the axle of the two transporting-wheels, as will be hereafter explained.

The invention further consists in combining a spring with a tilting axle, when so applied that it will assist in returning the teeth to a raking position after the discharge of each load, as will be hereafter explained.

The invention further consists in the attachment of a small lever to one member of the combination locking-lever, whereby said member can, by means of a slot made therein, be lengthened or shortened at will on its fulcrum or point of attachment, so as to cause the teeth of the rake to be adjusted to slight inequalities of the ground, or variances in the crop sought to be raked, without lifting the combination-lever out of lock, as will be hereafter explained.

In the annexed drawings, Figure 1 is a rear view of my improved machine. Fig. 2 is a plan view of the same. Figs. 3 and 4 are de-

tail views, showing the devices for attaching the rake-teeth to the rake-head. Figs. 5 and 6 are sectional views. Figs. 7, 8, and 9 are detail views.

A designates the axle of two transporting-wheels, B B, and C C are the thills, which are suitably hinged to the top of the axle A at *a a*, and which are connected together by cross-bars *b b'*, properly braced. At the rear ends and lower sides of the thills, blocks *c* are rigidly secured, to which a horizontal transverse head, D, is secured, into which clearing-teeth *d* are fixed, which extend back beneath the axle A, for the purpose of clearing the rake teeth when these teeth are thrown up, as will be hereinafter explained.

E designates the driver's seat, the standard of which is secured to the cross-bar *b'* of the thills, and extends upward and backward over the axle A, alongside of a compound lever used for locking the rake-teeth down to their work, and for unlocking the same and raising the rake-teeth to discharge the load, and also a hand-lever, F, which can be used for the same purpose. The hand-lever F is pivoted to a piece, *e*, so that lateral vibration can be given to it, which piece articulates forward and backward on a staple fixed to the top of the axle. The hand-lever F is thus allowed to receive a forward as well as a backward motion. This lever F is connected by two rods, *f f*, to the rear extremities of two short levers, *g g*, pivoted to plates on top of, and near, the extremities of the axle A, on the front ends of which levers friction-rollers *h h* are applied, which, when they are caused to bear hard against circular plates *i i* on the inside of wheels B B, will cause the axle to be tilted forward by the draft of the horse, thus raising the rake-teeth J, and depressing the clearing-teeth *d* and discharging the load.

The compound lever above referred to for locking the rake-teeth down to their work, and for unlocking the same to discharge the load, consists of a connecting-rod, *j*, link *k*, arm *k'*, and a standard, *l*, which latter is secured to the cross-bar *b'* of the thills, and has the rod *j* pivoted to it in a slot in said rod *j*. Said rod *j* is connected in its rear portion by the link *k* to the arm *k'*, which is fixed to the top of the axle. Said rod *j* has a number of perforations



through it for the connection of the link *k* at different points, for the purpose of adjusting the rake-teeth when in working position to run higher or lower, according to the height of the horse or the condition of the crop. The rod *j* has also a small longitudinal slot, *y*, through which the pivot-pin *y'* passes, which secures it to the standard *l*, allowing a slight degree of longitudinal motion, which motion is fixed and regulated by a short double lever, consisting of hand-lever *T*, pivoted at its extremity to the rod *j*, and an arm, *t*, pivoted near the end of said lever *T*, and fastened at its other extremity to the pivot-pin of the standard *l*, for the purpose of slightly raising or lowering the rake-teeth without unlocking the combination-lever, which locks and unlocks the same. The rod *j* has a curved handle, *n*, secured to it, by means of which the driver can conveniently adjust the parts in the position indicated in Fig. 6, and to aid in this adjustment I employ a spring, *m*, which acts on the arm *k'*, and which is secured to a staple on the bottom of the cross-bar *b'* of the thills. The handle *n* is also used for lifting the rod *j* above the center of motion, and thus releasing the lock and lifting up the rake-teeth. Each one of the rake-teeth *J* has a spring-coil, *p*, formed on one end, which terminates in a hooking end, *p'*. The spring *p* consists of one or more coils, which extend through a slot, *s*, in a plate, *s'*, fixed to the axle *A*, and receive through them a key-rod, *N*. The hook *p'* passes through the slot in plate *s'*, and catches over a lip, *r*, in the latter, which, with the key-rod *N*, rigidly holds the rake-tooth to the axle. All of the rake-teeth are confined to the axle, as above described, a single key-rod, *N*, serving for all of them, by removing which any one or more of the teeth can be detached from the axle.

In addition to the mode of releasing the lock of the compound lever heretofore described by raising the handle *n*, the same effect can be produced, when the driver desires to discharge the gathered load, by using the hand-lever *F*, and for this purpose said hand-lever *F* is constructed with a horn, *q*, which, when said hand-lever *F* is moved to the left, will lift the rod *j* out of lock, and allow the rake-teeth to be raised automatically, as above described.

The machine is perfect for use without the system of levers, rods, and friction-wheels put in motion by the use of hand-lever *F*; but by the use of such system there is less labor done by the driver and more by the horse, so as to

approach more nearly the character of an automatic machine.

To the bottom side of the axle *A* I secure a guard, *P*, which is a thin strip that extends out beyond the axle and beneath the spring-coils *p*, and prevents grass from becoming entangled with or in the coils.

I claim—

1. In a horse hay-rake mounted on two transporting-wheels, the thills *C C*, hinged to the top of the axle, in combination with a compound locking-lever for holding down or raising the lock-teeth at will, to be operated by a tripping-lever, *F*, for releasing this locking-lever when it is desired to discharge a gathered load, substantially as described.

2. In combination with an axle carrying rake-teeth, and having the draft-thills hinged to its upper side, the lever *F*, connecting-rods *ff*, levers carrying friction-rollers *h h*, and the plates *i i* on transporting-wheels *B B*, substantially as described.

3. In combination with the locking-lever *j*, formed with a longitudinal slot where the same is attached to the standard *l*, the double lever *T* and *t*, to produce a slight lengthening or shortening of said rod *j*, and thus slightly raise or lower the rake-teeth *J* without throwing the locking-lever out of lock.

4. The spring *m* on the thill-frame, in combination with the arm *k'*, axle, and locking-lever, substantially as described.

5. The hand-lever *F*, pivoted to a hinged piece, *e*, for allowing a forward, backward, and lateral vibration thereof, in combination with the oscillating rake-head *A*, having thills *C* pivoted to it, as described.

6. The guard-plate *P*, rigidly secured to the under face of the rake-head, in combination with the curved teeth *J*, provided with coils *p* immediately over the guard-plate, substantially as described, and for the purpose set forth.

7. In combination with the spring-coils *p* and hooks *p'* on teeth *J*, the plates *s'*, slotted and lipped as described, and the removable key-rod *N*, for holding the teeth in their places, substantially as described.

In testimony that I claim the above and foregoing I have hereunto subscribed my name in the presence of two witnesses.

JOHN BADGER.

Witnesses:

GEO. H. HURLBUT,  
A. E. JENNER.