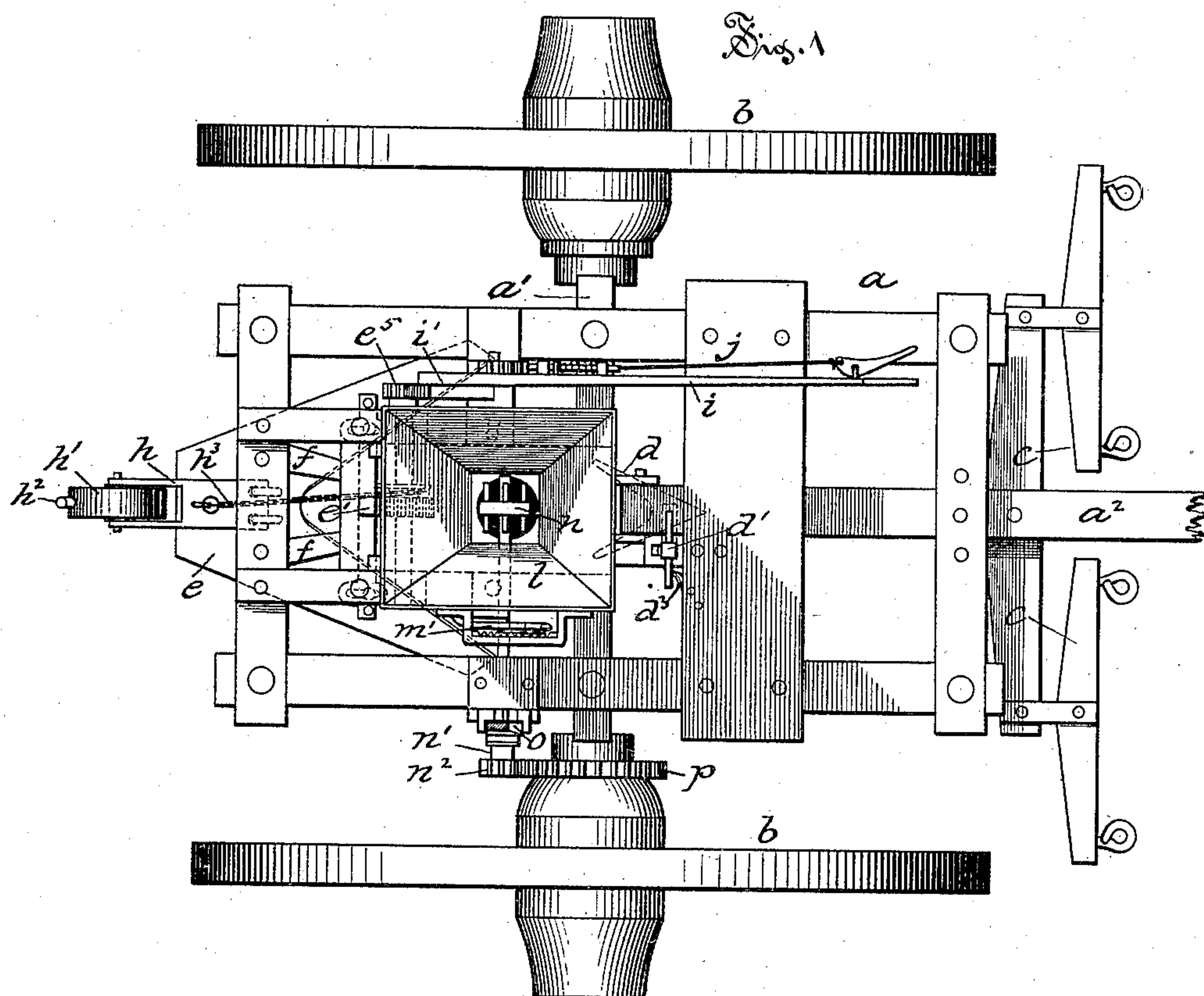


2 Sheets—Sheet 1.

FERTILIZER DRILL.

Patented Nov. 24, 1885.



Witnesses:
Wm. Sporkman.
H. P. Williams.

Inventor:
Augustus W. Kappenberg
By Simonds & Burdett,
Attys.

(No Model.)

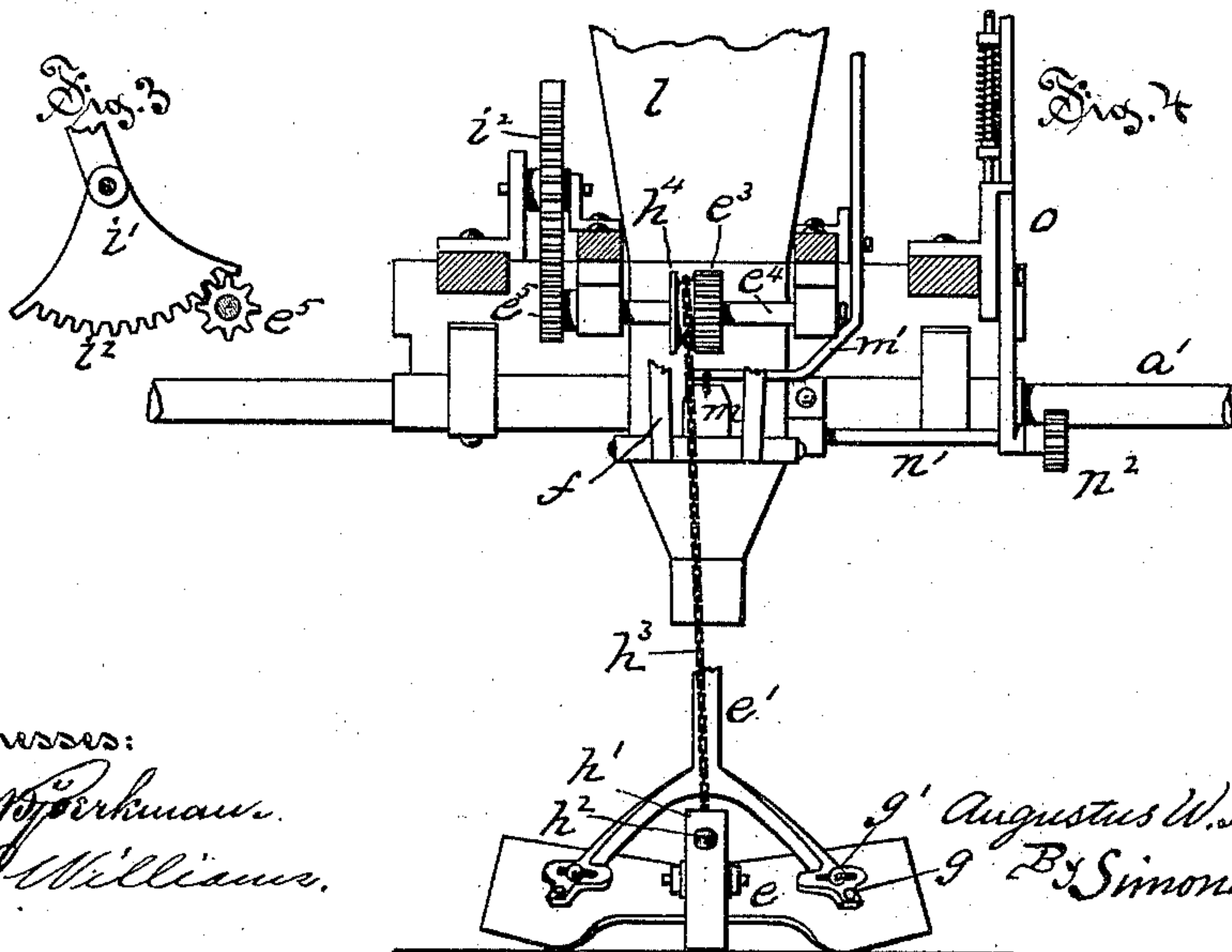
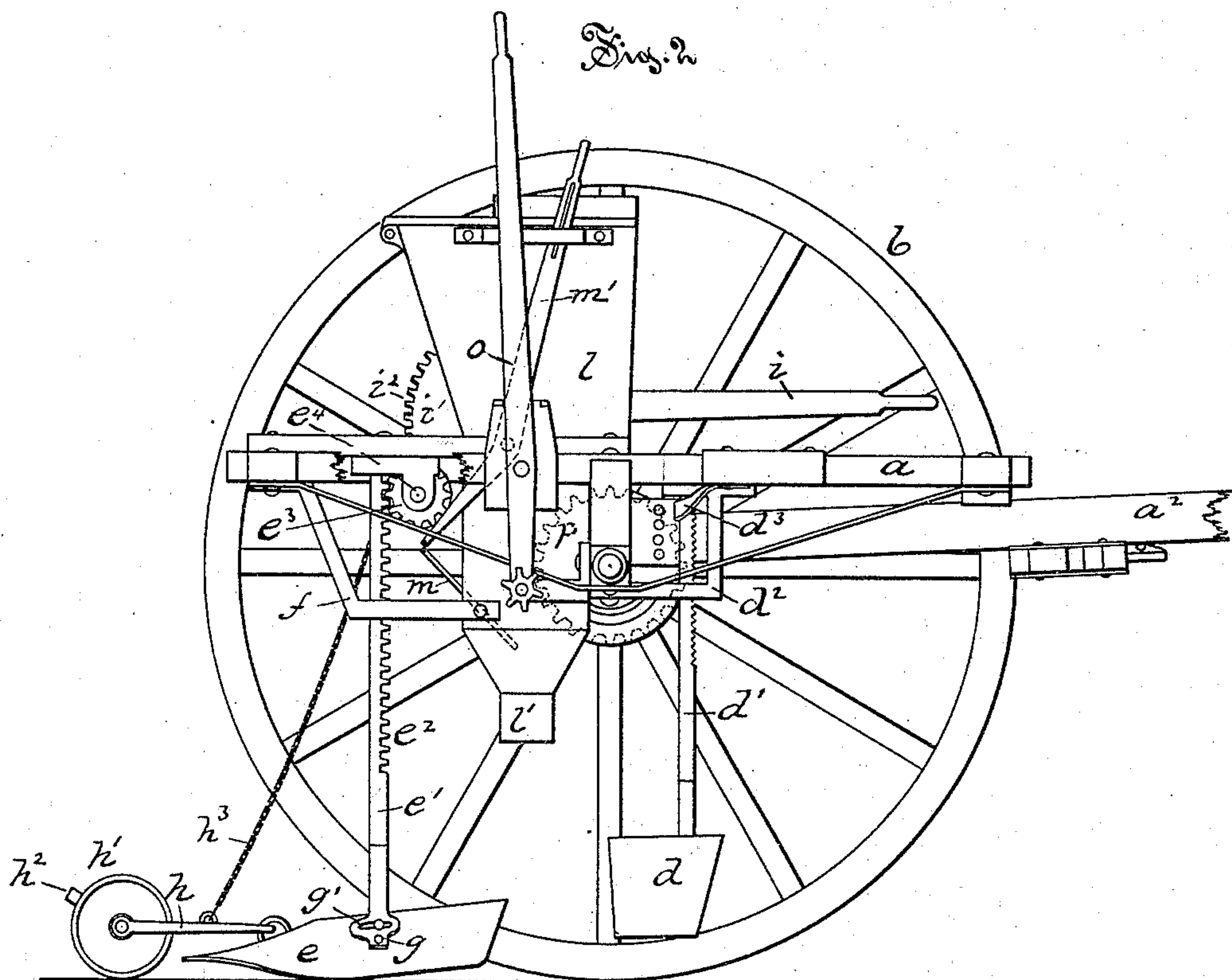
2 Sheets—Sheet 2.

A. W. KAPPENBERG.

FERTILIZER DRILL.

No. 331,201.

Patented Nov. 24, 1885.



Witnesses:
Wm. Perkins.
H. A. Williams.

Inventor:
Augustus W. Kappenberg
By Simonds & Burdett,
Attys.

UNITED STATES PATENT OFFICE.

AGUSTUS W. KAPPENBERG, OF EAST HARTFORD, CONNECTICUT.

FERTILIZER-DRILL.

SPECIFICATION forming part of Letters Patent No. 331,201, dated November 24, 1885.

Application filed May 25, 1885. Serial No. 166,547. (No model.)

To all whom it may concern:

Be it known that I, AGUSTUS W. KAPPENBERG, of East Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Fertilizer-Drills, of which the following is a description, reference being had to the accompanying drawings, where—

Figure 1 is a plan view of my improved machine with parts broken away to show construction and details. Fig. 2 is a side view of the machine with one wheel and certain other parts removed and broken away to show construction and detail parts. Fig. 3 is a detail view of the lower end of one of the levers, which bears a segmental gear, showing the stop device. Fig. 4 is a detail view in elevation of part of the machine, looking from the rear.

The object of my invention is to provide a machine adapted to furrow and ridge ground preparatory particularly for the cultivation of tobacco, to drop manure in furrows made by the machine, to cover such furrow, and to mark the ridges for placing the plants; and my improvement consists in the combination of devices to that end as more particularly hereinafter described.

In the accompanying drawings, the letter *a* denotes a frame of suitable material having an axle, *a'*, fast to the frame, and bearing wheels *b*, by means of which it is supported. The frame is also provided with a pole, *a''*, with suitable means, as the whiffletrees *c*, for attaching horses, or the like draft-animals to the machine.

The plow *d* is borne on an adjustable arm, *d'*, that is located in front of the axle and in about the center of the machine, the front side of said arm being roughened or indented, so as to engage the edge of the socket or opening in the supporting-bracket *d''*, against which edge the arm is forced by means of the spring *d'''*.

The V-shaped coverer *e* is suspended below the center line of the frame, from the rear part of the latter, by means of a rod, *e'*, bearing cogs *e''* in mesh with the cog-wheel *e'''*, which is borne on the shaft *e''''*, set transversely of the frame in suitable bearings. This rod *e'* is further supported by the braces *f*, fast to the frame-work of the machine, and having an open socket, through which the rod passes.

The coverer is formed of plate metal, as steel, bent to the desired shape, with the rear portion nearly flat and the side parts gradually turning upward to an almost vertical position. The lower end of the arm *e'* is forked, and is connected to the coverer by means of bolts. One of the bolts, *g*, through each arm forms a pivot, and the other passes through a slot, *g'*, in the arm, and by means of this device the coverer may be adjusted to the desired angle within the limits of the play of the bolt in the slot with a horizontal plane. To the rear part of the coverer is hinged a link, *h*, in the rear and forked end of which is pivoted the metallic wheel *h'*, bearing one or more pins, *h''*, which project from its periphery. A chain, *h'''*, is connected to the link, and leads up to a drum, *h''''*, fast to the shaft *e''''*, so that when the latter is rotated to raise or lower the coverer the chain will be wound upon the drum and the weight of the marking-wheel and link borne by it. On one end of this shaft *e''''*, which projects beyond its bearings in the frame, is fast a cog-wheel, *e''''''*, in mesh with the segmental gear *i''* on the short arm *i'* of the lever *i*, which is pivoted to the frame. This lever *i* bears a common form of catch, *j*, consisting of a short lever near the handle of the main lever in such position that both may be grasped at the same time, and with a cord connecting this short lever with the spring-bolt, whose other end takes into openings or between cogs formed in the edge of a plate or arm securely fastened to the frame. By means of this catch the coverer may be held at any desired point within the limit of its vertical play.

The hopper *l* is fast to the frame near its center, and extends downward to a suitable distance above the ground, where it terminates in the narrow outlet *l'*, the said outlet being adapted to be closed by a valve, *m*, which is operated by means of the lever *m'*, pivotally connected to the frame, and with its handle rising from the latter near the edge of the hopper, the cover of which forms a seat for the driver of the machine. The hopper is of course located so that its outlet is directly over the path of the plow and between the plow and the coverer, so that the fertilizer feeds through the hopper, is dropped into the furrow made by the plow, and is cov-

ered over in the ridge formed by the coverer. Within the hopper, and near its lower end, is a stirrer, *n*, borne on the end of a shaft whose outer bearing, some distance from the hopper, is formed in the lower end of the short arm of the lever *o*, this shaft *n'* being somewhat loose in the bearing that is close to the hopper, so that by swinging the lever the cog-wheel *n*² on the outer end of the shaft will be thrown into and out of gear with the cog-wheel *p*, that is fast to the hub of one of the wheels.

At each end of the segmental gear *i*² on the lever *i* there is a lug projecting beyond the outer edge of the teeth, and this forms a stop to limit the play of the lever and to prevent the lever end from getting out of mesh with the cog-wheel *e*⁵.

I claim as my invention—

1. In combination, the wheeled frame bearing the vertically-adjustable plow, the hopper fixed to the frame back of the plow with the stirrer borne on the rotary and swinging shaft, the vertically-adjustable V-shaped coverer fast to the frame back of and in line with the hopper and bearing the hinged link that supports the marking-wheel, the chain connecting

the link with the drum fast to the shaft, by means of which the coverer is vertically adjustable, and the respective levers for operating the parts, all substantially as described.

2. In combination, in a drill of the within-described class, the wheeled frame, the vertically-adjustable plow, the hopper, and the V-shaped coverer arranged in succession along the center of the frame, the coverer being pivotally connected to the forked ends of the rod having slots and bolts, whereby it is adjustable in a horizontal plane, and also bearing the marking-wheel having projecting pins on its periphery, all substantially as described.

3. In a drill of the within-described class, the hopper with a valve and stirrer arranged within the hopper and borne on the inner end of a swinging and rotary shaft which has its outer bearing in the short arm of a lever, and has also a cog adapted to be thrown into and out of mesh with the cog fast to the hub of one of the main wheels of the frame by means of said lever, all substantially as described.

AGUSTUS W. KAPPENBERG.

Witnesses:

CHAS. L. BURDETT,
H. R. WILLIAMS.