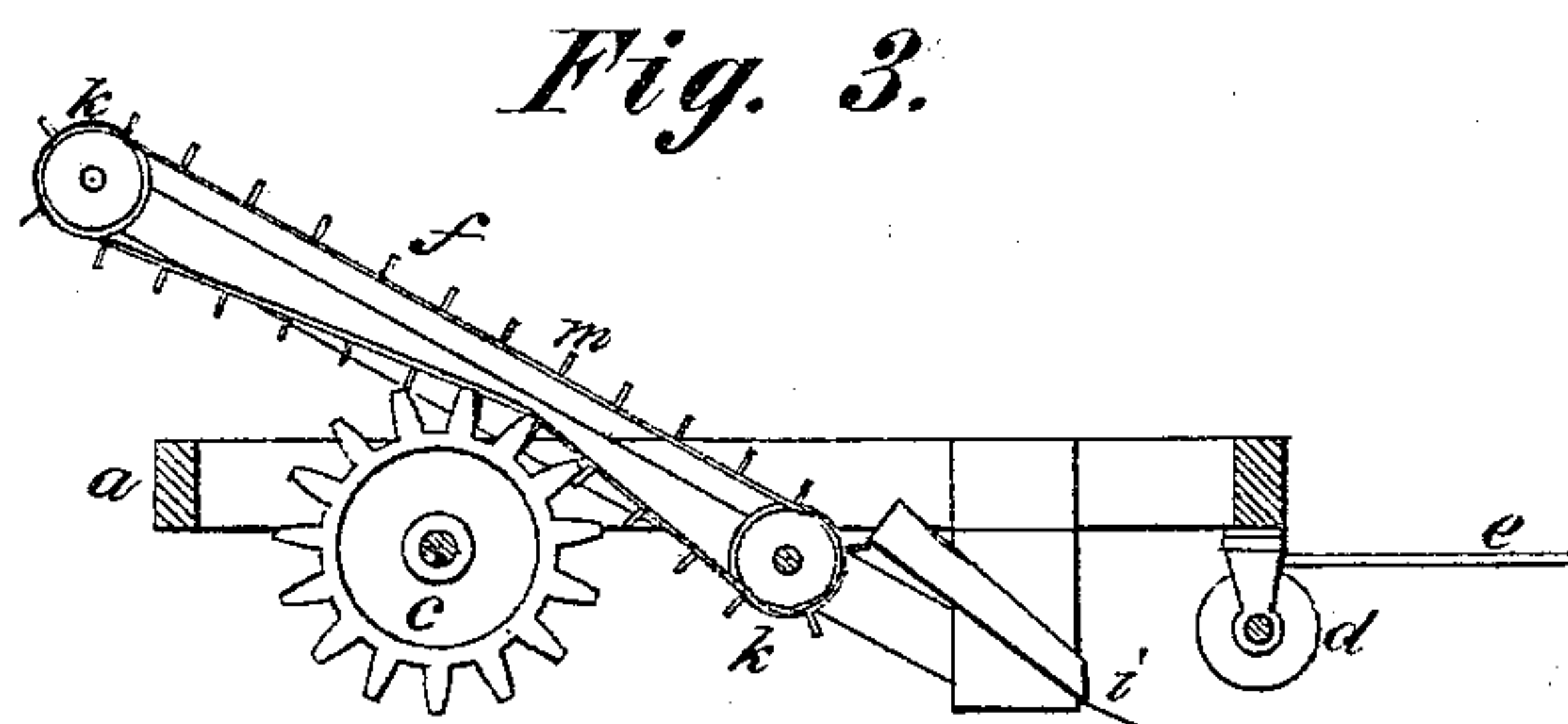
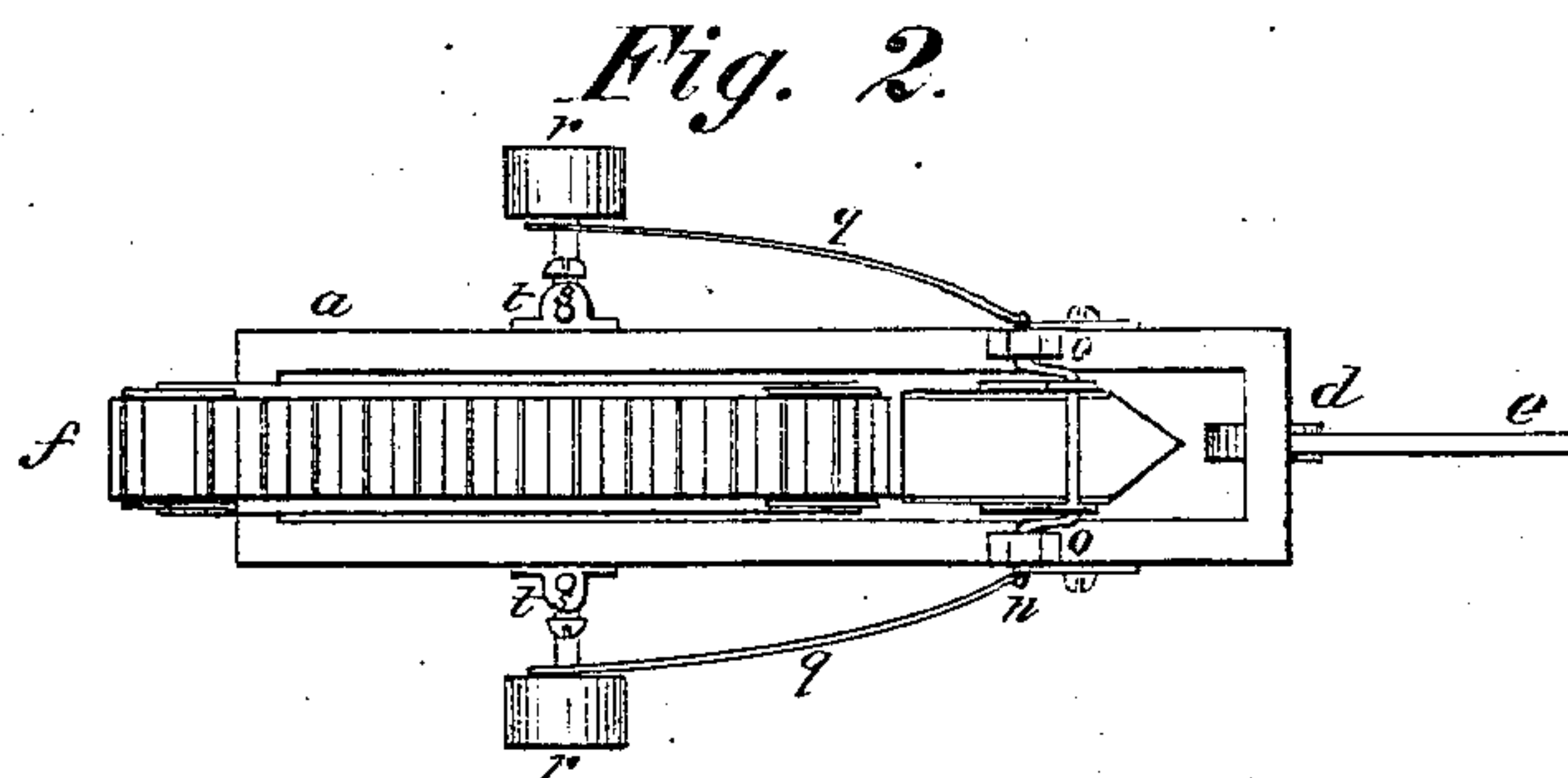
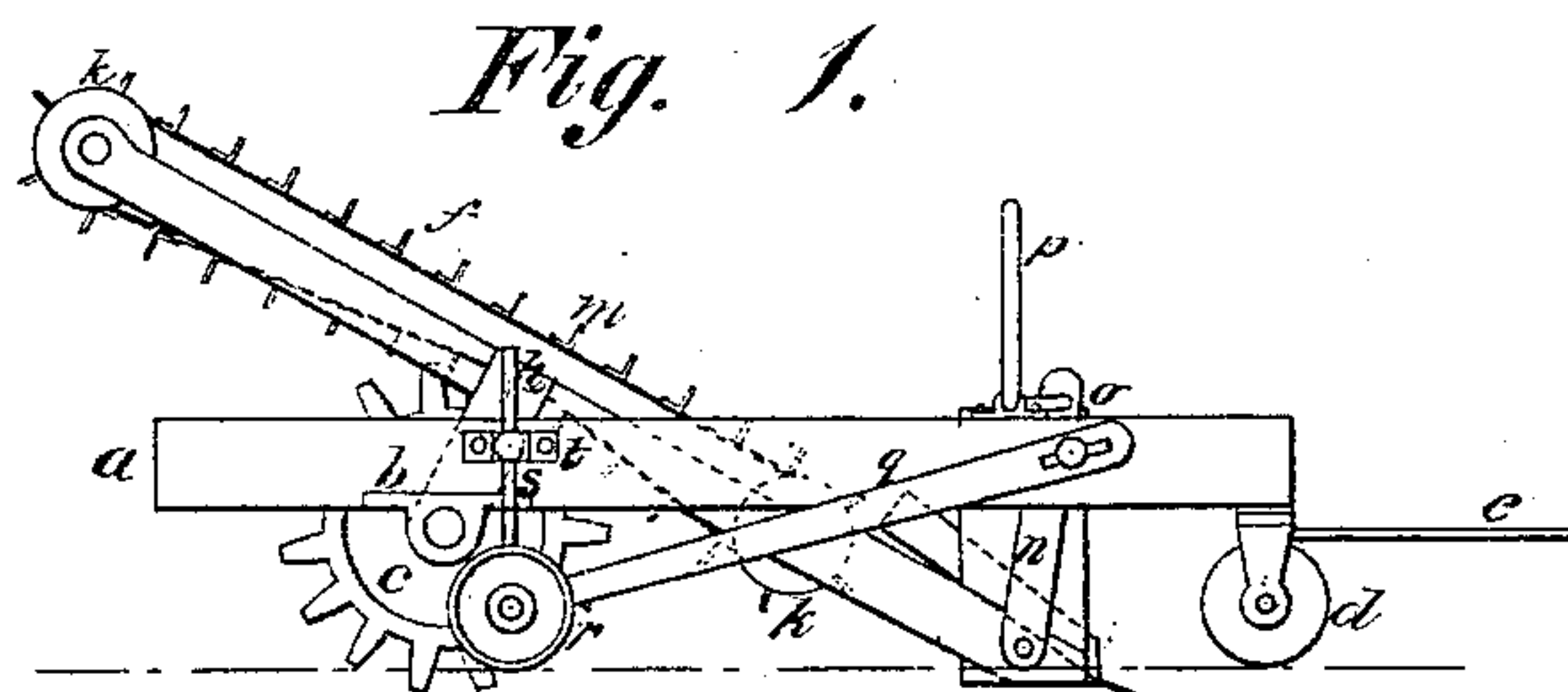


B. J. C. HOWE.
Ditching-Machines.

No. 148,955.

Patented March 24, 1874.



Witnesses

Phua Griffin Jr.
Samuel H. Hinsdell

Inventor

Benjamin J. C. Howe

UNITED STATES PATENT OFFICE.

BENJAMIN J. C. HOWE, OF SYRACUSE, NEW YORK.

IMPROVEMENT IN DITCHING-MACHINES.

Specification forming part of Letters Patent No. **148,955**, dated March 24, 1874; application filed March 9, 1874.

To all whom it may concern:

Be it known that I, BENJAMIN J. C. HOWE, of Syracuse, New York, have invented certain Improvements in the Construction of Excavators and Ditching-Machines, of which the following is a specification:

My improvements were designed to simplify the construction and perfect the action of that class of machines that employ endless revolving elevators, combined with a proper excavator for ditching and so forth, by which I reduce the number of parts, and insure a more positive action and greater efficiency than has been heretofore attained. My practical experience has proved this to be of great importance, enabling me to excavate with less power and greater expedition.

The construction is described as follows, reference being had to the accompanying drawings.

Figure 1 is a side view of the elevator. Fig. 2 is a top plan of the same. Fig. 3 is a vertical section thereof.

The letters refer to like parts in each figure.

The machine is composed of a stout oblong rectangular frame, *a*, with which the several working parts are connected. Near the rear end of this frame *a* journal-boxes *b* are affixed, in which the axle of wheel *c* turns. This wheel *c* has strong radial teeth projecting from it near each face, with a space or tread between them, which take into the ground, and cause the wheel to revolve without slipping as the frame *a* is drawn forward. The front end of the frame rests on a swiveling-wheel, *d*, to the support of which a draft-pole, *e*, is attached. Within the frame *a* an inclined elevator, *f*, is suspended, near its center, by struts *h*, which rest on and turn around the same center as the cog-wheel *c*. At the lower end of the elevator *f* a plowshare or scoop, *i*, is affixed, having an inclined plane, under the upper end of which there is a roller, *k*, and at the top of the frame is another similar roller. An endless belt or apron runs around these rollers, ascending on the upper side, and descending on the lower side. Ribs or buckets *m* project at right angles, or nearly so, from the belt at regular intervals, and these come in contact with the teeth, above named, projecting from wheel *c*, thus forming an endless rack, driven by the wheel *c*, which serves as an elevator for the earth scooped up by the

plow in front. The plow is raised or lowered by pitmen or connecting rods *n*, connecting it with crank-arms *o* on an axis in bearings above, and affixed to frame *a*. These arms *o* are worked by a hand-lever, *p*, or other convenient device.

By the above construction and arrangement of parts, it will be seen that the elevator is driven with certainty, with a very light apparatus, which can be drawn along with a minimum amount of power above that required to raise the earth, and requiring a smaller number of parts than in any other elevator. By adjusting the elevator on frame *a*, as described, the plow can be made to cut deep or shallow at the will of the operator.

As this apparatus is made narrow for the purpose of excavating a narrow ditch, and raises the earth to a considerable height, I employ outriggers on the sides to hold it steady. These are composed of a draft-bar, *q*, jointed to the frame *a* near its front end, and extending back, inclined outward. (See Fig. 2.) To the end of this bar is affixed a horizontal journal, on which a broad small wheel or roller, *r*, turns, from which projects upward a strong rod or bar, *s*, that passes up through a collar, *t*, on the frame *a*. This elevates or depresses roller *r* as is required to hold the machine upright in proper position while it is working either upon the surface or in the bottom of a ditch. A set-screw or other fastening holds the bar *s* at any required elevation.

The machine is drawn along upon the ground to be excavated. The plow is set to take a suitable furrow, which it raises upon the carrying-belt, from the top of which it is discharged into a trough or other conveyer, side-wise or in any other direction.

I claim as my invention—

The combination, in an excavating or ditching machine, of the plow *i* and endless carrier *f*, connected together in a pivoted frame adjusted for depth of cut by means of the crank-lever *n o p*, with the frame *a*, drive-wheel *c* beneath the carrier-belt, and adjustable outriggers *q r q r*, substantially as specified.

BENJAMIN J. C. HOWE.

Witnesses:

THERA GRIFFIN, Jr.,
LEMAN H. HINSDALL.