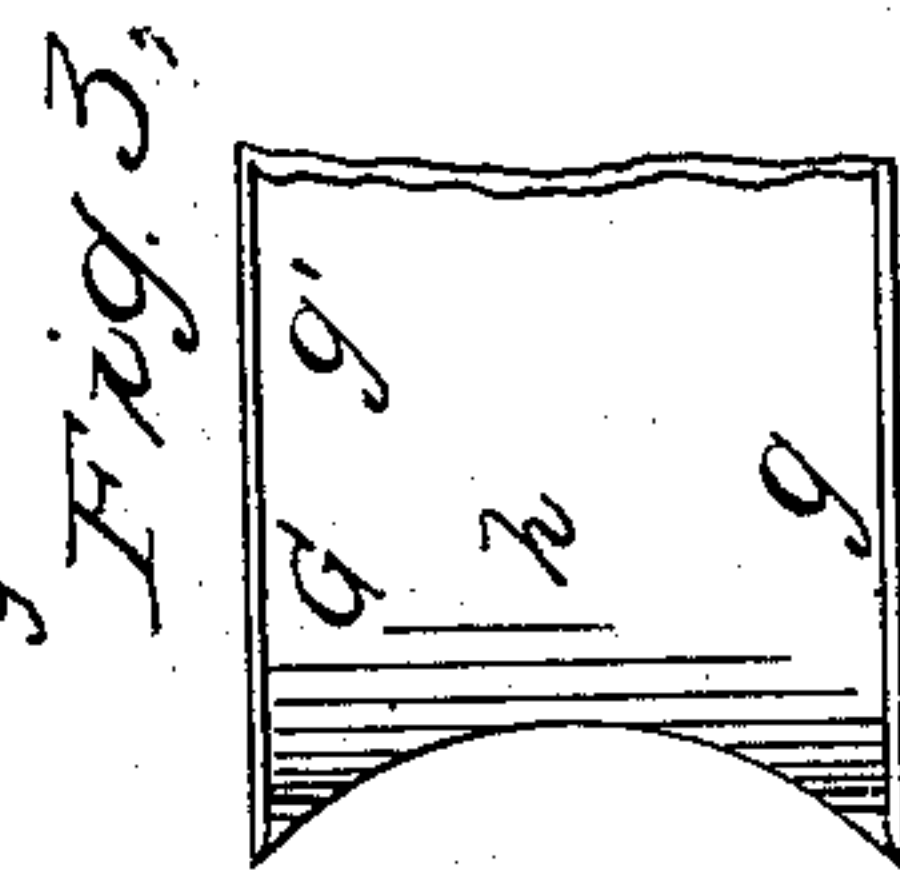
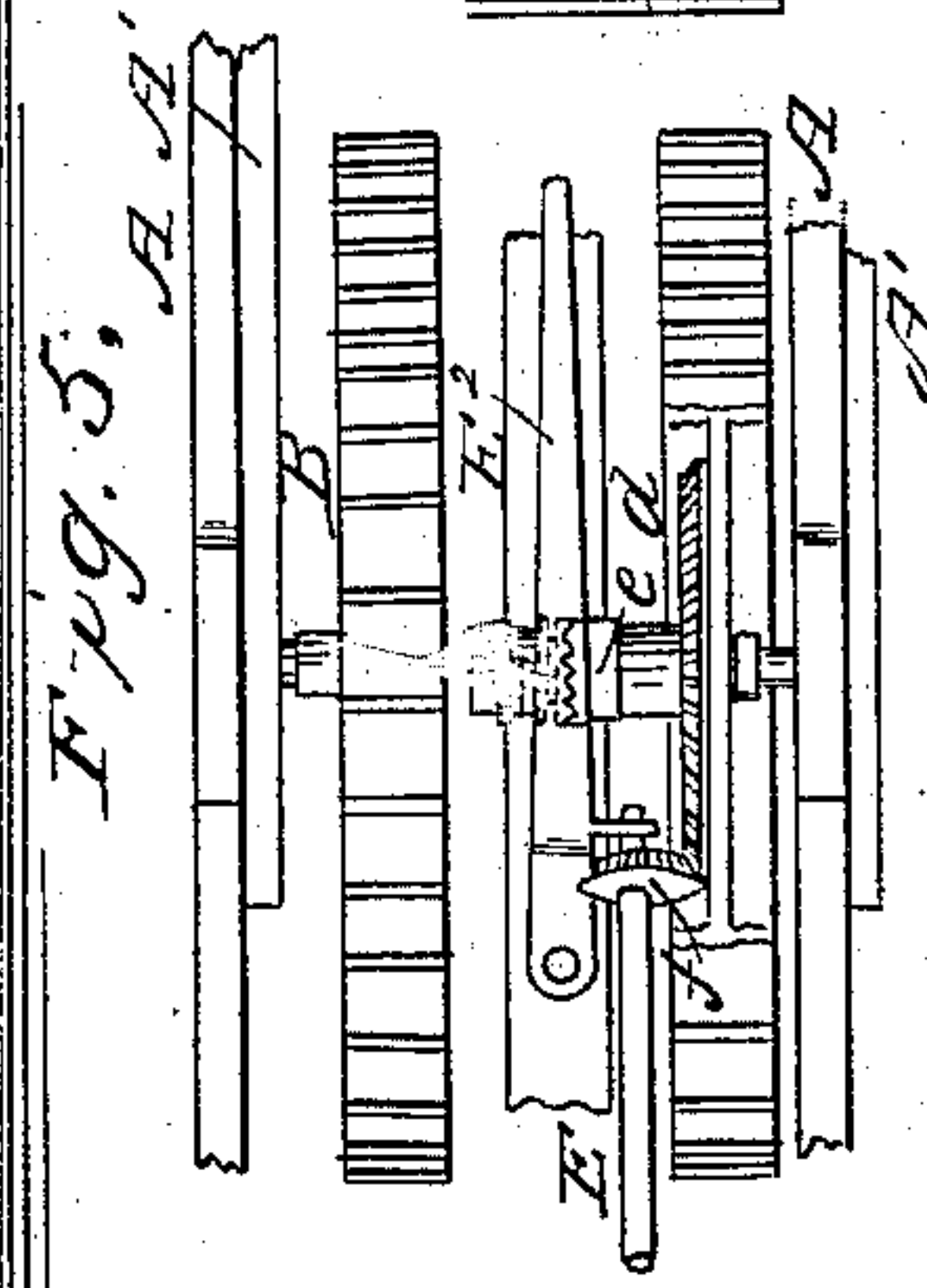
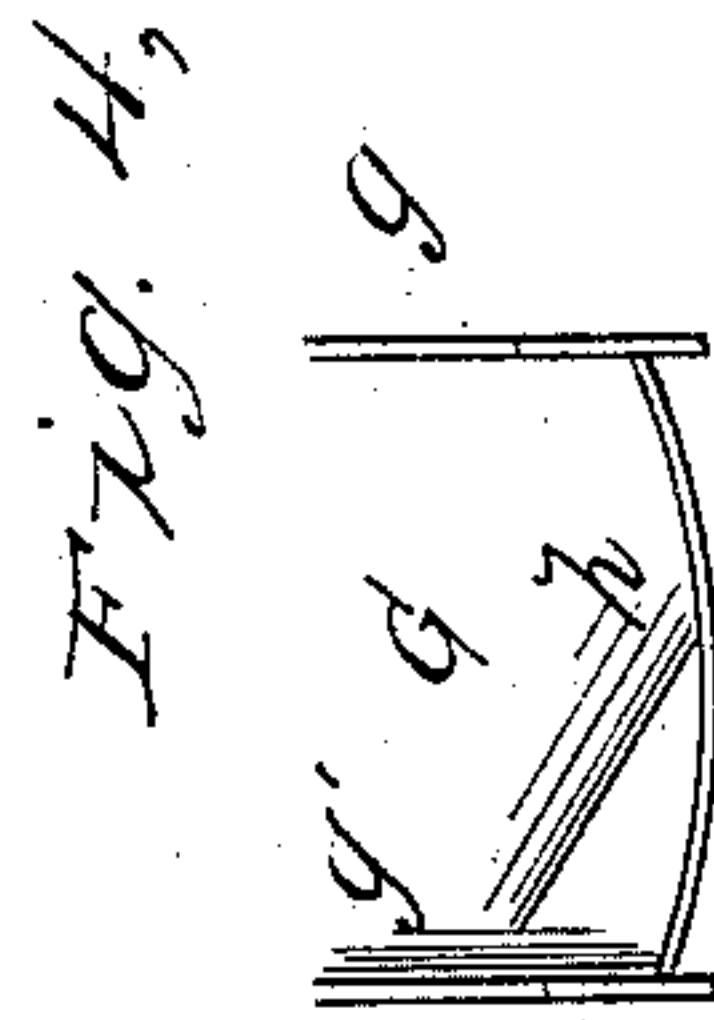
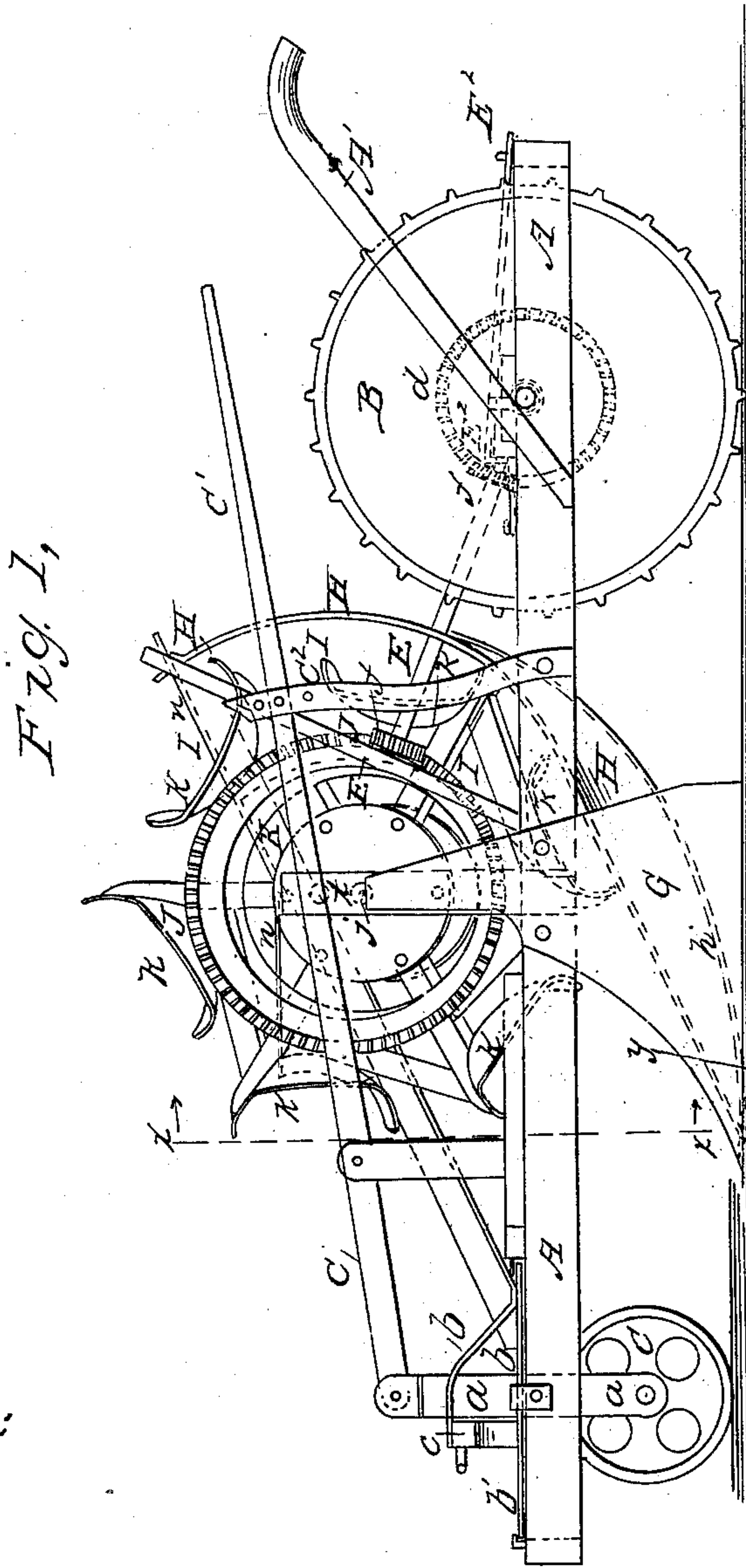
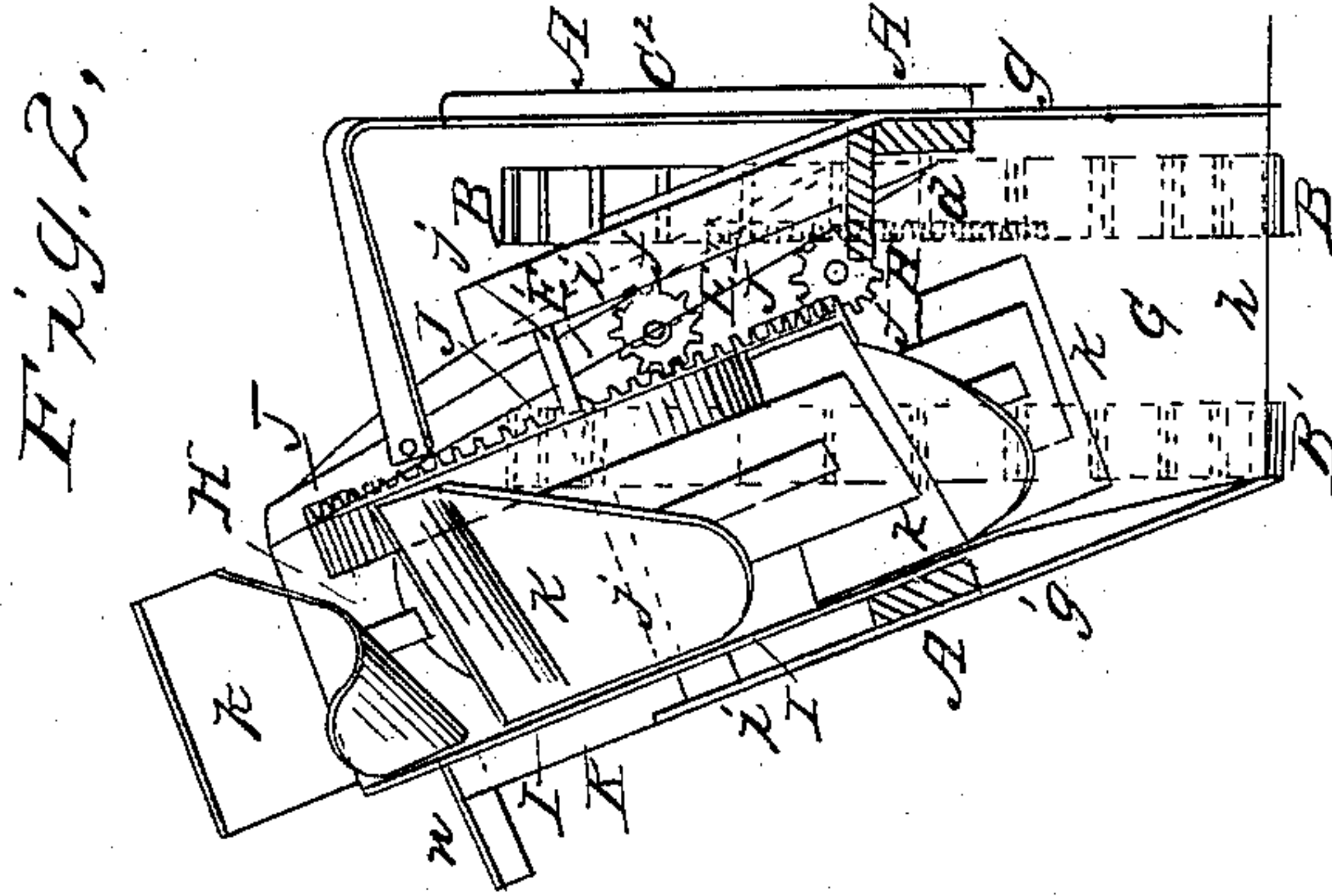


BENEDICT & CUMMINGS.

Ditching Machine.

No. 31 653.

Patented March 12, 1861.



Witnesses:
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H. S. Spencer

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UNITED STATES PATENT OFFICE.

I. A. BENEDICT AND G. W. CUMMINGS, OF CONNEAUT, OHIO.

DITCHING-MACHINE.

Specification of Letters Patent No. 31,653, dated March 12, 1861.

To all whom it may concern:

Be it known that we, ISAAC A. BENEDICT and G. W. CUMMINGS, of Conneaut, in the county of Ashtabula and State of Ohio, have invented a new and Improved Ditching-Machine; and we do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1, is a side elevation of one side of the improved ditching machine. Fig. 2, is a transverse section in the vertical plane indicated by red line x, x , Fig. 1 showing the parts in rear of this line. Fig. 3, is a plan view representing the front end of the shovel. Fig. 4, is a transverse section through the shovel taken in the vertical plane indicated in Fig. 1 by red line y, y . Fig. 5, is a plan view representing in detail the means for operating the clutch between the traction wheels.

Similar letters of reference indicate corresponding parts in the several figures.

This invention relates to certain novel improvements in machines for forming ditches through land for the purpose of draining off water, whereby the earth is rapidly plowed up, elevated to the surface and thrown off at a proper distance from the side of the ditch by the operation of rotary shovels or elevating and inclined guards, as will be hereinafter fully described.

To enable those skilled in the art to make and use our invention we will proceed to describe its construction and operation.

The long quadrangular frame A is composed of two longitudinal bars strongly braced by short transverse bars. This frame A is mounted on two traction driving wheels B. B'. at its rear end, and on a caster wheel C. at its front end. Two handles A'. A'. like plow handles, are secured to the rear part of frame A. by which the plowman controls the machine. The front end of frame A. is capable of being raised or depressed for the purpose of regulating the cut of the shovel and cause it to take up more or less earth according to the power of the machine, and the team operating it. For this purpose the caster wheel axle has its bearings in the lower ends of two perpendicular pieces a, a , which work in guides in brace straps b, b , which straps are secured to a horizontal ring b' , and turn with this ring. Ring b' works under clamps which hold it to the frame and

allow it to be turned. A bolster c , is secured to ring b' , and to this bolster the team is attached so that the machine is guided by the team. The perpendicular pieces a, a , are moved by a long lever C' which is pivoted to the top ends of these pieces a, a , and has its fulcrum in the top of post c' , and extends back to the rear end of the machine.

A pin a' , projects from lever C'. which catches into holes in a perpendicular post C². and secures the lever in the position in which it may be set. By detaching lever C'. from post C². and raising or depressing its long arm the front end of frame A. will be raised or depressed and the shovel may thus be adjusted to any desired pitch. This arrangement forms a convenient method of raising and depressing the front end of the machine, as it is very simple and easily managed but there is nothing specially new in it.

The two traction wheels B. B'. which support the rear end of frame A. move independently of each other when the machine is not in operation. One of these traction wheels B. has a spur gearing d , on its inside surface which is intended to drive a pinion shaft E. The two wheels B. and B'. are both made to operate as driving wheels for shaft E. although the driving gear is only on one of these wheels; this is effected by a clutch e , which locks the two wheels B. B'. together and causes the traction of both wheels to operate in rotating the pinion shaft E. Pinion shaft E has its end bearings respectively in an inclined post E' and in a lever E². and on each end of this shaft E. is a pinion spur wheel f . The lever E². is pivoted at its front end to the frame A. between the two traction wheels B. B'. and this lever is bent so as to pass over the axle of wheels B. B'.; a pin projects down from this lever E². into an annular groove in one of the clutch tubes e , and this clutch tube is moved endwise on the axle by the operation of lever E². When the long arm of lever E². is moved toward wheel B. the lower end of shaft E. is also moved up to this wheel, and the pinion spur wheel f , on this end of the shaft E is made to engage with the spur b ; at the same time that the pinion shaft is thrown into gear with wheel B. the two wheels B. B'. are locked together by the clutch e , so that the traction of both wheels is obtained to actuate the pinion shaft E.

By moving lever E². toward wheel B'. the parts are all thrown out of gear and the

pinion shaft E. is not rotated. The lever E². is moved so as to throw the parts out of gear when it is desired to transport the machine from place to place.

5 At about the middle of the length of the longitudinal bars of frame A. is arranged the shovel or plow G. which forms the ditch. This plow consists of two side plates *g, g'*, which are of the shape represented in Fig. 1. The front edges of these side plates *g, g'*, are inclined and made sharp so as to cut the sides of the ditch. Plates *g, g'*, are secured to and proceed down a suitable distance from the sides of the frame A. The plate *g'*, which is secured to the right hand side of the frame is inclined from a perpendicular plane outward as represented in Fig. 2 of the drawings. The bottom or sole plate *h*, of the plow connects the two side plates *g, g'*, together, and this plate *h*, is concave transversely on its upper surface and it is also inclined toward the front edge of the plow. The front edge of this bottom plate *h*, is sharp and curved inward as represented in Fig. 3. At the rear end of the inclined bottom *h*, of the plow is secured a curved guard H. which is inclined toward the right hand side of the machine as represented in Figs. 1 and 2 of the drawings; and on the right hand side of the curved guard plate H. is secured a side guard I. which proceeds from the rear end of the plate *g'*, up nearly as high as the guard H. At a point concentric with the curved guard H. and supported in standards *i, i*, is a shaft *j*, which is inclined toward the right hand side of the frame A. in a plane parallel with the surface of the guard plate H. This shaft carries a number of radial arms which are securely braced together and on the end of each arm is secured a curved shovel *k*, the extreme edges of which are inclined so as to touch or nearly touch the guard plate H. in their revolution; and these shovel plates *k*, are all so inclined that the earth elevated by them will slide off immediately they pass above the side guard plate I. On this shovel carrying wheel is secured a large spur wheel J. which is rotated by the pinion spur wheel *f*, on the upper end of shaft E.

K. is an inclined timber shown in Figs. 1 and 2, to the highest end of which the upper end of guard I. is attached. This timber proceeds downward and is secured at its front end at a point near the front end of frame A. This timber K. is also secured to the right hand standard *i*, which supports the inclined shaft *j*, and strengthens this standard. Along the highest part of the inclined piece K. is fixed a shelf or spout *n*, and it is over this shelf that the earth falling from shovels *k, k, k*, passes; this shelf *n*, may be made quite wide so as to throw

the earth off a proper distance from the side of the ditch. 65

The operation of the above described machine is as follows: The lower end of pinion shaft E is thrown into gear with the spur wheel on traction wheel B when the machine is at a proper place to commence the ditch. This is done by simply moving lever E.² toward the wheel B., when the clutch *e*, locks the two traction wheels together and brings both of these into operation as herein before described. The plow G. is now adjusted vertically, by moving the lever C.¹ until this plow is in a proper position to take up the required amount of earth, lever C.¹ is then secured to post C.² as herein above described. The machine is moved along by horses which are secured to the bolster *c*. The horses are now started and the plow commences to take up the earth. The side plates of this plow G. cut down the sides of the ditch while the edge of bottom plate *h*, cuts up the bottom of the ditch. The earth is forced back over the plate *h*, between side plates *g, g'*, as it is loosened, and here it is received by the rotating shovels *k, k, k*, and elevated by these shovels to the top of the guards H. and I. at which point the earth slides from the shovels *k*, over the shelf *n*, and falls off on the side of the ditch. These shovels *k, k, k*, in this manner carry the earth from the plow and deposit it along the right hand side of the ditch. In this way the machine is passed through the ditch until the required depth has been obtained. The inclined side *g'*, of the plow cuts down the sides of the ditch, leaving the ditch wider at the surface than at the bottom thereof for the purpose of preventing the earth from the sides of the ditch falling in and filling up the ditch. The shovels *k, k, k*, are so curved and inclined that one edge will touch the guard H. and the other edge scrapes along on the side guard I. All the earth loosened by the plow will therefore be scraped from the plow G. by shovels *k, k, k*, and deposited along the sides of the ditches as fast as it is loosened by this plow. 100 105 110

Having thus described our invention what we claim as new and desire to secure by Letters Patent is— 115

The inclined rotating shovels *k, k, k, k*, constructed as described, in combination with plow G., inclined and curved guard H. and the inclined side guard I., all arranged and operating as and for the purposes herein set forth. 120

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