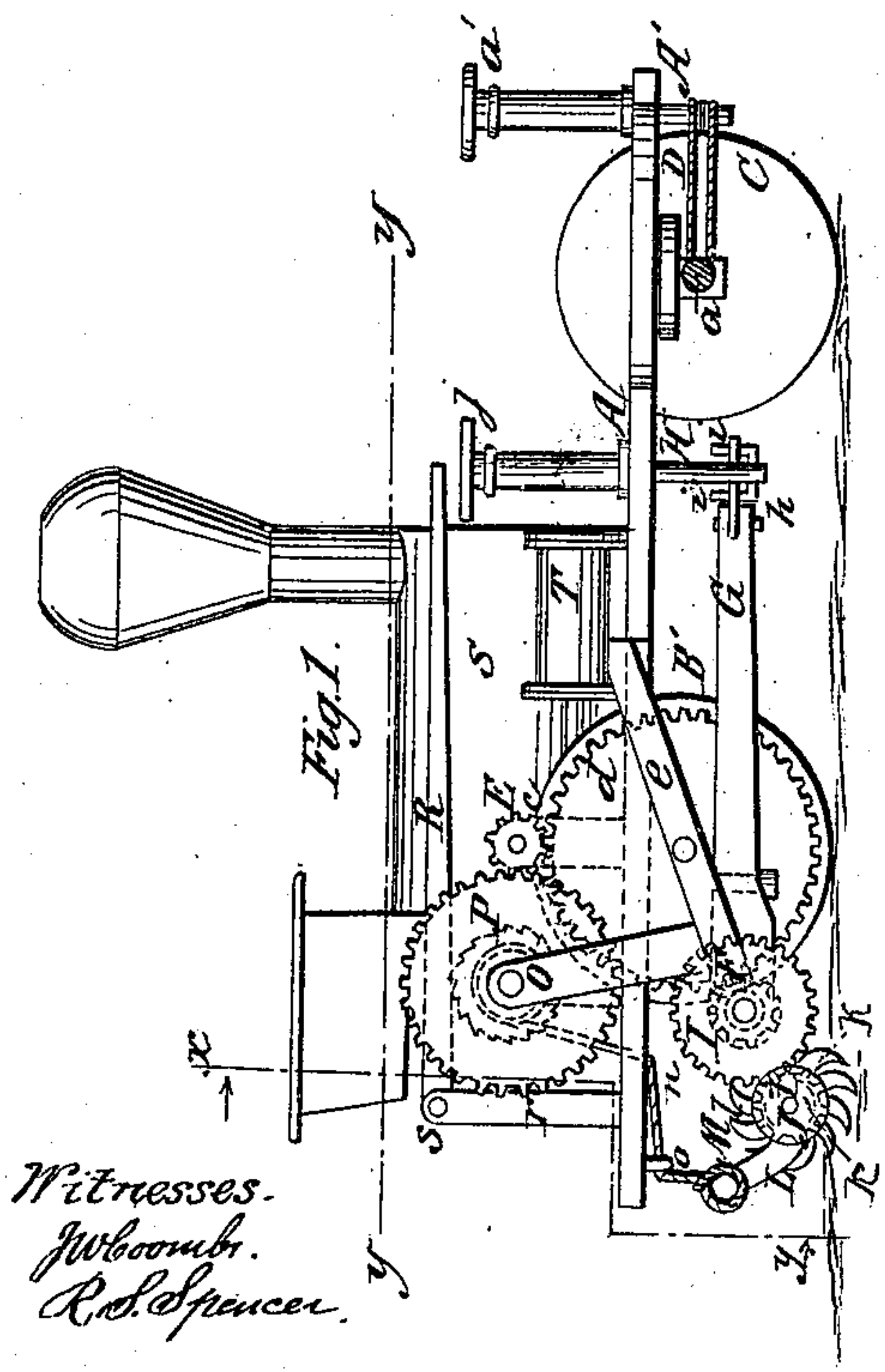
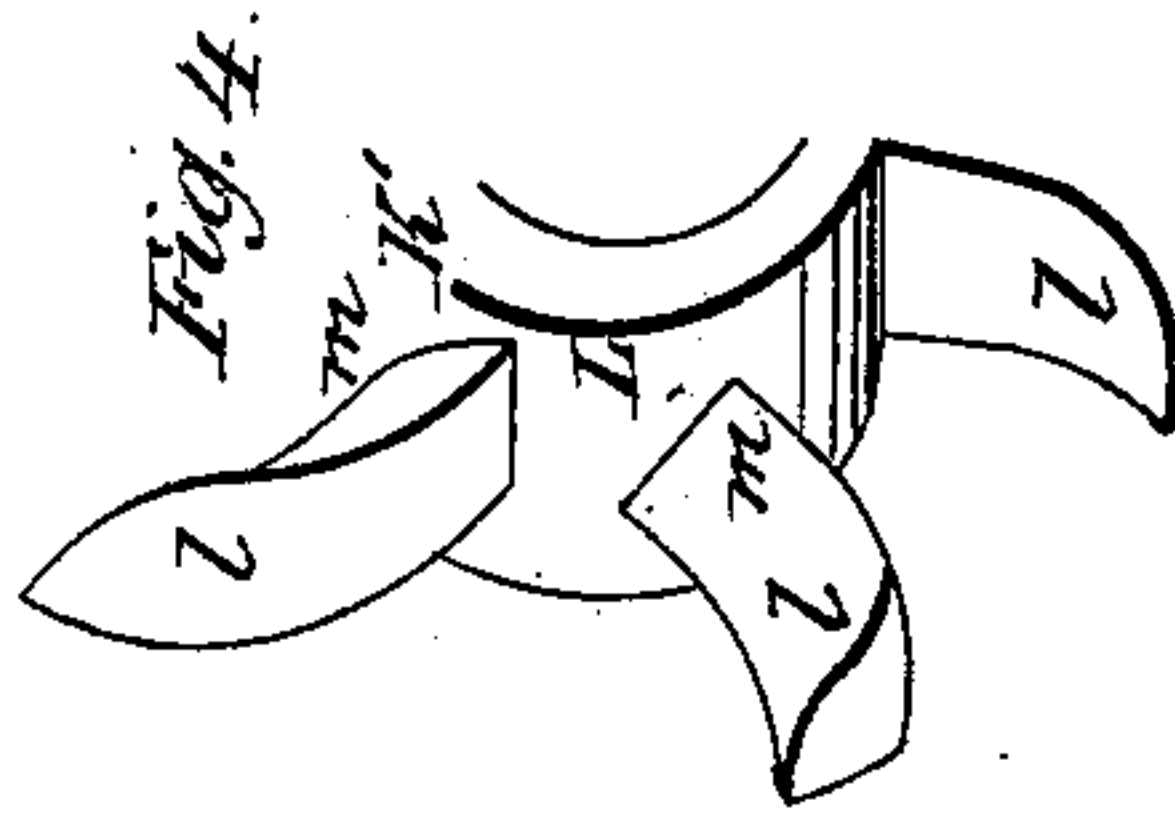
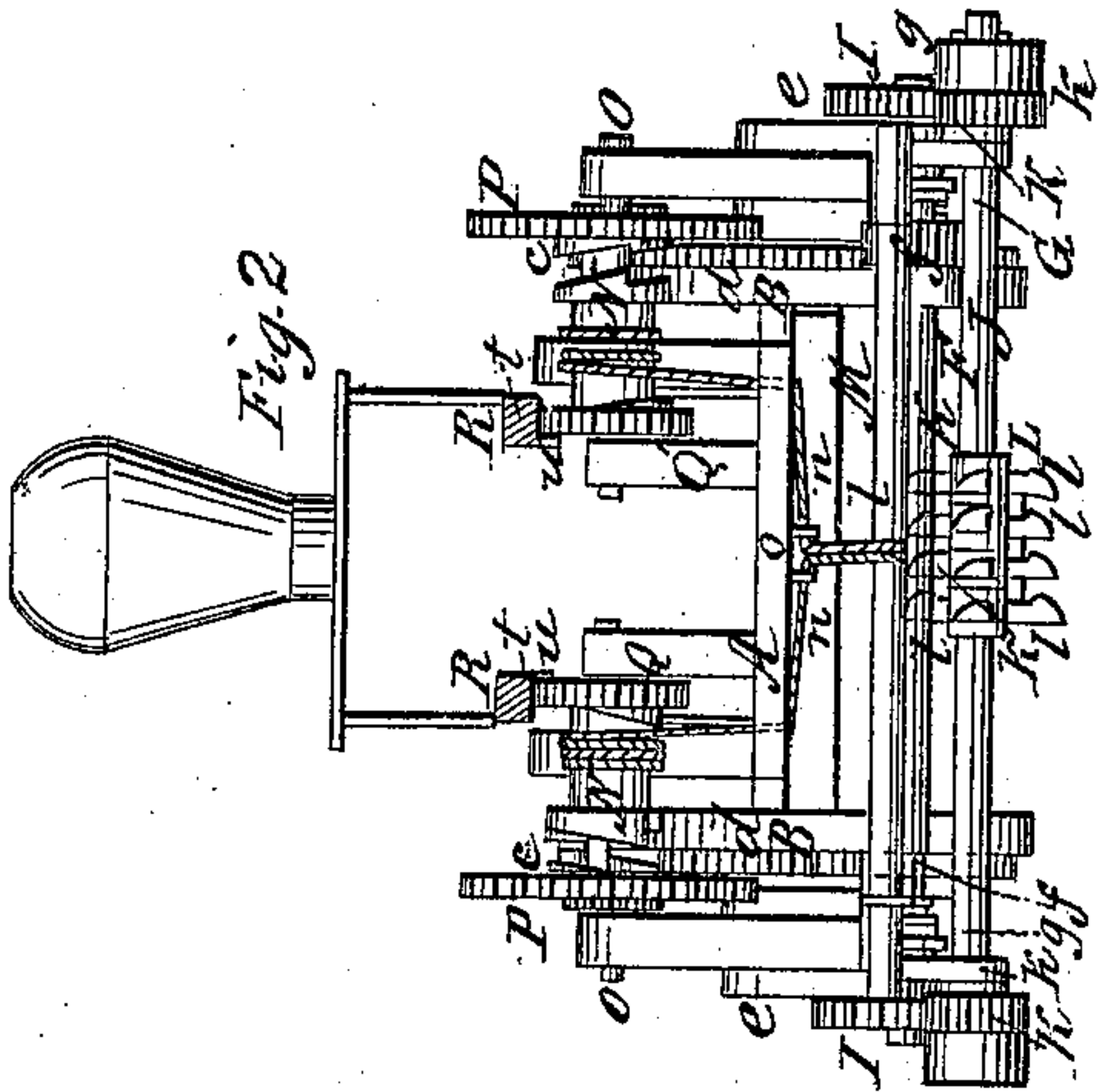


W. H. H. MILLEN.

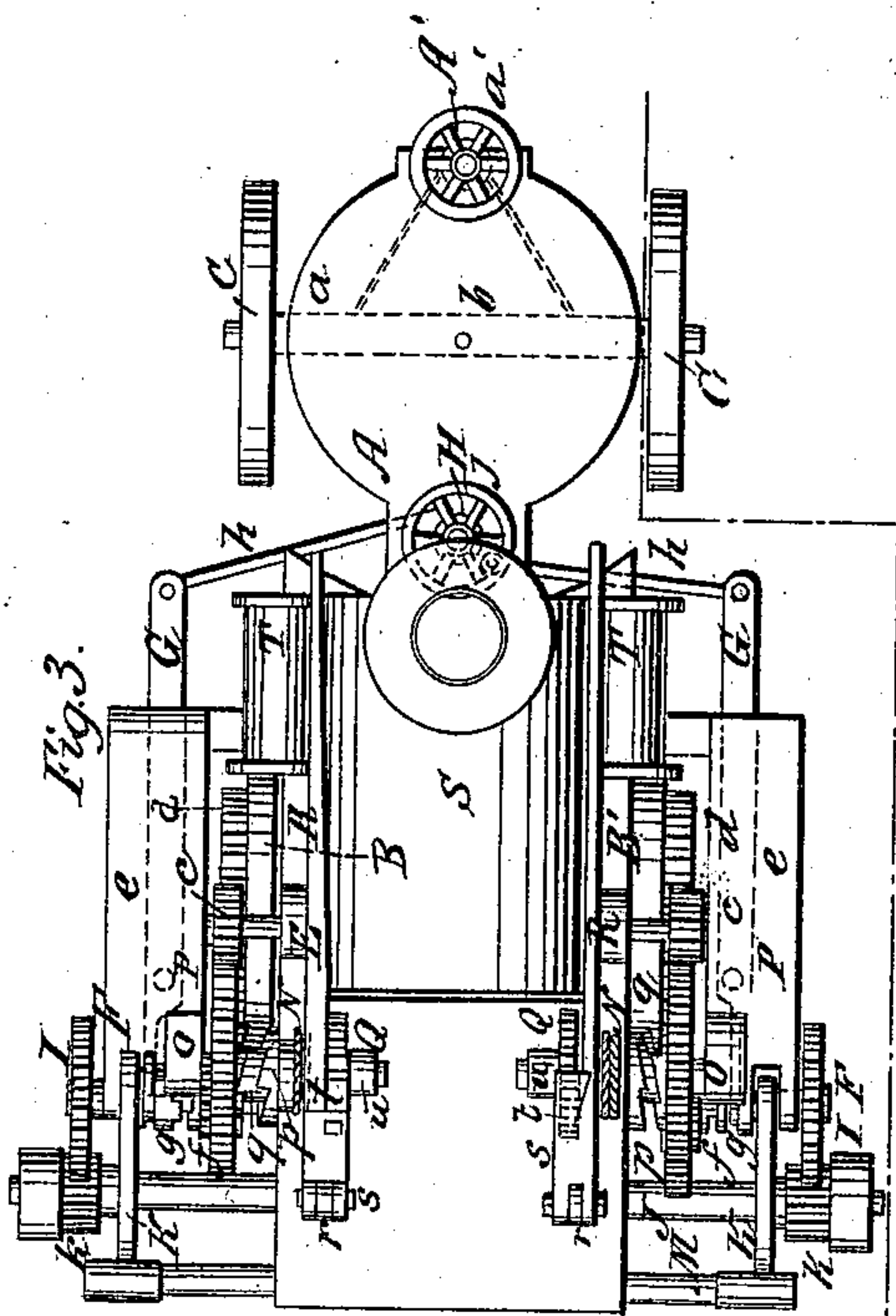
Steam-Plow.

No. 30,884

Patented Dec. 11. 1860.



Witnesses.
J. W. Coomb.
R. S. Spencer.



Inventor
W. H. H. Millen
per Wm. H. Co.
Atty.

UNITED STATES PATENT OFFICE.

WM. H. H. MILLEN, OF LITTLETON, NEW HAMPSHIRE.

IMPROVEMENT IN STEAM-PLOWS.

Specification forming part of Letters Patent No. 30,884, dated December 11, 1860.

To all whom it may concern:

Be it known that I, W. H. H. MILLEN, of Littleton, in the county of Grafton and State of New Hampshire, have invented a new and Improved Steam-Plow; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the annexed drawings, making a part of this specification, in which—

Figure 1 is a side elevation of my invention. Fig. 2 is a back sectional view of same, taken in the line *x x*, Fig. 1. Fig. 3 is a horizontal section of same, taken in the line *y y*, Fig. 1. Fig. 4 is a detached perspective view of a portion of one of the plows.

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

This invention relates to an improved steam-plow of that description in which rotary plows are employed.

The object of the invention is to obtain a light, portable, and efficient plowing-machine, one that may be readily manipulated and the parts placed under the complete control of the operator or attendant.

Steam-plows hitherto constructed—at least all those which have passed under my observation—have been necessarily made of great weight, in order to obtain sufficient traction that the machine may be propelled along. This involves a great expenditure, not only in the construction of the machine, but also in the running of the same.

By my invention it is believed that the above-mentioned difficulty is obviated, and an extremely light, durable, efficient, and economical steam-plow obtained.

To enable those skilled in the art to fully understand and construct my invention, I will proceed to describe it.

A represents a carriage, the back part of which is supported by the wheels B B', the front part being supported by a pair of wheels, CC, the axle *a* of which is connected to the carriage by a king-bolt, *b*. The axle *a* has a chain or rope, D, attached to it near its ends at equal distance from the bolt *b*, as shown clearly by the dotted lines in Fig. 3, and this rope is attached to a vertical shaft, A', which passes up through the platform of the carriage and has a hand-wheel, *a'*, on its upper end.

On the carriage A there is placed transversely a shaft, E, which has a pinion, *c*, at each end of it. These pinions *c c* engage with toothed wheels *d d*, which are secured concentrically to the outer sides of the wheels B B'.

To each side of the carriage A there is attached an inclined bar, *e*, the lower ends of which form bearings for a shaft, F, which is below the platform or bed of the carriage. On this shaft F there are placed loosely two pinions, *f f*, which may be connected to the shaft F, when desired, by means of sliding clutches *g g*. These clutches have each a lever, G, connected to them, and the fulcrum-pins of these levers pass into the under sides of the inclined bars *e e*. The levers G G extend toward the front part of the carriage and are connected to rods *h h*, the inner ends of which are attached to arms *i i*, which are at opposite sides of a vertical shaft, H, said shaft passing up through the platform of the carriage and having a hand-wheel, *j*, at its upper end.

To each end of the shaft F there is secured a toothed wheel, I, and these wheels gear into pinions *k k*, which are placed on a shaft, J. The shaft J has its bearings in arms K K, the front ends of which are fitted loosely on the shaft F, so that their outer parts and also shaft J may swing up and down.

On the shaft J there are placed a series of plows, K'. These plows are composed of curved arms *l*, attached to hubs L, which are secured to the shaft J side by side. The arms *l* have beveled or oblique face-surfaces *m*, as shown clearly in Fig. 4, said surfaces having a tendency to cast the earth at one side, similar to the mold-board of an ordinary plow.

The back ends of the arms K K are attached to a cross-bar, M, which has ropes or chains *n n'* attached to it at about its center. These ropes or chains pass through guides *o* at the under side of the platform of the carriage, and then pass up through the platform and are secured to hollow shafts N N, which are placed loosely on shafts O O. The outer ends of the shafts O O have toothed wheels P P on them, one on each, and these wheels gear into the pinions *c c* of the shaft E. The hollow shafts N N have ratchets Q on their inner ends, and the outer ends of said shafts N have clutches *p* on them, which, when the shafts N are shoved

outward, engage with clutches *g* at the inner sides of the wheels *P*, and cause the shafts *N* to be connected to the shafts *O O*.

On the back part of the platform of the carriage there are placed two uprights, *rr*, to each of which a lever, *R*, is attached by a fulcrum-pin, *s*. Each lever *R* has a pawl, *t*, attached to it and a lip *u*, the lips projecting down at the inner sides of the ratchets *Q*, the levers *R* being at the opposite sides of the ratchets.

S is a steam-boiler, which is placed on the carriage, and *T T* are two engines, which are placed one at each side of the boiler *S*. The connecting-rods of these engines are attached to the shaft *E*.

The boiler and engines may be of ordinary construction, and therefore do not require a minute description.

The operation of the machine is as follows: The carriage is propelled along in consequence of the pinions *c c* of shaft *E* gearing into the wheels *d d*, which are attached to the wheels *B B'* of the carriage. The carriage is guided by turning the shaft *A'*, the rope *D* moving the axle *a*. As the carriage moves along the shaft *J* is rotated through the medium of the gearing *c c d d f f I I k k*. As the shaft *J* rotates the plows *K'* turn over the ground, and the plows are allowed to rise and fall to conform to the inequalities of the surface of the ground in consequence of the shaft *J* being placed in the arms *K K*.

The rotation of the shaft *J*, and consequently of the plows *K'*, may be stopped at any time by the operator turning the shaft *H*, the arms *i i* and rods *h h* actuating levers *G G* and moving the pinions *f f* out of gear with the wheels *d d*.

In case obstructions should lie in the path of

the plows, or when the machine is to be moved from place to place, the operator or attendant, by moving the levers *R R* laterally, will move the hollow shafts *N N* on the shafts *O O* and connect the clutches *p q*. By this means the shafts *N N* will be rotated and the ropes or chains *n n* wound upon said shafts and the arms *K K* and plows *K'* elevated. The pawls *t* on the levers *R R* serve to hold up the plows. The lips *u u* of the levers being at one side of the ratchets *Q* and the levers *R* at the other side, cause the shafts *N* to be moved by a lateral adjustment of the levers *R*. The plows and their shaft are allowed to descend at any time by raising the levers *R* so that their pawls *t* may clear the ratchets *Q*.

I do not claim broadly the employment or use of rotary plows, for they have been previously used; but

I do claim as new and desire to secure by Letters Patent—

1. The arrangement of the levers *G G*, sliding pinions *f f* on shaft *F*, and the gearing *I I k k* on the shafts *F J*, essentially as shown, whereby the plows *K'* may be rotated or stopped instantly at the will of the operator or attendant.

2. The arrangement of the levers *R R*, with pawls *t* and lips *u* attached, the ratchets *Q* on the hollow shafts *N N*, the clutches *p q*, gearing *P* on the shafts *O*, on which the hollow shafts *N* are placed, and the ropes or chains *n n*, attached to the cross-bar *M* of the arms *K*, essentially as shown, for the purpose of elevating the shaft *J* and its plows *K'* when desired.

WM. H. H. MILLEN.

Witnesses:

JOHN M. CHARLTON,
GEORGE F. MINER.