No. 66,159. PATENTED JUNE 25, 1867.

C. MATHENY.

DITCHING MACHINE.

Fig. 1.

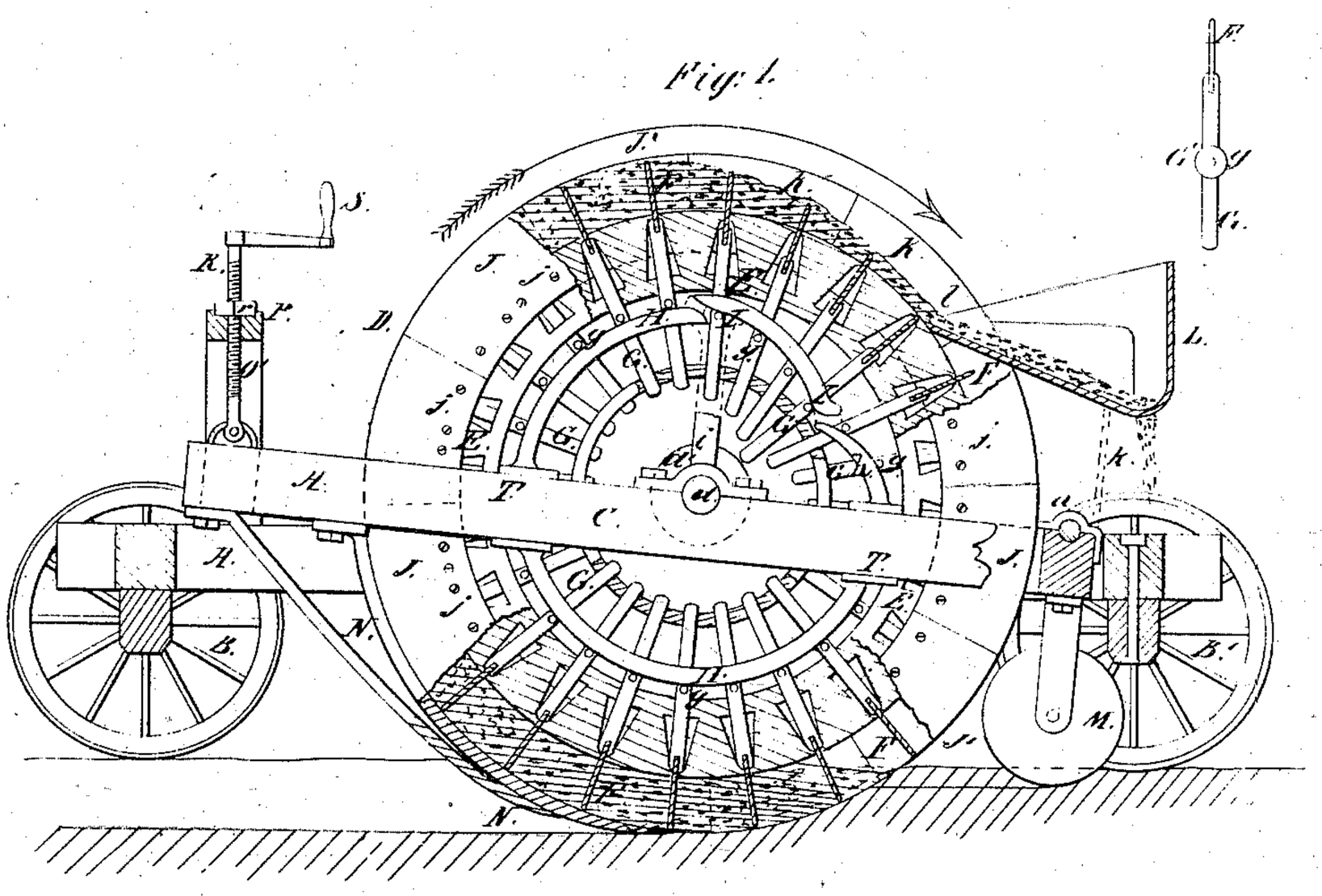
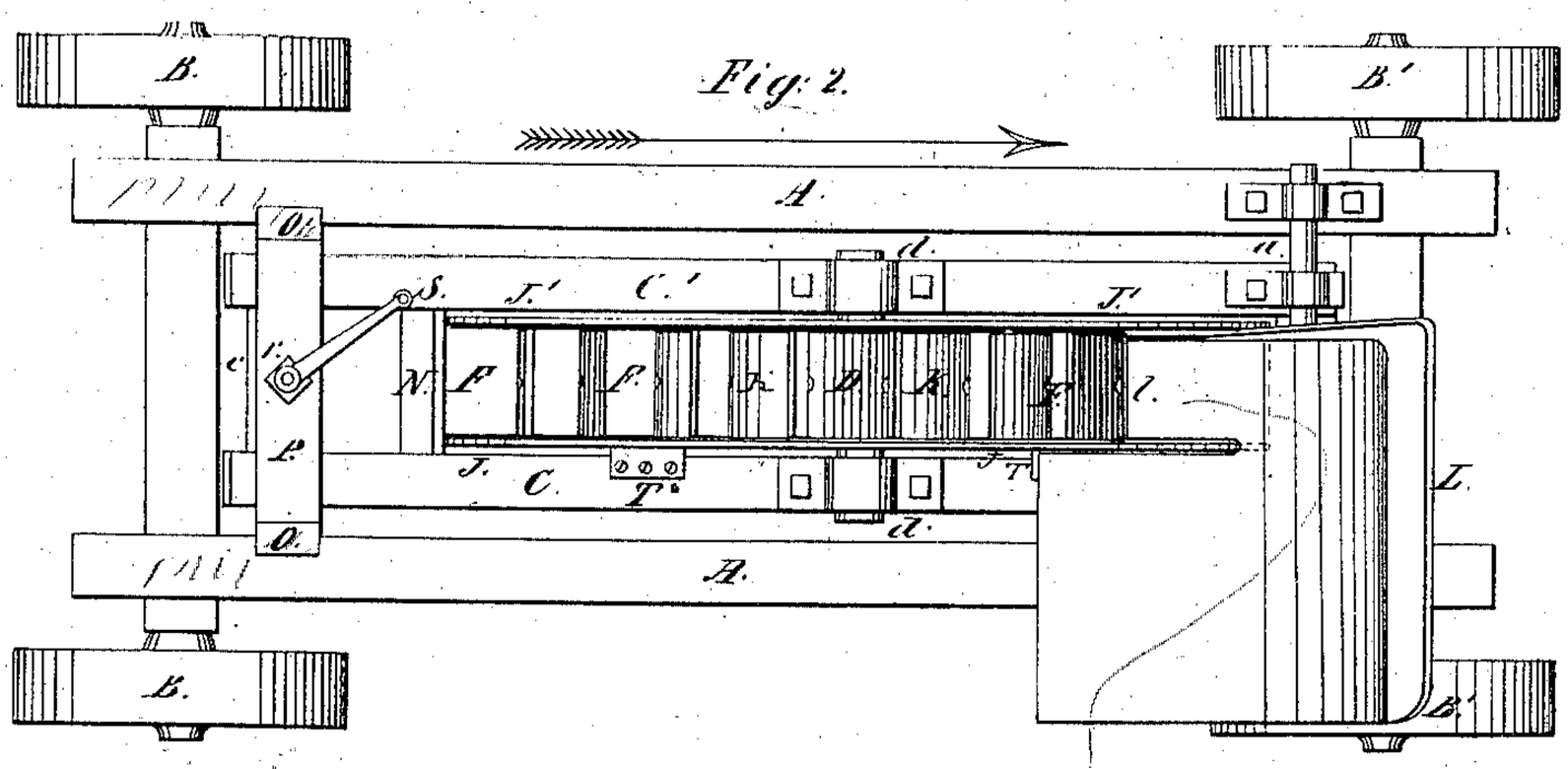


Fig. 2.



Witnesses.
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CHELTON MATHENY, OF GREENSBURG, INDIANA.

Letters Patent No. 66,159, *dated June* 25, 1867.

IMPROVED DITCHING MACHINE.

The Schedule referred to in these Letters Patent and making part of the same.

TO WHOM IT MAY CONCERN:

Be it known that I, CHELTON MATHENY, of Greensburg, in the county of Decatur, and State of Indiana, have invented certain new and useful improvements in Ditching Machines; and I hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawings, making part of this specification.

My invention relates to that class of ditching machines in which a wheel armed with spades is employed for cutting the ditch, and my improvement consists in retracting one set of the spades at the proper time so as to free the machine of the excavated dirt, and said spades are again protruded by means of a fixed cam, the whole being mounted in a suitable gravitating frame secured within a carriage. In the accompanying drawings—

Figure 1 is a longitudinal section of a ditching machine embodying my improvement, the excavating-wheel being shown partially in elevation, and partially in vertical section.

Figure 2 is a top view or plan of the machine.

A represents the main frame of the machine, which is supported upon the ground wheels B B B′ B′; and pivoted at *a* to the front end of this frame is an adjustable frame, C C′, which affords journal-bearings for the shaft *d* of the excavating-wheel D. The rim of the wheel D is provided with a series of radial slots, E, whose width increases inwardly or towards the centre of the wheel, for the purpose of allowing any dirt that might enter through them to fall out, thus preventing the working parts of the machine from getting clogged up. Each of the radial slots E is traversed by a knife or spade, F, having a stem, G, and this stem has connected to it a stud, *g*, which impinges against either of the fixed cams H I, the latter being secured to the adjustable frame C by means of the brace *i* and flanges T. For the purpose of reducing the friction caused by the contact of the cams H I and studs *g*, the latter may have journalled upon them an anti-friction roller, G′. Secured to the outsides of the rim of the operating-wheel, by the bolts *j*, is a number of segmental plates forming my segmental cutters J J′, and the distance or space between said plates determines the width of the ditch. The segmental plates J J′ and radial spades F, together form a series of compartments, K, which serve to contain the excavated earth. L is an inclined scraper, the elevated end of which, *l*, rests upon the periphery of the excavating-wheel D, and this scraper sloping obliquely in front of the wheel serves to deliver the dirt from the said excavating-wheel and throw it off on one side of the ditch. The scraper is connected to the frame C C′ by means of the arm K. The forward end of the adjustable frame C C′ is provided with two rotary cutters, M, which assist the segmental plates J J′ in cutting down the sides of the ditch, and the rear end of this frame has secured to it a shovel or scoop, N, which clears the ditch of any loose earth which may have fallen into it, and this shovel also prevents the dirt from dropping out of the compartments K. The frame C C′, which carries the excavating-wheel D, is adjusted so as to enable the latter to cut either a deep or shallow ditch by means of the following devices; Rising vertically from the main frame A are two stanchions, O O′, whose upper ends are connected by means of the beam P, and the latter has secured to it a nut, *r*, with which the screw R engages, and the upper end of this screw is furnished with a crank or winch, S, by which it is rotated. The lower end of the screw is attached to the transverse beam *c* of the adjustable frame C C′, and it will be seen that the said frame and its accompanying excavating-wheel can be raised or lowered by simply turning the crank S either to the right or left. The screw may be omitted, and a windlass may be journalled in the stanchions O O′, having a rope or chain attached to the beam *c*, or a simple lever may be employed in place of either of these devices.

The operation is as follows: When the machine is drawn over the ground the excavating-wheel D is rotated in the direction indicated by the red arrow, and the weight of the machine forces said wheel and the radial spades into the ground a distance equal to the depth of the segmental plates J J′, thus forcing the earth into the compartment K, where it is retained until the said compartment has arrived at a point directly over the shaft *d*, when the eccentric portion of the cam I causes the radial knife or spade F to retract. This retraction of the knife is continued until the compartment has reached a position about at an angle of forty-five degrees, and at this point the knife is completely withdrawn from its advanced position. The scraper L now comes into action, and as it presses closely against the periphery of the cutting-wheel it liberates the dirt from the latter and discharges it at one side of the ditch. This scraper may be set so as to deliver the dirt either on the right-

hand or left-hand side of the ditch, as may be desired. The action of the scraper L should be deferred as long as possible, so that the weight of the excavated earth contained in the compartments K will assist in forcing the excavating-wheel into the ground. The excavating-wheel being cleared of dirt by the retraction of the knives and the action of the scraper, the said knives are again protruded by means of the studs *g* being brought in contact with the eccentric portion *h* of the cam H, and the continued revolution of the cutting-wheel, fills and empties the compartments in the manner above described.

It is intended that this machine shall only cut as it is drawn in one direction, but by providing two scrapers, L, instead of one, and by arranging the cams H and I in a proper manner, the machine will cut as it is drawn in either direction.

A ditch being cut as deep as possible the adjustable frame is lowered by simply rotating the screw R, and by successively cutting and then lowering a ditch of any required depth may be cut.

In the drawing the excavating-wheel D is represented as being a simple disk, but it is evident that it can be constructed in the same manner as any ordinary wheel, having a number of arms radiating from the hub *d'* outwardly to the rim which contains the spades.

I claim herein as new, and of my invention—

1. In a ditching machine the revolving excavating-wheel D, armed with two circumferential cutters, J J', and a series of radial knives, F, the latter being automatically advanced and retracted by the cams H and I, as and for the purpose herein described and set forth.

2. The inclined scraper L *l*, when used in combination with the wheel D, knives F, cams H I, and cutters J J', for the purpose of freeing the wheel of the excavated earth in the manner explained.

3. I also claim the pair of revolving cutters or coulters M, operating as described and for the purpose set forth, when used in combination with the aforesaid wheel D J J', knives F, and cams H and I.

4. In combination with the wheel D J J', knives F, and cams H I, I claim the shovel or scoop N, for the object herein explained and set forth.

In testimony of which invention I hereunto set my hand.

CHELTON MATHENY.

Witnesses:

GEO. H. KNIGHT,

JAMES H. LAYMAN.