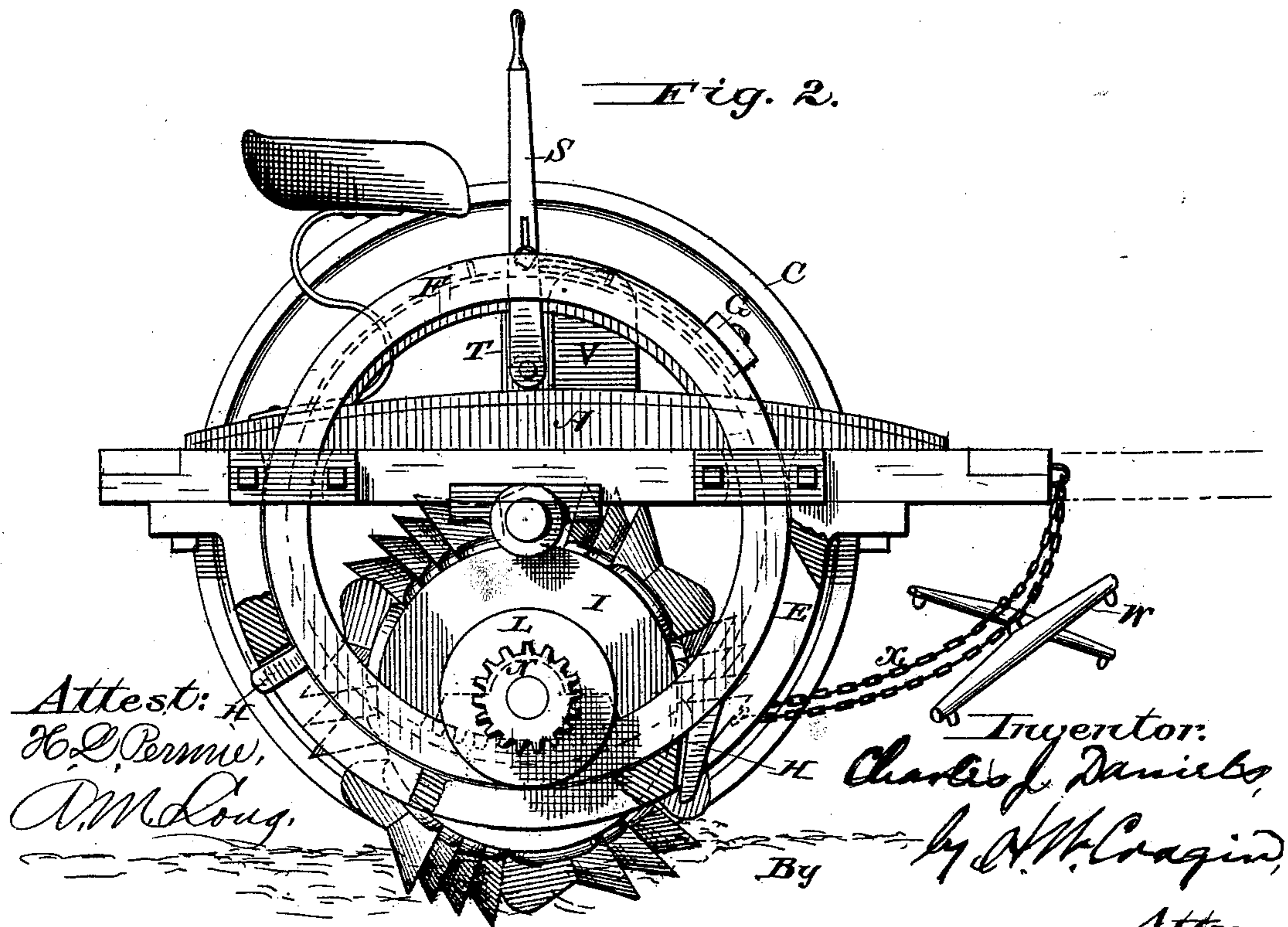
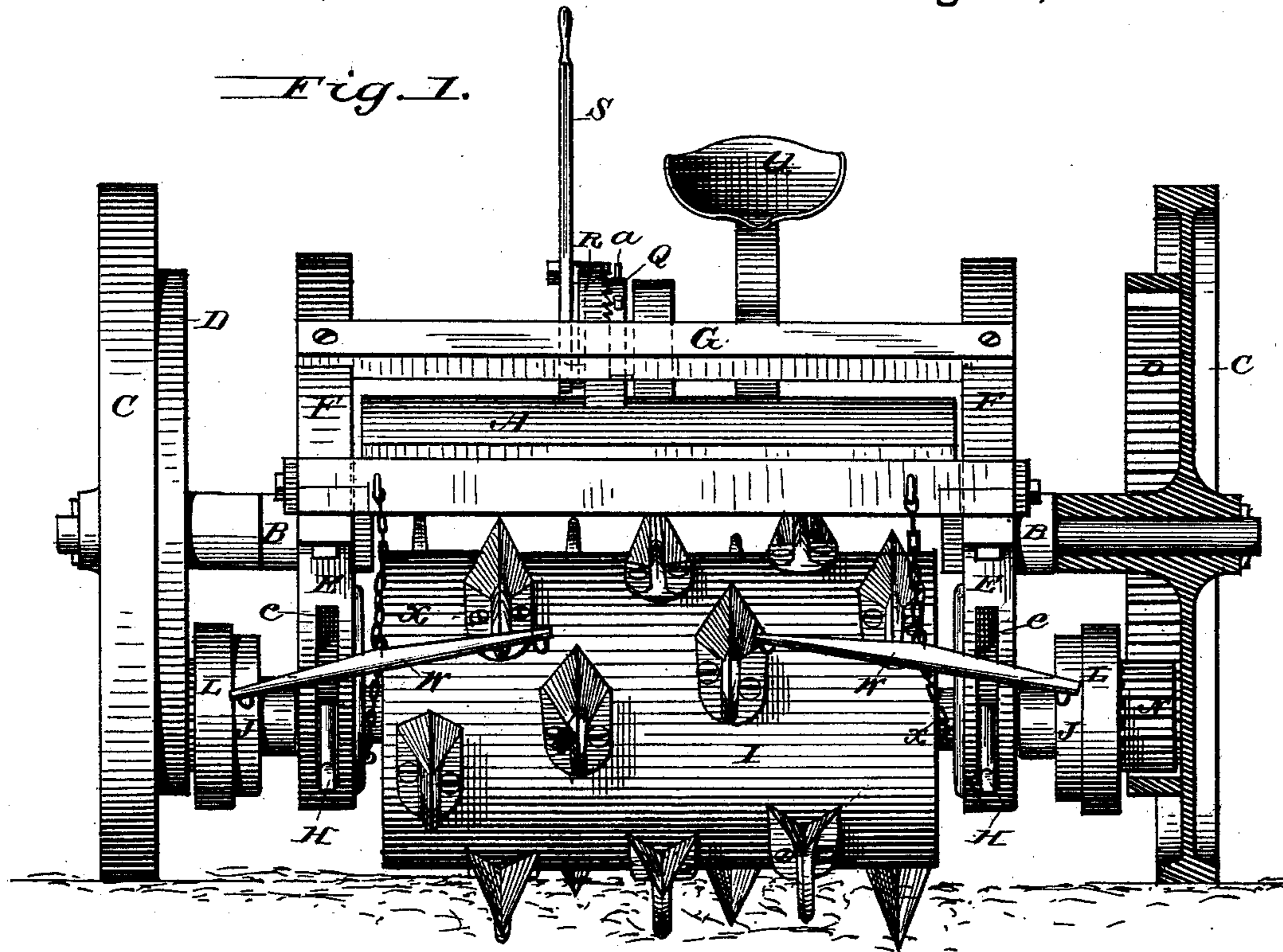


C. J. DANIELS.
Combination Harrow and Plow.

No. 218,429.

Patented Aug. 12, 1879.



Attest: H.
H. L. Perme,
A. M. Doug.

Inventor.
Charles J. Daniels,
by N. W. Craigin,
Atty.

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Fig. 3.

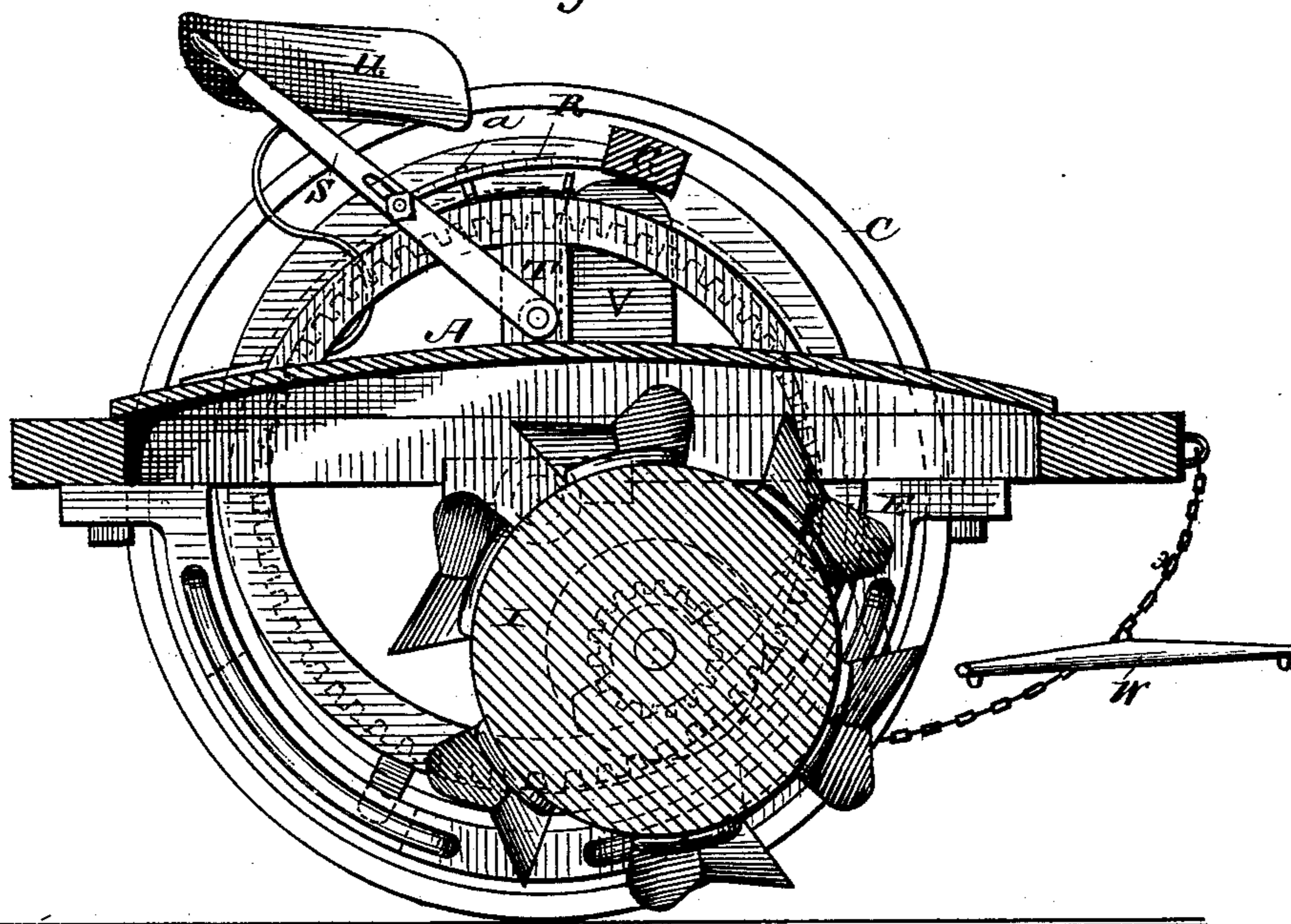


Fig. 4.

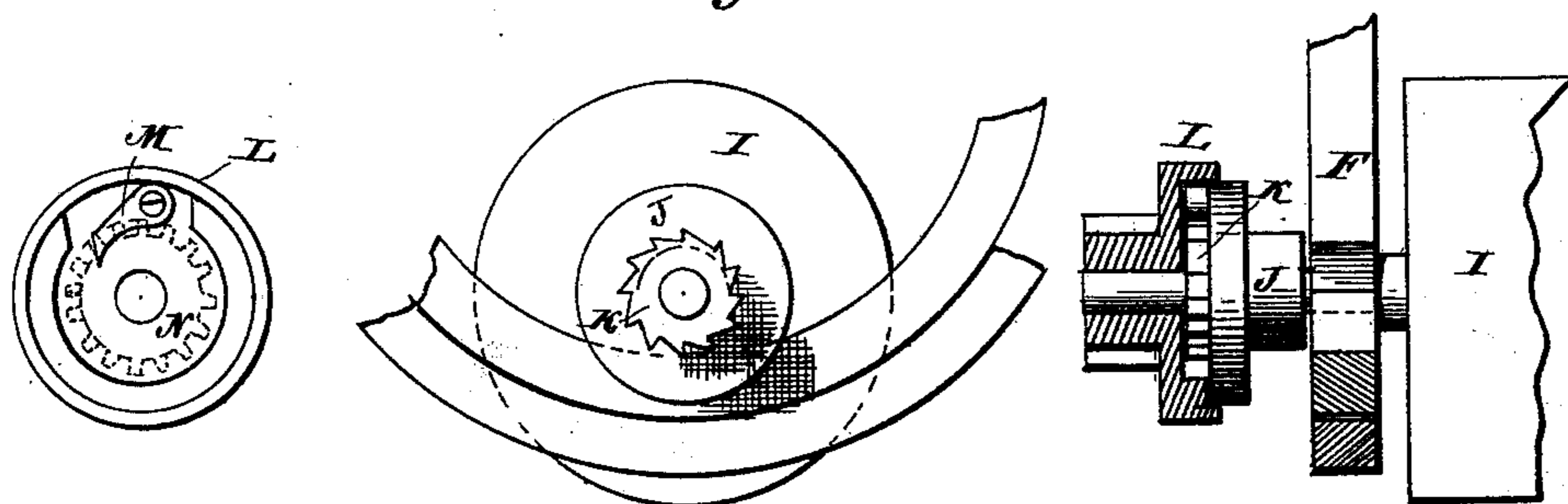
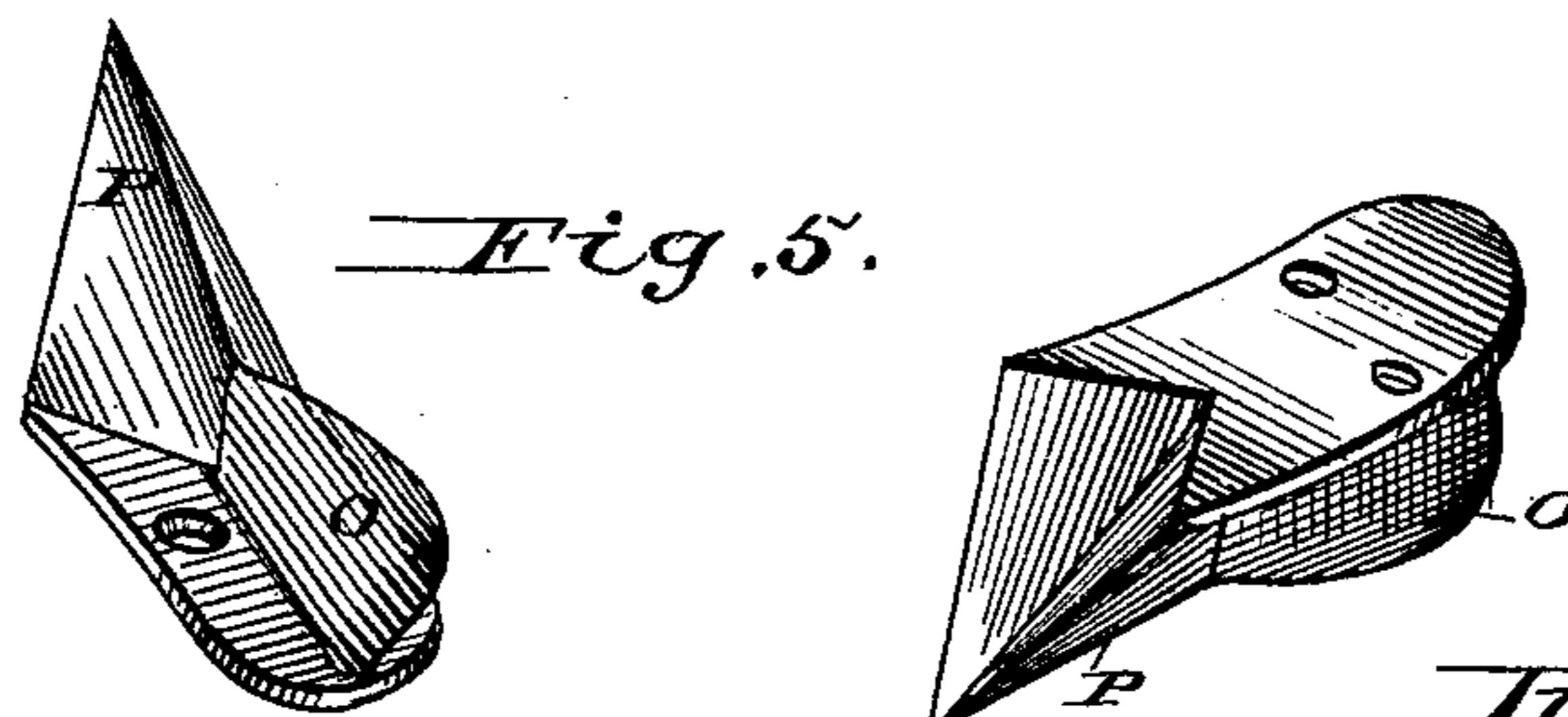


Fig. 5.



Attest:
H. L. Perrine,
A. M. Long.

Inventor.
Charles J. Daniels,
By *A. M. Cragin*
Atty.

UNITED STATES PATENT OFFICE.

CHARLES J. DANIELS, OF LEBANON, NEW HAMPSHIRE.

IMPROVEMENT IN COMBINATION HARROW AND PLOW.

Specification forming part of Letters Patent No. **218,429**, dated August 12, 1879; application filed June 23, 1879.

To all whom it may concern:

Be it known that I, CHAS. J. DANIELS, of Lebanon, in the county of Grafton and State of New Hampshire, have invented certain new and useful Improvements in Combination Harrow and Plow; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification, and in which—

Figure 1 is a front elevation, partly in section, of the harrow and plow, with the points or teeth lowered for operation; Fig. 2, a longitudinal vertical section thereof; Fig. 3, a longitudinal vertical section with the points or teeth raised from contact with the ground; Fig. 4, detail views of the gearing mechanism, and Fig. 5 a front and rear perspective of the teeth or points.

My invention is a combined harrow and plow; and it consists in the construction and combination of parts hereinafter more particularly set out.

In the accompanying drawings, the letter A indicates the platform of the harrow, rectangular in form, and having boxes B on its sides, in which boxes the wheels C are journaled. The boxes may have the axles made as a part thereof and the wheels fitted thereon. These wheels are made with a flange, D, on one side, the inner circumference thereof being toothed or cogged, as shown in Figs. 1 and 3.

Beneath the platform, to its sides, under the aforesaid boxes, there are bolted or otherwise secured semicircular rings E, in which are two longitudinal slots, e. On the sides of the platform, through openings therein, there are passed two circular rings or bands, F, the one connected to the other by means of a bar, G. The portions of these rings under the platform have prongs H affixed thereto, which prongs project into and through the slots described as being formed in the semicircular rings E, and are intended to control the circular play of the rings F. In the lower sections of these latter rings there is journaled a cylinder, I. The ends of the journals of this cylinder are made to project through and outside of the

rings F, and on them is keyed or screwed a collar, J, having on its face a ratchet-disk, K.

On the same journal there is slipped another collar, L, which is flanged, so that the flange will fit over the edge of the collar J, and has a spring-pawl, M, screwed therein, so that it will act with the ratchet-disk on the collar J. This collar L is free to turn in one direction on the journals of the cylinder, but is prevented from turning in the opposite direction by reason of the pawl engaging with the teeth of the ratchet-disk.

It is also provided on its outer face with a pinion, N, which fits within the circumference of the rim D, and in contact with the teeth or cogs thereon, and by reason thereof the cylinder is caused to revolve, as will be hereinafter described.

The periphery of the cylinder I has a series of points or teeth fastened thereto in oblique lines along the length thereof, so that when one point is leaving the ground the fourth point (where there are four teeth or points across the cylinder) will be entering. These points or teeth are constructed of the form shown in Fig. 5, with a cutting blade or edge, O, in front of the wedge-shaped points proper, P. The teeth thus constructed are screwed or otherwise secured to the face of the cylinder, so that the cutting-edge will be in advance of the tooth proper, thereby opening the ground for the latter, which enters deeper into the ground than the cutting-edge.

On the top of the platform there is a curved or other shaped bar, Q, bolted thereto, and provided along its length with pins a, with which a ratchet-bar, R, is to engage. This ratchet-bar is secured at one end to the cross-bar G, and at the other end to a lever, S, pivoted or hinged to the platform, or to the post T rising therefrom.

The platform has also on it a seat, U, for the driver, and an abutment, V, near unto the bar Q. The purpose of this abutment is to receive and hold the bar G, which is pulled up thereon, when the points or teeth to the cylinder are to be kept free from contact with the ground. The single-trees W are fastened to the chains X, connected to the harrow-frame, as shown.

A harrow and plow constructed according to the foregoing description can have its teeth

or points inserted more or less into the ground at the will of the operator, or they may be entirely freed from contact therewith, so that it can be driven over the ground as an ordinary wheeled vehicle would be.

The depth of the teeth or points in the ground is regulated by moving the lever S backward or forward. By pushing it forward the rings F are revolved, so as to carry the cylinder backward, which movement throws the cylinder to the lower points of the semicircular rings E, and therefore lowers the cylinder, and with it the points or teeth. During this time the pinion on the cylinder's shaft is in contact with the teeth of the flange D, and therefore when the harrow or plow is pulled forward the cylinder carrying the teeth, turns with the revolution of the wheels C, and the cutting-edges of the teeth are caused to enter the ground first, thereby opening it for the wedge-shaped tooth proper, and as the tooth at one end of the oblique line of teeth is leaving the ground the tooth at the other end is entering.

By this arrangement of the teeth less power is required to move the harrow than where the teeth are in a straight line across the length of the cylinder. The cylinder when adjusted for the depth of cut required is held in that position by engaging the ratchet-bar R with the teeth on the bar Q.

If it is desired to raise the cylinder, so as to free the teeth from contact with the ground, the lever S is pushed backward until the cross-bar G is raised onto the abutment, which takes the pinion N out of gear with the toothed flange D of the wheel C, and leaves the harrow free to be driven off as an ordinary wheeled

vehicle. Practice has demonstrated that this harrow will leave the ground very smooth with the grain well worked into it; and if the ground has been manured the harrow will work it into the ground, leaving the latter light; and it has been further demonstrated that the stone in the ground will be thrown to the surface instead of being turned in, as is the case with the ordinary plow.

Having described my invention, what I claim is—

1. The rings F, connected by bar G, in combination with the semicircular rings E, cylinder I, having pinions N, and wheels C, having cogged flanges D, substantially as set forth.

2. The platform A, supported on wheels C, in combination with rings F, semicircular rings E, and toothed cylinder I, substantially as set forth.

3. The platform A, provided with bar Q, having pins *a*, combined with ratchet R, lever S, bar G, rings F, having projections H, and semicircular rings E, having slots *e*, substantially as set forth.

4. In a rotary cultivator, the cylinder I, provided with teeth having the cutting-blades O and the wedge-shaped portions P, constructed and arranged as shown and described, and for the purpose set forth.

In testimony that I claim the foregoing as my own I affix my signature in presence of two witnesses.

CHARLES J. DANIELS.

Witnesses:

R. W. CRAGIN,

HIRAM STURTEVANT.