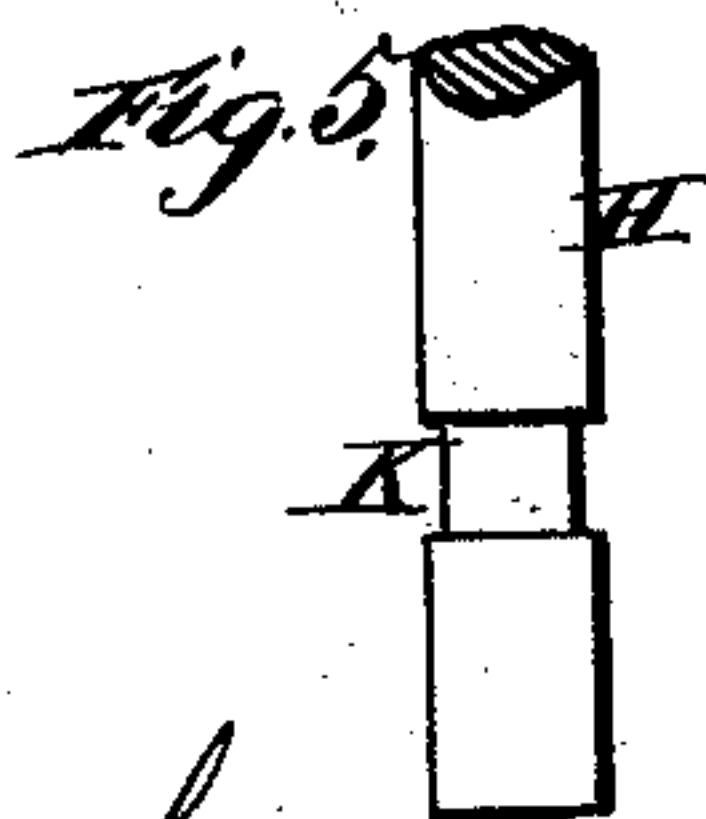
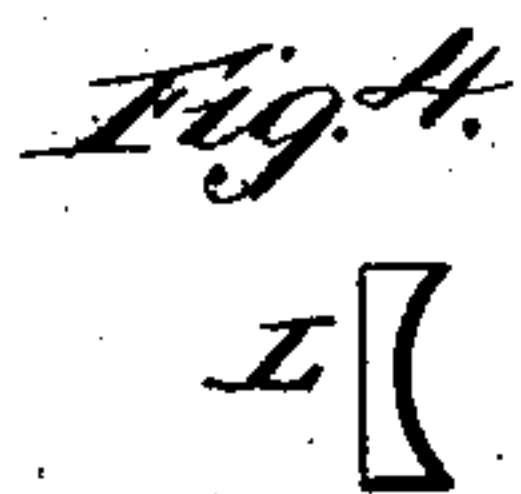
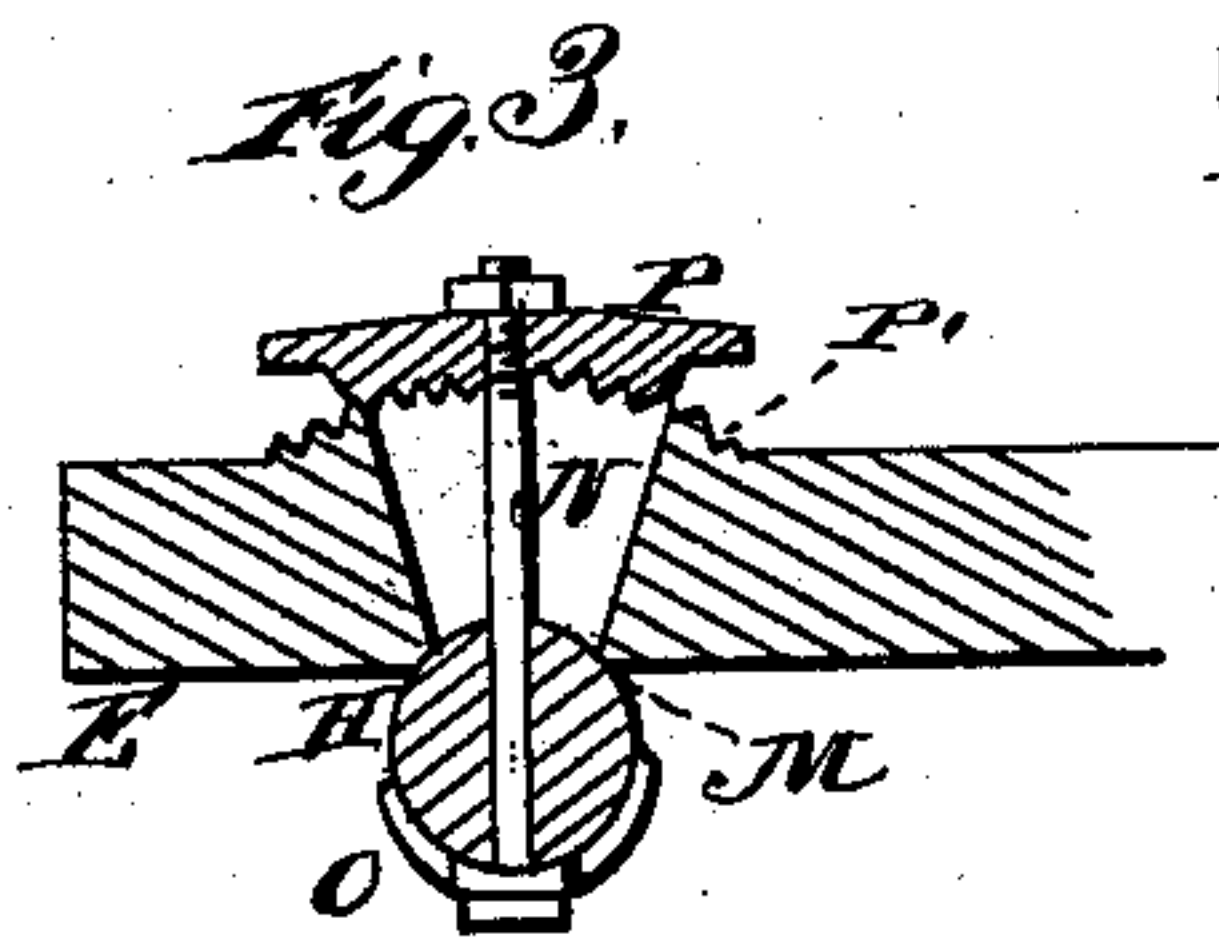
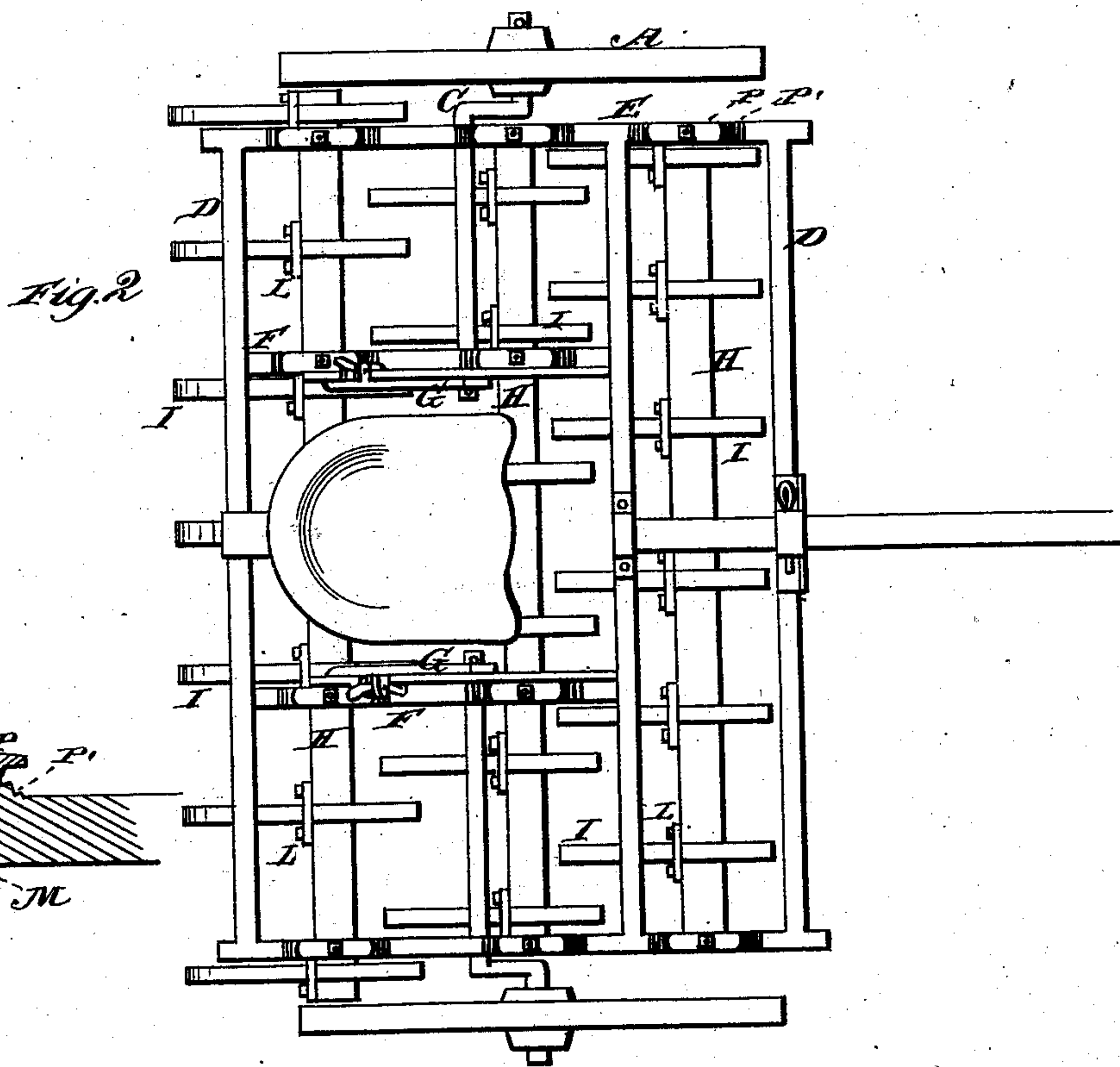
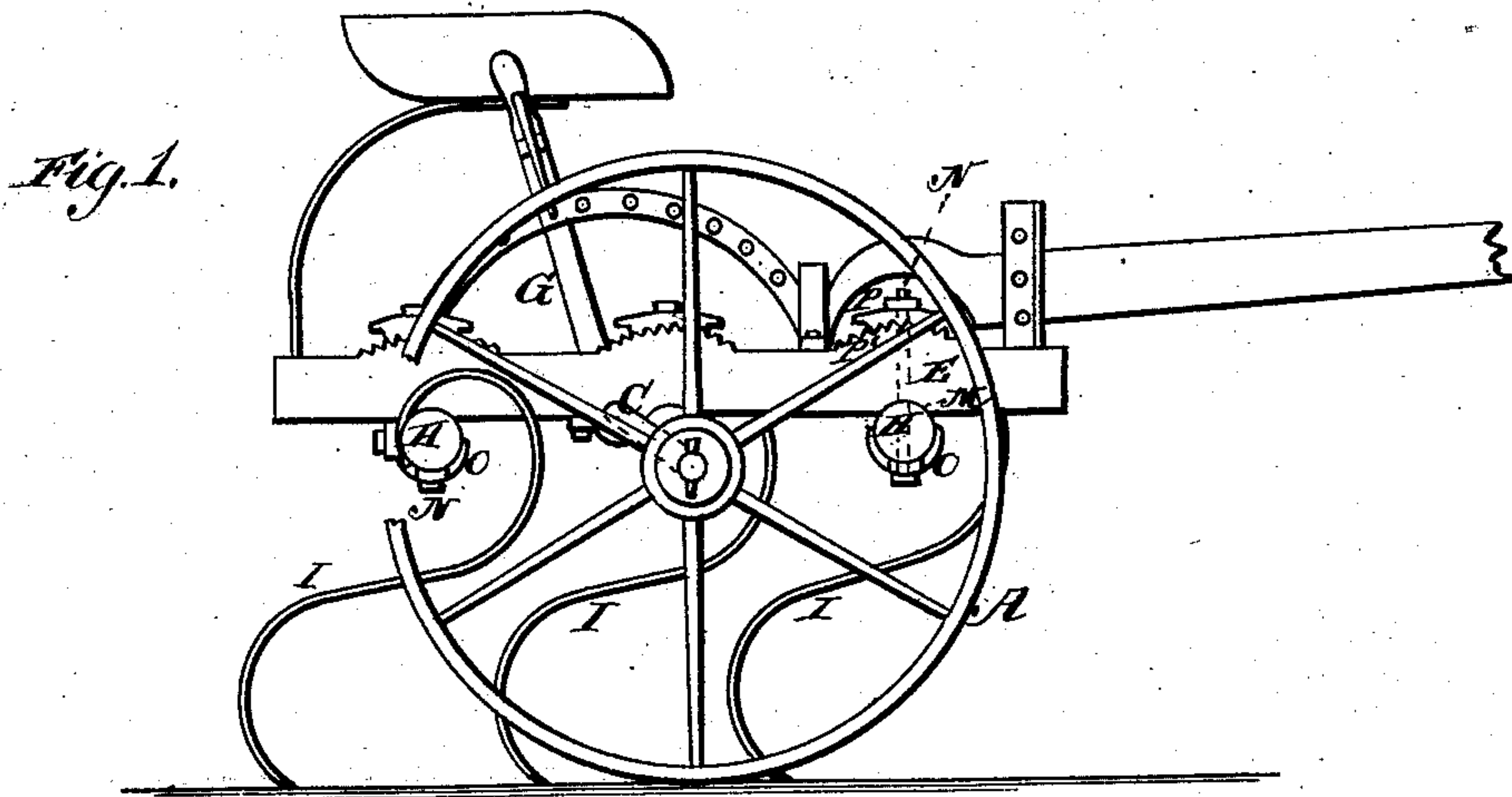


H. SPRINGER.
Spring-Tooth Cultivator.

No. 224,487.

Patented Feb. 10, 1880.



WITNESSES
Robert Emmett
James J. Sheehy.

INVENTOR
Henry Springer.
Gilmore, Smith & Co.
ATTORNEYS

UNITED STATES PATENT OFFICE.

HENRY SPRINGER, OF VICKSBURG, MICHIGAN.

SPRING-TOOTH CULTIVATOR.

SPECIFICATION forming part of Letters Patent No. 224,487, dated February 10, 1880.

Application filed December 13, 1879.

To all whom it may concern:

Be it known that I, HENRY SPRINGER, of Vicksburg, in the county of Kalamazoo and State of Michigan, have invented certain new and useful Improvements in Spring-Tooth Cultivators; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings, making a part of this specification, and to the letters and figures of reference marked thereon.

Figure 1 of the drawings is a representation of a side elevation of my spring-tooth cultivator. Fig. 2 is a plan view of the same; and Figs. 3, 4, and 5 are detail views.

This invention has relation to wheel-harrows; and it consists in the improvements in the construction of the same hereinafter fully described, and particularly pointed out in the claims.

Referring by letter to the drawings, A A designate the supporting-wheels of the main frame, and C C the crank-axes upon which said wheels are mounted.

The main frame is composed, essentially, of the cross-bars D, side bars, E, and the two bars F F, arranged intermediate of the center of the machine and its two side bars, E.

The axles are journaled in the bars E and F, and are turned for the purpose of actuating their crank ends, and thereby raising the main frame, by means of hand-levers G, arranged upon the inner ends of the axles so as to extend up alongside of the driver's seat and within convenient reach of the driver. These hand-levers are adjusted and secured in proper position by means of the ordinary sector-rack and latching-lever, or equivalent means, and it will be noticed that the bars F form convenient supports for the said racks, although it is not absolutely essential that they should be secured to these two particular bars.

H refers to shafts which carry the spring-teeth I. These teeth approximate in configuration to the letter S, the lower semicircular part of which is, however, somewhat larger than the upper portion thereof. The upper end of each tooth is set in a groove, K, formed around the shaft, and is securely held therein by means of a clip or plate, L, which is curved or concaved upon its under side, so as to con-

form to the curvature of the tooth and shaft, and bolted to the latter, substantially as shown.

The above-described peculiar conformation of the teeth gives to each tooth the advantages of a double or compound spring, and by securing them to the shafts in the manner specified it will be seen that while they are passing through the ground the strain will not come at right angles to their upper ends, since the resistance of the ground will tend to draw the upper curve of the tooth around the shaft, thus enlarging its bearing in proportion to the strain incurred. The grooves K effectively prevent any lateral displacement of the teeth and afford side supports for the same, so as to keep them at all times in the line of work.

The concave form of the clips L renders them far more efficient than if they were flat, since under my arrangement the teeth will be prevented from slipping in the grooves with much less strain upon them by reason of the broad bearing-surface of the clip being made in conformity with the curvature of the tooth.

The shafts which carry the teeth are supported in semicircular recesses M, formed in the lower edges of the bars E F of the main frame by means of rods N, which are secured at their lower ends to half-rings or clasps O, arranged to partially embrace the shafts and keep them up in the bearings M.

The rods N pass upward through recesses formed in said bars, and are provided at their upper ends with toothed plates P, which engage with segmental racks P', formed or secured upon the bars of the main frame. These segmental racks are recessed or mortised similarly to the bars upon which they are secured, so that by loosening a nut upon the end of a rod the toothed plate may be freed from the segment and the rod moved backward or forward, thus causing a sufficient rotary movement of the shaft to bring the tooth into the proper angle or pitch, the remaining rods and toothed plates on the shaft being of course operated at the same time in a similar way.

The rear or front shaft, which carries spring-teeth, extends out from the side bars, and carries a spring-tooth at each end between the bars E and the wheels. In this way I form a guiding-line or furrow for the wheel to travel in when driving the machine back across the

field, thus leaving no uncultivated part of the land. The crank-axle becomes important in this connection, since in driving the machine with one wheel in a furrow thus made it may
5 become necessary to lower the wheel.

Having thus described my improvement, what I claim is—

1. The main frame provided with segmental or equivalent racks P', with a continuous mortise through the rack and frame, in combination with the shaft H, carrying the cultivator-teeth, and its supporting-rod, provided with a toothed plate, P, arranged to engage

with the rack upon the main frame, substantially as shown and described.

2. The main frame, rack P', shaft H, carrying the teeth, supporting-rod N, toothed plate P, and semicircular clasp O, all arranged substantially as herein shown and described.

In testimony that I claim the above I have
hereunto subscribed my name in the presence
of two witnesses.

HENRY SPRINGER.

Witnesses:

MATHEW VAN DUSEN,
WILLIAM G. HAWKINS.