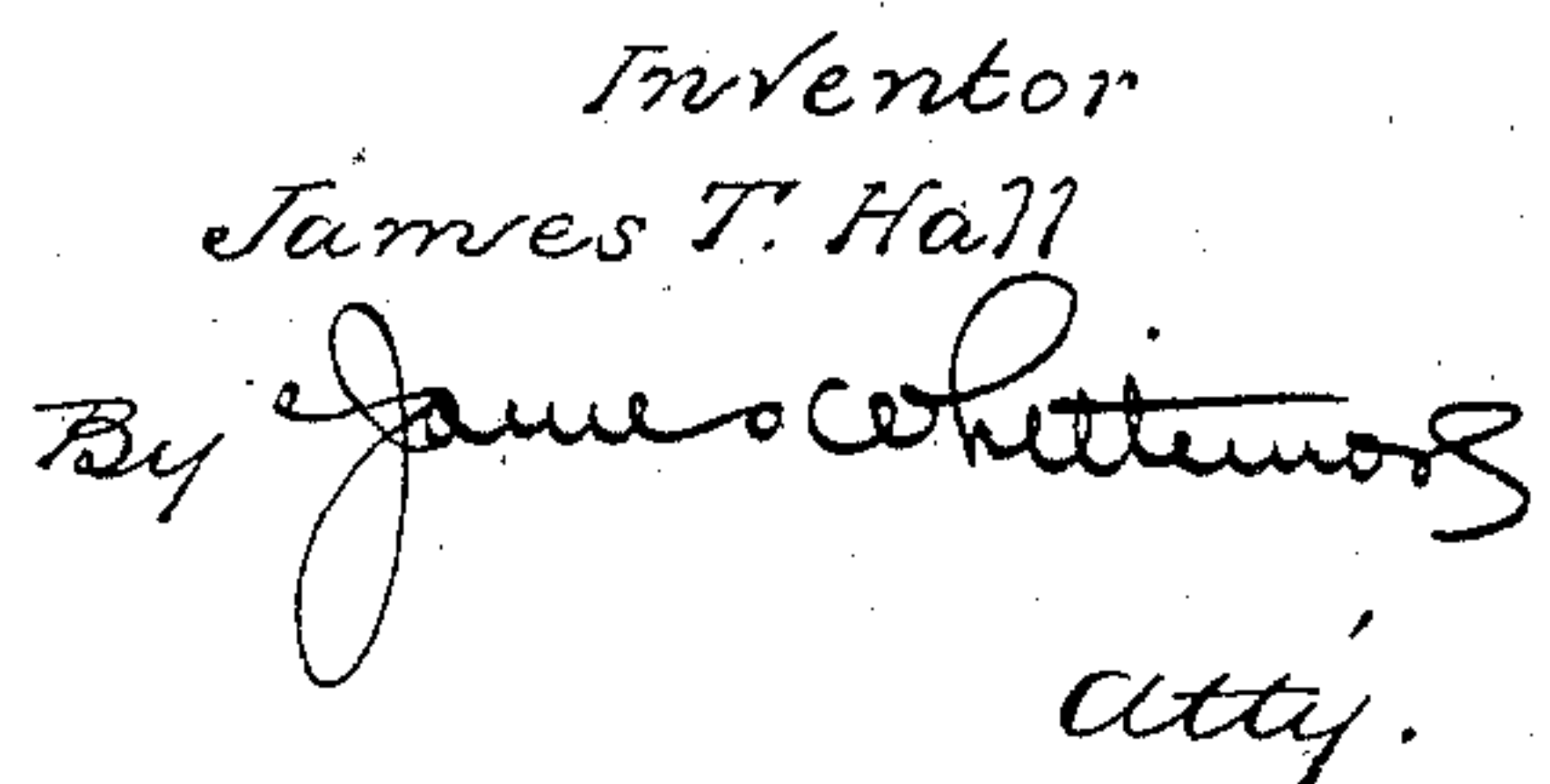


PATENTED SEPT. 1, 1903.

APPLICATION FILED JAN. 9, 1903.

2 SHEETS—SHEET 1.



Witnesses
W. H. Robertson
Thos. S. S. S. S. S.

No. 737,612.

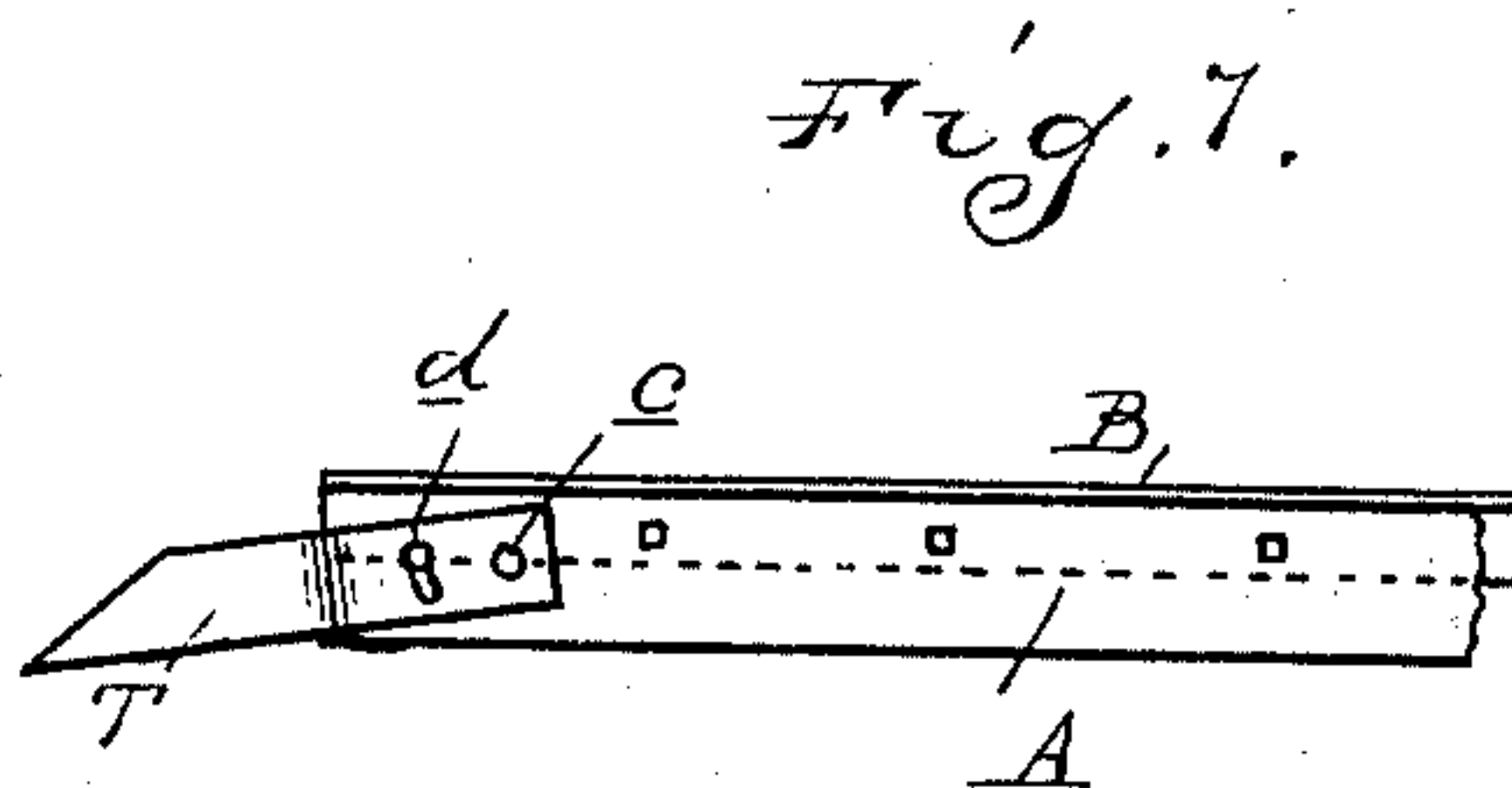
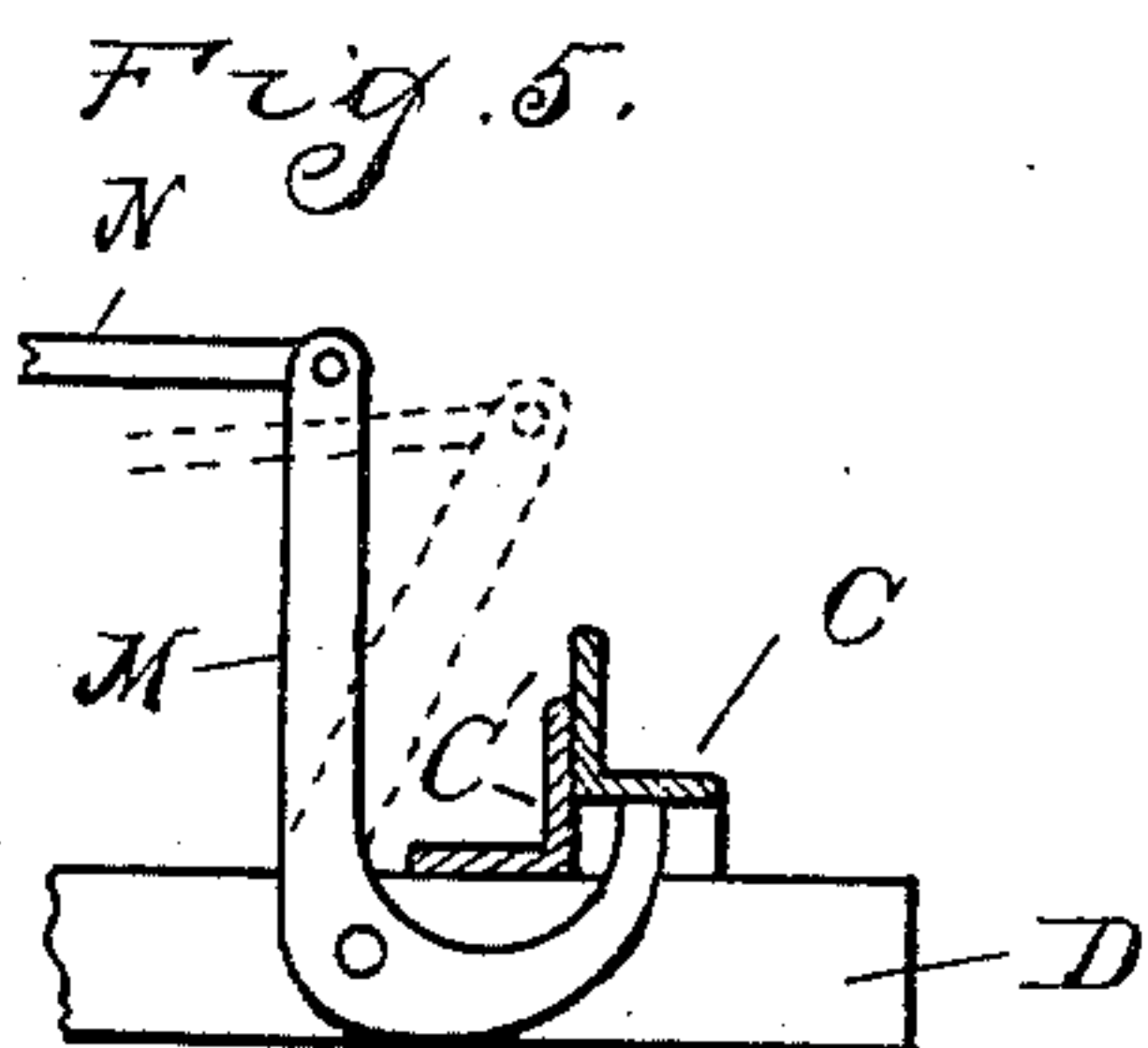
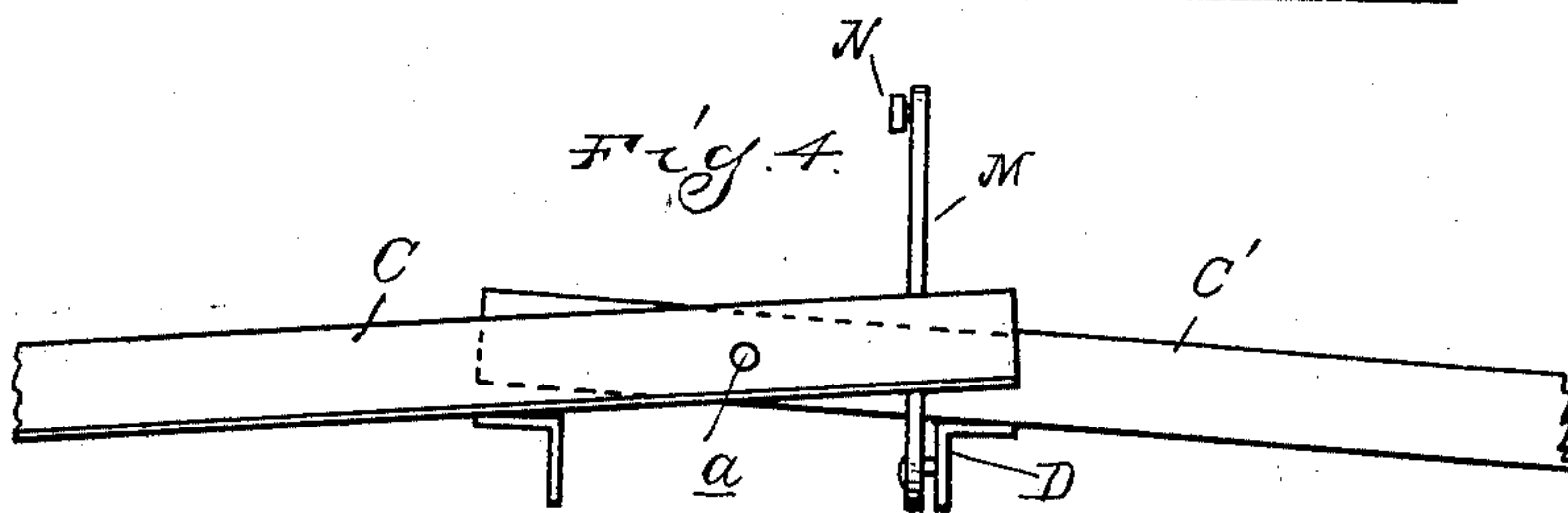
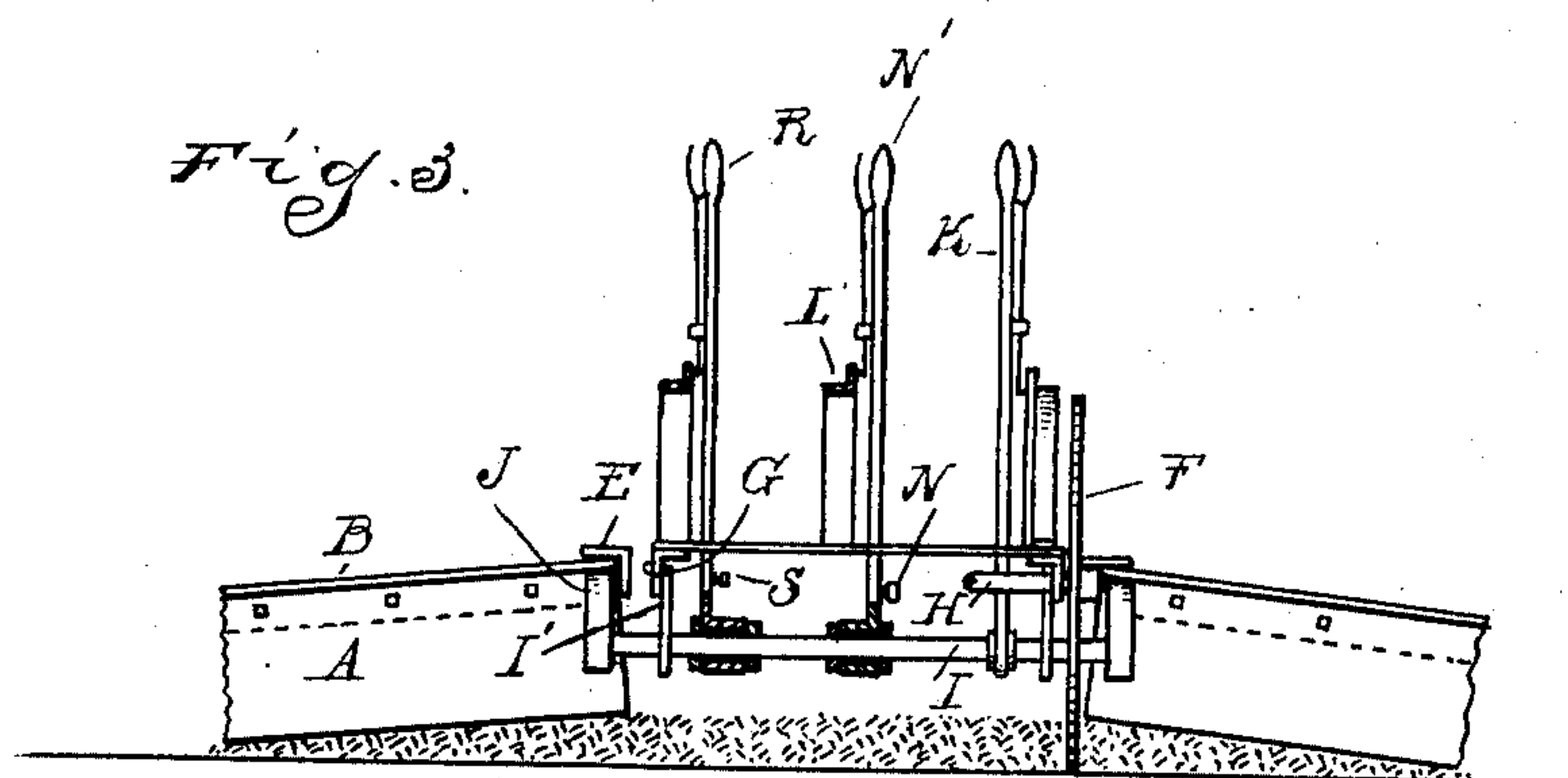
PATENTED SEPT. 1, 1903.

J. T. HALL.
ROAD GRADER.

APPLICATION FILED JAN. 9, 1903.

NO MODEL.

2 SHEETS—SHEET 2.



Witnesses
A. H. Robertson.
M. B. O'Gherly.

Inventor
James T. Hall
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att'y.

UNITED STATES PATENT OFFICE.

JAMES T. HALL, OF CHICAGO, ILLINOIS.

ROAD-GRADER.

SPECIFICATION forming part of Letters Patent No. 737,612, dated September 1, 1903.

Application filed January 9, 1903. Serial No. 138,347. (No model.)

To all whom it may concern:

Be it known that I, JAMES T. HALL, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Road-Graders, of which the following is a specification, reference being had therein to the accompanying drawings.

The invention relates to new and useful improvements in road-graders; and it consists in the peculiar construction of the various devices herein shown and described.

In particular the invention consists in the device for causing the scraper-sections to assume an angle to each other, in a device for raising and lowering the scraper-sections or the front portions thereof from the ground, in a device for raising the rear ends of the scraper-sections for the purpose of distributing the scraper soil more evenly over the road where the soil is loose, in the construction of adjustable cutters at the forward end of the scraper-blades, and, further, in the construction, arrangement, and combination of the various parts, all as more fully hereinafter described, and particularly pointed out in the claims.

In the drawings, Figure 1 is a plan view of my improved road-grader. Fig. 2 is a side elevation thereof. Fig. 3 is a rear elevation, partly in section. Fig. 4 is a front elevation of the central portion thereof to illustrate the operation of the lever which causes the scrapers to assume an angle to each other. Fig. 5 is a section on line *y y*, Fig. 1. Fig. 6 is a cross-section on line *x x*, Fig. 2, showing the construction of the scraper-blades. Fig. 7 is a side elevation of the forward end of one of the scraper-blades, showing the adjustable cutter.

A represents two oblique scraper-blades converging toward their rear ends. These blades are preferably formed of plates of steel, having connected to their upper ends an angle-bar B, which not only forms a stiffening for the blades, but the horizontal face of the angle forms a means to which the cross-bars C C' may be connected.

D represents longitudinal bars connected at their rear ends to the rear ends of the angle-bars B at the top of the scrapers and extending parallel to each other to the front of

the machine. Each pair of cross-bars C C' are connected to one of the longitudinal bars D, forming two triangular frames, as plainly shown in Fig. 1, each triangular frame consisting of a scraper A, its angle-bar B and longitudinal bar D, and the two cross-bars C C'. The ends of the cross-bars C C' extend over the longitudinal bar D, to which they are connected, a sufficient distance so that their free ends will be above the other longitudinal bar D, and these overlapping portions of the cross-bars are pivoted together at the middle point of the machine on the pivot-bolts *a*, so that the two triangular frames carrying the respective oblique blades are centrally hinged together, so that they may assume an angle to each other below a horizontal line; but these blades cannot extend into an angular position above the horizontal line because of the overlapping ends of the cross-bars striking the longitudinal bars D. This will be plainly understood by reference to Fig. 4.

The draft attachment, which may be of any suitable construction, I preferably connect to the forward cross-bars C and C'. This draft connection I have not shown.

The longitudinal bars D, I preferably extend rearwardly beyond the intersection of the scraper-blades to form the extensions E.

F represents two steering-disks extending parallel with the longitudinal bars D, journaled on the ends of the cross-bar or shaft H, which connects the rear ends of the angle-bars G, which extend parallel to and between the rear portion of the bars D. The disks F, the angle-bars G, and the cross-bars H form a frame, which I call the "steering-frame," and this frame is pivoted at its forward end on the transverse bolt or pivot G', so that it may be raised and lowered upon this pivot by the operator, who grasps the handles H', secured to the frame at the rear of the machine, and by means of which he may steer the scraper in the road.

I is a transverse shaft secured in depending brackets I', secured near the rear end of the bar G and journaled in those brackets. At each end this shaft has a cam-block J outside of the steering-frame and beneath the horizontal flange of the rear end of the longitudinal bars D.

Secured to the shaft I is an operating-lever K, by means of which the shaft may be rocked, and the segment L, with the usual latch on the lever for engaging, catches in the segment to hold the lever in its adjusted position.

When it is desired to lift the rear end of the scraper-blades A slightly, so as to distribute the scraped soil a little more evenly in certain cases and not carry quite so much to the discharge between the rear ends of the scrapers, the operator draws back upon the lever K, rocking the cam-blocks J against the rear extensions E of the bars D, thereby lifting slightly the rear end of the scrapers, as shown in Fig. 2, thus causing part of the dirt scraped by the forward end of the scraper-blades to be spilled or discharged gradually beneath the rear portions of the scraper and not carry it all to the space between the ends thereof.

I find in some instances that it is desirable to cause the scraper to act a little more severely than in others, and I find that this can be accomplished by lifting the middle portion of the triangular frames, so as to cause the two frames to stand at an angle to each other below the horizontal position of those frames. This I may accomplish in a number of different ways; but the way I prefer is shown in the drawings, consisting of a lever M, pivoted on one of the side bars D and engaging the overlapping end of one of the cross-bars C and C', as shown in Figs. 4 and 5. If it is secured to the right-hand bar D, it is necessary to pass under one of the cross-bars, as shown in Fig. 5; but if it is secured to the left-hand cross-bar D it can engage directly with the overlapping end of the cross-bar immediately adjacent to the pivotal point. The upper end of the lever M, I connect by a connecting-rod N with a lever N', journaled on the shaft I and having a locking engagement with the segment O on the steering-frame. Drawing backward on this lever will cause the lever M to be rocked and the two cross-bars to be moved into an angle to each other below the horizontal, as shown in Fig. 4, thereby increasing the severity of the scraping action of the scraper-blades.

In some instances it is desirable, as in crossing bridges, to lift the forward end of the scraper, so as not to catch on the boards in the bridge, and it is also sometimes desirable in very sandy soil to have bearing-wheels to limit the distance in which the scrapers will cut into the soil. I therefore provide means to accomplish these results by providing the wheeled crank-shafts P, one journaled on each triangular frame and having wheels P', secured to the cranks, preferably outside of the scraper-blades, and crank-arms Q, connected to the lever R, journaled on the shaft I by means of the connecting-rod S, which is preferably separately connected to the indi-

vidual cranks—as, for instance, by the furcations b of the connecting-rod. By drawing backward on the lever R the crank-shafts P are rocked and the wheels P' are lowered below the scraper-blades, lifting the forward end of the scraper free from the road for crossing bridges or culverts, or the wheels may be simply lowered partially to act as a guide to determine the amount of the cutting of the scrapers. The lever R is provided with the usual latch adapted to engage into a segment S' on the steering-frame.

I find that it is desirable at times on hard roads where a severe scraping effect is desired to provide the forward end of the scrapers with knives or cutters T, preferably bent with their outer ends in the line of draft, as plainly shown in Fig. 1. I may secure these cutters or knives adjustably in position in any desired manner—as, for instance, by pivoting them at their rear ends on the pivot-bolt c and employing an adjusting-bolt d, working through a segmental slot in the knives, so that they may be raised or lowered, as desired, and clamped in their adjusted position.

What I claim as my invention is—

1. In a road-grader, the combination of two scraper-frames hinged to have an angular movement in relation to each other, of a wheeled crank on each frame, and a common actuating device for the two crank-shafts to lower the wheels and raise the scraper-blades.

2. In a road-grader, the combination of the two scraper-frames hinged together to have an angular movement in relation to each other, a lever and an actuating device operated by the levers for causing said frames to assume an angular relation to each other.

3. In a road-grader, the combination of two scraper-frames hinged together, of a vertical frame pivoted to the scraper-frames at the rear, a steering disk or blade thereon, and means for raising the rear ends of the scraper-frames in relation to the steering-blade.

4. In a road-grader, the combination of two scrapers arranged in the shape of a V, with the small end rearward, of cutter-blades hinged to the front of said scrapers, and means for holding said blades in their adjusted positions.

5. In a road-grader, the combination of two scraper-blades arranged in the shape of a V with the small end rearward, of cutter-blades adjustably secured to the front of the scraper-blades, having their outer portions arranged substantially in the line of draft.

In testimony whereof I affix my signature in presence of two witnesses.

JAMES T. HALL.

Witnesses:

M. B. O'DOHERTY,
A. G. ROBERTSON.