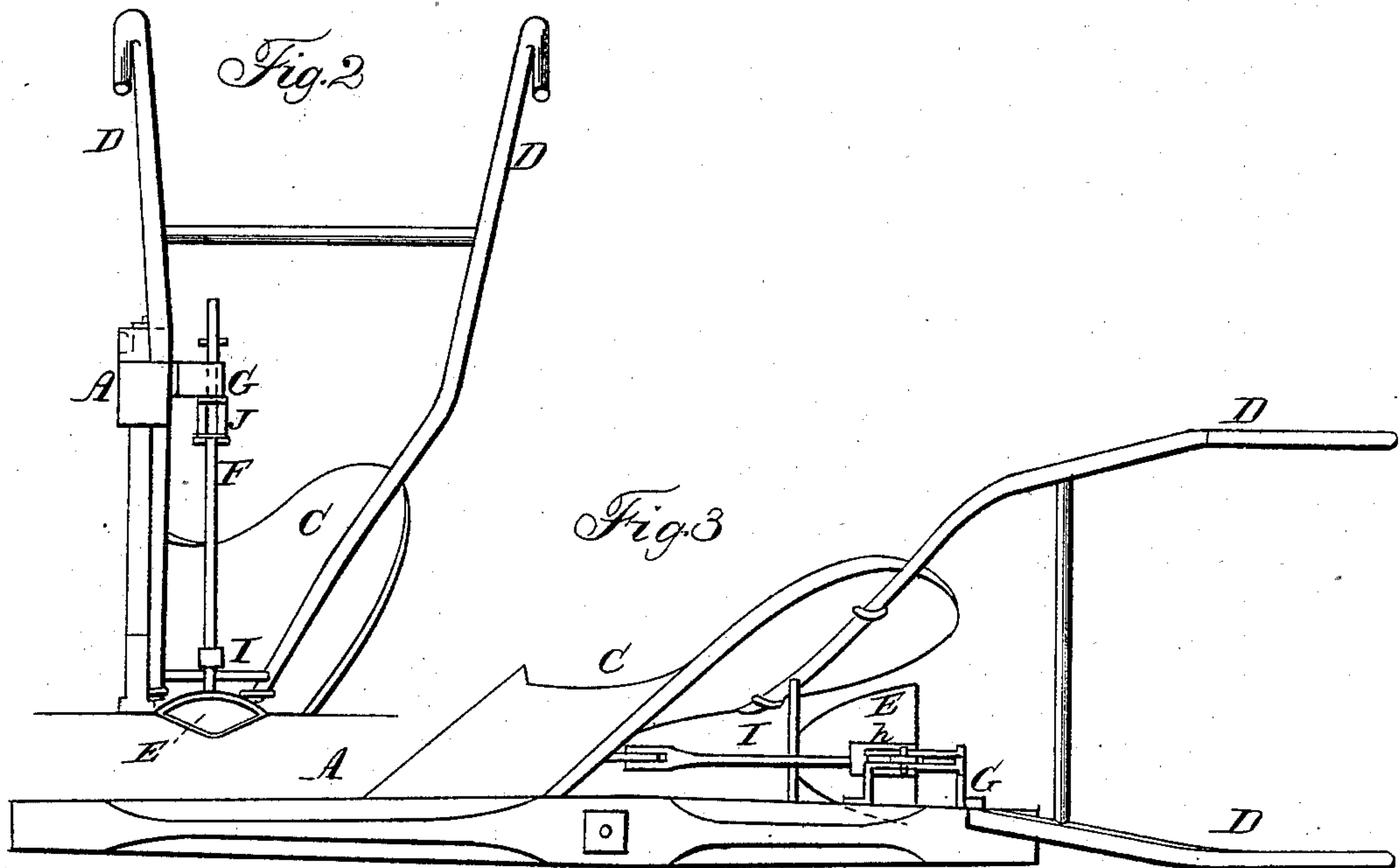
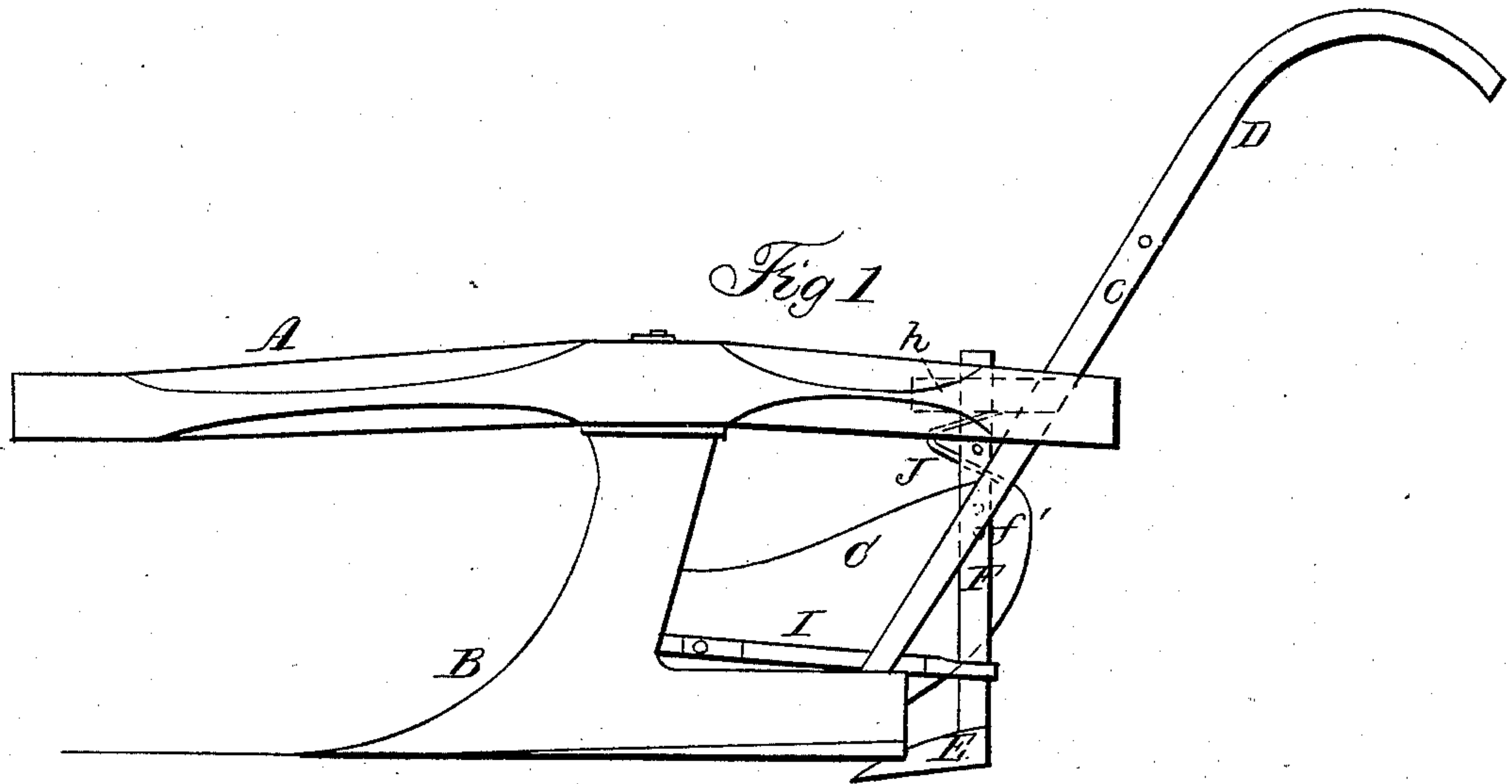


J. A. KRAKE.

Subsoil-Plow.

No. 66,597.

Patented July 9. 1867.



Witnesses,
B H Muehle
E D Forbush

Inventor,
John A Krake

United States Patent Office.

JOHN A. KRAKE, OF ALDEN, NEW YORK.

Letters Patent No. 66,597, dated July 9, 1867.

IMPROVEMENT IN SUBSOIL ATTACHMENT TO PLOUGHS.

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

TO ALL WHOM IT MAY CONCERN:

Be it known that I, JOHN A. KRAKE, of Alden, in the county of Erie, and State of New York, have invented a new and improved Subsoil Attachment to Ploughs; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure I is a side elevation of a plough with my improved subsoil attachment.

Figure II is a rear end elevation.

Figure III is a plan view.

The nature of this invention consists in making and attaching a subsoil plough to the common plough in such manner that it shall be propelled in the line of draught of the common plough to which it is attached, and be free to oscillate right and left and vertically, without throwing it out of the line of draught.

Letters of like name and kind refer to like parts in each of the figures.

A B C D represents a plough of common construction. E represents the share, and F the upright wrought-iron standard, forming a subsoil plough. This standard has adjustable pin-holes *f'* for adjusting or setting the plough to cut any required depth. This standard passes through a mortise formed in the supporting bracket G. This bracket is securely bolted to the plough-beam A. At the front end of this mortise is placed a friction-roller, *h*, against which the front edge of the standard-bar bears when the plough is in operation. The standard-bar being flat, and the mortise being deep, the standard has a broad bearing in the mortise, which will prevent the standard from turning sidewise, and the friction-roller prevents any wedging of the standard in the mortise, and allows it to work freely in the mortise. I represents a flat connecting-spring, which clasps the standard and connects with the mould-board of the common plough by means of a flat fork on the end of the spring, and an ear or holding-piece formed on or connected with the mould-board. This holding-piece is placed directly in the line of draught, so that the pull of the subsoil plough will be directly in the line of draught of the common plough. This spring will perform the office of a draw-rod, and also of aiding to bring the subsoil plough back into the line of draught quickly, in case it has been thrown out by meeting any obstruction, and will also permit the subsoil plough to vibrate vertically. A simple connecting-rod may be used instead of this spring, but I use the spring by preference. If a connecting-rod is used instead of the spring I, then I propose to use two spiral springs, one between the land-side of the plough and the connecting-rod, and one between the connecting-rod and mould-board, so placed and connected that these springs will act to quickly move the subsoil plough back into the line of draught in case it has been oscillated or turned to the right or left. There is a flat bent spring, J, having mortises through its ends, through which the standard passes. The upper end of this spring bears against the bracket, and the lower end against a pin in the standard. This spring will permit a vertical movement of the sub-soil plough, in case it strikes a stone or other obstruction, and yet is of sufficient strength to keep the plough at work at its proper depth. The subsoil plough may also oscillate a little right and left, and yet its central point cannot be thrown out of the line of draught. Also, in case the common plough strikes a stone or other obstruction, it will not disturb the full action of the subsoil plough. The flexible connections of the subsoil plough to the common plough, as above described, will compensate for and allow either plough to meet and pass ordinary obstructions without difficulty. In case the subsoil plough is thrown out by any obstruction, the spring will bring it back immediately to its work. A spiral spring may be placed upon the standard with the same effect.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination and attachment of a subsoil plough to a common plough, in such manner that it shall be drawn in the line of draught of the common plough, to which it is attached, and be free to oscillate right and left and vertically, without throwing it out of the line of draught, substantially as described.
2. The connecting-spring I, applied and used for the purpose and substantially as described.
3. The spring J, applied and used, in combination with the standard F and bracket G, for the purpose and substantially as described.
4. The bracket G, having a friction-roller, *h*, as a means of supporting and guiding the standard of the subsoil plough, substantially as described.

Witnesses:

B. H. MUEHLE,
E. B. FORBUSH.

JOHN A. KRAKE.