

(No Model.)

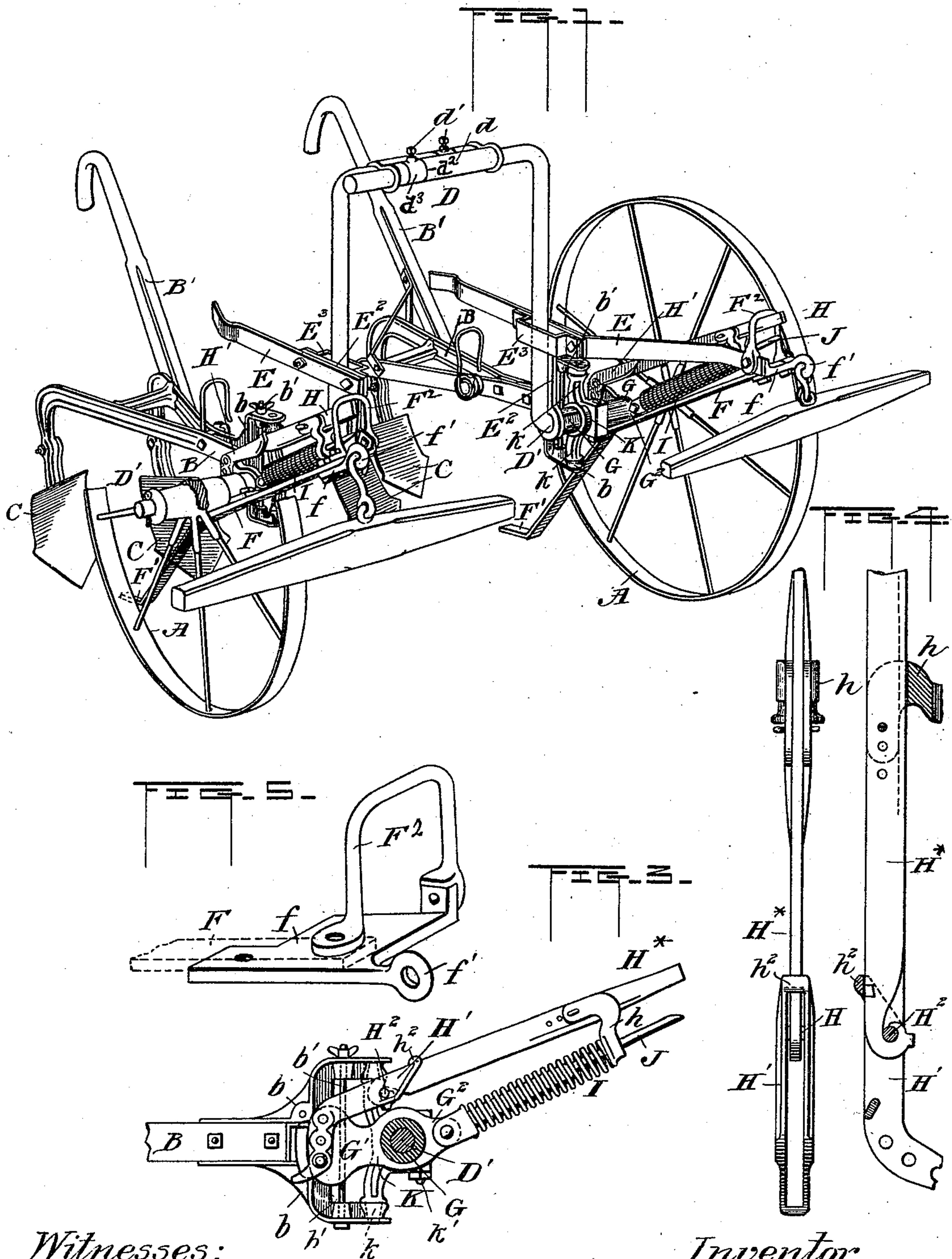
2 Sheets—Sheet 1.

S. D. POOLE.

ATTACHMENT FOR WHEEL CULTIVATORS.

No. 510,091.

Patented Dec. 5, 1893.



Witnesses:

L. A. Conner  
Chas. E. Riordan.

Inventor

Staley D. Poole  
By Butternorth & Dowell  
his attorneys.

(No Model.,

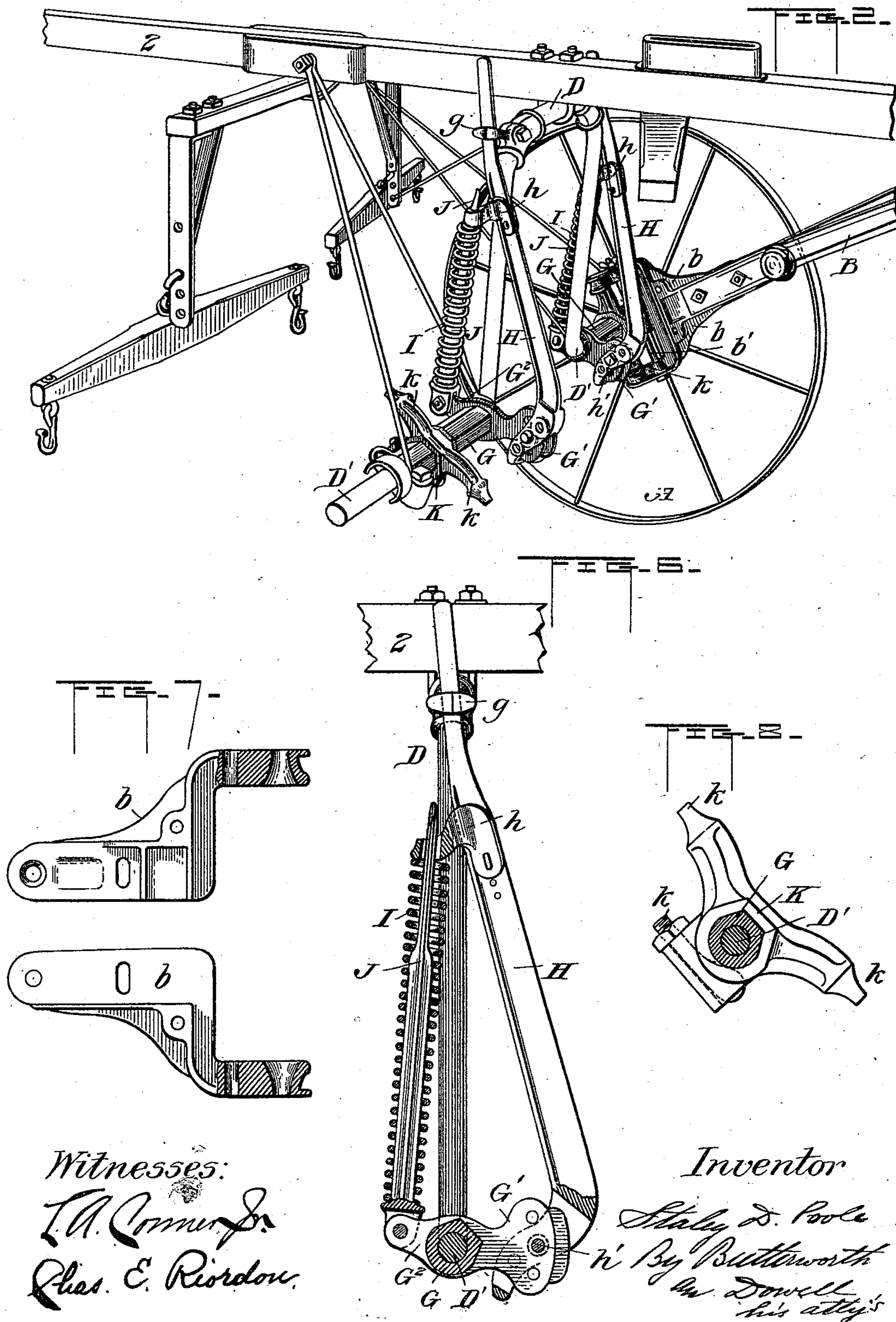
2 Sheets—Sheet 2.

S. D. POOLE.

## ATTACHMENT FOR WHEEL CULTIVATORS.

No. 510,091..

Patented Dec. 5, 1893.





# UNITED STATES PATENT OFFICE.

STALEY D. POOLE, OF MOLINE, ILLINOIS, ASSIGNOR TO THE DEERE & COMPANY, OF SAME PLACE.

## ATTACHMENT TO WHEEL-CULTIVATORS.

SPECIFICATION forming part of Letters Patent No. 510,091, dated December 5, 1893.

Application filed September 29, 1893. Serial No. 486,776. (No model.)

*To all whom it may concern:*

Be it known that I, STALEY D. POOLE, a citizen of the United States, residing at Moline, in the county of Rock Island and State of Illinois, have invented certain new and useful Improvements in Attachments to Wheel-Cultivators; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The principal objects of my invention are to provide improved mechanism whereby the weight of the plow beams and shovels may be counterbalanced, so that they may be more easily lifted, and to provide mechanism which will not necessitate the holding of the shovels in the ground against the action of the constantly increasing force of the counterbalancing spring.

A further object is to provide improved mechanism which will permit the counterbalancing mechanism to accommodate itself to the varying conditions to which it is subjected in use, whereby locking, or breaking of the parts, is prevented.

The invention consists in certain features of construction and combination of parts all as will be more fully hereinafter described and then pointed out in the claims at the end of this description.

In the accompanying drawings which form a part of this specification, Figure 1 is a perspective view of my counterbalancing mechanism applied to a tongueless cultivator. Fig. 2 is a perspective view of the same as applied to an ordinary wheeled tongue cultivator, some of the parts and the near wheel being removed. Fig. 3 is a detail sectional view of the counterbalancing mechanism shown in Fig. 1. Fig. 4 is a detail in side and edge view of the hinged lever. Fig. 5 is a detail of the yoke and casting which confines the end of the lever, forming part of the counterbalancing mechanism. Fig. 6 is a detail side elevation, partly in section, of the counterbalancing mechanism as applied to the tongue cultivator. Fig. 7 is a detail of the castings or clevis for coupling the end of the plow beam to the axle as shown in Fig. 3; and Fig. 8 is a detail view of the coupling section between the plow beam and the sleeve of the counterbalancing mechanism.

Like letters and numerals of reference indicate like parts wherever they occur.

In the drawings A, represents the wheels of the cultivator, which may be provided with two shovel beams B, having suitable handles B', and two gangs of shovels C. Referring particularly to Fig. 1, the arch D, of the cultivator axle is composed of two pieces coupled together by a double sleeve *d*, formed at opposite sides with slots *d*<sup>2</sup> to receive rings *d*<sup>3</sup>, each of which is provided with a set screw *d*'. This construction of coupling device permits a free forward and backward motion of the wheels A, and affords means for adjusting the wheels nearer together or farther apart as occasion may require, the set screws serving to hold the wheels in the adjusted position. Thus each side of the cultivator has an independent motion and in case one horse should step ahead of the other (their being no tongue) the cultivator would not be turned around nor the line of the furrow changed. The forward and backward movement of each half of the arch is limited by the strap or yoke E<sup>3</sup>, which is secured to the bar E. The arch D, at each side has the usual horizontal portions D', upon which the wheels A, are journaled. A bar F, is journaled to each axle-arm D', and one end thereof extends downwardly and rearwardly and has thereon a foot F', which may rest on or slide along the ground, and the other end extends forward and to it is secured the casting or plate *f*, having the eye *f*', formed thereon to which the whiffletree is attached. A yoke F<sup>2</sup>, is bolted or otherwise suitably secured to the front end of the bar F, and within said yoke is confined the front end of the lever H, of the counterbalancing mechanism. The forward end of the bar F, is rigidly connected by the casting or plate *f*, to bar E, which in turn is secured to a T-shaped casting E<sup>2</sup>, which is supported on the axle D', close to the arch so as to permit a vibratory or oscillatory movement of the axle or arched portion thereof within certain limits as previously described.

Before describing the counterbalancing mechanism, which is common to both the forms of cultivators shown in drawings, I will briefly describe the "tongue" cultivator shown in Fig. 2. The arch D in this type of cultivator is beneath the tongue 2, and is secured thereto by any suitable coupling. I have



shown in this figure, the axles  $D'$ , and the arch  $D$ , as being continuous, and not capable of the adjustments just described with reference to Fig. 1, but it is obvious that either form of the axle or any suitable form may be employed.

In the "tongue" cultivator the counterbalancing mechanism stands in a vertical instead of a more nearly horizontal position in order to adapt it to the changed construction of the frame. The end of lever  $H$ , is confined within clamps  $g$ , secured to the arch  $D$ , and serves the same purpose as the yoke  $F^2$ , in Fig. 1. Suitable braces are also provided and the necessary whiffletree supports. In this figure I have shown one of the shovel beams elevated, and the other beam is omitted so as to show the counterbalancing mechanism more clearly.

Referring now to the counterbalancing mechanism,  $G$  represents a sleeve which is adapted to fit on the axle loosely, and is provided with the projections or ears  $G'$ , and  $G^2$ , one extending forward and the other rearward of the axle. The ear or projection  $G'$ , which is the rearward extension, is provided with a series of perforations to provide for adjusting and varying the tension of the spring  $I$ , which surrounds a rod  $J$ , and the extent of oscillation of sleeve  $G$ . The rod  $J$  is pivotally secured to the ear or projection  $G^2$ , at one end, and its free end passes through the eye of the clip  $h$ , upon the lever  $H$ , adapted to receive said rod  $J$ , and the spring  $I$  is confined between a flange or collar on rod  $J$ , and said clip. The lever  $H$ , is pivotally secured to the projection  $G'$ , at one end and is also provided with a series of holes, and a bolt  $h'$ , unites it to the said projection. The lower end of the lever  $H$ , is preferably cut out, so that its sides embrace the projection  $G'$ . This lever may be made in one piece, as in Fig. 2, or in two parts or sections  $H$ ,  $H'$ , as shown in Figs. 1, 3 and 4. In the latter case a pin  $H^2$ , is used to unite the parts, forming a rule-joint, and a web  $h^2$ , limits the movement so that the spring  $I$ , normally holds the lever straight, with capacity to yield in one direction. The lever is in a single piece as shown in the other figures, and such a construction performs the function of a part counterbalancing mechanism equally well under normal conditions. The object of the hinged construction will be presently described. The sleeve  $G$ , may be formed with ridges or a polygonal outer surface, so that the coupling  $K$ , to which the shovel beams are attached, will not rotate thereon. A bolt  $k'$ , having a wedge-shaped body portion clamps the coupling  $K$  in the desired place on the sleeve  $G$ . The prongs  $k$ , of the coupling  $K$ , are adapted to engage sockets in the end pieces or castings  $b$ , secured to the shovel beams. These end pieces are preferably detachably bolted to the beam  $B$ , in any suitable manner, the two halves being brought together by a tie-bolt  $b'$ , so as to hold the prongs  $k$ , in their

sockets. The effect of the spring  $I$ , on the shovels when they are in the ground, may be varied by shifting the bolt  $h'$ , so as to pass the same through the series of holes in the projection  $G'$ , and lever  $H$ , thus giving a lifting, depressing or (when  $G^2$  is over axle) no effect. The effective force of the spring is varied by moving the clip  $h$ , up or down on lever  $H$ , a series of perforations in the lever  $H$ , permitting this adjustment.

The difficulty with machines of this type heretofore has been to keep the shovels in the ground, as it is necessary to overcome the constantly increasing force of the counterbalancing springs; and the previous devices are liable to become locked by the turning of the pipe-box or sleeve so as to throw the projection  $G'$ , down under the axle, necessitating the use of a pry or hammer to restore the parts to normal position.

My improvement has a number of advantages over other similar spring devices heretofore in use. In the first place it cannot become locked, for the projection  $G'$ , cannot be thrown downward and pass under the axle so that the spring cannot restore it. Furthermore, when the shovels are in the ground the force of the spring  $I$ , will be against the axle, practically in the direct line of force, for the reason that the projection or ear  $G^2$ , to which the rod  $J$ , is attached, and against which the spring exerts its force, will turn up into the line of force between the outer end of the rod  $J$ , and the axle, and hence it is not necessary to hold the plows in the ground against the force of the spring.

In operation when the beams are being raised the spring  $I$ , begins to exert its lifting force through the medium of the coupling  $K$ , which is rigidly held upon the sleeve  $G$ , as soon as the plowman starts to lift the shovels from the ground, and the leverage increases as the elevating of the shovels is continued, the spring exerting its force on the projection  $G^2$ . When the tongue is on the ground and the plowman throws down or lets fall the beams, the projection  $G^2$ , of the pipe box or sleeve  $G$ , will strike against the lever  $H$ , and sometimes with force enough perhaps to break it. But in using the jointed or hinged lever, under such circumstances, said lever will yield or bend out, and the force of the spring will bring it back into proper position. Furthermore, should one or both of the wheels of the cultivator run up on high ground, or over a clod of dirt, or a stone, the shovels and beams would turn down and be in a lower relative position than usual, and here again the projection  $G^2$ , would strike the lever  $H$ , and in such case, if the lever were stiff or a solid casting, the shovels could go no lower, but the hinged lever will yield or bend out and allow the shovels to still remain in the ground.

Numerous slight changes will suggest themselves which may be made without departing from the spirit and scope of my invention, and hence I do not desire to be limited to the ex-



act construction and arrangement of parts shown and described.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent of the United States, is—

1. In a wheel cultivator, the combination with the axle, of the sleeve rotatably secured thereon and provided with a forwardly and a rearwardly projecting lug or ear, the plow beam, a lever pivotally secured at one end to one of said lugs, and a spring extending from the lug at the opposite side of the axle and forming a direct connection between the same and the free end of said lever, substantially as described.

2. In a wheel cultivator, the combination with the axle and plow beam of a sleeve having a polygonal outer surface, a coupling section fitting said surface and uniting said beam and sleeve, forward and rearward projections upon the sleeve, a rod secured to one of said projections and a lever secured to the other, a spring surrounding the rod and confined between the projection on the sleeve and a clip or fixed part of said lever, and means for holding said lever and spring in the desired relative positions, substantially as described.

3. In a wheel cultivator, the combination with the axle, of the sleeve rotatably secured thereon and provided with a forwardly and a rearwardly projecting lug or ear, the plow beam coupled to said sleeve, a lever pivotally secured at one end to one of said lugs, a rod pivoted at one end to the opposite lug and having its free end passed through an eye on said lever, and a compressed spring placed on said rod between said eye and lug, all arranged and adapted to operate substantially as described.

4. In a wheel cultivator, the combination with the axle, of the sleeve rotatably secured thereon and provided with a forwardly and a rearwardly projecting lug or ear, the plow beam coupled to said sleeve, a lever pivotally and adjustably secured at one end to one of said lugs, a rod pivoted at one end to the opposite lug and having its free end passed through an eye-piece adjustably secured to said lever, and a compressed spring placed on said rod between said eye-piece and lug, all arranged and adapted to operate substantially as described.

5. In a wheel cultivator, the combination with the axle, of the sleeve rotatably secured thereon and provided with oppositely projecting lugs or ears, one of which has a series of perforations therein, the plow beam coupled to said sleeve, a lever pivotally and adjustably secured at one end to said perforated lug, a rod pivotally connected at one end to the oppositely projecting lug and having its free end loosely fitted in an eye on the free end of said lever, and a counterbalancing spring interposed between said eye and oppositely projecting lug, substantially as described.

6. The combination, in a wheel cultivator,

of a sleeve rotatably secured on the axle thereof and provided with lugs or ears projecting in opposite directions therefrom, one of said lugs being provided with a series of perforations, a lever having a series of perforations at one end adjustably secured to said perforated lug and provided at its free end with an eye-piece adjustably secured thereto, a rod pivoted at one end to the opposite lug with its free end loosely engaging said eye-piece, and a compressed counterbalancing spring placed on said rod between the eye-piece and lug, substantially as described.

7. The combination with the axle of a wheel cultivator, of the sleeve rotatably secured thereon and provided with forwardly and rearwardly projecting lugs or ears, the plow beam coupled to said sleeve, a jointed lever pivotally secured at one end to one of said lugs, and a spring extending from and connecting the opposite lug to the free end of said jointed lever, all arranged and adapted to operate substantially as described.

8. The combination, in a wheel cultivator, of the sleeve rotatably secured on the axle thereof and provided with a forwardly and a rearwardly projecting lug or ear, the plow beam coupled to said sleeve, a jointed lever pivotally secured at one end to one of said lugs, a rod pivoted at one end to the opposite lug and having its free end arranged to slide through an eye on the free end of said pivoted lever, and a spring placed on said rod between said lug and eye, substantially as described.

9. An attachment for wheel cultivators, comprising the sleeve adapted to be rotatably secured on the axle of the machine; said sleeve having a pair of lugs or ears which project in opposite directions therefrom, a lever having one end pivotally secured to one of said lugs, a rod pivoted to and extending from the opposite lug through an eye on the free end of said lever, and a counterbalancing spring interposed on said rod between said lug and eye, substantially as described.

10. In a wheel cultivator, the combination with the axle, of the sleeve fitted thereon and having a forward projection, the rod pivoted to said projection, a rearward projection also on said sleeve provided with a series of perforations, a lever having a series of perforations at one end pivotally secured to the latter projection, a spiral counterbalancing spring placed on said rod, and an adjustable clip or eye-piece secured to the free end of said lever and engaging the free end of said rod, said spring being compressed between said eye-piece and a shoulder on said pivoted rod, substantially as described.

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

STALEY D. POOLE.

Witnesses:

P. C. SIMMON,  
C. H. POPE.