(No Model.) 3 Sheets—Sheet 1.

S. N. HENCH & W. A. DROMGOLD.

CULTIVATOR.

No. 348,208. Patented Aug. 31, 1886.

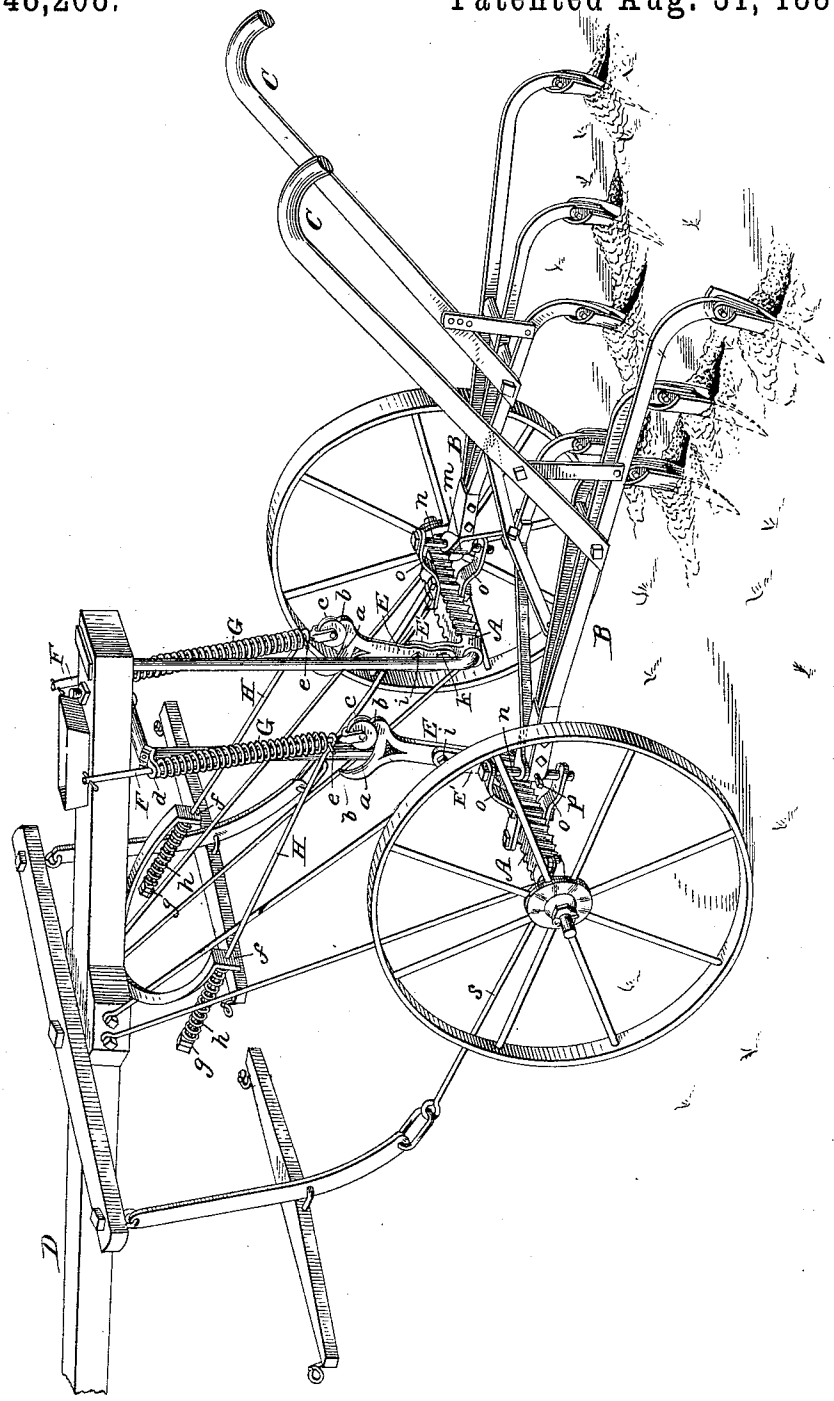


Fig. 1.

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E. F. Dick

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Walker A. Dromgold
by Munn & Co
their attorneys

N. PETERS, Photo-Lithographer, Washington, D. C.

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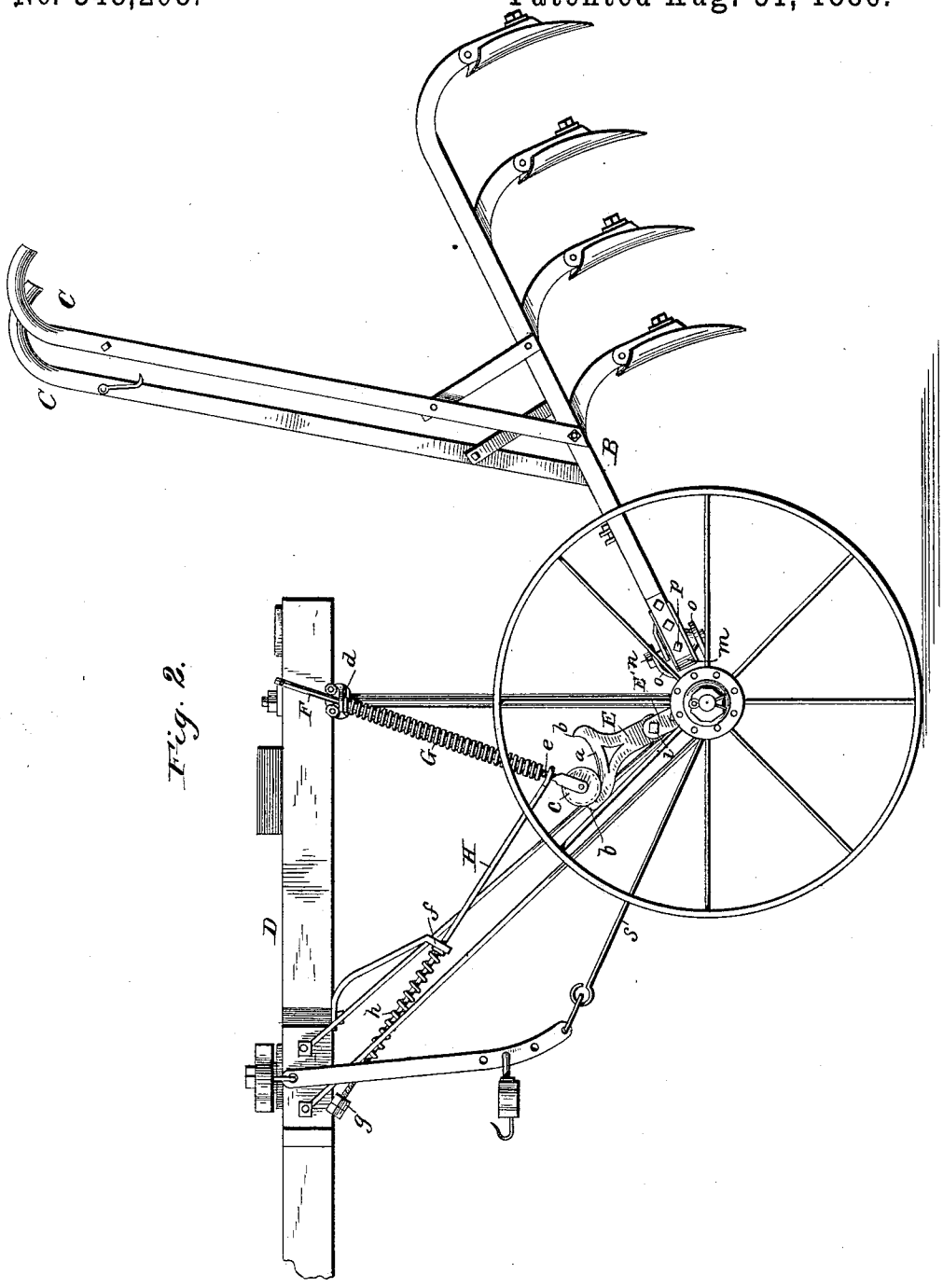


Fig. 2.

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S. N. HENCH & W. A. DROMGOLD.

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Fig. 4.

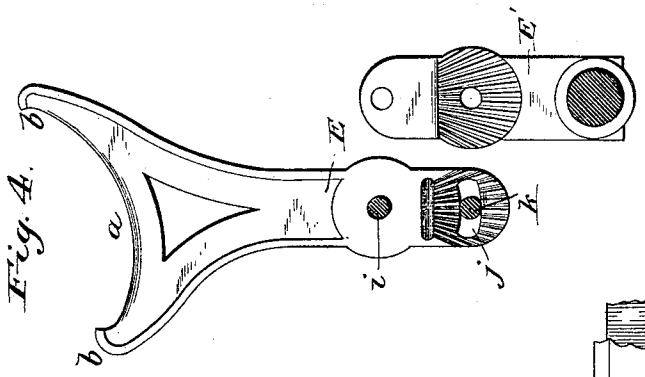
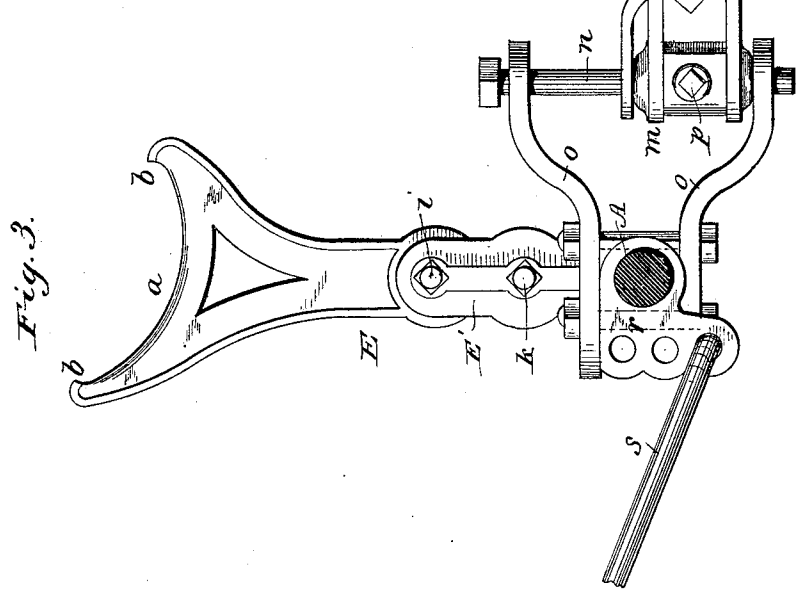


Fig. 3.



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UNITED STATES PATENT OFFICE.

SAMUEL N. HENCH AND WALKER A. DROMGOLD, OF YORK, PENNSYLVANIA.

CULTIVATOR.

SPECIFICATION forming part of Letters Patent No. 348,208, dated August 31, 1886.

Application filed June 10, 1886. Serial No. 204,708. (No model.)

To all whom it may concern:

Be it known that we, SAMUEL N. HENCH and WALKER A. DROMGOLD, both residing in the city of York and State of Pennsylvania, have invented certain new and useful Improvements in Cultivators, of which the following is a specification.

Our invention has relation mainly to devices for regulating the pressure of the shovel-beams or drag-bars of cultivators. Heretofore it has been customary to use for this purpose spring pressure-rods, pinned or pivoted to upright rods or bars on the axle to which the beams or drag-bars are secured, and acting, according as they are inclined to one side or the other of the dead-center, to hold or tend to hold the beams down or up, as the case may be. Under this arrangement the greatest compression of the springs which surround and control the pressure-rods is at the time when the rods are on the dead-center—that is to say, in the straight line with the bars or rods on the axle to which they are pivoted—and when the pressure-rods incline to one side or the other of this position the springs expand proportionately, and consequently lose in power and efficiency. To remedy this serious defect we dispense entirely with the hinge-joint between the spring pressure-rod and the rod or bar on the axle, and in lieu thereof we provide the spring pressure-rod with a roller affixed to its lower end, and we form or provide the upright bar on the axle with a track on which the said roller can fit and run. The track can have any inclination desired, so that the spring need not be permitted to expand after passing the dead-center, but can still exert its full force. One material advantage of this arrangement is, that we are thereby enabled to maintain the pressure after the pressure-rod has passed the dead-center in the direction required, when the shovels are lifted, and we are consequently able to produce a cultivator in which the shovel-beams are raised and held up above the ground by springs alone, thus dispensing with all hooking or fastening agencies hitherto employed for the purpose. In connection with this arrangement we employ regulating spring-rods, by adjusting which the pressure of the pressure-rods upon the shovels can be graduated and regulated to a nicety. These and other features of our improvements can best be explained and understood by reference to the accompanying drawings, in which—

Figure 1 is a perspective view of a cultivator embodying our improvements with the shovel-beams down. Fig. 2 is a view with the shovel-beams up. Fig. 3 is an enlarged side elevation of one of the track-standards, together with one of the draft-couplings and one of the shovel-beam couplings, and the axle on which the same are fastened, the axle being in transverse section. Fig. 4 is an elevation of the two parts of the track-standard.

A is the axle. B are the two shovel-beams, with handles C, and D is the tongue. These parts, together with their accessories, are of any usual or suitable construction, and require no detailed description.

Fast to the axle are the upright standards E, which form part of the system by which pressure is brought upon the shovel-beams. Upon the tops of these standards are tracks *a*, having a stop, *b*, at each end. On these tracks fit and move the peripherally-grooved rollers *c*, carried in suitable bearings or housings on the lower ends of pressure-rods F, which rods pass at their upper ends through guides *d*, attached to the tongue D or to brackets thereon. Surrounding the rods are stiff spiral pressure-springs G, confined between the guides *d* and pins *e* on the rods, which pins can be set up or down in different holes in the rods, so as to vary at will the initial pressure or compression of the springs. The general shape or contour of the track is shown more plainly in Figs. 3 and 4. It is curvilinear, sloping upwardly on each side of the point where the roller rests when it is on the dead-center. The track is longer and higher in front of this point than it is in rear, the object of this formation being to provide a track portion at the front, on which the pressure-rod roller can act to the extent requisite to raise and hold the shovel-beams clear of the ground whenever desired, as indicated more clearly in Fig. 2. The upward inclination of the track to each side of the dead-center prevents expan-

sion of the pressure-spring after it passes the dead-center, and maintains said spring in the compressed state requisite to cause it to exert and maintain the needed pressure upon the shovel-beams. In other words, the arrangement is such that the distance between the point where the pressure-spring bears aga n t the guide *d* and the surface of the track on which the roller bears remains practically unchanged, no matter at what point the roller may be on the track between the termini or stops *b*.

Each pressure-rod below its spring is encircled by the loop of a rod, H, which I have hereinbefore termed a "regulating spring-rod." Said rod passes through a guide, *f*, on a bracket attached to the tongue D, through which guide it can slide or play back and forth. Encircling the front end of the rod, and confined between the guide *f* and a nut, *g*, on the front end of the rod, is a spiral spring, *h*, the action of which can be adjusted and regulated by screwing the nut *g* toward or away from the guide. These rods H exercise a yielding pull on the pressure-rods in a forward direction, and serve to regulate the degree of pressure exerted by said pressure-rods. If, for instance, the soil is very loose and the shovels do not need much pressure on them, or if the shovels by their weight might tend to run too deep and require some counteracting instrumentality to hold them up, all that is required is to tighten or screw down the nuts *g* on the rods H. By this means the springs *h*, when the beams are depressed, are put under such compression as to pull upon the pressure-rods and prevent the rollers from moving too far back of the dead-center, thus holding the beams and shovels in such manner that the latter will run shallow or merely touch the ground, and at the same time will be under a very elastic spring-pressure.

Another function of the spring-regulating rods is to assist in the operation of raising the shovel-beams from the position shown in Fig. 1 to that illustrated in Fig. 2. In this operation, when the shovel-beams are lifted by hand a very short distance from the ground, the spring-rods H, by their pull on the pressure-rods, cause the rollers to travel forward on the tracks beyond the dead-center, with the effect of elevating and maintaining the beams in the position shown in Fig. 2.

It is desirable to make the tracks adjustable as to their pitch, in order to vary the presssure on the shovels when they are down. This result, manifestly, can be accomplished in various ways. One convenient arrangement for the purpose is shown in Figs. 3 and 4. In this arrangement each standard E is in two parts, the lower part, E′, fast to the axle, and the upper part, E, which carries the track, pivoted to the lower at *i*, and provided in its end, below the pivot, with a curved slot, *j*, struck from the pivot-bolt *i* as a center, through which passes a clamping or tightening bolt, *k*, from the lower part, E′. The contiguous faces of the two parts E′ E are "rose-formed," or ribbed or serrated, so that when pressed together by the bolts *i k* they will interlock. By loosening the bolts *i k* the upper track-carrying part, E, can be tilted so as to set the track at any pitch, and can then be secured in its adjusted position by tightening the bolts.

Each shovel-beam is secured by a sleeve, *m*, to a vertical coupling-bolt, *n*, which swivels in a coupling-bracket, *o*, attached to the axle in any usual or suitable manner. The sleeve can slide up and down on the bolt *n*, and is held in adjusted position thereon by the set-screw *p*. In connection with this device we employ an under-draft arrangement, as shown more plainly in Fig. 3, consisting of the draft-coupling *r*, fast on the axle, to which is connected below the axle the draft-coupling rod or link *s*. The under-draft tends to force the shovels down, and the adjustable connection of the shovel-beam with its coupling enables us to vary the pitch or inclination of the shovels.

Having now described our improvements, and the manner in which the same are or may be carried into effect, we remark, in conclusion, that we do not restrict ourselves to the details of construction and arrangement of parts hereinbefore set forth, for it is manifest that the same can be widely varied without essential departure from our invention; but

What we claim, and desire to secure by Letters Patent, is as follows:

1. The combination of the shovel-beams or drag-bars and their supporting-frame, spring-pressure mechanism having its two parts connected by a roller and track-joint, and spring-regulating mechanism, whereby the action of the spring-pressure mechanism is graduated and regulated, substantially as and for the purposes hereinbefore set forth.

2. The combination of the shovel-beam axle or shaft, the oscillatory and sliding spring pressure-rod, and the standard fixed to said axle and connected with said rod by a roller and track-joint, substantially as and for the purposes hereinbefore set forth.

3. The combination of the axle or shaft, the spring pressure-rod, and standard connected together by a roller and track-joint, and the spring regulating-rod, substantially as and for the purposes hereinbefore set forth.

4. The combination of the shovel-beams and their supporting-axle, the track-standards fixed to said axle, the spring pressure rods-provided with rollers which bear and run on said tracks, and the spring regulating-rods, under the arrangement and for joint operation as hereinbefore set forth.

5. The combination of the axle or shaft and the spring-pressure mechanism having one of its parts provided with a roller and the

other of its parts provided with a track for said roller, adjustable in pitch, substantially as and for the purposes hereinbefore set forth.

6. The two-part adjustable track-standards E E′, in combination with the axle and the spring pressure-rod and roller, substantially as and for the purposes hereinbefore set forth.

In testimony whereof we have hereunto set our hands this 9th day of June, 1886.

SAMUEL N. HENCH.
WALKER A. DROMGOLD.

Witnesses:
GEORGE B. KRABER,
CHAS. A. HAWKINS.