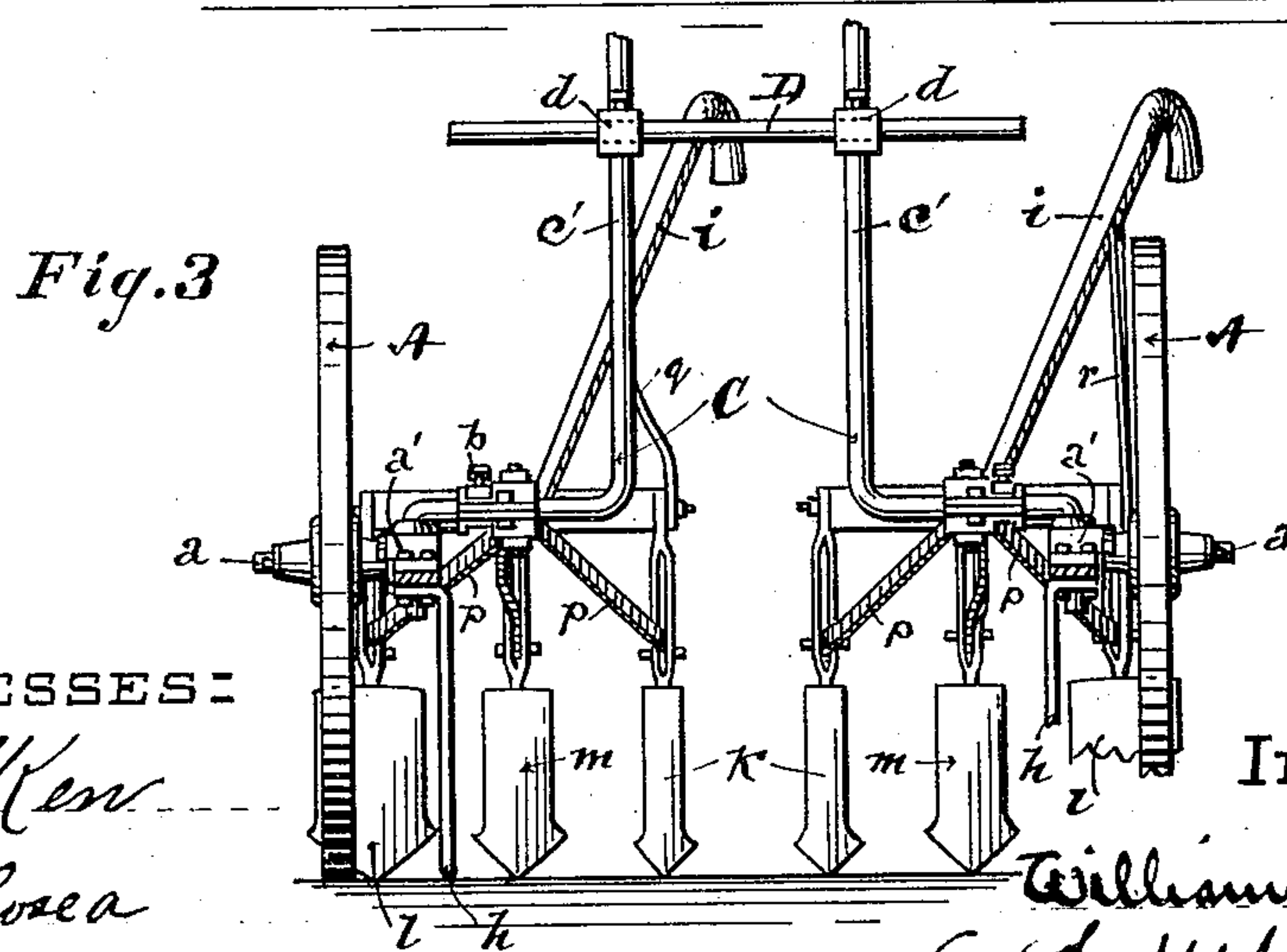
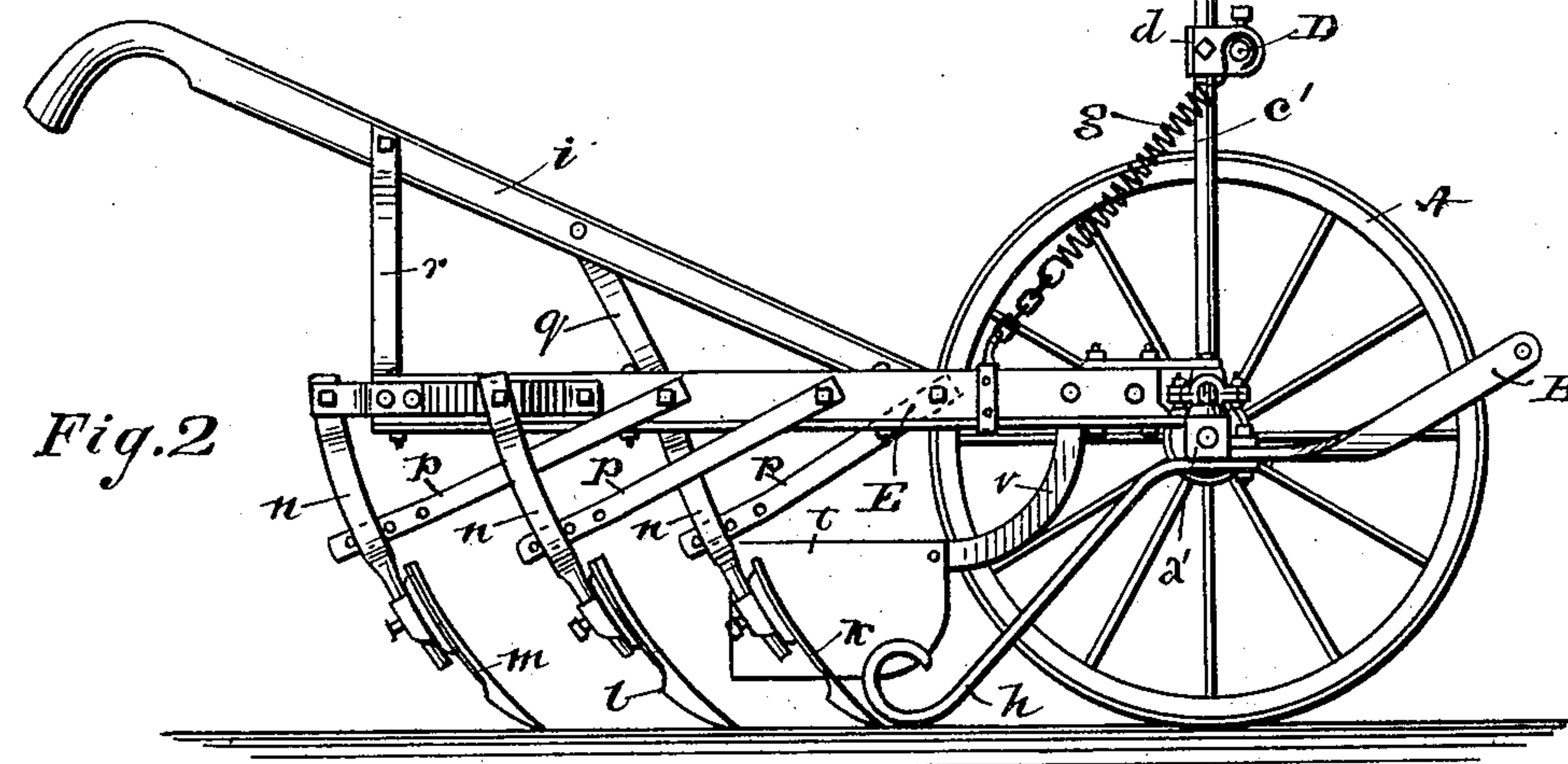
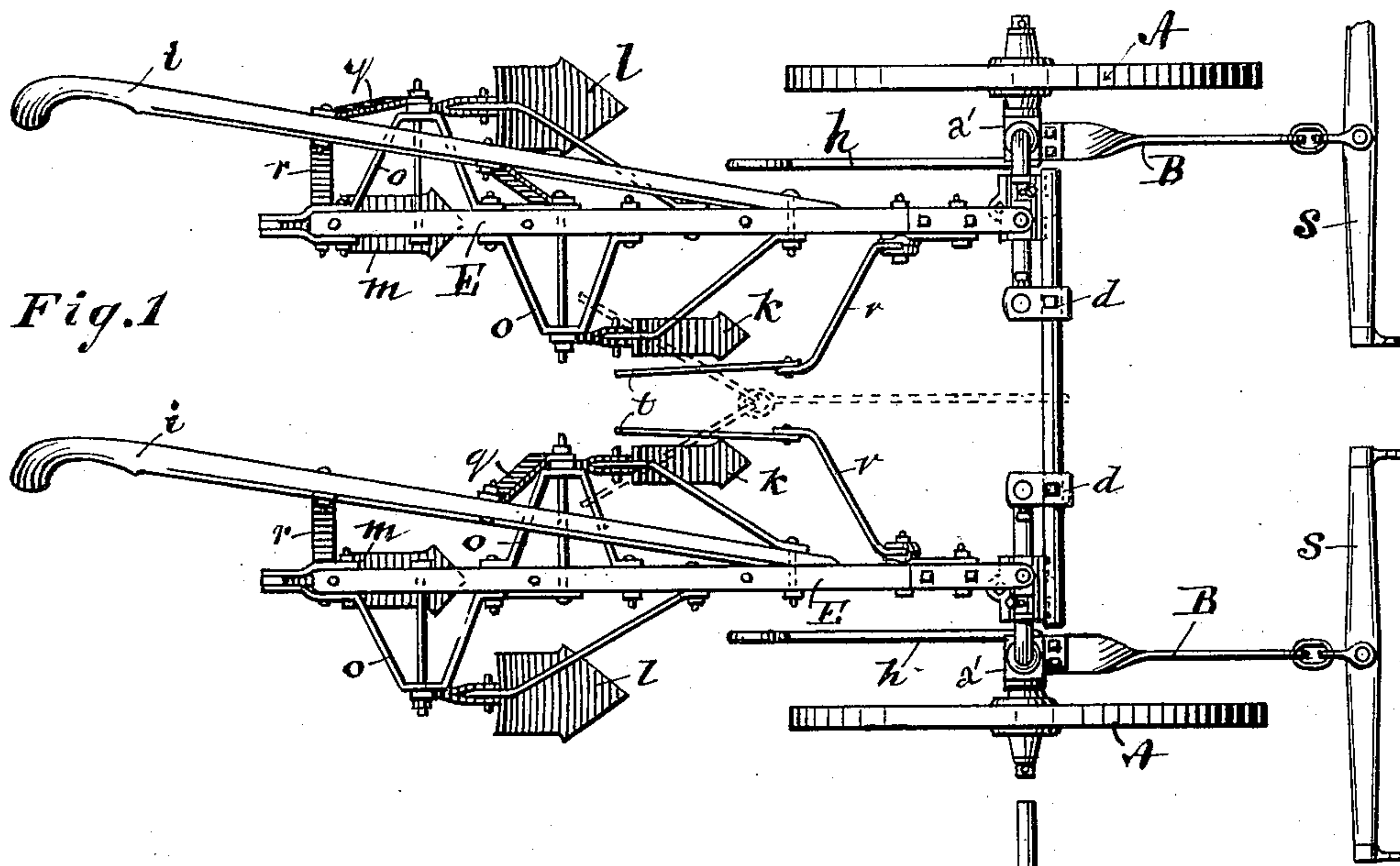


2 Sheets—Sheet 1.

No. 406,422.

Patented July 9, 1889.



WITNESSES:

E. L. Ken
L. E. Hosea

INVENTOR:

William H Bonnell
By Kellum & Co. atty

(No Model.)

2 Sheets—Sheet 2.

W. H. BONWELL.
CULTIVATOR.

No. 406,422.

Patented July 9, 1889.

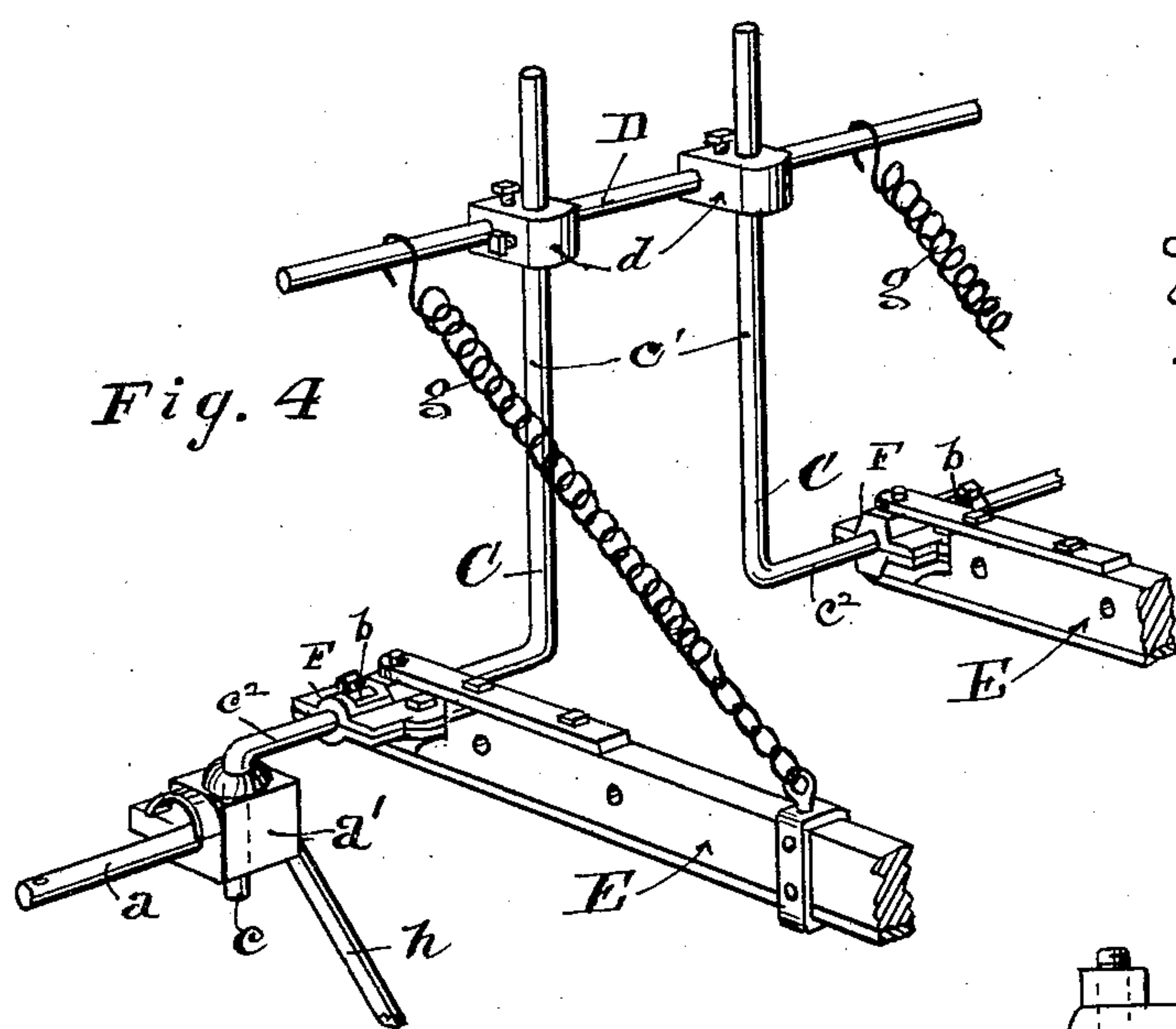


Fig. 4

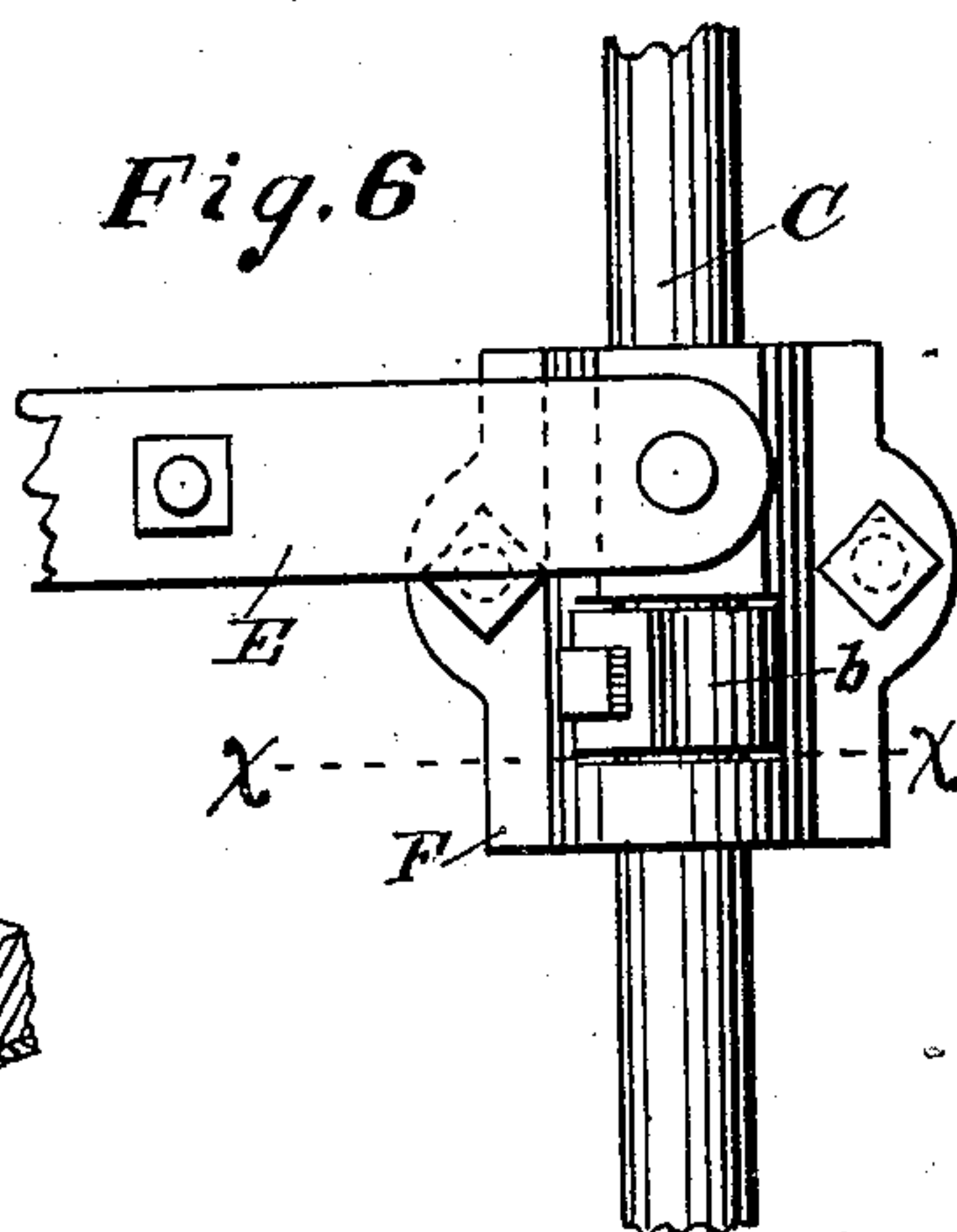


Fig. 6

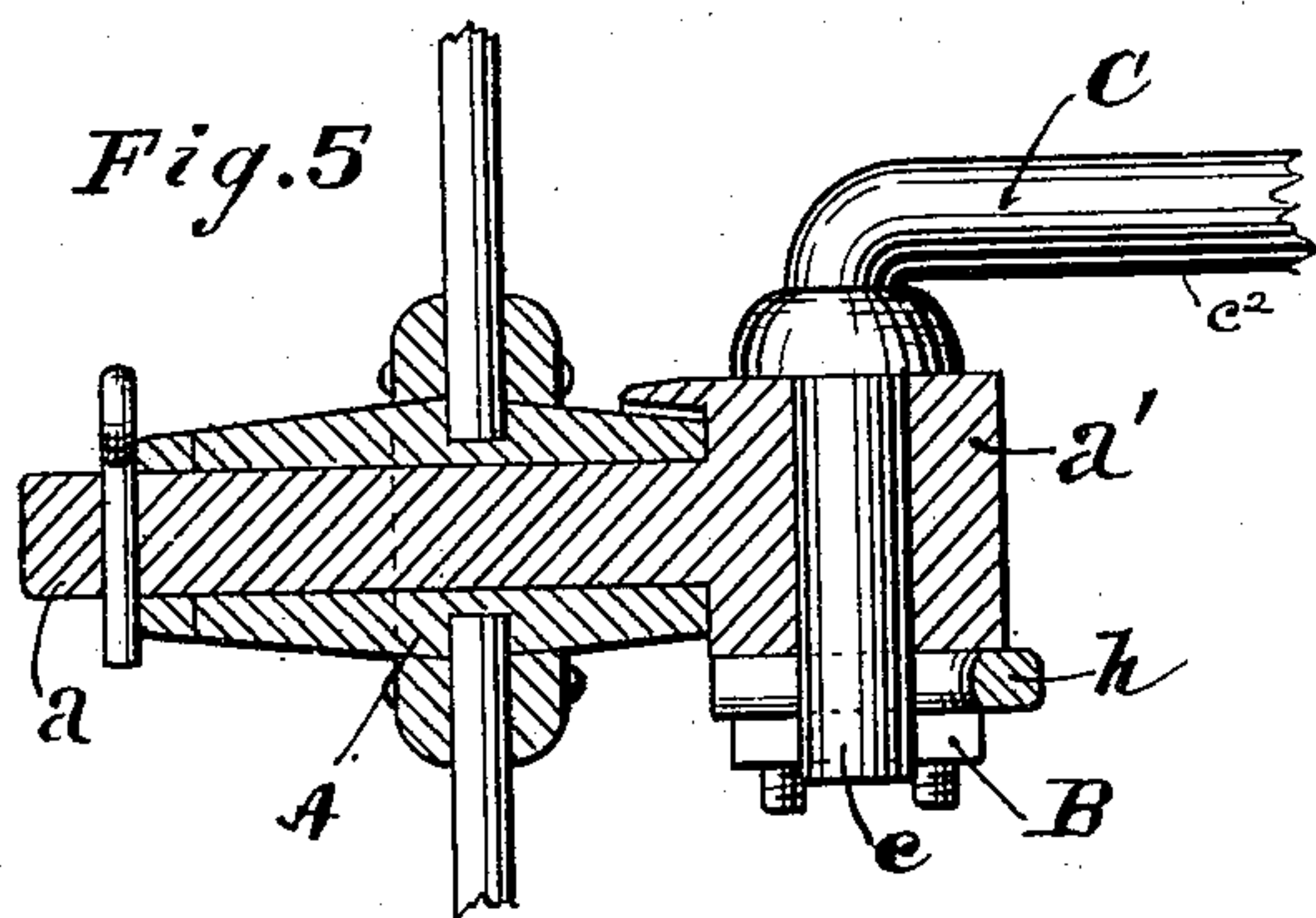


Fig. 5

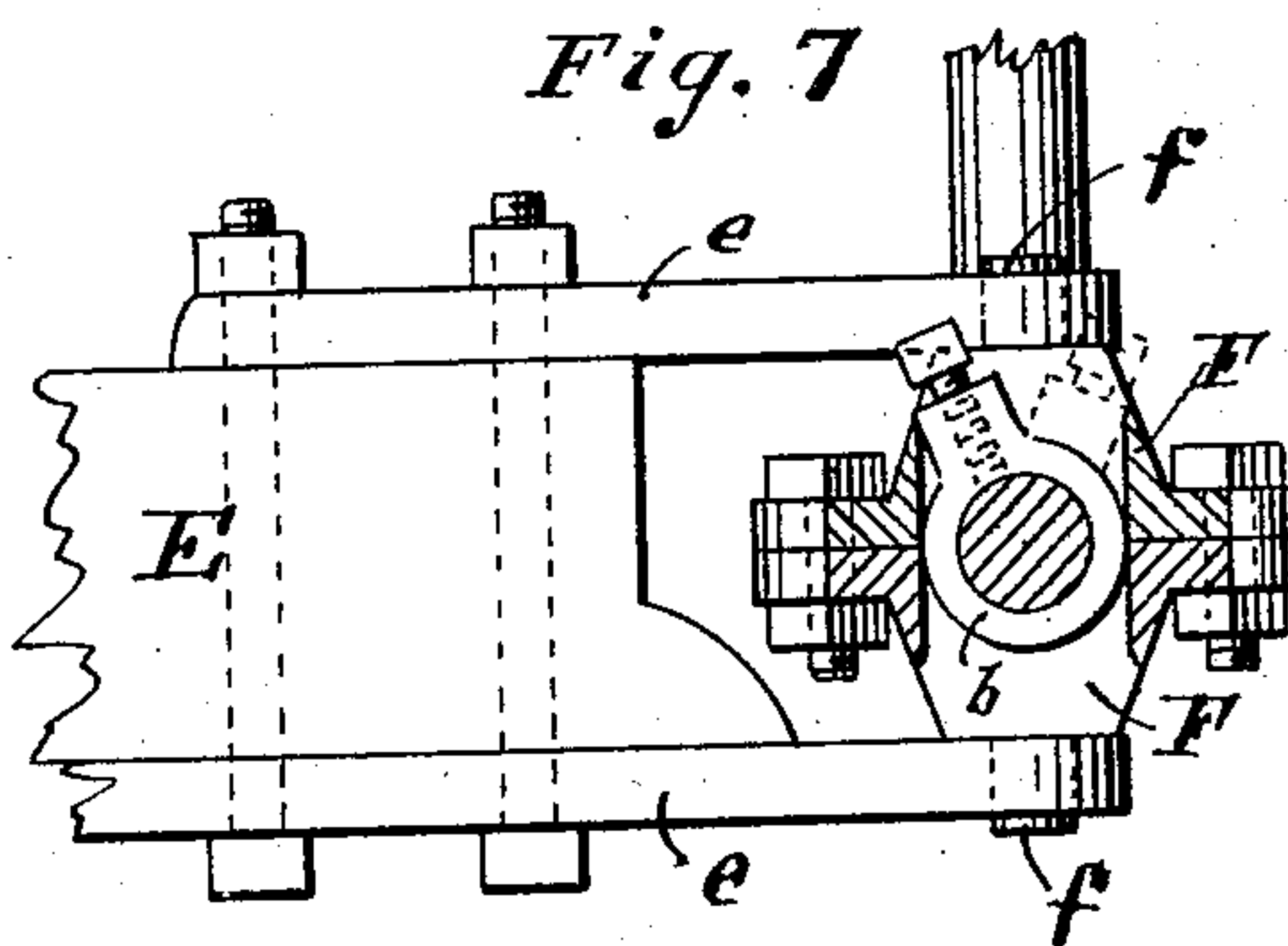


Fig. 7

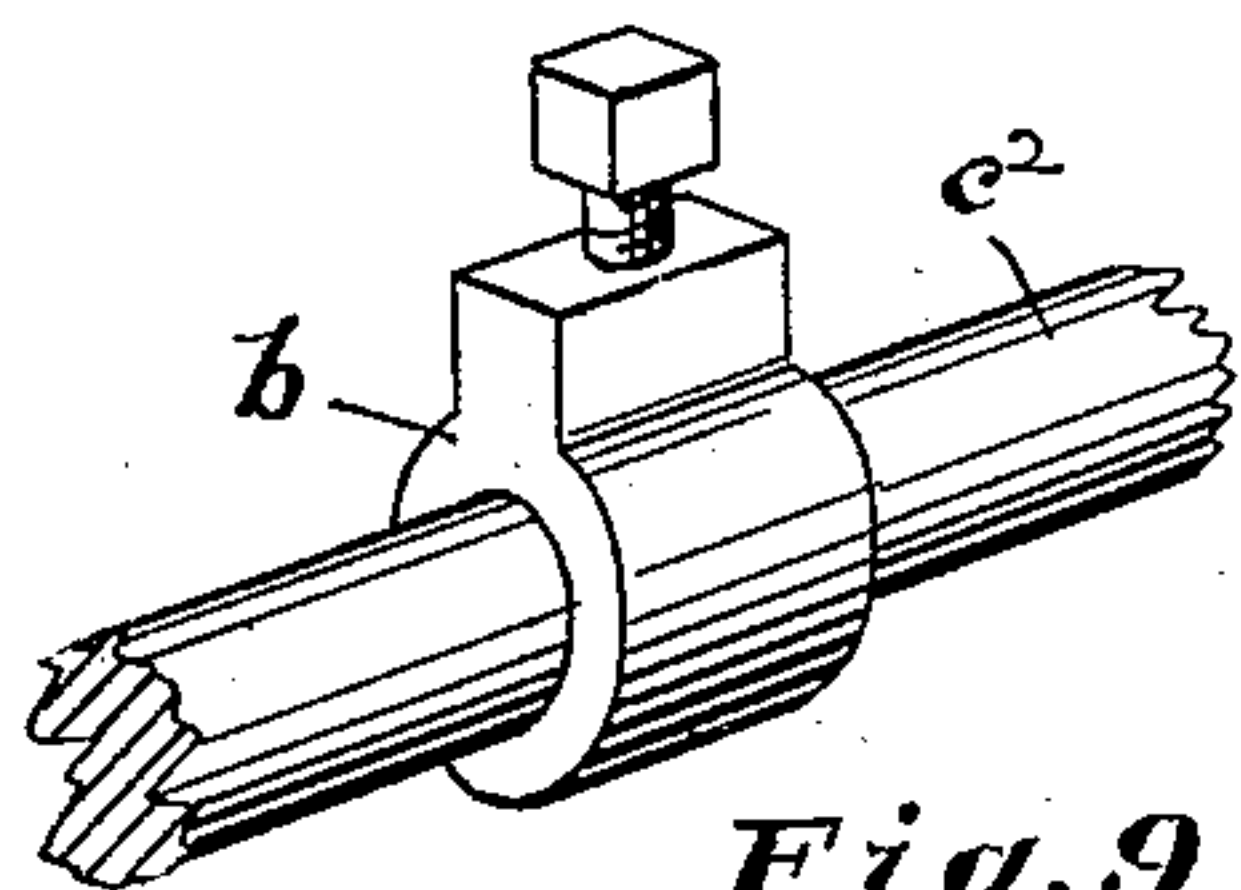


Fig. 9

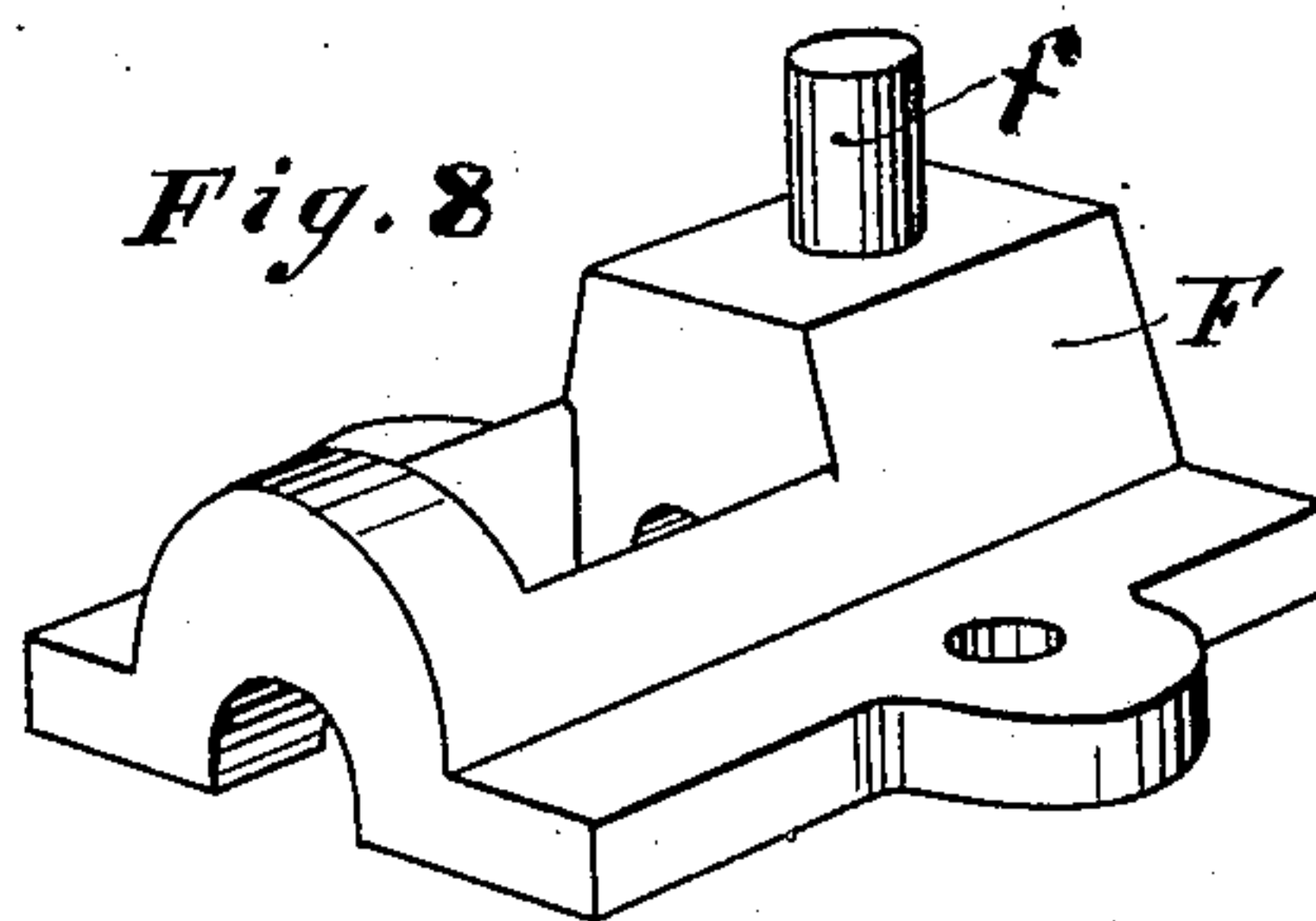


Fig. 8

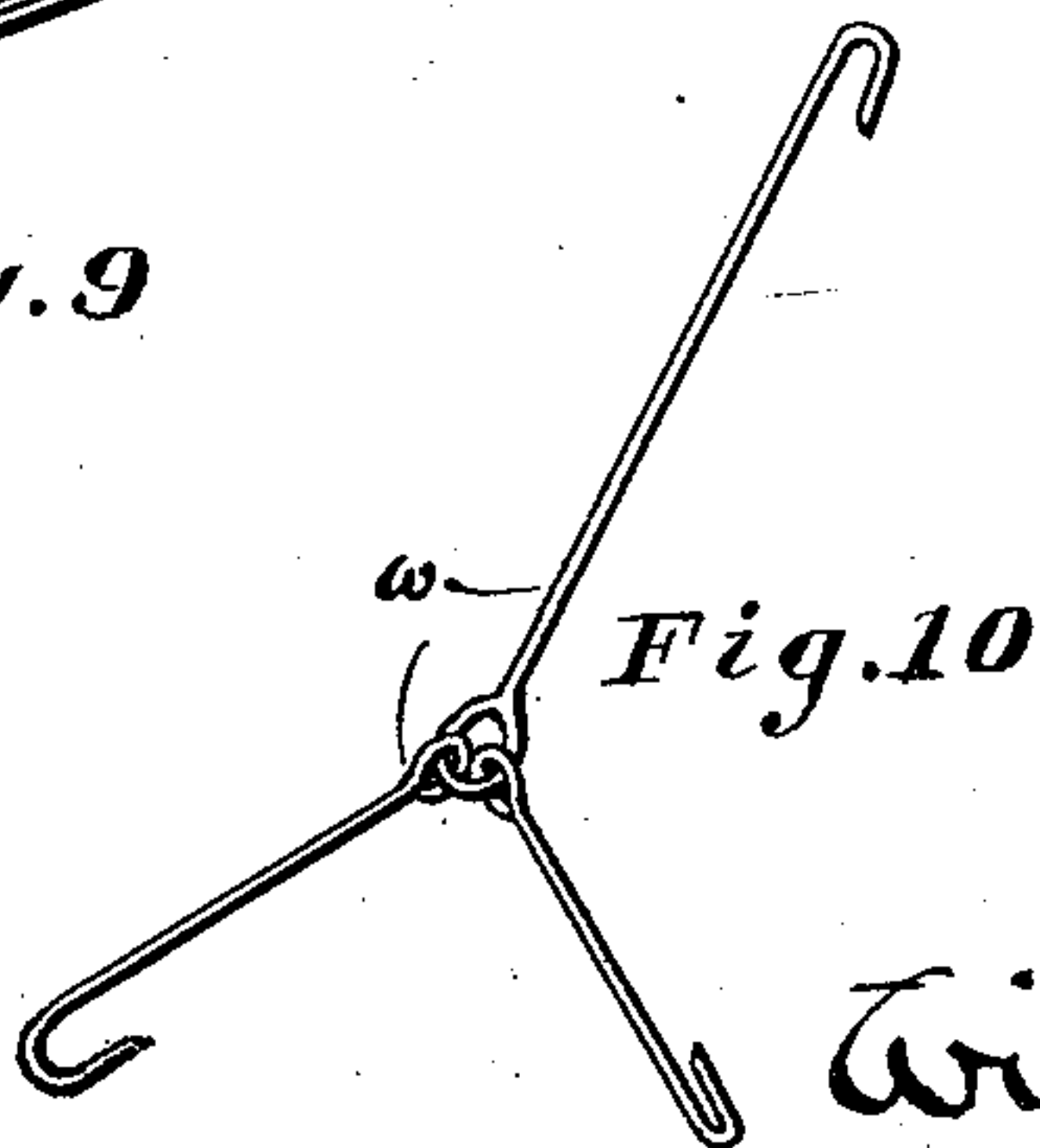


Fig. 10

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INVENTOR:

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UNITED STATES PATENT OFFICE.

WILLIAM H. BONWELL, OF BROOKVILLE, INDIANA.

CULTIVATOR.

SPECIFICATION forming part of Letters Patent No. 406,422, dated July 9, 1889.

Application filed August 21, 1888. Serial No. 283,314. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM H. BONWELL, a citizen of the United States, residing at Brookville, Franklin county, Indiana, have
5 invented new and useful Improvements in Cultivators, of which the following is a specification.

My invention relates to wheeled cultivators, its object being to produce a light, durable, and efficient machine for cultivating corn
10 and similar crops in rows.

To this end the invention consists in the construction, combination, and relative arrangement of parts hereinafter more fully
15 pointed out, tending to improve the machine and more perfectly adapt it to the special uses of its class.

Mechanism embodying my invention is illustrated in the accompanying drawings, in
20 which—

Figure 1 is a plan view complete of the machine embodying my improvements. Fig. 2 is a corresponding side elevation; Fig. 3, a front elevation; Fig. 4, a perspective elevation of the axle-arch and its immediate connections; Fig. 5, an axial section of one of the wheel-hubs and spindle, showing the vertical pivotal connection with the arch-bar; Fig. 6, a detail plan showing the construction and arrangement of one of the share-beam attachments; Fig. 7, a side elevation of the same parts shown sectioned in the plane xx of Fig. 6. Fig. 8 is a detached perspective view of one of the cap-plates shown in Figs. 6 and 7.
30 Fig. 9 is a detached perspective view of the retaining-clip shown in Figs. 6 and 7, and Fig. 10 is a detached view of the bifurcated link employed in holding up the share-beams when out of use.

Referring now to the drawings, A A designate the bearing-wheels, and $a a$ the pintles upon which the same run. These pintles are terminated at the rear by pivot-blocks a' , and engage upon the lower vertical terminals c of the arch-bars C as pivots. These bars are bent as shown in Figs. 3 and 4, and are connected across their upper vertical terminals c' by the cross-rod D, thus constituting the arch or bent axle usually employed in cultivators of this
40 class. The cross-rod D is connected to the vertical terminals c' through the medium of blocks d , which are adjustable vertically upon
50

the terminals c' , and in which the rod D is adjustable horizontally, whereby the wheels A may be adjusted to varying distances apart, 55 and the connecting-bar D of the arch may be set at varying heights to clear the tops of the standing corn.

It will be observed that the wheel-pintles a are arranged to oscillate freely in a horizontal 60 plane upon the pivots c ; but the wheels are kept in the true line of draft by rigid attachment of the draft-bars B to the under side of the pintle-blocks a' , the singletrees s being attached, in the usual manner, to the front 65 ends of the draft-bars B.

The share-beams E are attached to the horizontal portions c^2 of the arch-bars C in such manner as to swing pivotally thereon, both horizontally and vertically, and at the same 70 time allow of the adjustment of the share-beams horizontally to bring the gangs of shares either closer together or farther apart, as desired. The attachment is made by means of duplicate caps or blocks F. (Shown in 75 perspective in Fig. 8.) These caps or blocks are formed to embrace the horizontal portion c^2 of the rod C, and the share-beams are bifurcated in front or provided with projecting straps e , extending forward at the upper and 80 lower sides of the beam, engaging upon the projecting pintles f of the caps F. These caps, when clamped together by bolts around the horizontal portion c^2 of the bar C, turn freely thereon, thus allowing the share-beams 85 E to oscillate freely in a vertical plane, while the beams also oscillate freely in a horizontal plane upon the pintles f . The caps F are held to position adjustably upon the bar C by means of collars b , embracing the bar C with- 90 in a central opening left in the caps F. These collars are held rigidly to the bar C by set-screws, which permit their adjustment laterally upon the bar as desired; but when adjusted they retain the caps and the share- 95 beams E in a fixed position relatively to the arch and the bearing-wheels A.

The share-beams E are held suspended by means of a coiled spring (or spring-chain) g , engaging upon the extensions of the rod D, 100 and the vertical portion of the arch C is prevented from overturning under the weight of the share-beams by two trailing feet or supporting-bars h , fastened securely to the un-

der sides of the pintle-blocks *a'*, and resting upon the ground somewhat to the rear of the bearing-wheels A.

The share-beams E extend rearward from the pivotal connection before described, and are provided with the usual manipulating-handles *i* and carry each three shares or shovels, arranged as follows: first, a share K at the inside of the beam and running close to the corn-row; second, a share *l* on the outside of the beam, about fifteen inches from the first and about eight inches behind the first, and, third, a share *m*, depending from the rear of the beam centrally between the other two and running about eight inches behind the last. The first and second of these shares in the order named are suspended primarily by their shanks *n* from lateral brackets *o*, secured to the beam, the shanks of all being connected adjustably to tie-rods *p*, extending forward and attached to the beam, by which means the angle of penetration of the shares is adjusted as desired and the shares securely held against the resistance of the earth. The shares are held rotatably upon their shanks *n* by means of set-screws, by which they may be adjusted to throw outwardly or inwardly, as desired, at one side and the inner share K at the other.

The manipulating-handles are held to the share-beams by braces *q* and *r*, extending to the beam and to the outer ends of the brackets *o*, as convenient.

In addition to the shares, each beam carries a "clod-guard" *t*, a plate of sheet-iron carried vertically just inside of and above each inner share K, upon a brace-rod *v*, bolted to the beam. These prevent clods upturned by the leading shovel or share from falling over against the stalks of corn, and are used when the shoots of grain are young and tender, and may be removed when not required.

A bifurcated link *w* is employed for permanently suspending the share-beams from the arch-bar D when the machine is to be drawn to and from the field.

The mode of operation in general is the same as that of this type or class of cultivators. In detail, however, it will be obvious that by manipulating the set-screws in the blocks *d* the arch-bars C may be set as close together or as far apart as desired, while, without varying such adjustment, the bar D may be set as high or low as desired. Without varying either of the last-mentioned adjustments, the share-beams E may be set either closer together or farther apart, or either

may be adjusted toward or from the other independently. It will also be observed that should one horse pull stronger than the other the share-beam is drawn forward without altering the true alignment either of itself or its bearing-wheel in the line of draft. The alignment is preserved by the pivotal attachment of the share-beam to the bar C, the pivotal attachment of the wheel-pintle to the bar C and the rigid attachment of the draft-bar B to the wheel-pintle acting in harmony.

It should be noted that the construction of the share-beams and share is such that either may be used independently of the other and of the wheel and axle by detaching from the blocks F and attaching a second handle *i*. It then becomes and can be used as an ordinary cultivator with one horse.

I claim as my invention and desire to secure by Letters Patent of the United States—

1. In a wheeled cultivator, the combination of an axle extended horizontally outward from the central arch and bent downward terminally, wheel-pintles engaging said vertical terminals to swing horizontally upon the same as pivots, draft-bars rigidly secured directly to and extending forward from the wheel-pintles, coupling-blocks F, and share-beams connected with the horizontal portions of said axle, whereby an unequal strain upon one of the draft-bars is compensated for by the pivotal connection of the said wheels and share-beams with the axle and the proper alignment of the cultivator preserved, substantially as described.

2. In a wheeled cultivator, the combination, with the axle and the share-beams, of the coupling blocks or caps F, each having a vertical pivot for connecting it with its share-beam, pivoted horizontally to the axle and having a central aperture, and a collar *b* in said aperture embracing the axle and held in any desired position by a set-screw, substantially as described.

3. In a wheeled cultivator, the combination, with the arched axle C and the pivoted share-beams E, of a bifurcated link *w*, adapted to be attached to the arched axle and elevate the share-beams out of working position, substantially as described.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

WILLIAM H. BONWELL.

Witnesses:

HENRY B. O'BYRNE,
SAMUEL S. HARRELL.