

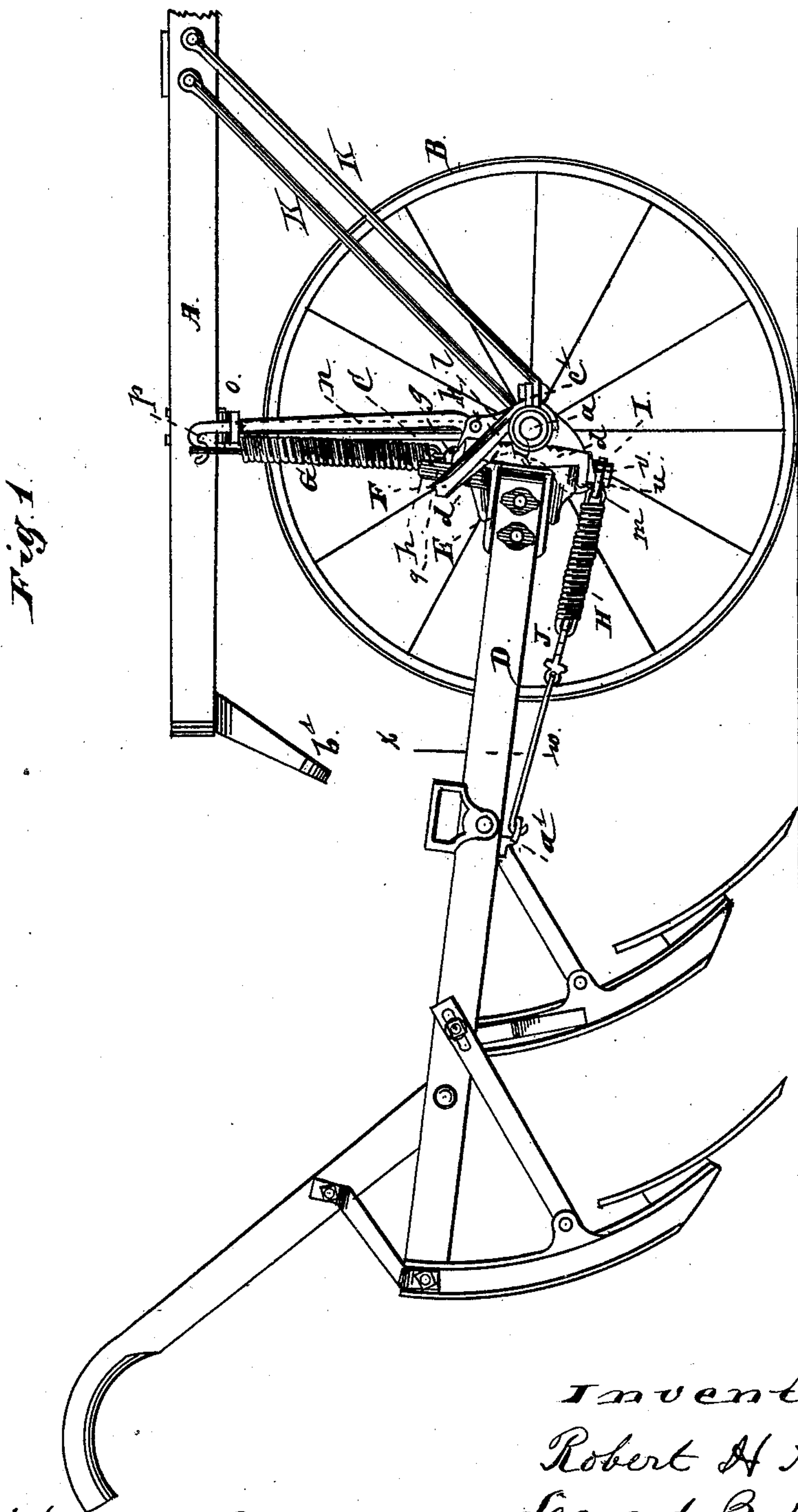
(No Model.)

6 Sheets—Sheet 1.

R. H. AVERY & L. B. BERRIEN.
CULTIVATOR.

No. 351,684.

Patented Oct. 26, 1886.



witnesses:
Harry T. Jones.
Albert H. Adams.

Inventor:
Robert H. Avery.
Leonard B. Berrien.
By West & Bond Attys.

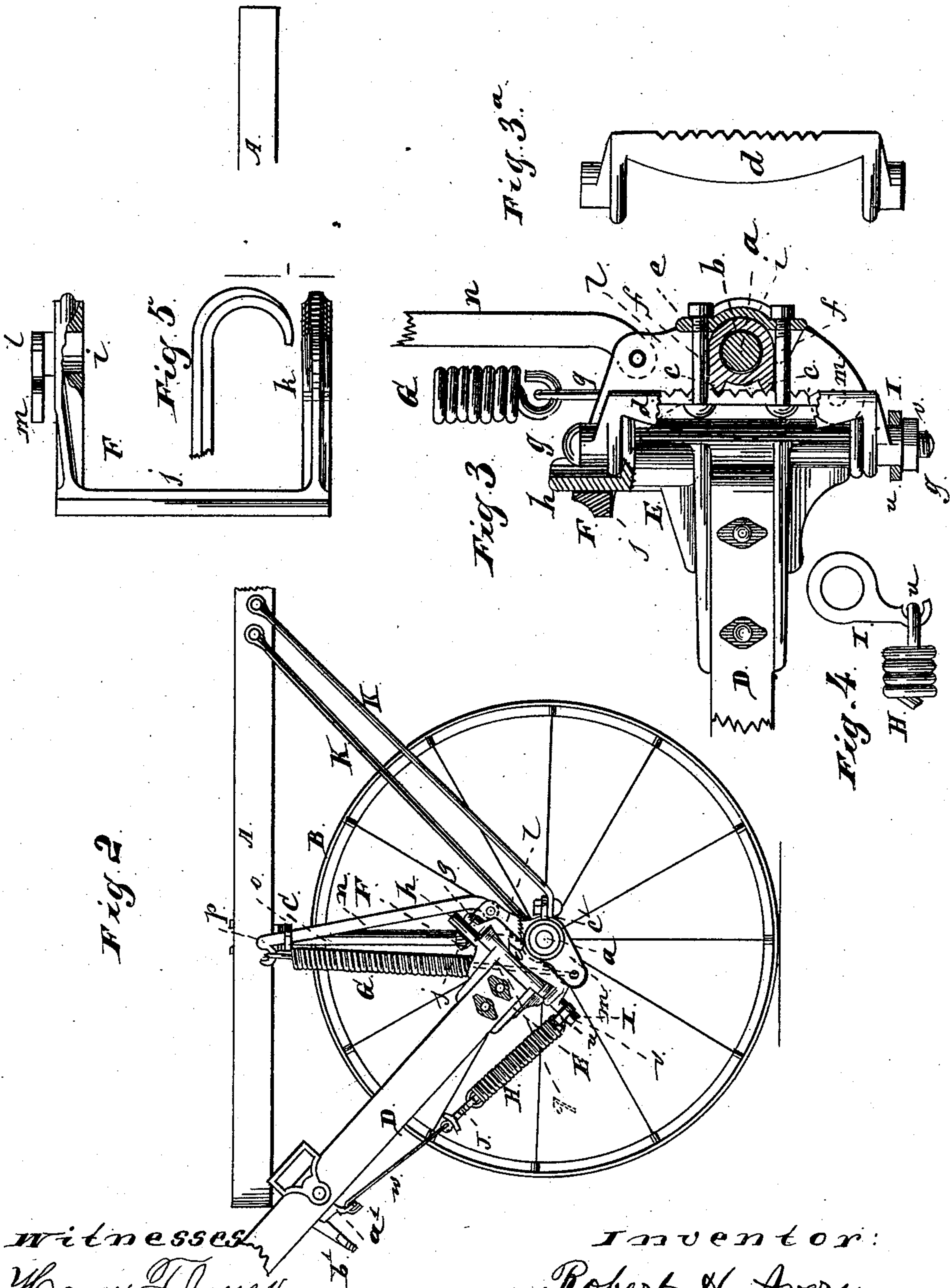
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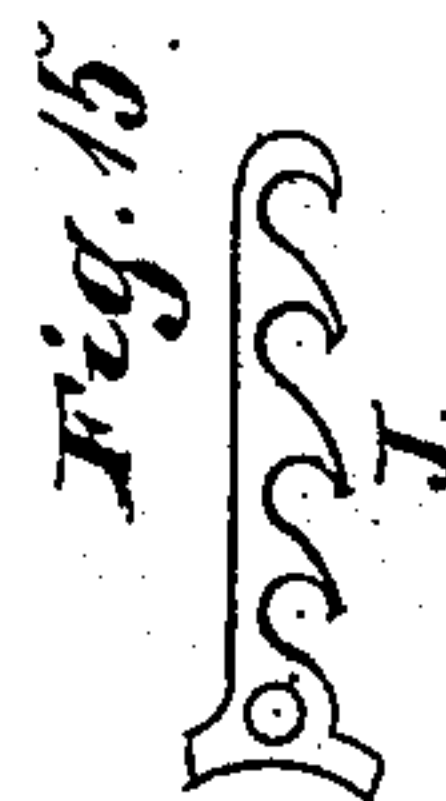
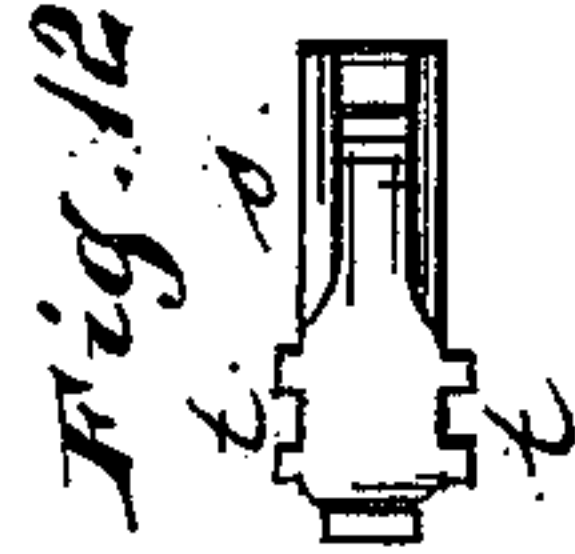
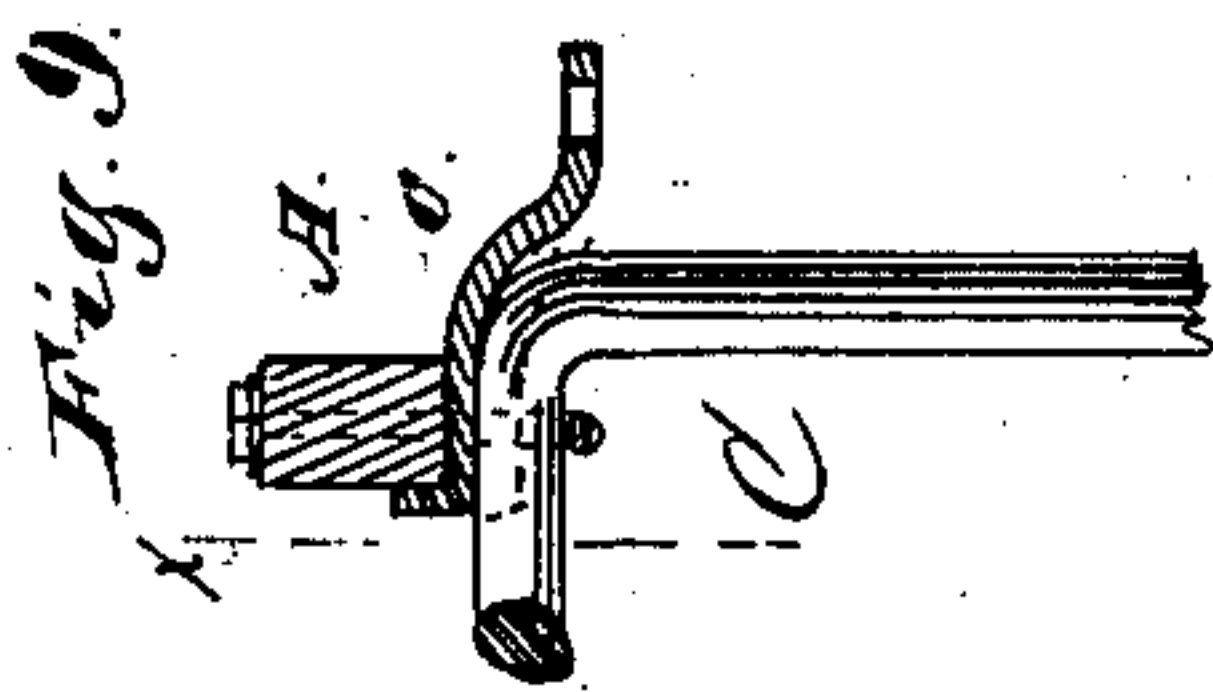
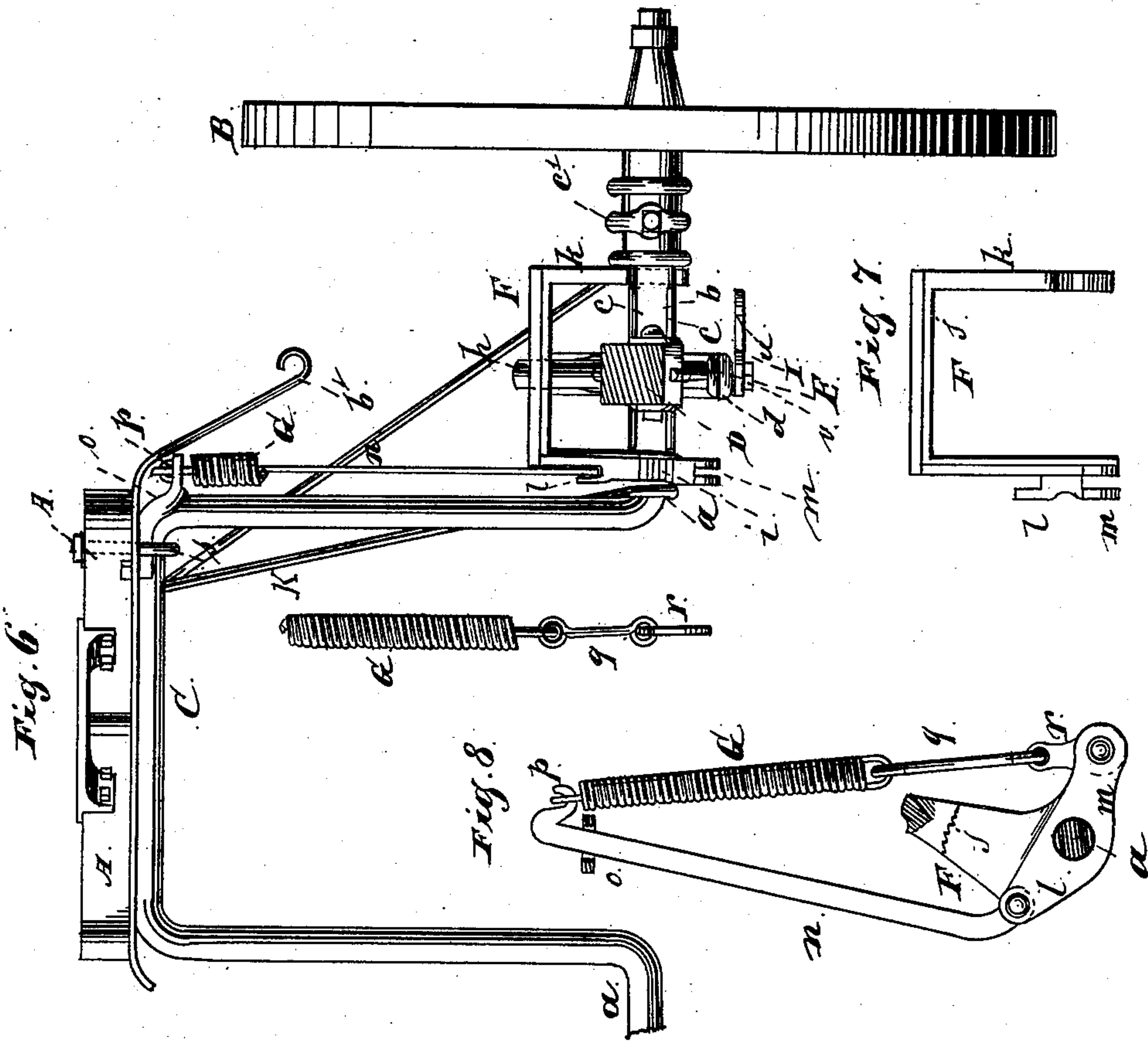
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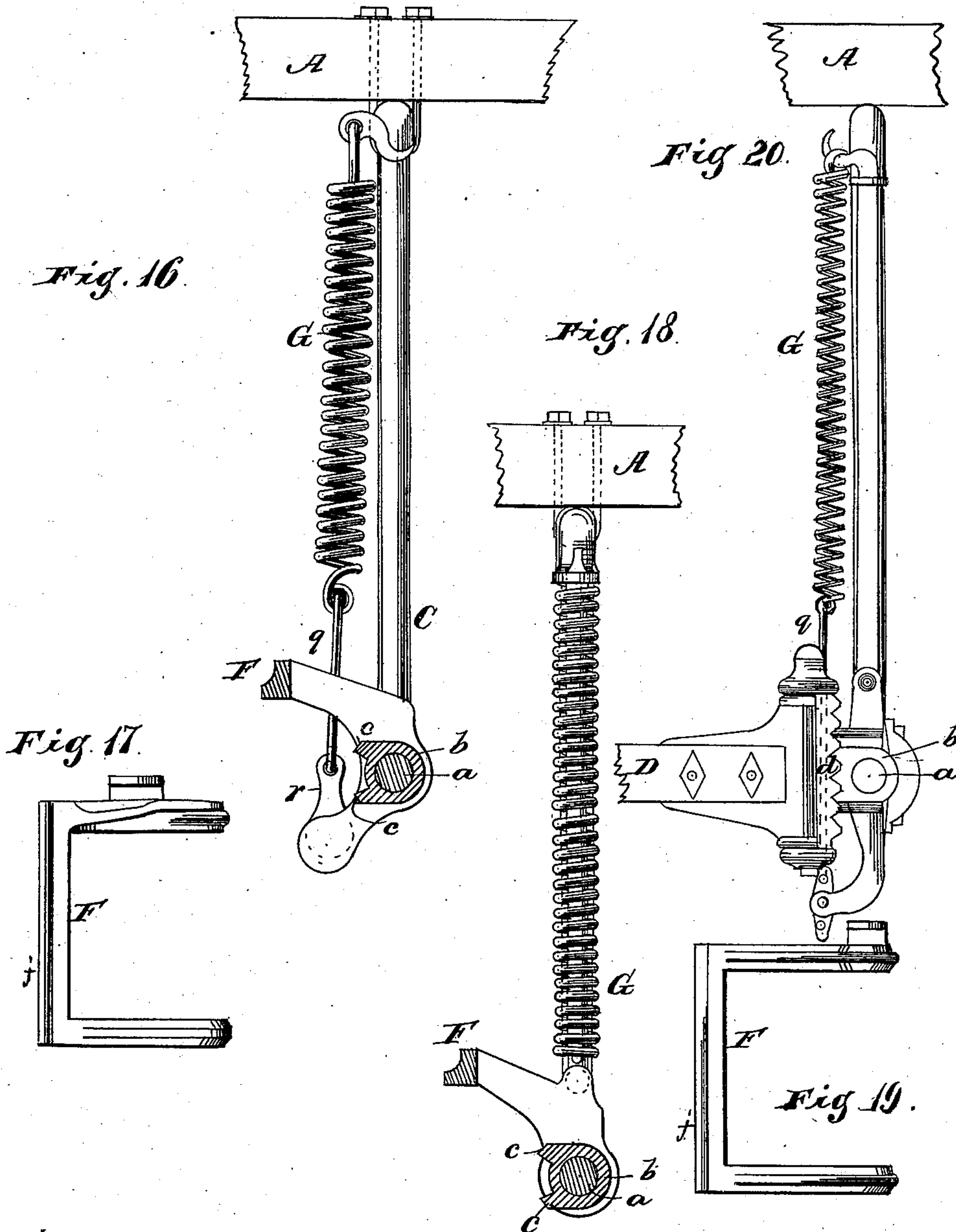
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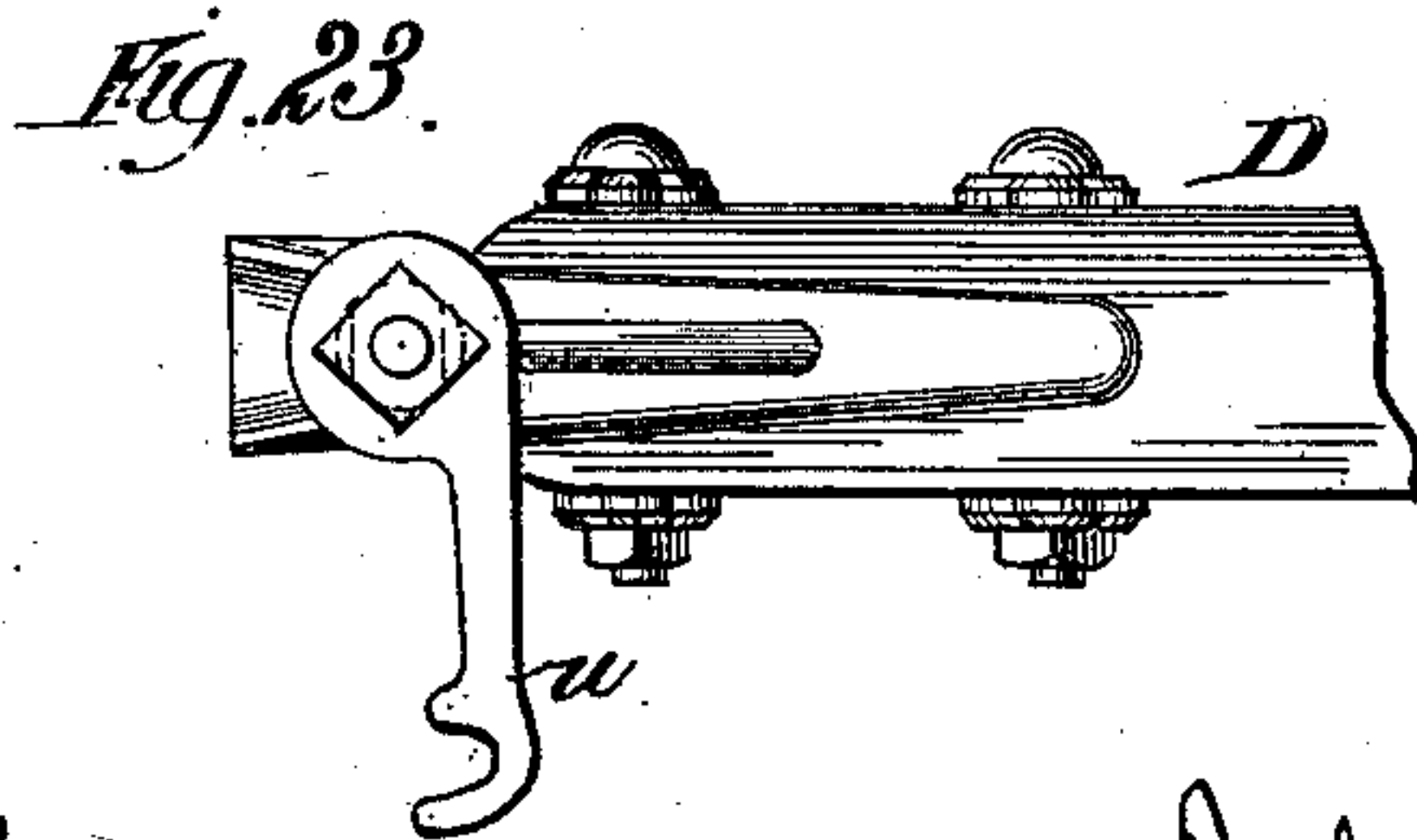
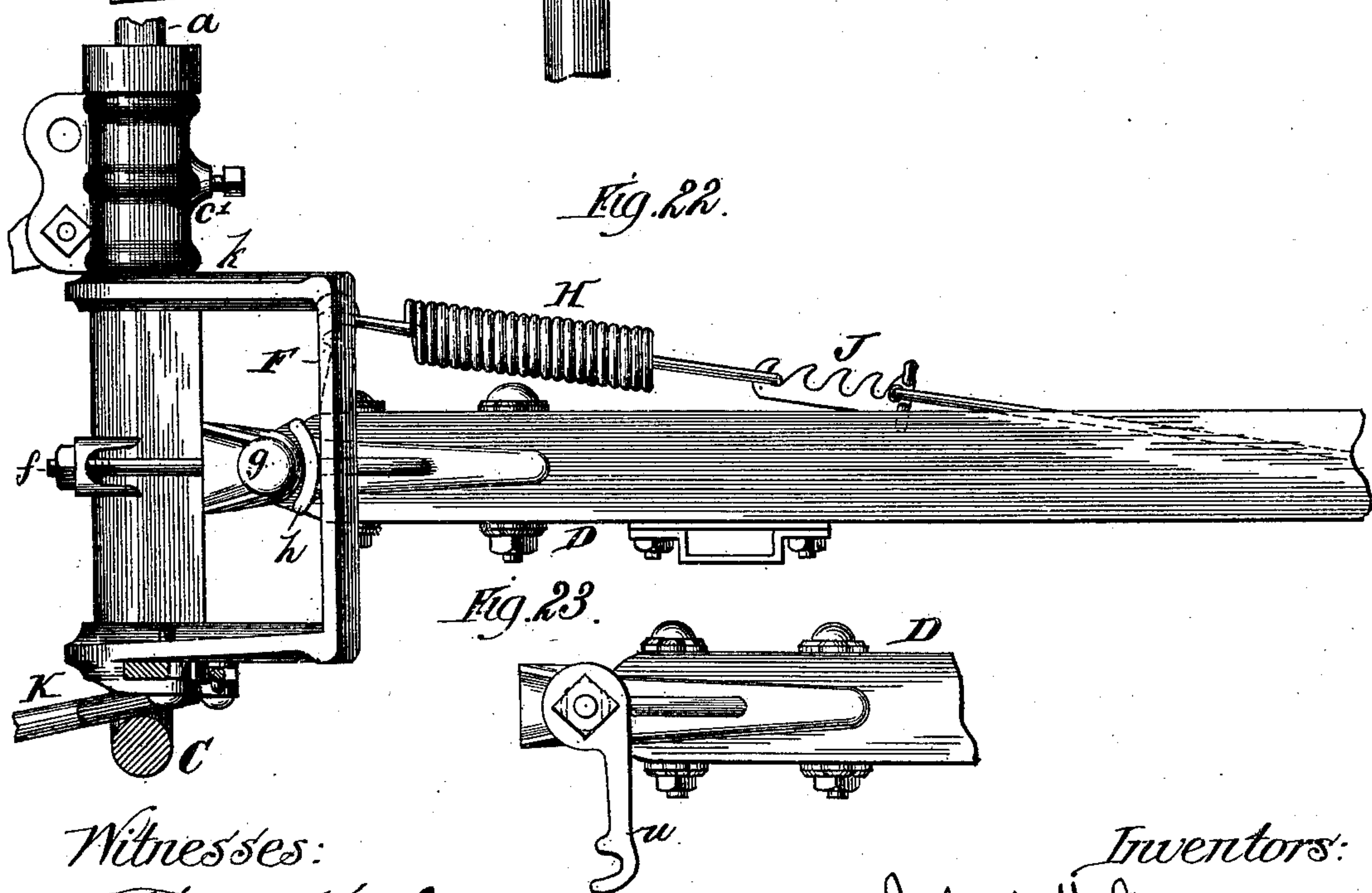
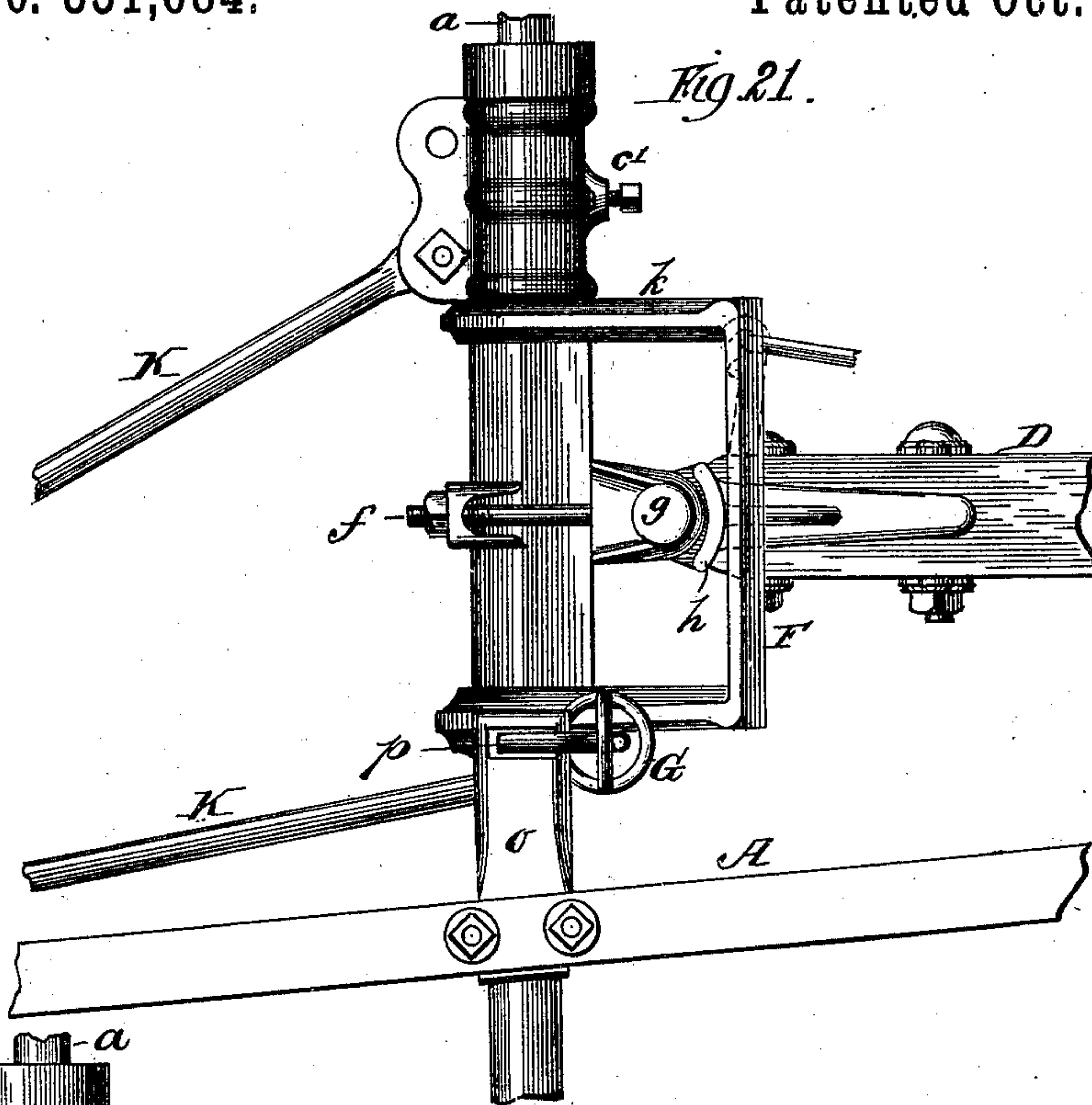
(No Model.)

6 Sheets—Sheet 5.

R. H. AVERY & L. B. BERRIEN.
CULTIVATOR.

No. 351,684.

Patented Oct. 26, 1886.



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(No Model.)

6 Sheets—Sheet 6.

R. H. AVERY & L. B. BERRIEN.
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Fig. 23.

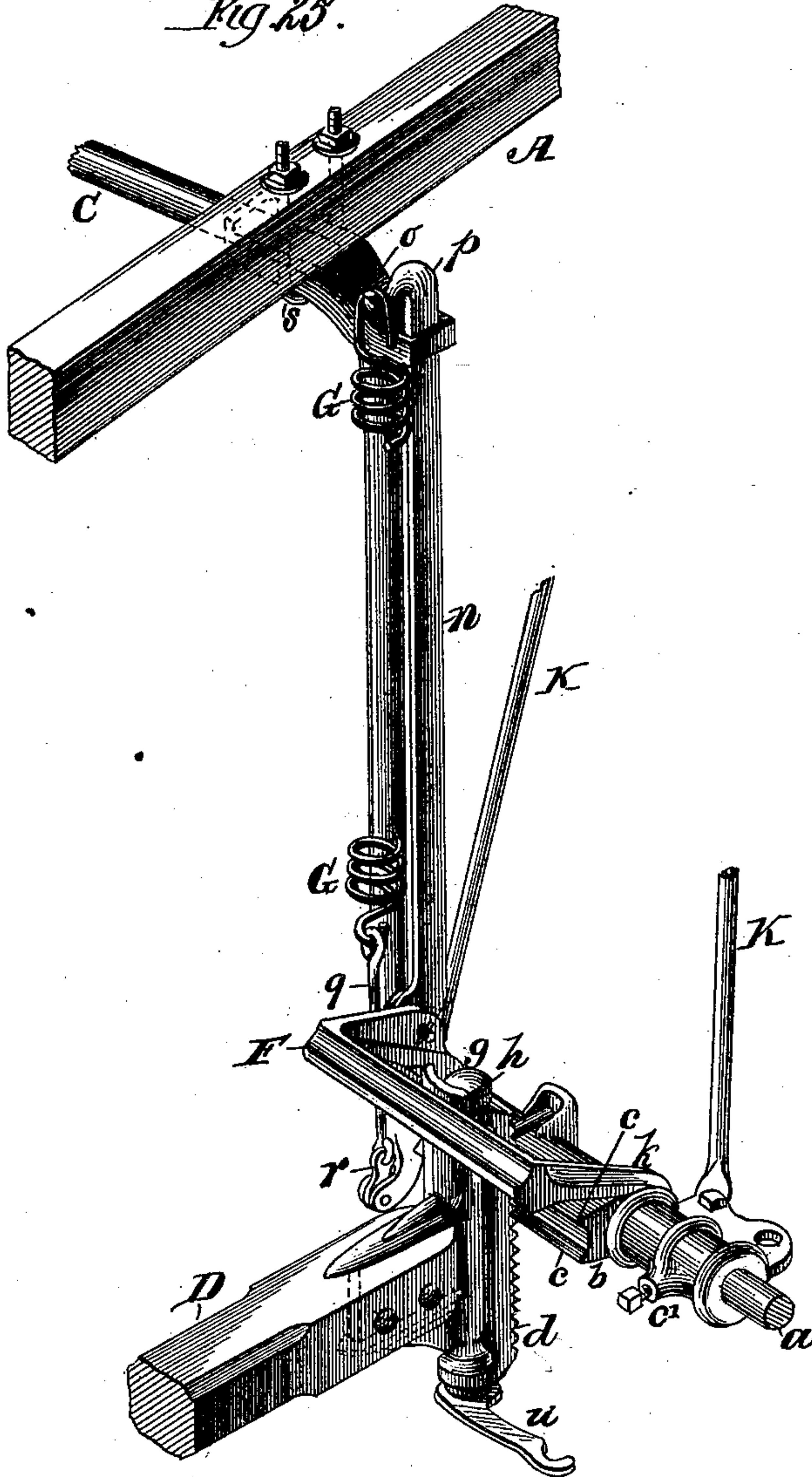
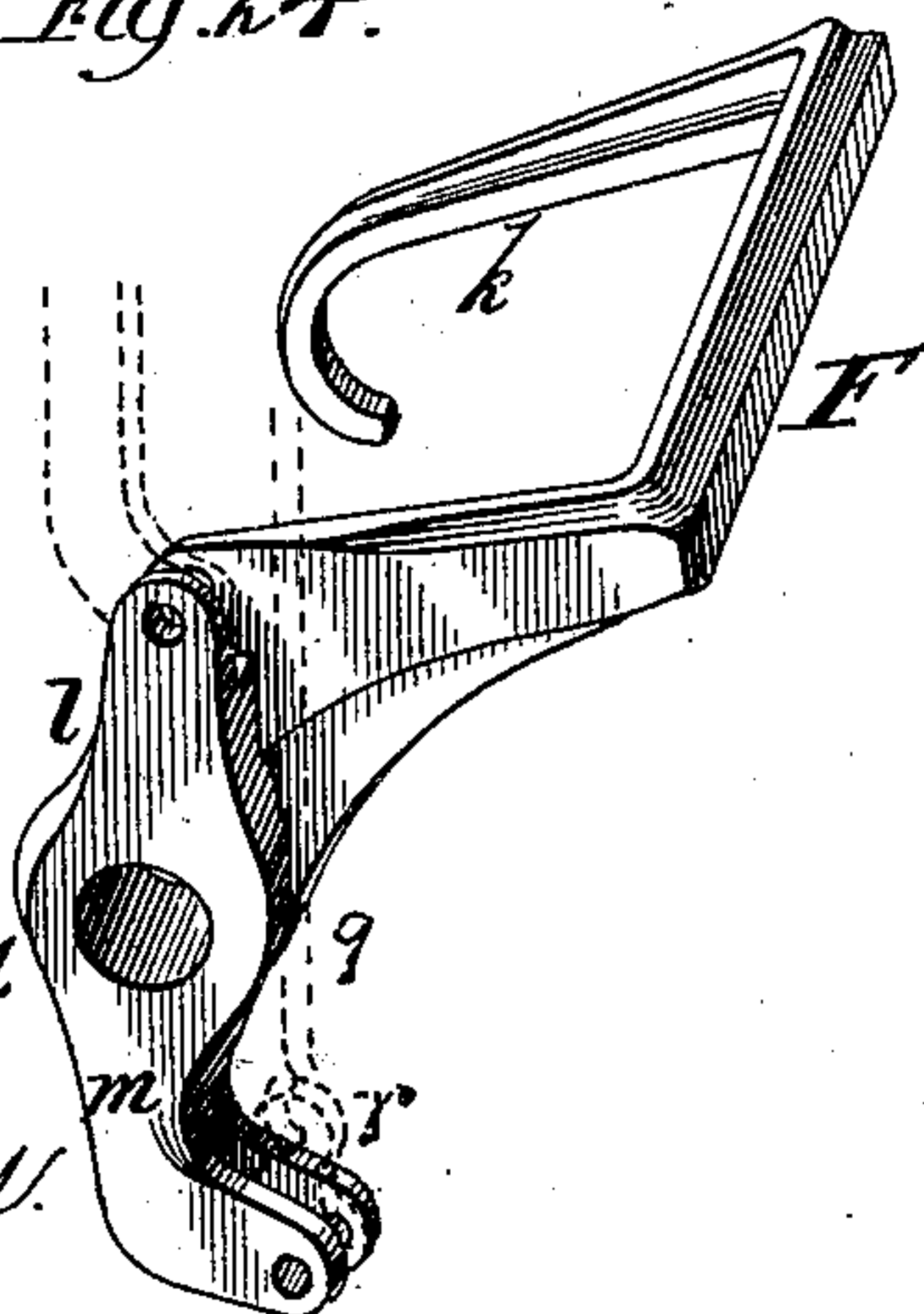


Fig. 24.



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UNITED STATES PATENT OFFICE.

ROBERT H. AVERY AND LEONARD B. BERRIEN, OF PEORIA, ILLINOIS,
ASSIGNORS TO THE AVERY PLANTER COMPANY, OF SAME PLACE.

CULTIVATOR.

SPECIFICATION forming part of Letters Patent No. 351,634, dated October 26, 1886.

Application filed August 21, 1885. Serial No. 174,964. (No model.)

To all whom it may concern:

Be it known that we, ROBERT H. AVERY and LEONARD B. BERRIEN, residing at Peoria, in the county of Peoria and State of Illinois, and citizens of the United States, have invented a new and useful Improvement in Cultivators, of which the following is a full description, reference being had to the accompanying drawings, in which—

Figure 1 is a side elevation, one wheel being removed and the shovels down; Fig. 2, a side view, one wheel being removed and the shovel-beam being raised; Fig. 3, a detail, being a side elevation of the parts shown, some parts being in section. Fig. 3^a is a detail. Fig. 4 is a detail and a plan of the parts shown. Fig. 5 is a detail, and is a plan of the part represented. Fig. 6 is a rear view, or a section at line *x* of Fig. 1, looking to the right, showing, however, only one side of the cultivator complete. Fig. 7 is a detail. Fig. 8 is a detail, being a side elevation of the parts represented. Figs. 9, 10, 11, 12, and 13 are details. Figs. 14 and 15 are details. Figs. 16 and 17 show a modification, Fig. 16 being a side elevation, and Fig. 17 a plan, of the parts shown. Figs. 18 and 19 show another modification, Fig. 18 being a side elevation, and Fig. 19 a plan, of the parts shown. Fig. 20 is a side elevation of the parts shown, showing another modification. Figs. 21 and 22 are plan views of certain parts; Figs. 23 and 24, details of some of the parts; Fig. 25, a perspective of certain parts. Some of the figures are enlarged.

The leading objects of our improvement are to provide improved devices for practically counterbalancing the weight of the beams and shovels and aid in lifting the same, and to provide an improved device for counteracting the tendency of the shovels and beams to crowd either to the right or left, which we accomplish as illustrated in the drawings.

Those things which we claim as new will be pointed out in the claims.

In the drawings, A represents a split tongue of a cultivator; B, one of the wheels; C, the arch, having at each side a horizontal part, *a*, as usual, which parts *a* carry the wheels, and to these parts the forward ends of the beams are connected. The cultivator is provided

with two shovel beams and two gangs of shovels, only one of which are shown.

D is one of the shovel-beams, which is connected to one of the horizontal parts *a* of the arch, so that the shovels can have vertical motion. As shown, this is accomplished by means of a sleeve and other parts.

b is the sleeve, which rotates on *a*, and is provided upon one side with projections *c*.

d is an iron notched upon one side to correspond with the projections *c*. It has an ear at each end. It is secured in place by means of a clip, *e*, and bolts *f*.

E is a casting having a pin which enters the forward end of the beam, to which it is secured by bolts. The forward end of this casting has a long bearing to receive a coupling-pin, *g*, which also passes through the ears upon the piece *d*. Thus the vertical and lateral movements of the shovels are provided for.

h is a projection extending up from the casting E.

F is a lever, journaled, as shown, at *i* upon *a*.

j is an arm extending out from the upper end of the lever F, with which arm the projection *h* at the forward end of the plow-beam engages. This arm *j* may be regarded as a part of the lever F.

k is an arm extending from the outer end of the arm *j*. Its lower end is provided with a hook, which partially encircles the horizontal part *a* of the arch, the office of *k* being to steady and support the arm *j*.

At the lower end of the lever F are two arms, one, *l*, extending forward, and the other, *m*, extending rearward.

The lever F, with the arms *j k l m*, may be cast together.

G is a strong coil-spring, the upper end of which is connected with a hook, *p*, upon the upper end of the bar *n*. The other end, as shown, is secured to a short rod, *q*, which, as shown, is connected with a loose piece, *r*, which is pivoted to the end of the arm *m*, so that in effect one end of the spring G is connected with the upper end of *n*, and the other end with the arm *m*.

As shown, the iron *o* is secured to the frame by means of a clip, *s*, which passes around the arch and through one part of the split tongue,

as shown in Figs. 9 and 10, Fig. 10 being a section at line *x* of Fig. 9. There are notches *t* on the sides of the piece *o*, which notches receive the clip *s*.

5 H is a coil-spring, the forward end of which engages with a hook, *u*, at the outer end of a short bar, I, which is rigidly secured to the lower end of the part *d* by means of a nut, *r*, on the pin *g*. The other end of the spring H
10 is connected to a notched bar, J, which is shown enlarged in Figs. 14 and 15.

w is a rod, the forward end of which is connected to the notched bar J, and the other end engages with an eye, *a'*, on the under side of
15 the beam.

b' is a hook, on which the beam can be hung up when not in use.

K are braces.

c' is a casting on the part *a*, held in place by
20 a set screw, and located between the hub of the wheel and the arm *i* of the part F. This part F swings freely on the horizontal part *a*, and has no connection with the sleeve *b*. The projection *h*, extending up from the casting E,
25 passes inside of the bar *k*, which is a part of F, and ordinarily this part *h* comes in contact with the inner surface of the bar *k*.

It will be observed by looking at Fig. 8 that
30 the coil-spring G is not connected with the frame at either end, but that one end is connected with the upper end of the bar *n*, the lower end of which bar is pivoted to the forward end of the arm or lever *l*, while the other end of this spring is connected with
35 the outer end of the arm or lever *m*, both of which levers *l m* are permanently connected with the lower end of the arm *j*, which encircles and rotates upon *a*, so that the spring when under tension pulls down on the bar *n*, which
40 has a tendency to force the lever *l* downward, while the other end of the spring, being connected with *m*, has a lifting tendency upon it. The spring G is to be so arranged that it will be under the greatest tension when the shovels
45 are down or in the ground. When the parts are in this position, the outer ends of the levers *l m* and the part *a* will be in nearly the same vertical line, but not exactly, and in this position, though the spring is then under the
50 greatest tension, it will have but little effect in counterbalancing the weight of the beam and shovels; but if the rear end of the beam be raised the position of the levers *l m* will be changed by the action of the spring, and its effect in counterbalancing the beam and shovels
55 will be greatly increased. It will be seen that this spring G has a double action, lifting on the lever *m* and pulling down through the bar *n* on the lever *l*. This spring acts upon
60 the beam through the bar *j* in contact with the projection *h*. If the beam be returned to the position shown in Fig. 1, the part *h*, engaging with *j*, causes F to partially rotate upon *a*, increasing the tension of the spring; but the
65 changed position of the parts at the same time decreases its sensible effect. We thus provide a spring which is not connected to the frame

at one end, but is connected at both ends with devices through which the spring acts upon the beam. We are thus able to use a lighter
70 spring than would be required if one end were rigidly secured to the frame, and obtain equally beneficial results. This spring acts upon the beam through the two levers *l m*, one of which extends forward and the other to the
75 rear of the axle; or these two levers *l m* may be considered as a single lever pivoted upon the axle at or near its center.

The spring H serves the purpose of counteracting the tendency of the beams and shovels to swing to one side by the turning of a furrow. The rod *w*, to which one end of the spring is in effect connected, is attached to the beam. The other end is secured at a point
80 considerably to one side of the center of the beam, so that the tendency of the spring is to pull the beam to that side. The hook *u* might be placed upon the other side of the beam, and then the spring being attached thereto, its tendency would be to pull the beam in the opposite
85 direction. The tension of the spring can be regulated by connecting one end in the different notches in the bar J. This spring H does not interfere with the movement of the shovels laterally to dodge plants out of line.
90

The advantages arising from the use of a lever, F, in conjunction with a spring for lifting the shovel-beam, can be utilized in other ways than thus far described.
95

Fig. 16 shows an arrangement in which the
100 lever F and a spring operate on the beam without the use of the connecting-bar *n*, and with this form of construction the arm or projection *l* is dispensed with, and the upper end of the spring is attached to an eye or hook on
105 the frame of the machine, or to some other suitable support, and with this construction the spring acts as a draw-spring to raise the lever and cause it to act on the beam. Fig. 18 shows another arrangement, in which the spring is
110 caused to encircle a guide-rod, which takes the place of the rod *n*, the spring being engaged at its upper end with a collar or arm on the frame, and at its lower end with a pin or collar on the rod adjacent to the arm or projection
115 *l*, and in this construction the arm or projection *m* is dispensed with. The spring in this construction is a push one, to bear against the arm or projection *l* to raise the lever and cause it to act on the beam. Fig. 20 shows
120 another arrangement, in which the lever is attached rigidly to the beam-box and the spring and rod are both used, the arm for the spring being forward and under and the arm for the rod above the center of rotation, and with this
125 construction the spring and rod act as first described.

What we claim as new, and desire to secure by Letters Patent, is—

1. A pivoted or journaled lever, F, provided with two arms or projections, *l m*, one extending forward, the other rearward, in combination with a shovel-beam, substantially as and for the purposes specified.
130

2. In a cultivator, a lever arranged to act on the beam, in combination with a spring, G, connected at one end with the lever and at its other end with a rod or bar, through which the spring acts on the same lever, substantially as and for the purpose specified.

3. In a cultivator, the combination of a shovel-beam, a pivoted or journaled lever, F, provided with two arms, one extending forward and the other rearward, a spring, G, and a rod or bar, *n*, substantially as and for the purposes specified.

4. In a cultivator, the combination, with the shovel-beam and vertical pivot of the plow-beam, of a spring, H, having its rear end connected with the shovel-beam, and its forward end connected at one side of the center of said beam to a hook on the vertical pivot of the plow-beam, substantially as and for the purpose specified.

5. The combination, with the beam D and bar I, formed with hook *u*, and secured to the

part *d*, of the spring H, connected at one end to the hook of bar I, and the notched piece J, connecting said beam and spring, substantially as described.

6. The combination of a lever, F, mounted upon the part *a*, and provided with a coupling-pin, *g*, a shovel-beam provided with a projection with which said pin will engage, and a spring to act on said lever, substantially as specified.

7. A lever, F, having opposite arms *l m*, in combination with bar *w*, spring G, and a shovel-beam, substantially as and for the purpose specified.

8. A lever, F, in combination with a rod, *n*, guide *o*, a spring, G, and a shovel-beam, substantially as and for the purposes specified.

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