

(No Model.)

2 Sheets—Sheet 1.

H. MYERS.  
HORSE HAY RAKE.

No. 353,424.

Patented Nov. 30, 1886.

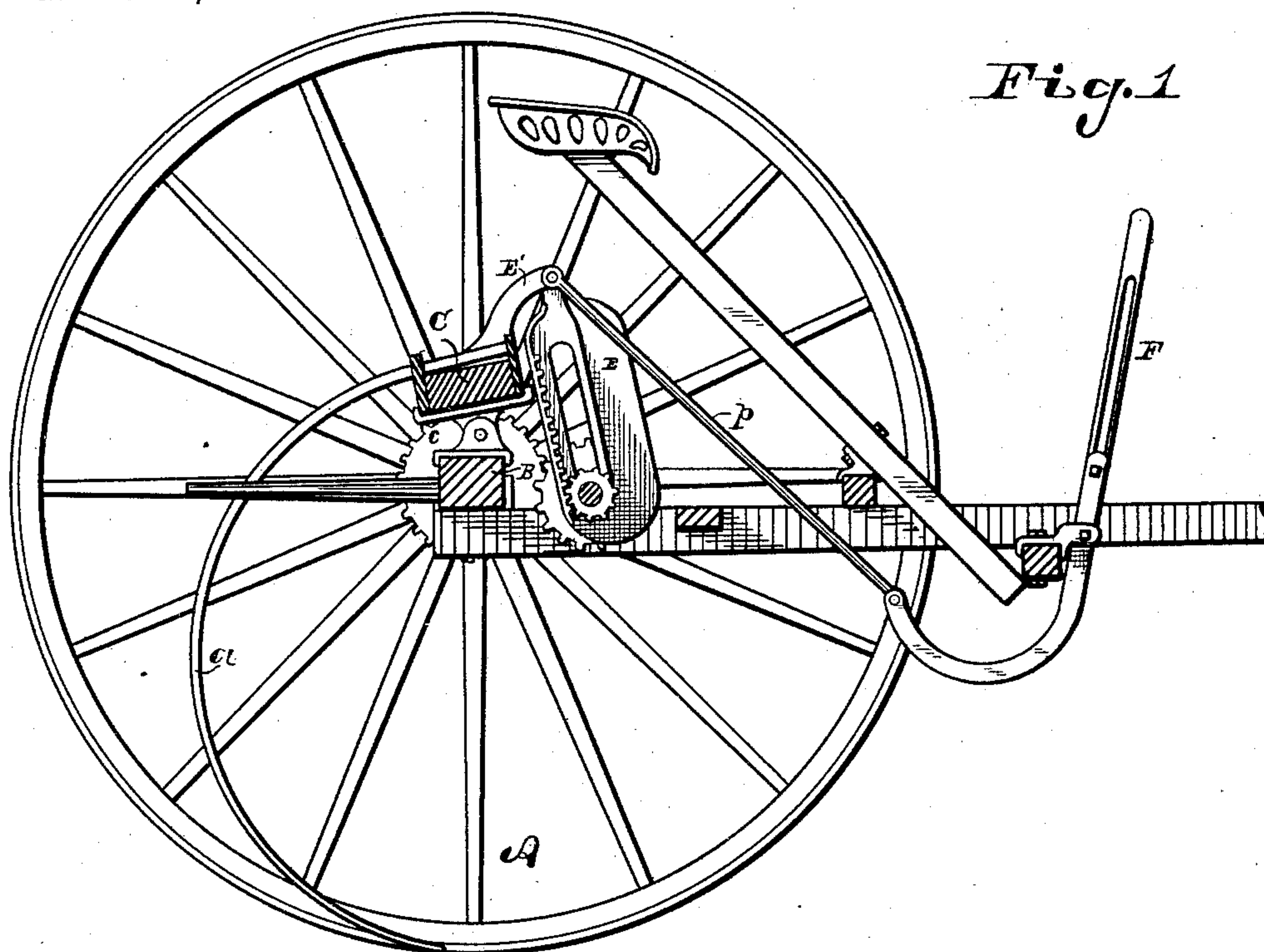


Fig. 1

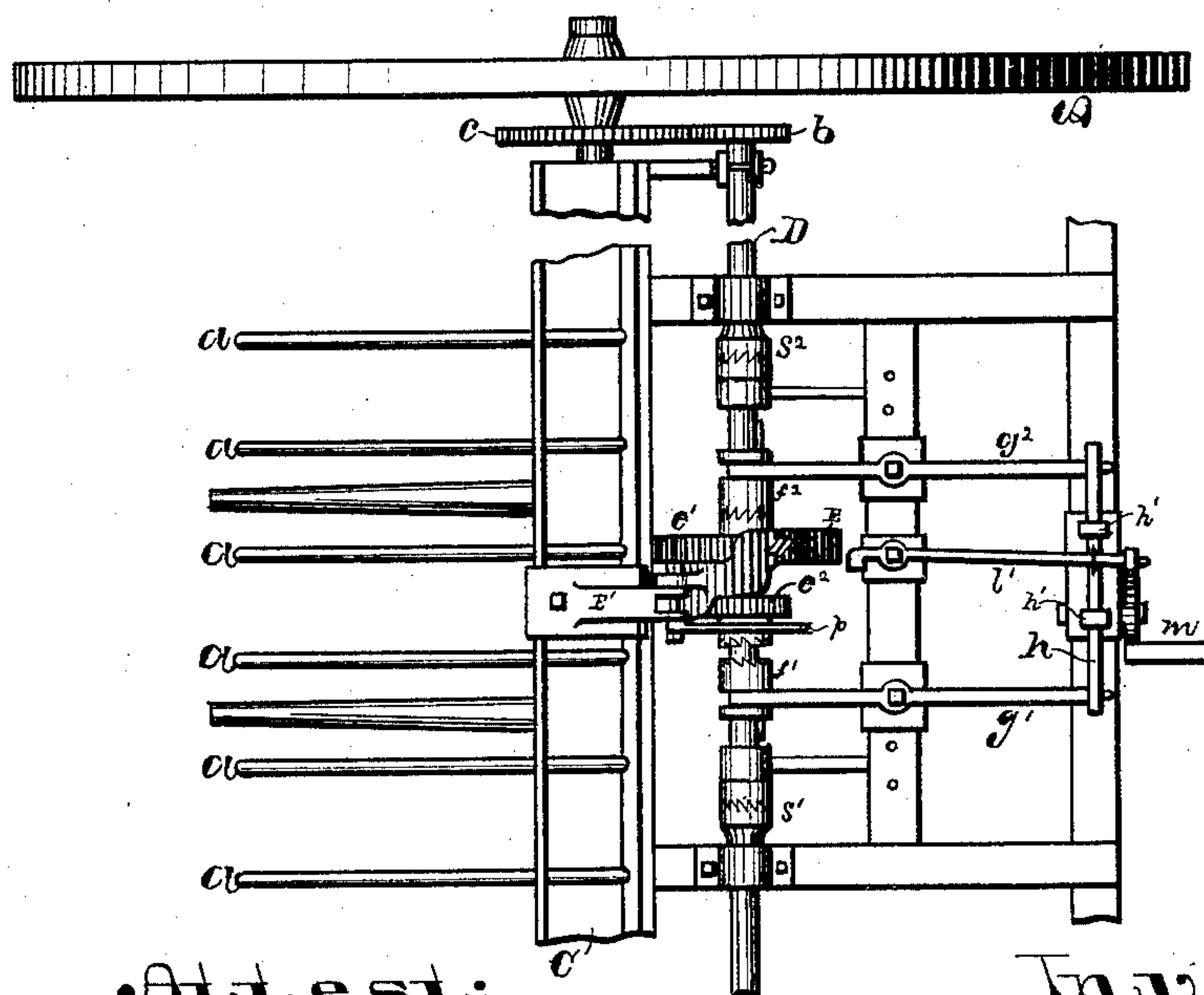


Fig. 2

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F. E. May.

Inventor:  
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att'y

(No Model.)

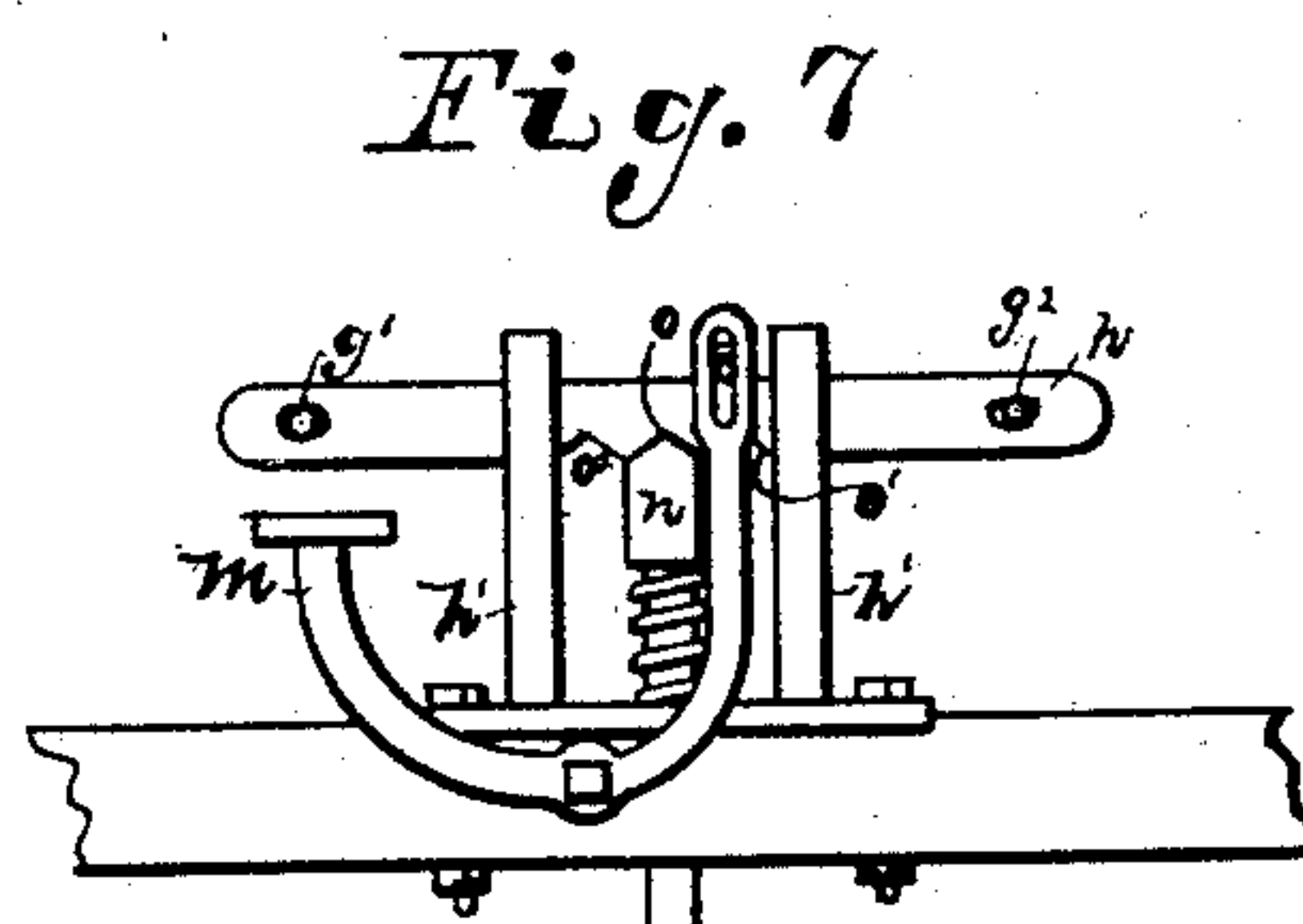
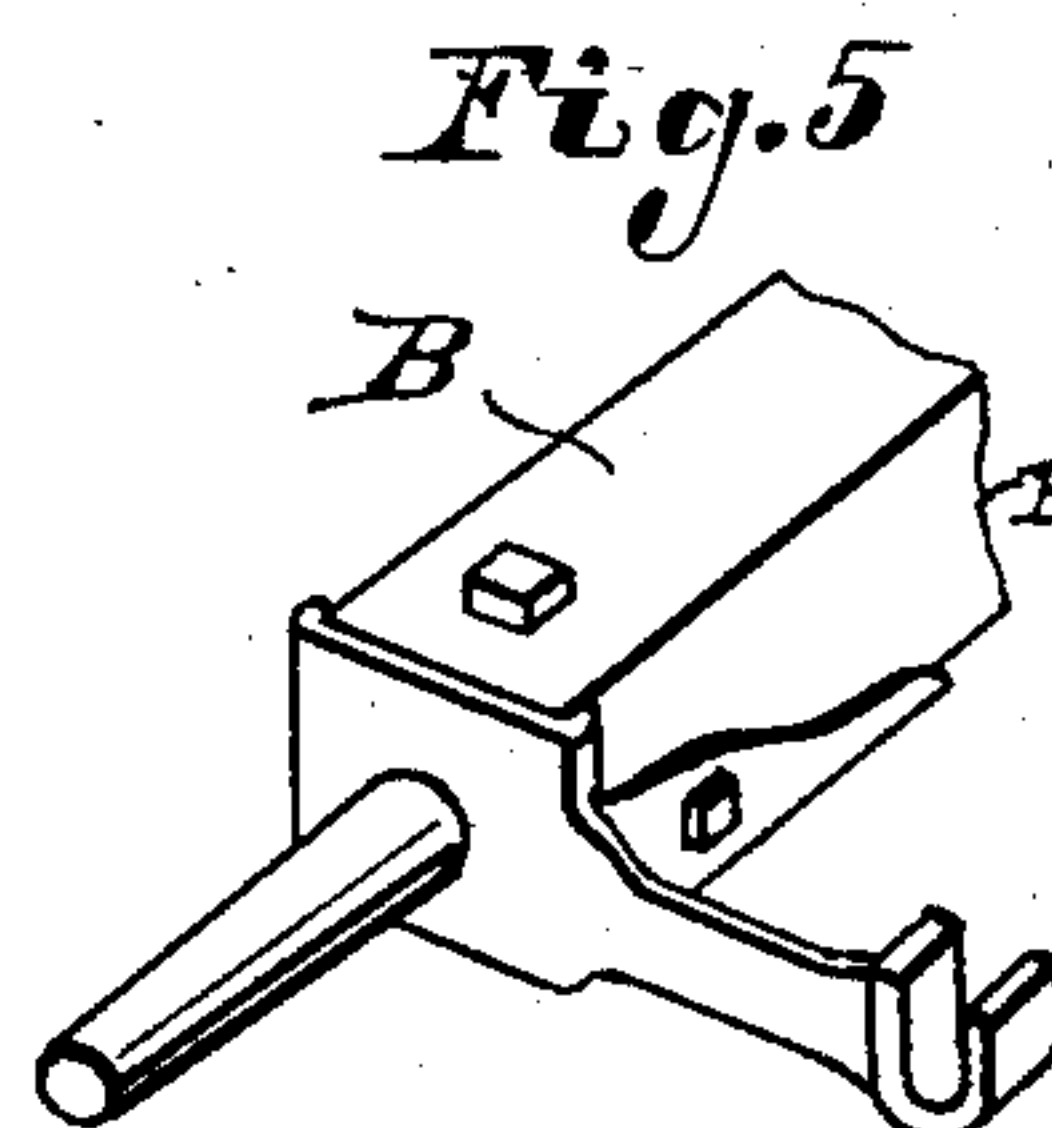
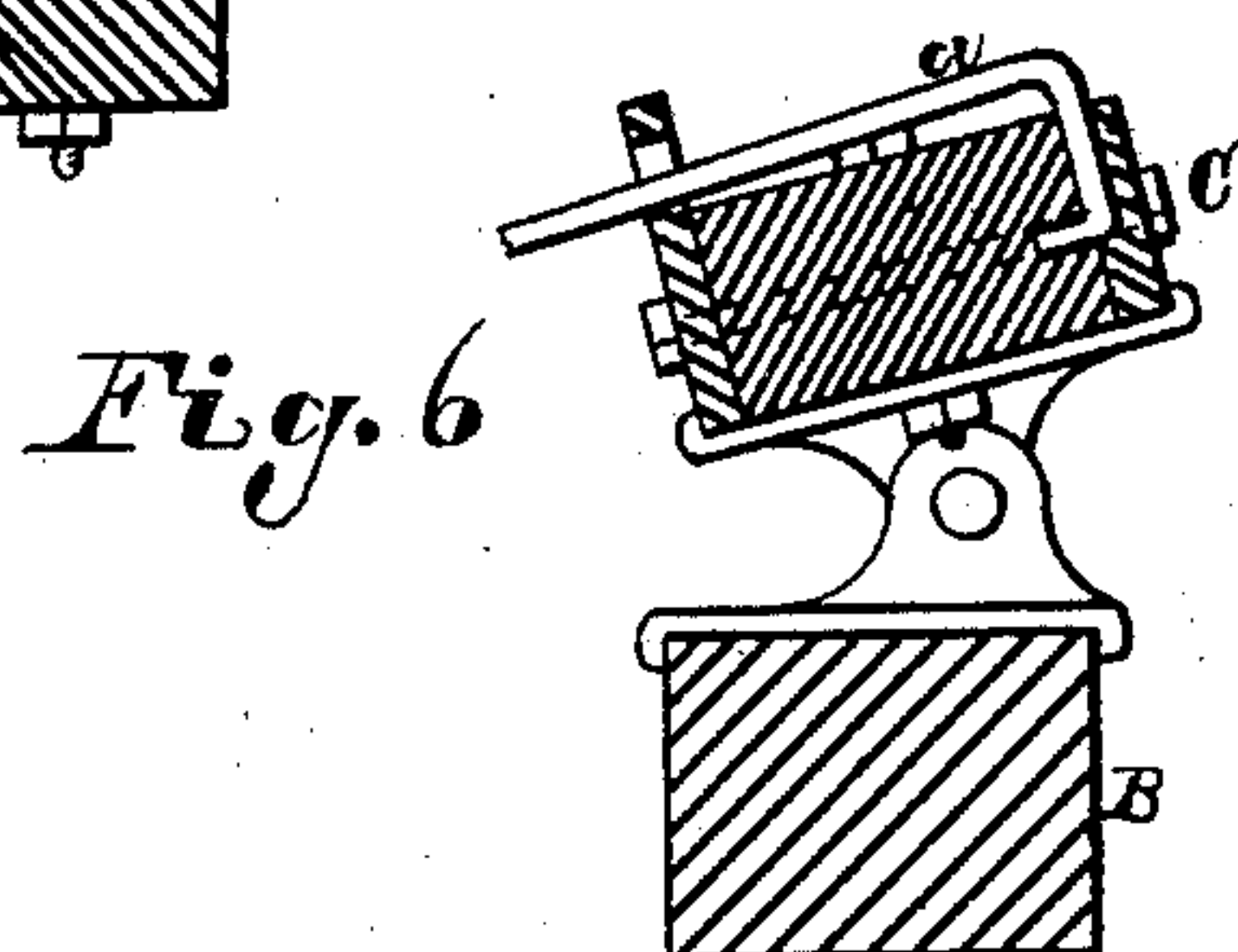
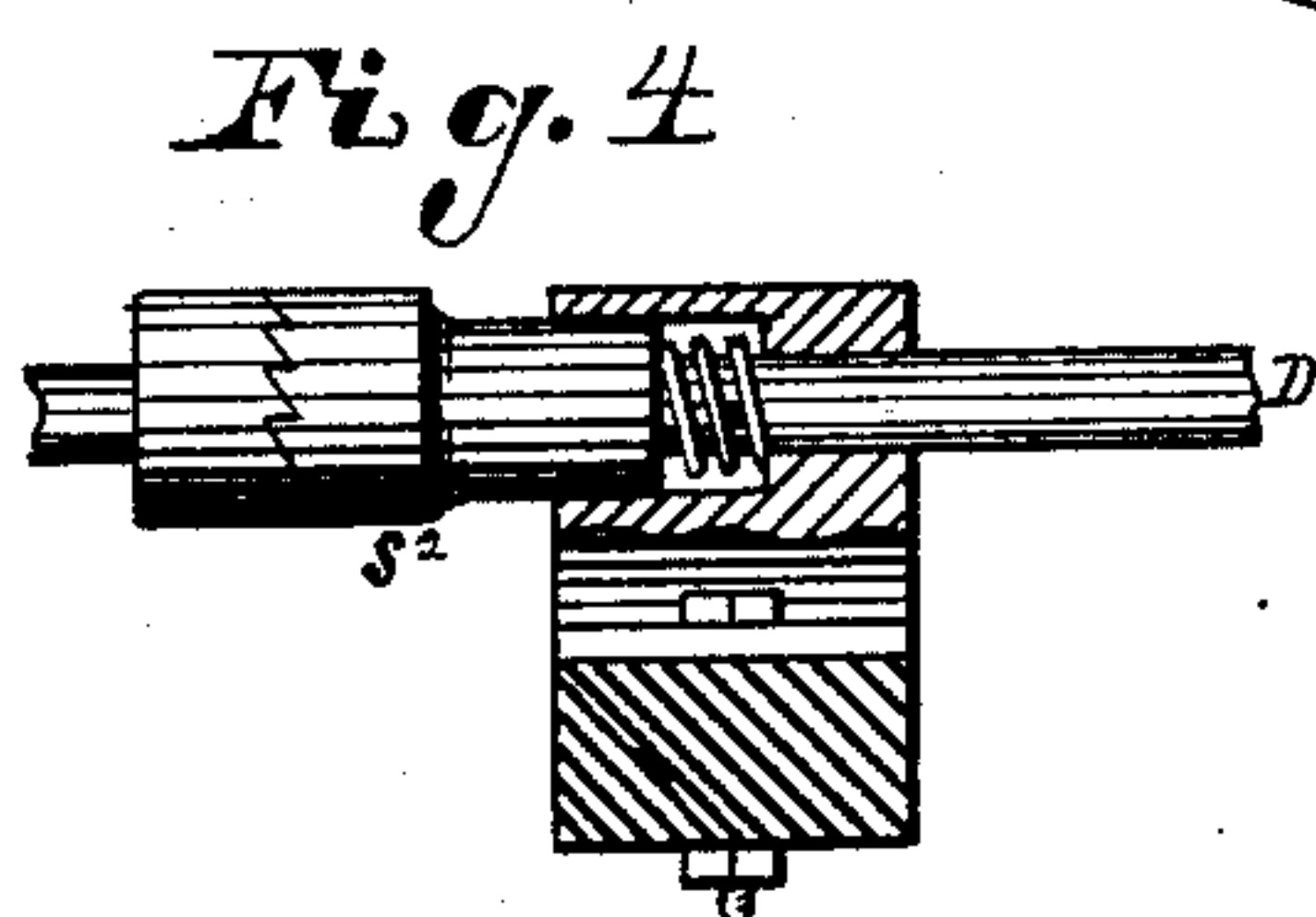
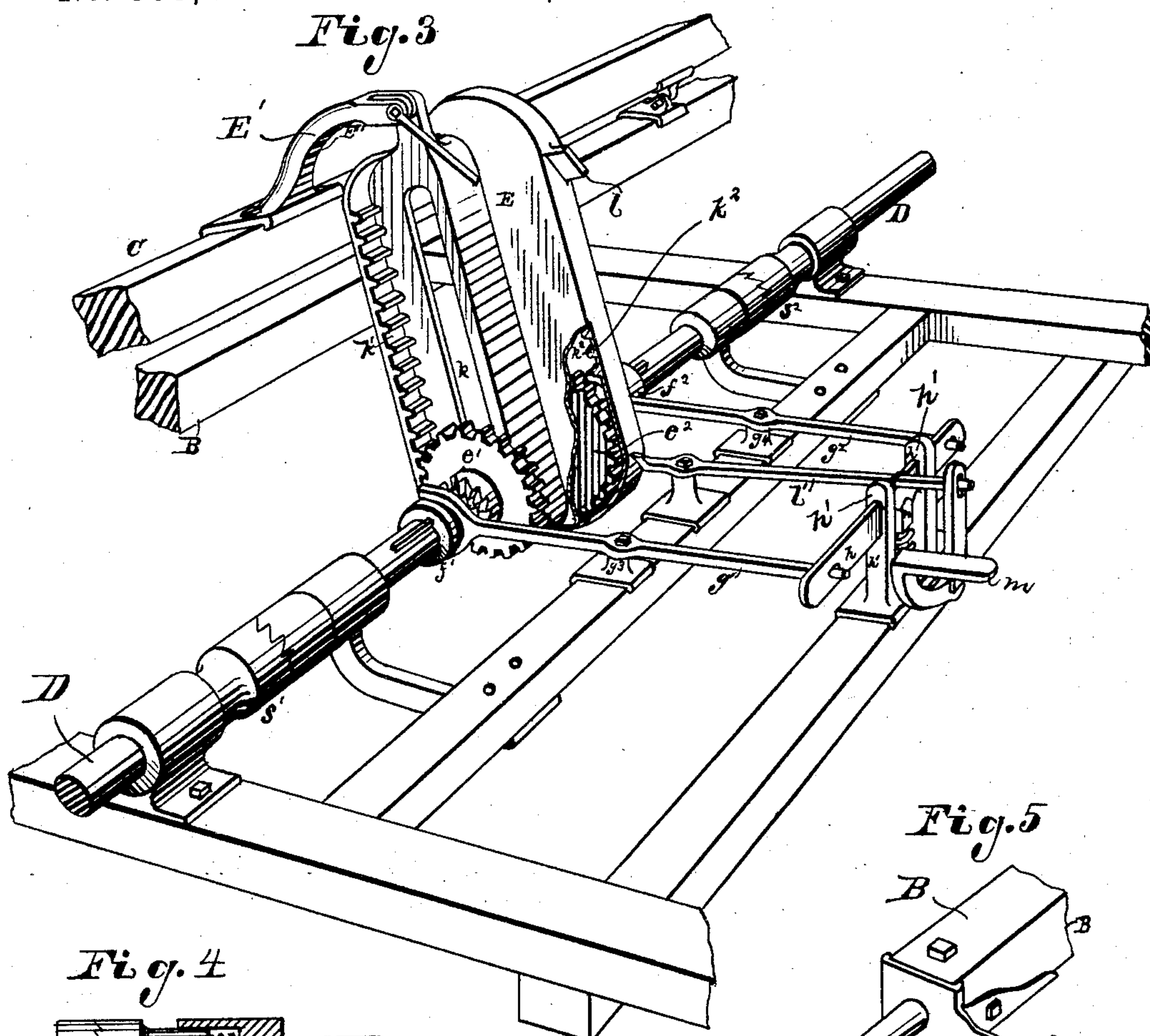
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F. E. May.

Inventor:  
Hiram Mayers  
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# UNITED STATES PATENT OFFICE.

HIRAM MYERS, OF SPRINGFIELD, OHIO.

## HORSE HAY-RAKE.

SPECIFICATION forming part of Letters Patent No. 353,424, dated November 30, 1886.

Application filed December 8, 1885. Serial No. 185,063. (No model.)

*To all whom it may concern:*

Be it known that I, HIRAM MYERS, a citizen of the United States, residing at Springfield, in the county of Clark and State of Ohio, have  
5 invented certain new and useful Improvements in Horse Hay-Rakes, of which the following is a specification.

My invention relates to improvements in hay-rakes; and the object of my invention is to  
10 provide means for automatically raising and lowering the rake-teeth in dumping the load by the motion of the carrying-wheels as the rake is drawn forward.

My invention consists in the constructions  
15 and combinations of parts hereinafter described and claimed.

In the accompanying drawings, Figure 1 is a sectional elevation view of a hay-rake embodying my invention. Fig. 2 is a partial plan view  
20 of the same. Fig. 3 is a perspective view of the raising and lowering mechanism; and Figs. 4, 5, 6, and 7 are views of some of the various parts in detail.

In the said drawings, A represents the carrying-wheels, B the axle, and C the rake-head, to which the rake-teeth  $a$  are secured, said rake-head being hinged at each end to the axle B in the usual way.

Supported in bearings on the frame of the rake is a revolving shaft, D, parallel with the axle B, and provided at each end with a pinion,  $b$ , which pinions engage with spur-gears  $c$  on the hubs of the respective carrying-wheels A. Journaled loosely on the shaft D, near the  
30 middle thereof, are two spur-pinions,  $e' e^2$ , of different sizes. These pinions are adapted to turn loosely on the shaft and independent of each other, and are provided on their outer hubs with clutch-faces adapted to be engaged  
40 by the respective clutches  $f'$  and  $f^2$ . These clutches  $f'$  and  $f^2$  are secured to the shaft D by feathers, so that they revolve with said shaft, but are capable of being moved longitudinally on said shaft by pivoted bifurcated levers  $g' g^2$ , the prongs of which engage in grooves in the peripheries of the said clutches. These bifurcated levers  $g' g^2$  are pivoted at  $g^3 g^4$  to the frame of the rake, and are each connected at their outer ends to a slide,  $h$ , which is adapted to reciprocate in bearings  $h'$  on the frame.  
50

On the shaft D, between the pinions  $e' e^2$ , is

a yoke, E, in the central web of which is a slotted opening,  $k$ , through which the shaft D extends. This yoke E is provided with two racks,  $k' k^2$ , and is so constructed that the said  
55 racks come on opposite sides of the respective pinions  $e' e^2$ , in a position to be engaged thereby. The yoke E is connected at the top by means of a curved arm,  $E'$ , to the rake-head C. The rack  $k'$  is so constructed that its teeth constantly engage with the teeth of the smaller pinion,  $e'$ , of the other rack,  $k^2$ , terminating at its lower end above the end of the yoke, so that when in the normal position the said rack  $k^2$  is out of engagement with the larger pinion,  $e^2$ .  
60 When the rack is in the normal position for dumping, the clutch  $f^2$  is pushed into engagement with the larger pinion,  $e^2$ , so that the said pinion turns with the shaft D, which in turn derives its motion from the wheels A A  
70 through the gears  $b c$  as the rake is drawn forward. The clutch  $f'$ , however, is disengaged from the small pinion  $e'$ , which engages the rack  $k'$ , so that the said pinion remains at rest on the shaft D while said shaft is being re-  
75 volved.

When it is desired to raise the rake-teeth, and thus dump the load, the slide  $h$  is moved longitudinally, thus oscillating the levers  $g' g^2$  simultaneously, thereby disengaging the clutch  
80  $f^2$  and throwing the clutch  $f'$  into engagement. The pinion  $e'$  is thus started to revolve with the shaft D, and, engaging the teeth of the lifting-rack  $k'$ , draws down the yoke E, thus oscillating the rake-head C and raising the  
85 rake-teeth  $a$ .

In order that the rake-head may be released when raised to the proper height and returned positively to its proper position, I provide means for automatically disengaging the pin-  
90 ion  $e'$  from and simultaneously connecting the other pinion,  $e^2$ , to the revolving shaft D. The teeth of the larger pinion,  $e^2$ , having, by the former movement of the yoke E, become engaged with the rack  $k^2$ , which stands on the  
95 opposite side of the shaft from the lifting-rack  $k'$ , the yoke will be moved positively back to its normal position by the said rack and pinion. I preferably accomplish this by providing on the front edge of the yoke E a cam pro-  
100 jection,  $l$ , adapted, as the yoke is moved longitudinally to raise the rack, to come against one



end of a cam-lever,  $l'$ , which is pivoted at  $l^2$  to the frame, and connected at the other to the slide  $h$ . The slide  $h$  will thus be moved longitudinally through its bearings, thereby simultaneously moving the clutch-levers  $g' g^2$ , which are each connected thereto. The end of the cam-lever  $l'$  which is connected to the slide  $h$  is preferably extended beyond said slide and connected to a curved foot-lever,  $m$ , which is pivoted to the frame in easy reach of the driver. By pressing down on the foot-lever it will be seen that the slide  $h$  will be moved longitudinally, thus changing the position of the respective clutches. Means are thus furnished for starting the rake to dump when a sufficient load has been accumulated.

Immediately under the slide  $h$ , on the frame, is a spring-bolt,  $n$ , which presses against said slide, and is adapted to enter notches  $o o' o^2$ , to hold the clutches against accidental disengagement. The end of the spring-bolt is beveled each way, the notches being correspondingly formed, so that when considerable pressure is applied from either direction the bolt will be forced out of the notch and the slide moved longitudinally. The clutches are preferably so arranged that when the spring-bolt  $n$  is in the center notch,  $o$ , both pinions are disengaged, so that the rake may be dumped by hand, if desired.

A hand-lever,  $F$ , is provided at the forward part of the frame, and is connected to the arm  $E'$  on the rake-head by a connecting-rod,  $p$ , so that when the clutches are both disengaged from the respective pinions the rake may be drawn up and remain at rest while moving the rake from place to place, or may be dumped by hand in the ordinary manner. I preferably make the hand-lever  $F$  in two parts, secured together by a thumb-screw, which passes through a slotted opening in one of the parts, so that when the rake is used as a self-dump the handle may be telescoped, so as to be less in the way.

In order that the carrying-wheels may turn backward, and to provide for operating the rake from one or both wheels, and in turning corners, &c., I provide on either side of the pinions  $e' e^2$  on the shaft  $D$  spring-clutches  $s' s^2$ , (see Fig. 4 for detail,) adapted to drive the shaft when turned forward, but adapted to slip around on the serrated faces when turned backward. By this arrangement either or both wheels may be turned backward without driving the pinions; or one wheel may turn backward and the other forward, as in turning corners, in which case the forwardly-turning wheel becomes the driving-wheel and drives the pinions to dump the rake.

In using the pinions, one for raising and one for lowering the rake described, I make the raising-pinion small and the lowering-pinion large, so that the rake will be moved more slowly, and thus with more power, in rising to dump the load, but will be moved faster in lowering, and be quickly returned to its normal position for raking.

This rake, it will be seen, is simple and effective in its operation, and may be used either as an automatic dumper, or it may be dumped by hand in the usual way. By its operation as an automatic dump the rake is moved positively in both directions, and is lowered positively after dumping the load, instead of being dropped suddenly, as in other rakes of this character.

Having thus described my invention, I claim—

1. The combination, with the rake-head, of the reciprocating yoke attached to said rake-head and provided on either side with the racks thereon, loosely-revolving pinions on a revolving shaft adapted to be engaged on opposite sides by said racks, and means for automatically connecting and disconnecting said pinions to and from the revolving shaft, substantially as specified.

2. The combination, with the rake-head, the yoke provided with racks on either side thereof attached to said rake-head, and the revolving shaft having the pinions thereon adapted to engage said racks, of the spring-clutches on each side of said pinions, adapted to drive the shaft in a forward direction only, substantially as set forth.

3. The combination, with the rake-head, the yoke provided with racks on either side thereof attached to said rake-head, and the loosely-revolving pinions adapted to engage with said racks, of the clutches on the shaft adapted to engage said pinions, and mechanism, substantially as set forth, for simultaneously moving one of said clutches out and the other into engagement with the respective pinions as the yoke nears the limit of its forward stroke, substantially as and for the purpose set forth.

4. The combination, with the pinions revolving loosely on the shaft, the yoke adapted to be engaged by said pinions, and the rake-head attached to said yoke, of the revolving clutches, the clutch-levers adapted to move said clutches longitudinally on said shaft, a slide connecting said clutch-levers together, and a foot-lever connected to said slide, substantially as specified.

5. The combination, with the yoke and the loosely-revolving pinions adapted to engage respectively on opposite sides with said yoke, of the revolving clutches adapted to be moved simultaneously by a slide,  $h$ , to engage and disengage said pinions respectively, and a cam projection on said yoke adapted to move said slide, substantially as set forth.

6. The combination, with the rake-head and the yoke connected thereto, said yoke being provided with racks on opposite sides thereof, pinions of unequal diameters adapted to engage the respective racks on the said yoke and raise and lower the rake at different speeds, substantially as specified.

7. The combination, with the rake-head, the pinions and their clutches, and the yoke adapted to be engaged by said pinions, of the



clutch-levers connected to said clutches, a  
slide connecting said clutch-levers, a foot-  
lever for moving said slide, and a spring-bolt  
for holding said slide in different positions,  
5 substantially as set forth.

8. The combination, with the rake-head and  
yoke, the pinions to engage therewith, and the  
clutches to engage said pinions, of the clutch-  
levers connected to said clutches, a slide con-  
10 necting said levers, a cam-lever connected to  
said slide, and a cam projection on said yoke

adapted to strike said lever, a spring-bolt for  
holding said slide, and a foot-lever adapted  
to move said slide, substantially as and for the  
purpose set forth.

In testimony whereof I have hereunto set my  
hand this 30th day of November, A. D. 1885.

HIRAM MYERS.

Witnesses:

CHASE STEWART,  
F. WILLIS BAINES.

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