

(No Model.)

3 Sheets—Sheet 1.

B. A. WEATHERBEE.
MACHINE FOR GATHERING STONES.

No. 300,173.

Patented June 10, 1884.

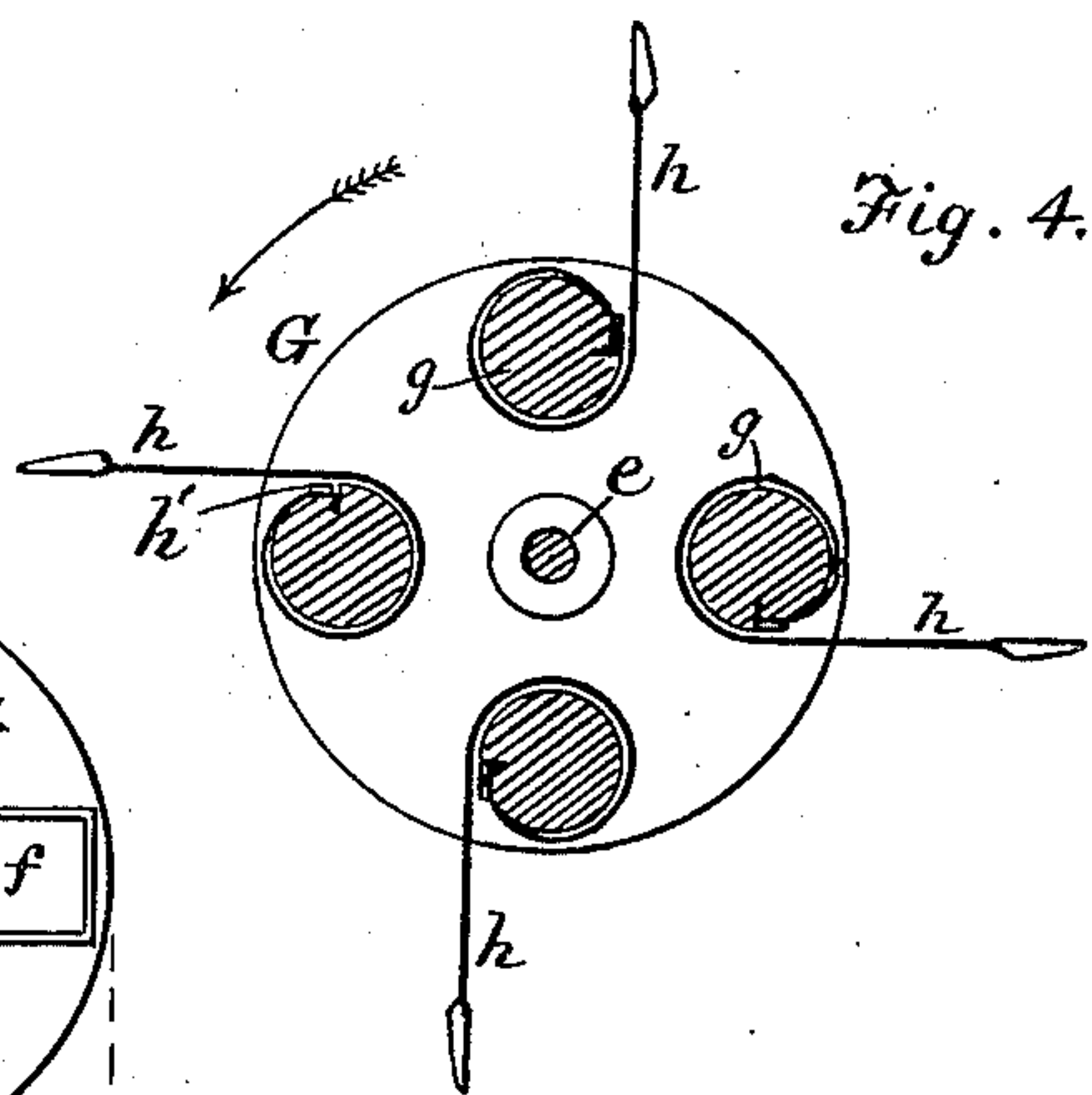
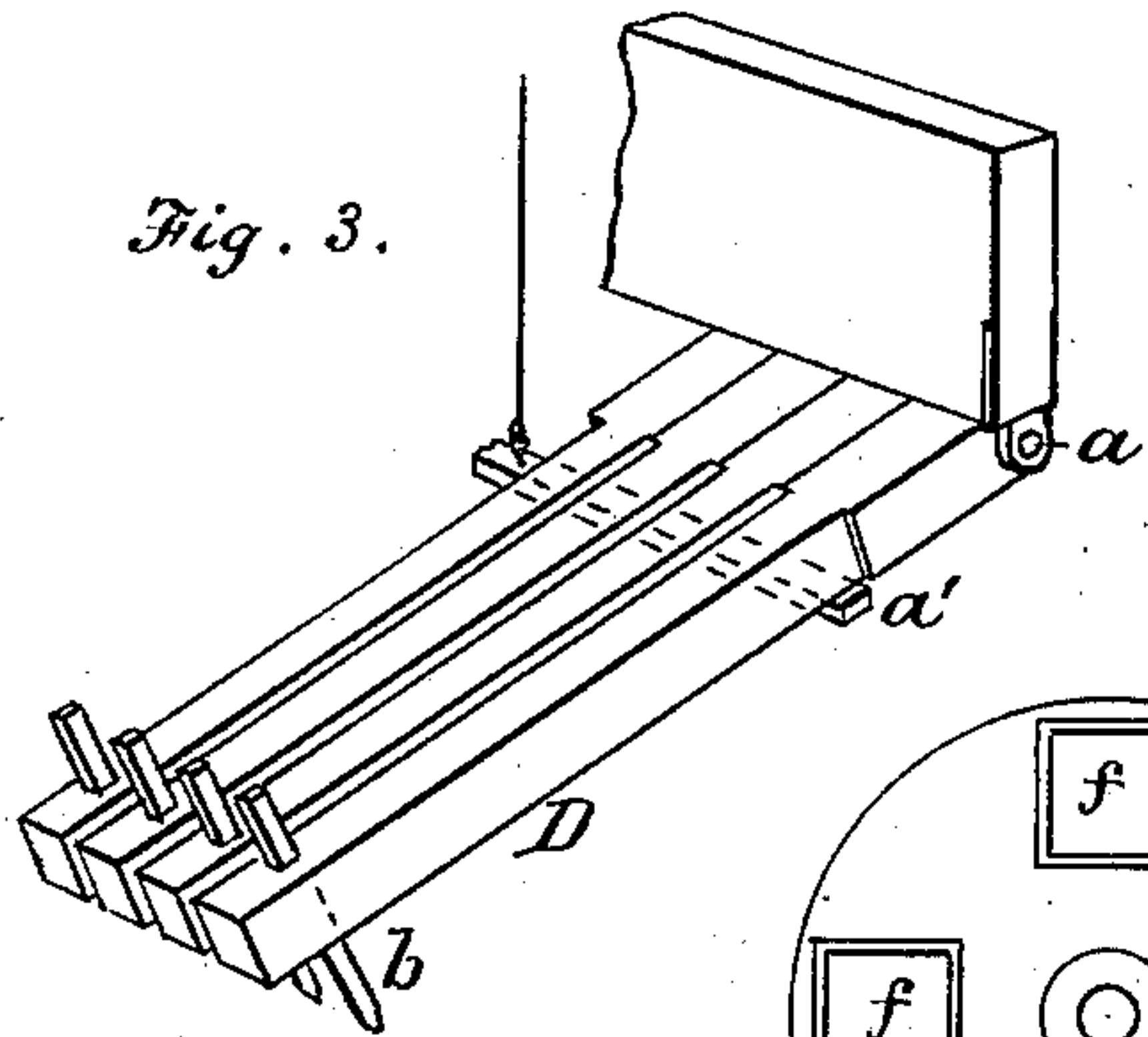
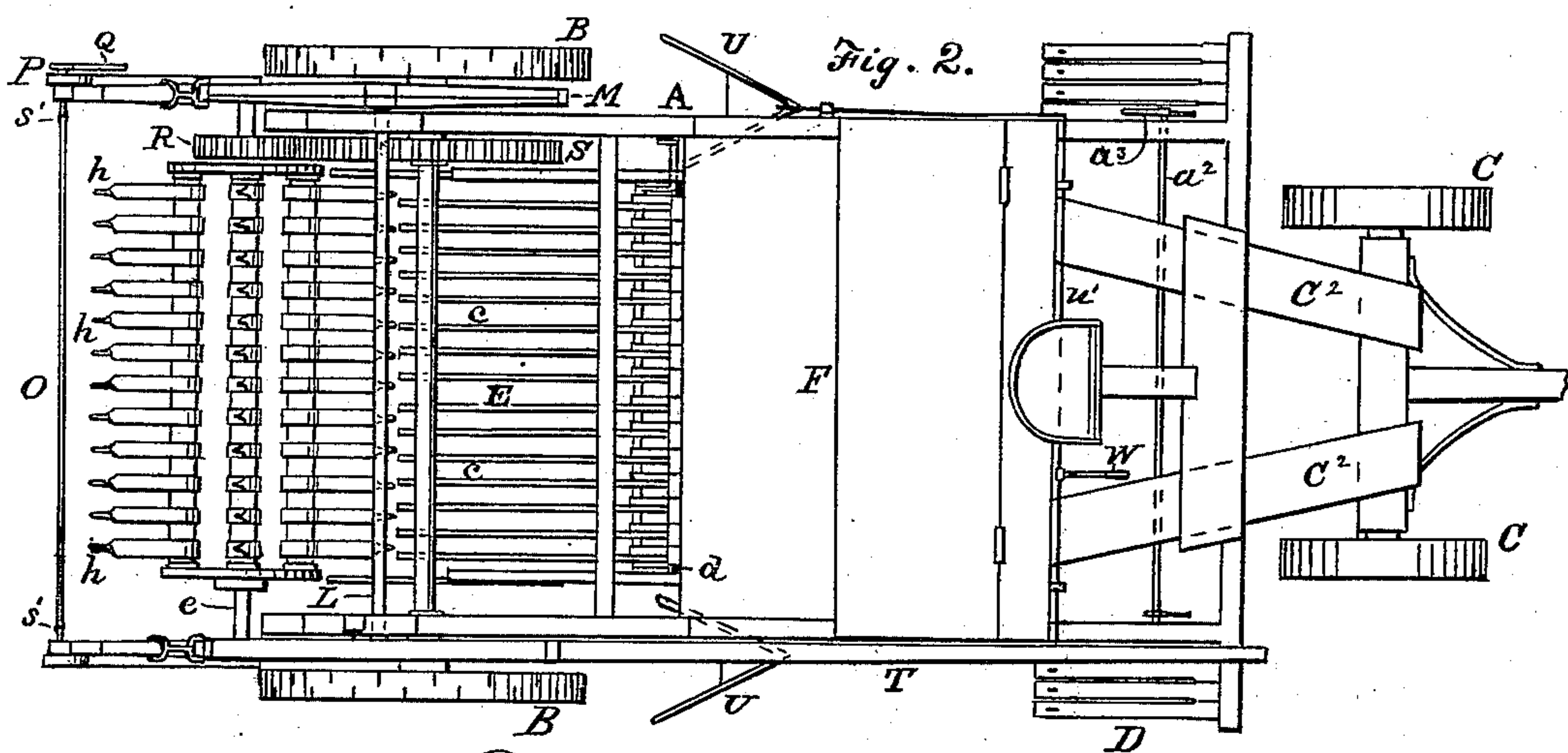
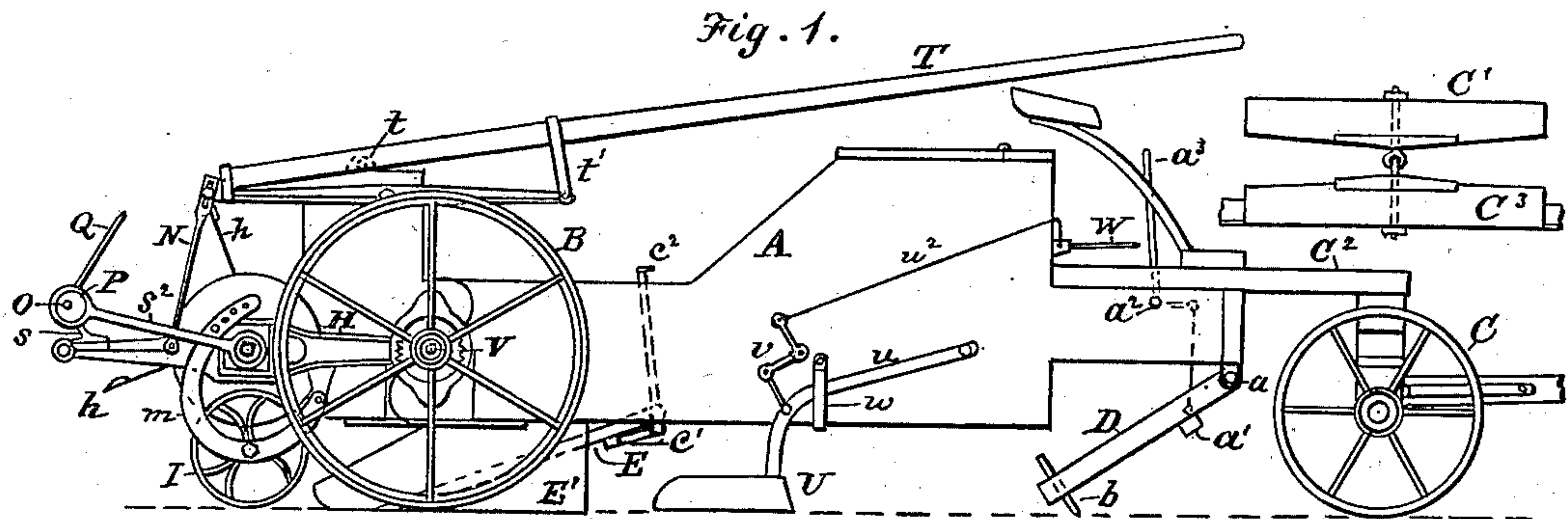
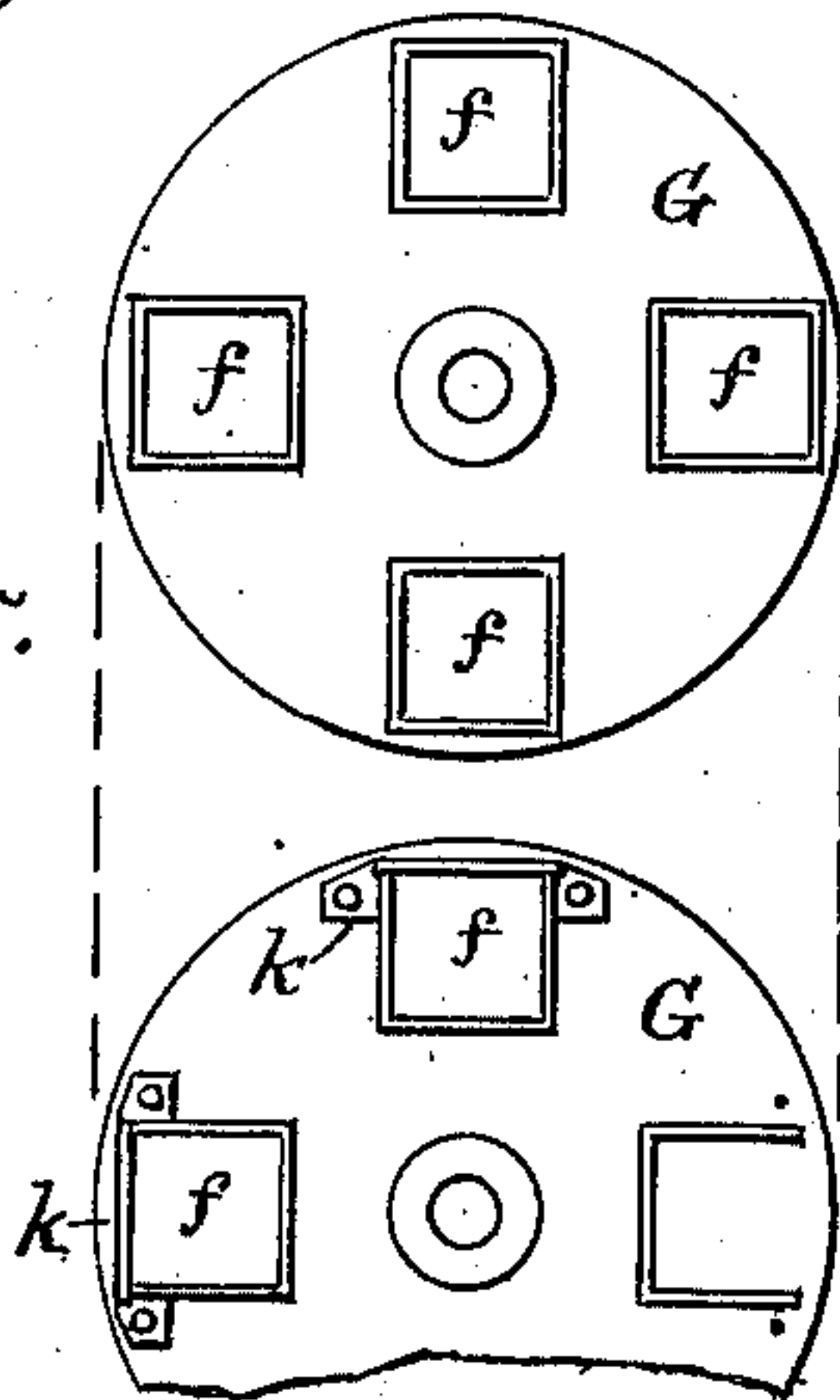


Fig. 5.



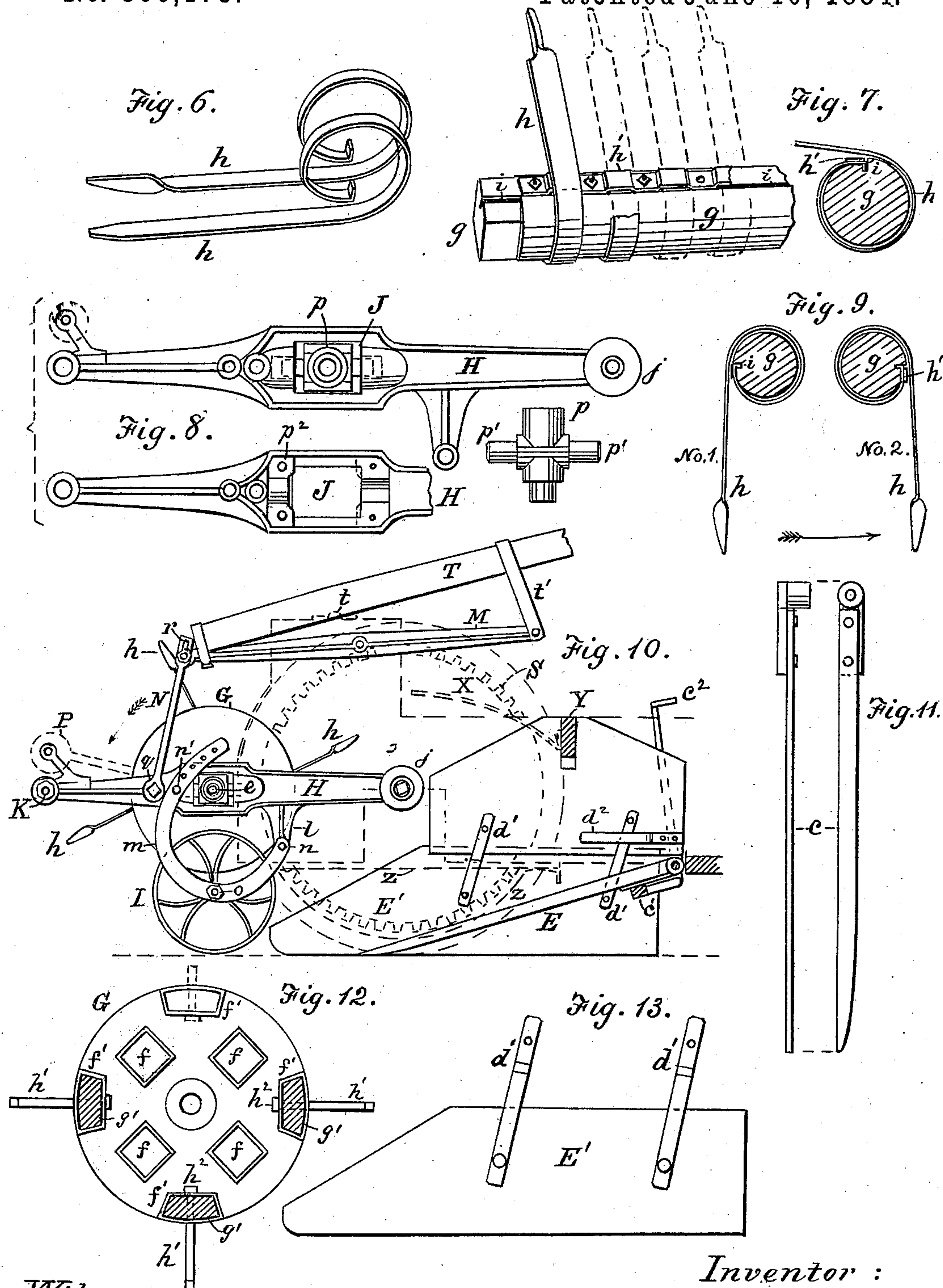
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3 Sheets—Sheet 3.

B. A. WEATHERBEE.
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Fig. 14.

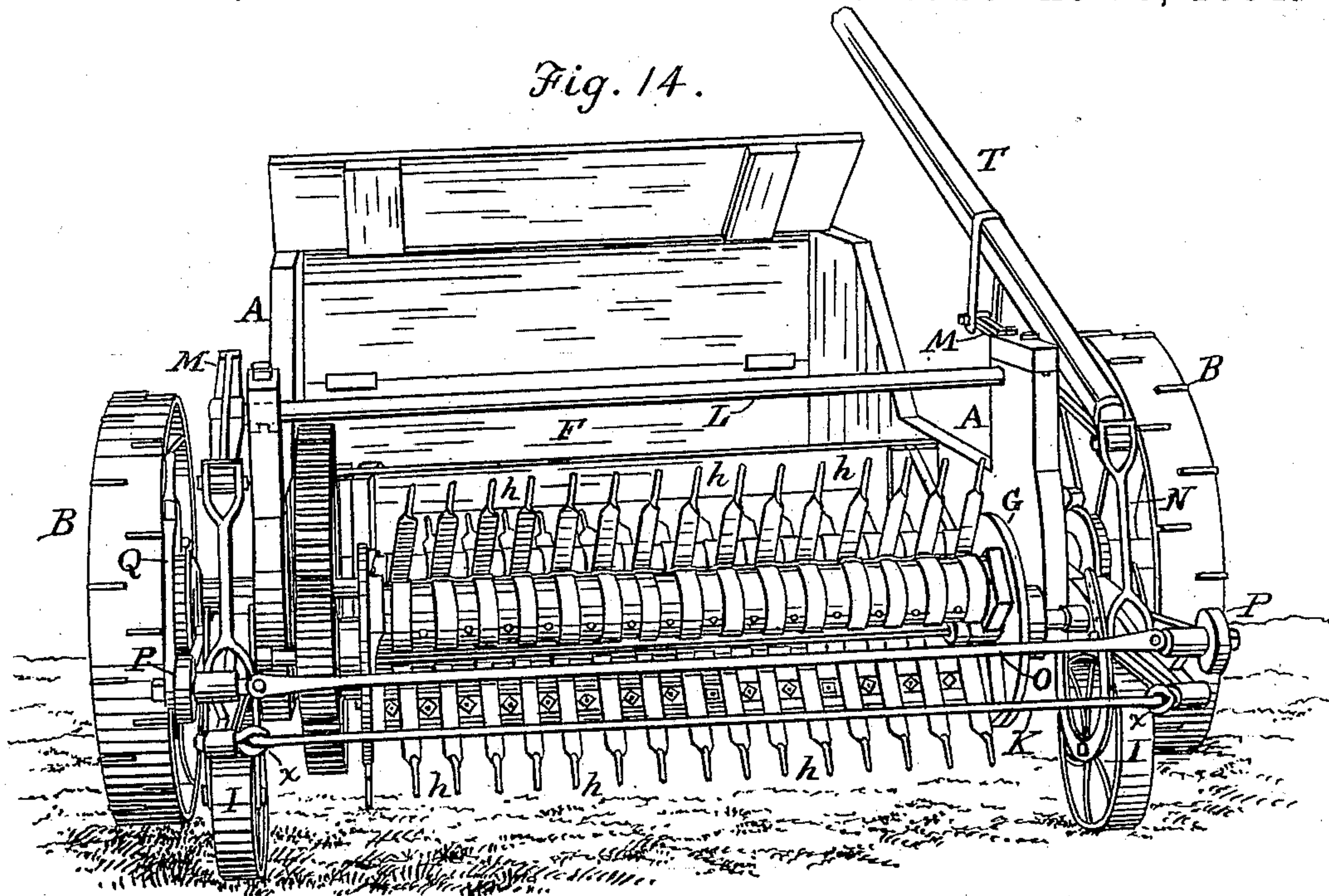


Fig. 15.

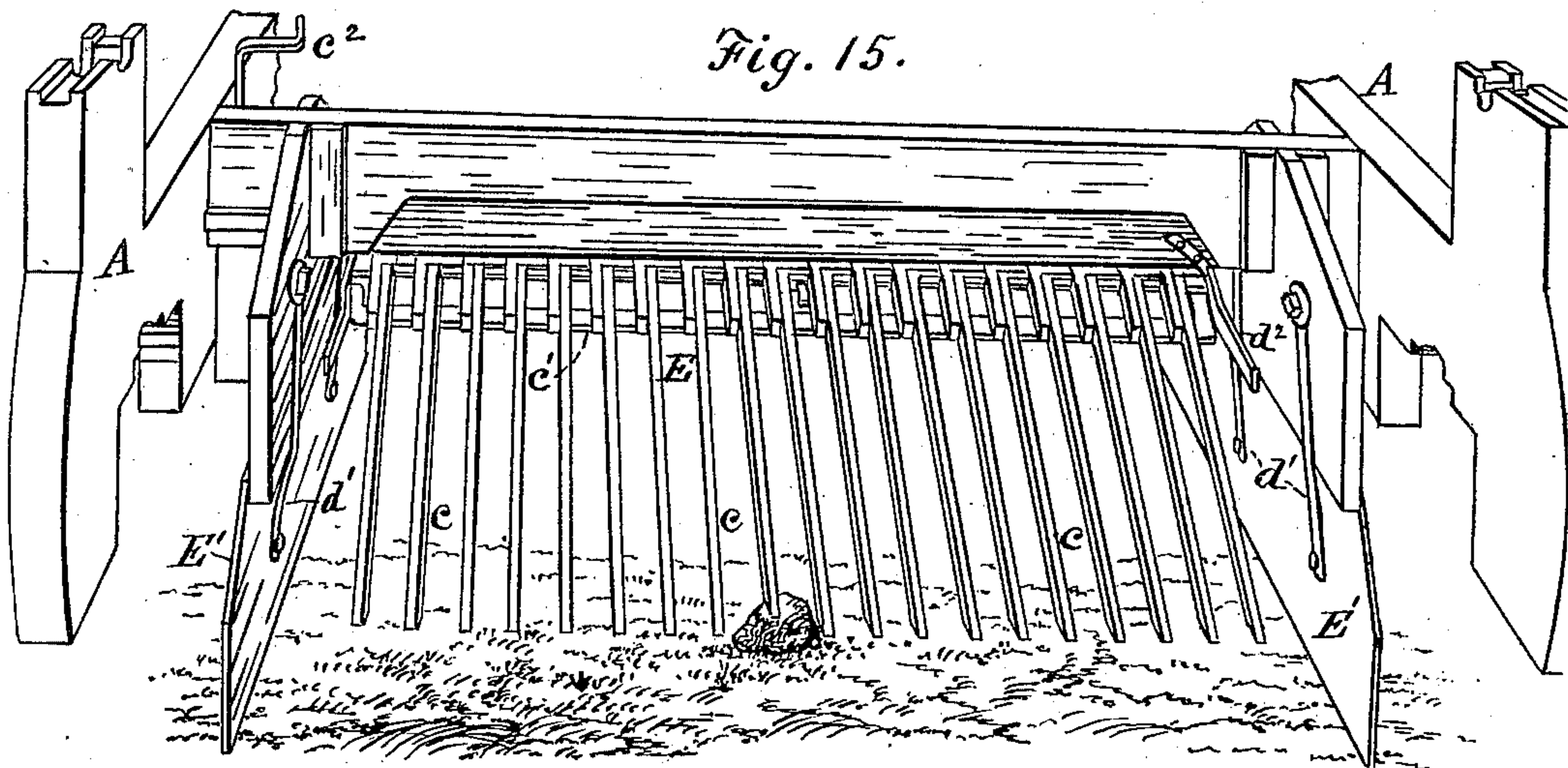
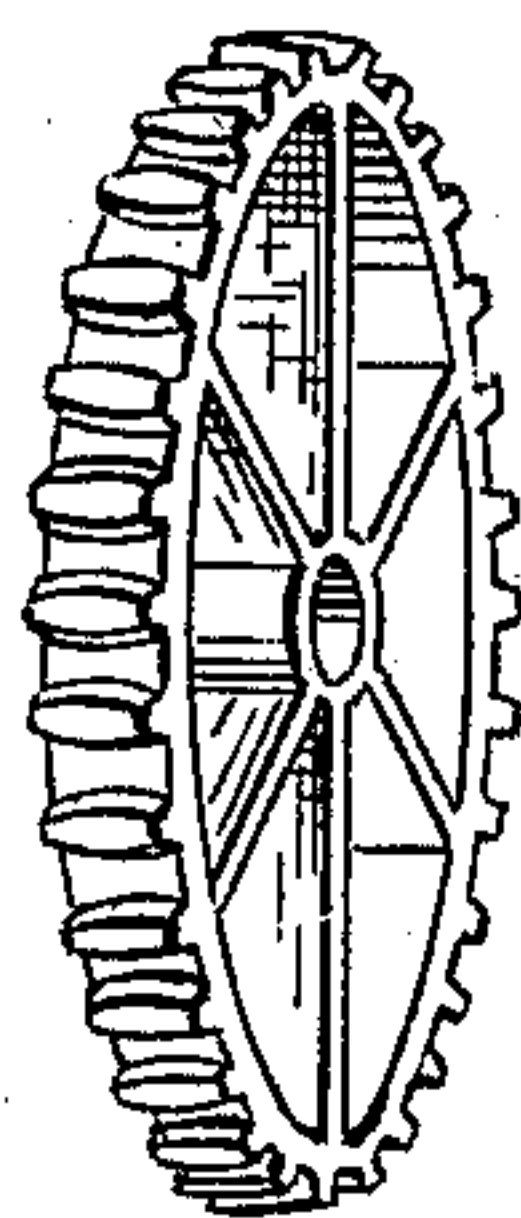


Fig. 16.



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UNITED STATES PATENT OFFICE.

BRAYTON A. WEATHERBEE, OF WARREN, NEW YORK.

MACHINE FOR GATHERING STONES.

SPECIFICATION forming part of Letters Patent No. 300,173, dated June 10, 1884.

Application filed May 17, 1883. (No model.)

To all whom it may concern:

Be it known that I, BRAYTON A. WEATHERBEE, a citizen of the United States, residing at Warren, in the county of Herkimer and State of New York, have invented certain new and useful Improvements in Machines for Gathering Stones, of which the following is a specification, reference being had therein to the accompanying drawings.

10 This invention relates to machines for gathering stones; and it consists in certain improvements in the construction of the same, as hereinafter shown, described, and claimed.

My invention has chiefly for its object to 15 construct a machine for gathering stones which shall contain, first, an efficient picking device for loosening stones in the surface of the ground, and thus facilitate the operation of the gathering devices; second, a revolving 20 propelling device by which the stones are propelled or driven from the ground into a box or receptacle suitably located to receive them, guides being provided to direct the course of the stones to the receptacle; third, mechanism for supporting, adjusting, and regulating 25 the propelling device in position, said mechanism being automatic in operation, thus rendering the revolving propeller self-adjusting during operation.

30 Stone-gathering machines as heretofore constructed and used have been provided with elevating devices for taking up the stones; but a machine constructed with my improvements accomplishes the object in a different 35 manner, the stones being propelled or driven from the ground by a revolving propeller into a receptacle provided for them, and the operation being rapid and effectual.

In the accompanying drawings, Figure 1 is 40 a side view of a stone-gathering machine having my improvements. Fig. 2 is a plan of the same. Fig. 3 illustrates in perspective the picking device. Fig. 4 represents a transverse section of the revolving propeller. Fig. 5 represents the inner side of one of the propeller- 45 heads. Fig. 6 illustrates the propelling-teeth. Fig. 7 shows the manner of attaching the propelling-teeth. Fig. 8 illustrates the arms and pivotal bearings of the propeller-shaft. Fig. 50 9 shows different positions of propelling-teeth. Fig. 10 is a partial side and sectional elevation illustrating the stone-gathering apparatus.

Fig. 11 illustrates the teeth or sections forming the inclined hinged apron. Fig. 12 is a transverse section showing a form of propeller 55 used for large stones. Fig. 13 represents one of the swinging guides used in connection with the sectional apron. Fig. 14 is a rear perspective view. Fig. 15 illustrates the sectional apron in perspective. Fig. 16 illustrates the toothed gear-wheel through which 60 power is transmitted.

A designates the frame of the machine, and B the main driving-wheels.

C indicates the front wheels of the truck, 65 the axle C³ of which has a link-connection with the bolster C' above it by means of two eyebolts connected at the eyes and one passing through each part, as shown, and the wheels C being small enough to turn under the pieces 70 C², connecting the bolster with the main frame, the truck may be readily and quickly turned.

D indicates a number of pickers, which are 75 hinged to the machine at its forward part by means of a fixed rod, *a*, passing through them at their upper ends, the lower ends being provided with teeth *b* and resting on the ground. These pickers D are placed forward of the stone-gathering apparatus, and serve to loosen the stones in the surface of the ground; so that 80 they are more readily caught by the apparatus in the rear. The pickers may be raised from the ground, as desired, by any suitable means, those shown being a bar, *a'*, placed transversely under the pickers and connected 85 by cords or rods with short arms on a shaft, *a''*, passing across the machine at the front end, and operated by means of a lever, *a'''*.

E represents a sectional drag-apron formed of straight teeth *c*, each tooth having a loose 90 connection at its front end with a rod, *d*, fastened at each end to the frame of the machine at the bottom, the rear end of the tooth trailing on the ground. The apron is in an oblique position, with the free ends of the teeth 95 resting on the ground, and serves to guide the stones and fragments thrown forward by the stone-propelling device into the box or receptacle F, and prevents the stones going under the same during the operation herein described. 100 Each tooth *c* having an independent movement as the apron passes over the stones, each tooth may be lifted singly by a stone over which it passes, so that the inclined

plane formed by the apron generally keeps its position. The teeth forming the apron may be raised simultaneously by means of a rod or bar, c' , passing under the apron, said bar having an elbow at each end, and being connected at one end with a pivoted lever, c^2 .

The swinging guides E' , one being placed at each side of the apron E and extending rearward, are used in connection with the apron in directing the course of the stones as they are driven forward by the stone-propeller. The said guides are loosely suspended to the frame-work on the inner sides by the straps d' , so that their lower edges nearly touch the ground. They have a swinging movement endwise, so that in case of contact with any obstacle the swinging guide rises, and thus avoids damage, and a guard, d^2 , fixed to the frame, serves to keep the guide in place, and prevents it swinging too far forward.

The gathering of stones is effected by means of a propelling device provided with teeth or beaters the strokes of which send the stones from the ground into the receptacle F .

G indicates the disks which form the heads of the revolving propeller, which is on a shaft, e , said disks having formed on their inner sides the seats or recesses f , to receive the square ends of the bars g .

To the bars g are removably secured the propelling-teeth h in the following manner: A groove, i , is formed in each bar lengthwise, and the inner end of each strip forming a tooth is bent at a right angle and is inserted in the groove. (See Figs. 6 and 7.) The strip is then secured to the bar by a strap, h' , fastened to the bar by bolts and nuts, the bolts entering between the strips forming the teeth, so that the latter may be readily removed as desired. When the bar g is made of wood, the groove i is usually provided with an iron lining. The bars g are also removable, the seats f in one of the disks G having each a removable flange, k , which is secured in place by bolts and nuts. Either of the bars g may be taken out by detaching the flange k at the end of it. (See Fig. 5.) The propelling device on shaft e is so adjusted in position that when it is rotated the points of the teeth pass near enough to the ground to strike the stones, the strokes of the teeth being forward, so as to drive the stones in the direction in which the machine is drawn. The propeller being rapidly rotated, the stones are struck suddenly and forcibly by the teeth, and are effectually driven forward to the stone-receptacle without any other conveying or elevating devices. As shown in the drawings, (see Fig. 7,) each strip forming a tooth h passes from the point of its attachment once around bar g , hugging the bar, and then straight outward, with any desired form of point at its outer end, (see Fig. 6,) a spring-tooth being thus formed which is very efficient in propelling the stones into the box or receptacle. The spring-teeth may be set in either of two positions, as illustrated in Fig. 9. When adjusted in position

No. 1, the contact with the stones tends to unwind them from bar g ; but when set in position No. 2, such contact tends to close the strip forming the tooth more tightly about the bar. This change in the position of teeth is readily effected by simply reversing the position of bars g , having the teeth attached.

The shaft e of the revolving propeller has its bearings in the arms H , one of which is on each side of the machine, and has a pivotal connection at one end j with the axle of a driving-wheel B . A short arm, l , projects downward from each arm H , the curved arms m being pivoted thereto at n , and being also adjustably secured to arm H by bolt at n' .

A shaft, o , of ground-wheels I has its bearings in the curved arms m , the arms H being thus supported and regulated in position. The rear extremities of said arms H are connected by a rod, K , which is provided with knuckle-joints x . J is an opening in each of the arms H , within which is placed a box, p , in which the shaft e of the revolving propeller is journaled. Two short arms or trunnions, p' , extending laterally from the box p , enter sockets formed in arm H , the parts being so constructed as to allow the box p a lateral movement, and also a rocking movement lengthwise. The lateral movement is to allow shaft e to be moved in and out of gear, and the rocking movement is to prevent any binding of the shaft in passing over uneven ground. The opening J is made larger on one side of arm H , to allow the insertion of journal-box p , which, when placed, is secured by pieces p^2 , bolted to the arm H , as shown. As will be seen from this construction, the arms H , carrying the propeller, have their center of movement in the axles of driving-wheels B , and said arms, being supported by arms m and ground-wheels I , are raised or depressed as said wheels pass over surfaces where the ground is not level, the revolving propeller making the same movement, and thus keeping a uniform proximity to the ground, so that the propelling-teeth strike the stones, which are effectually driven forward, whether the surface of the ground is level or uneven.

On each end of a shaft, L , having bearings at the top of the frame, is an arm, M , the same being attached at or near its center, and such attachment being either rigid or in such a manner that a rocking movement of one arm M imparts a like movement to the arm M on the opposite side. A rod, N , connecting with each arm H at q , has its upper end connected in an elongated aperture or short slot, r , with the rear end of an arm M . The purpose of the arms M and their connections is to provide for the automatic adjustment of the revolving propeller as the machine moves forward. When one ground-wheel I is elevated by rising ground which does not affect the other wheel, one arm H , and consequently one end of the propeller, is also raised, and the connecting-rod N raises the rear end of an arm M . A like movement is immediately impart-

ed through shaft L to the opposite arm M, and this arm being also connected with the opposite arm H, the propeller receives the same lifting force at both ends, thus preventing any damage that might result to the gearing from irregular movements of the revolving propeller. The slots r at the connections of rods N with arms M allow a slight irregular movement of the propeller, as a slight rising or falling of either end of it.

For the purpose of moving the revolving propeller in or out of gear, an eccentric, P, is placed on each end of a transverse rod, O, having bearings s , held by arms H, near their outer ends, said rod being usually provided with knuckle-joints s' . A removable rod, s^2 , connects each eccentric with the end of the shaft e of the revolving propeller, and by a movement of a lever, Q, at one end of rod O the shaft e may be moved sufficiently to move the gear-wheel R on said shaft either in or out of gear with the large gear S, fixed to the axle of the driving-wheels B, the movement being allowed by the construction of the journal-boxes p and arms H, as above stated.

Motion is imparted from driving-wheels B to the revolving propeller by means of ratchets and spring-pawls V on axle and driving-wheels, and gear-wheels S and R. A set of gears R and S may be employed at each end of driving-shaft, if deemed advisable. The teeth of these gear-wheels are of peculiar construction, being made somewhat rounded and bulging horizontally at the middle, as shown in Fig. 16. The object of this form of teeth is to allow somewhat for a little variation between the movements of the revolving propeller and the driving-wheels, and prevent any interruption of the connection between gear-wheels R and S.

A pole, T, forming a lever, with its fulcrum t at the top of the frame, has its rear end connected with the rear end of one of the arms M, the forward end of said arm being also connected at t' with the pole which is intended for the driver, who may by a movement of the pole move both arms M, and thus raise the propeller as desired.

U indicates a small V-shaped scraper having an arm, u , pivoted to the frame of the machine. One of these scrapers is placed forward of and on a line with each driving-wheel, to keep a clear track for said wheel, a fixed guard, w , serving to retain it in place, and allowing it a limited vertical movement in case of contact with any obstacle. The scrapers U may be raised from the ground as desired by means of a foot-lever, W, on a shaft or rod, u' , across the front part of the machine. At each end of said rod is an elbow or crank-arm connected by a rod, u^2 , with one arm of a bell-crank, v , pivoted to each side of the machine, the other arm being connected, as shown, with the arm u of the scraper, and by pressing the lever downward the driver raises the scrapers.

As the machine is drawn forward, the pick-

ers D loosen any stones sticking in the surface of the ground, so that they may be readily reached by the teeth of the propeller. The inclined apron following passes over the stones, and from its sectional construction, as above stated, mainly keeps its parts in position. The propelling device in the rear, receiving motion from the driving-wheels through the gearing, as set forth, is rapidly revolved, and its elevation being properly adjusted by means of the curved arms m the points of the teeth h pass very near the ground, striking the stones and propelling or driving them to the receptacle F, carried by the frame, and any stones that may be driven or thrown in an indirect or diagonal course will strike either the inclined apron or the guides E' , and are directed to the stone-receptacle.

For the purpose of gathering large stones a set of bars, g' , having firm, straight teeth fixed thereto, as shown in Fig. 12, is provided, the teeth h' being passed through the bar g' and secured by nuts h^2 . The bars g' are usually provided with an iron facing on their outer and inner sides, so that the teeth h' are firmly held. The bars g and g' are used interchangeably as occasion requires, the change being effected by simply removing one set of bars from the revolving propeller in the manner described, and substituting other bars with the other form of teeth. As the teeth h' are made shorter than the teeth h , it may be necessary to set the bars g' farther from the center of the propeller, and to answer the purposes of both bars g and g' the heads G may be constructed with two sets of recesses or seats for the ends of bars, as shown in Fig. 12, in which four seats f are intended to receive bars g , and four f' to receive bars g' , as may be desired.

A curved apron (indicated at X) forming a guard and extending rearward is usually secured to a cross-bar, Y, of the main frame, and another guard, Z, is also secured to the frame-work, so that it is held in position under the gear-wheel for the protection of said wheel.

Having described my invention, I claim—

1. In a stone-gathering machine, the pickers D, placed forward of the stone-propelling apparatus, for loosening the stones, and having independent hinge-connection at their forward ends with the frame, in combination with the revolving propeller arranged in rear thereof, substantially as set forth.

2. In a stone-gathering machine, a revolving propelling device having spring teeth or beaters attached to horizontal bars, each tooth being attached at its inner end to a bar and being passed around said bar, substantially as and for the purposes described.

3. A revolving stone propelling device having heads G, and provided with removable bars holding spring-teeth adapted for striking and propelling the stones, substantially as shown and described.

4. The revolving stone-propelling device having the heads G, provided with seats f ,

removable bars *g*, with grooves *i*, and the teeth *h*, severally passing around said bars, being secured thereto, as shown, in combination with suitable operating mechanism, substantially as set forth.

5 5. In combination with a revolving device on a shaft, the arms *H*, having a pivotal connection with the machine-carriage, and provided with openings *J*, and adjustable journal-boxes *p* within said openings, having lateral arms *p'*, entering sockets in arms *H*, substantially as and for the purposes set forth.

10 6. In combination with the arms *H*, carrying the shaft of a revolving propelling device, a transverse shaft, *L*, having arms *M*, attached thereto, and the rods *N*, with end slots, *r*, connecting said arms *H* and *M*, substantially as and for the purpose set forth.

15 7. In a stone-gathering machine, the combination, with the revolving propeller, of the inclined sectional drag-apron, each section being loosely coupled to the lower part of the

machine and forward of the propelling device, substantially as and for the purpose set forth.

25 8. In a stone-gathering machine, in combination with a revolving propelling device and a receptacle for stones, the inclined drag-apron arranged in front of the propeller and formed of teeth, each being severally coupled at its forward end to the machine, and means for raising the apron, substantially as set forth.

30 9. In a stone-gathering machine, the guides *E'*, suspended to the frame-work of the machine to swing endwise, and provided with fixed guards *d'*, in combination with a stone-propelling device, substantially as set forth.

35 In testimony whereof I have affixed my signature in presence of two witnesses.

BRAYTON A. WEATHERBEE.

Witnesses:

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W. BURRIS.