

*S. W. Tyler.*  
*Hemp & Flax Harvester.*

N<sup>o</sup> 68132

FIG. 1

Patented Aug. 27, 1867.

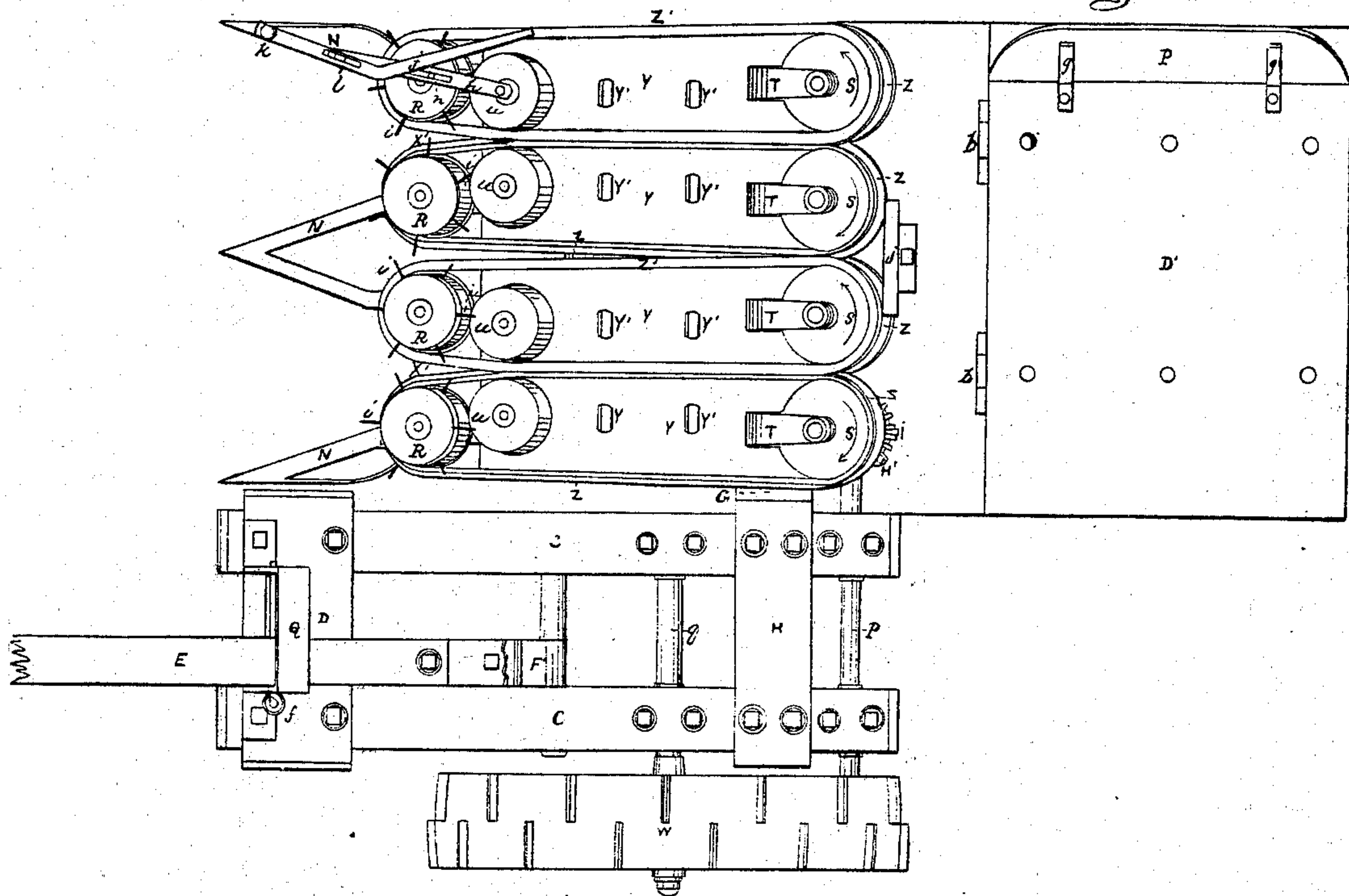
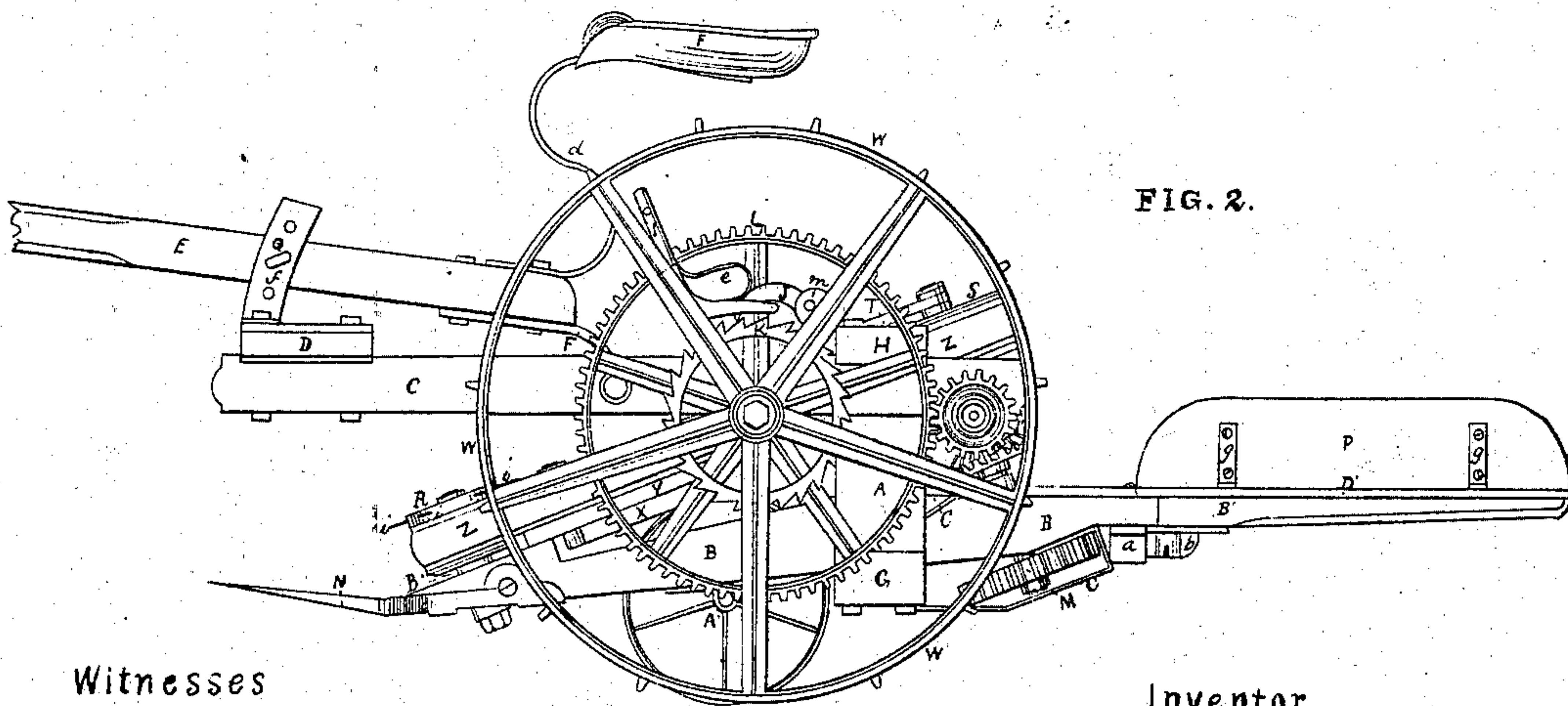


FIG. 2.



Witnesses

*Franklin Scott*  
*Edw. Schaefer*

Inventor

*S. W. Tyler*

S. W. Tyler.  
Hemp & Flax Harvester.

N<sup>o</sup> 68132

Patented Aug. 27, 1867.

FIG. 8.

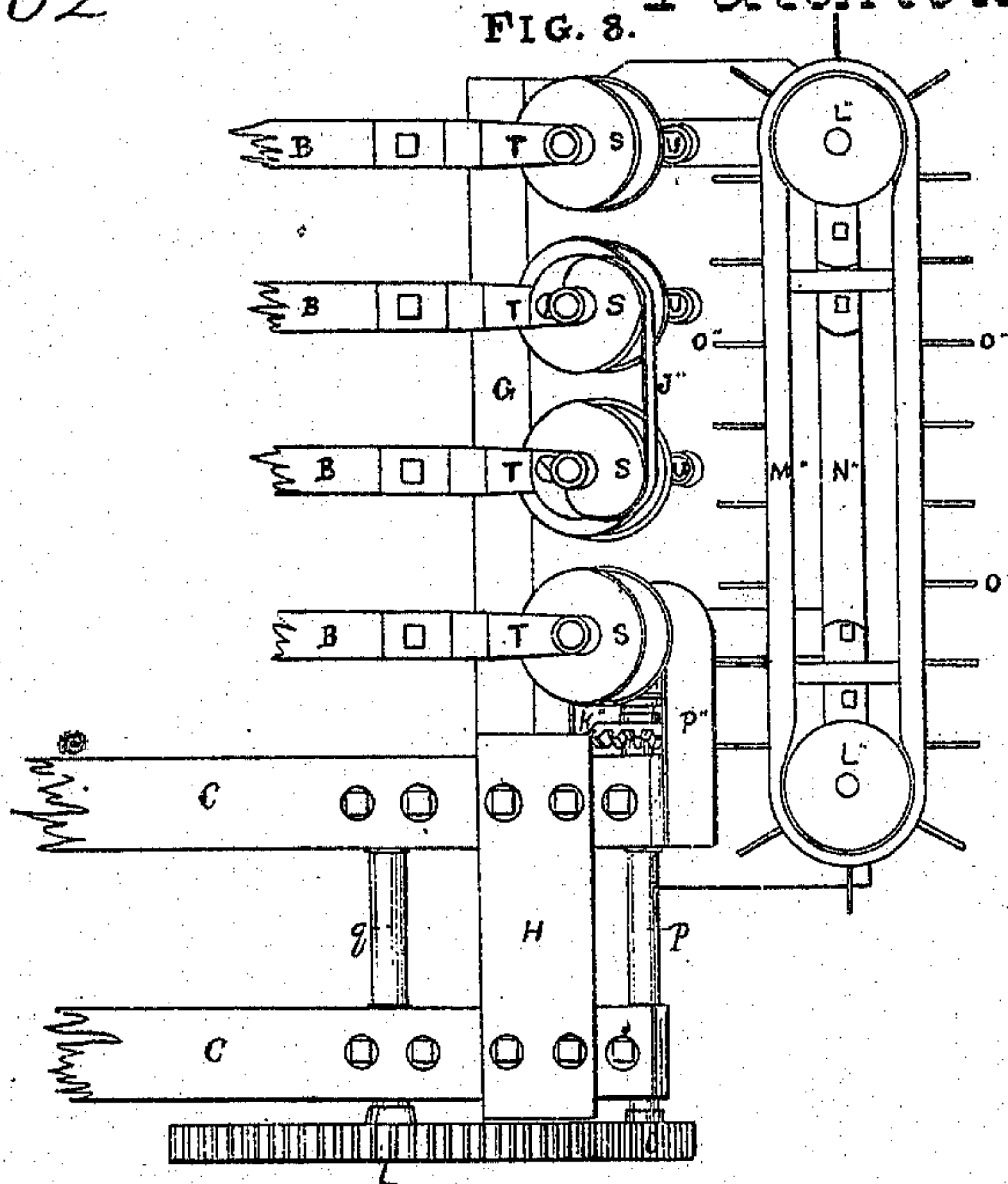


FIG. 9.

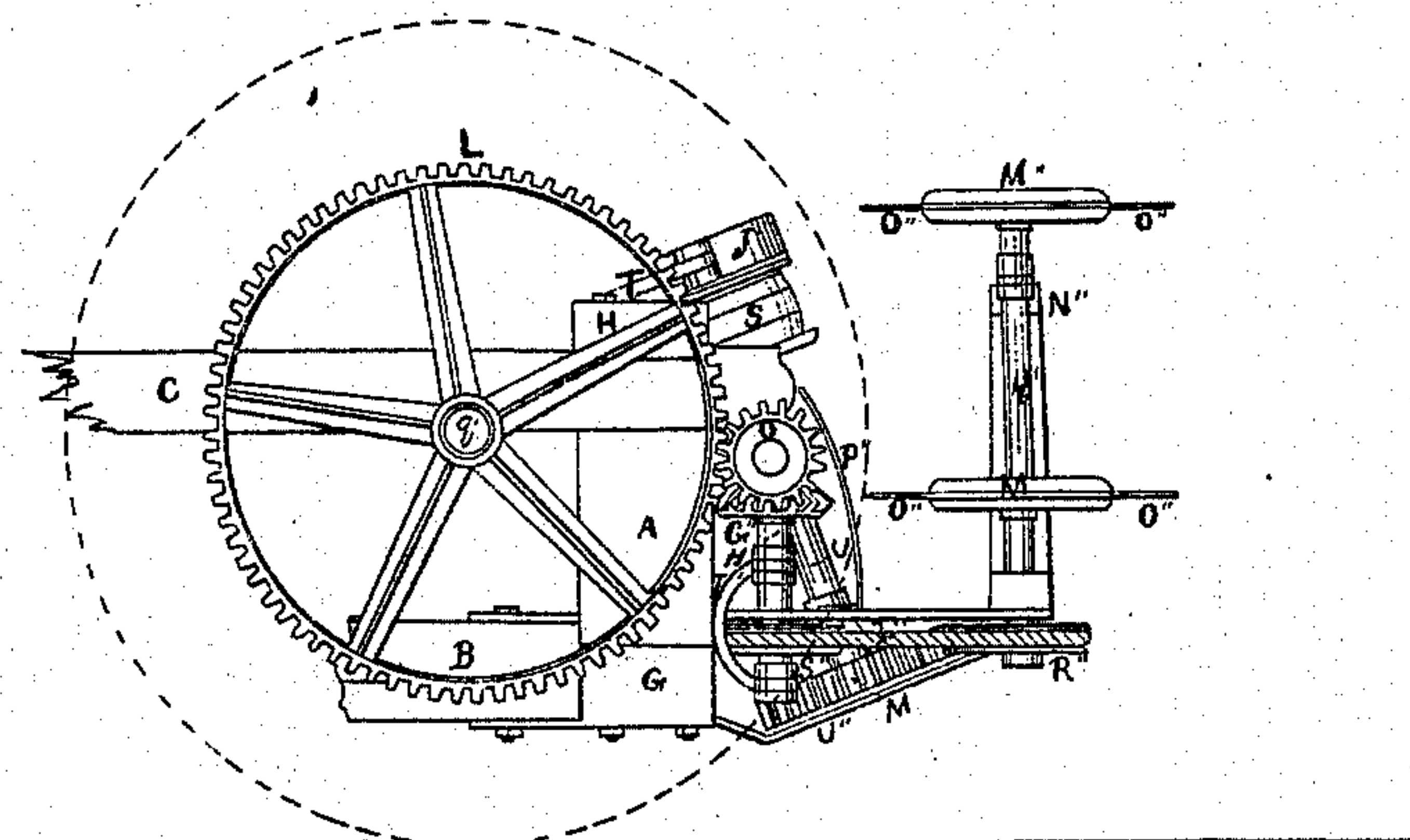


FIG. 10.

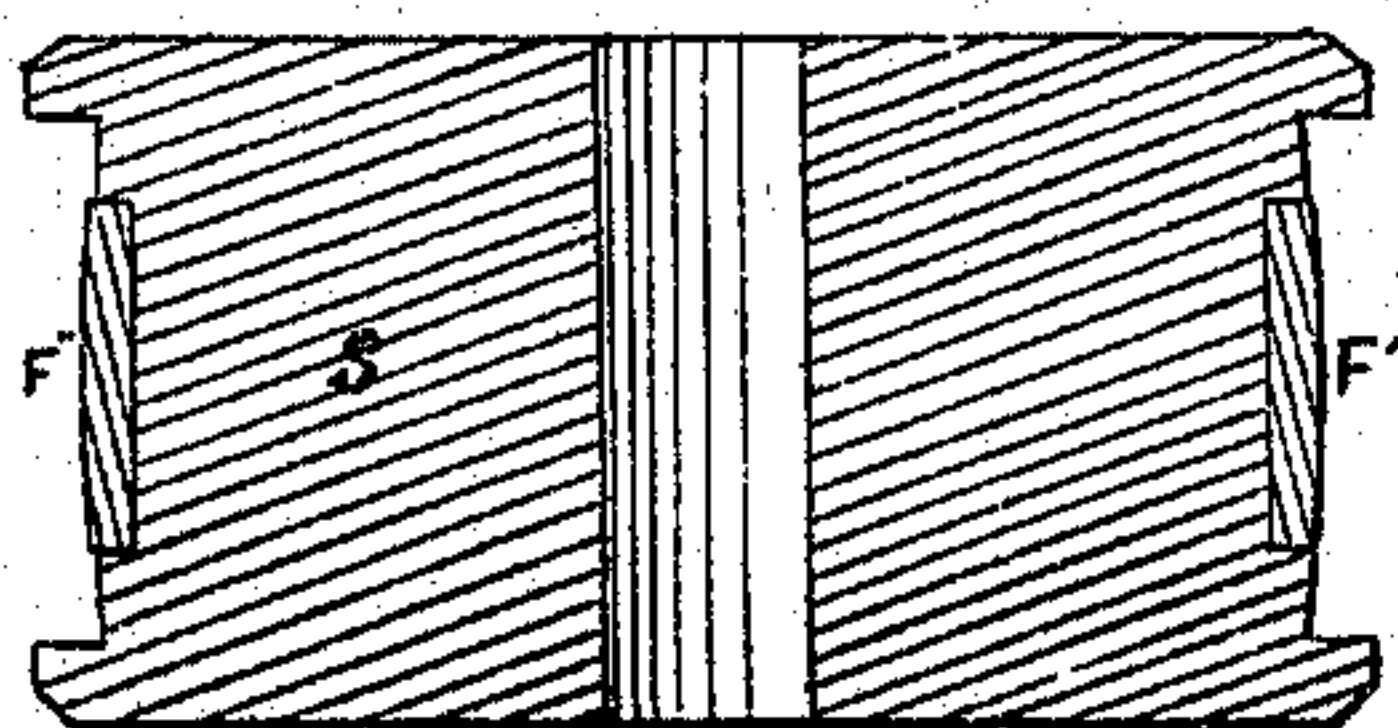
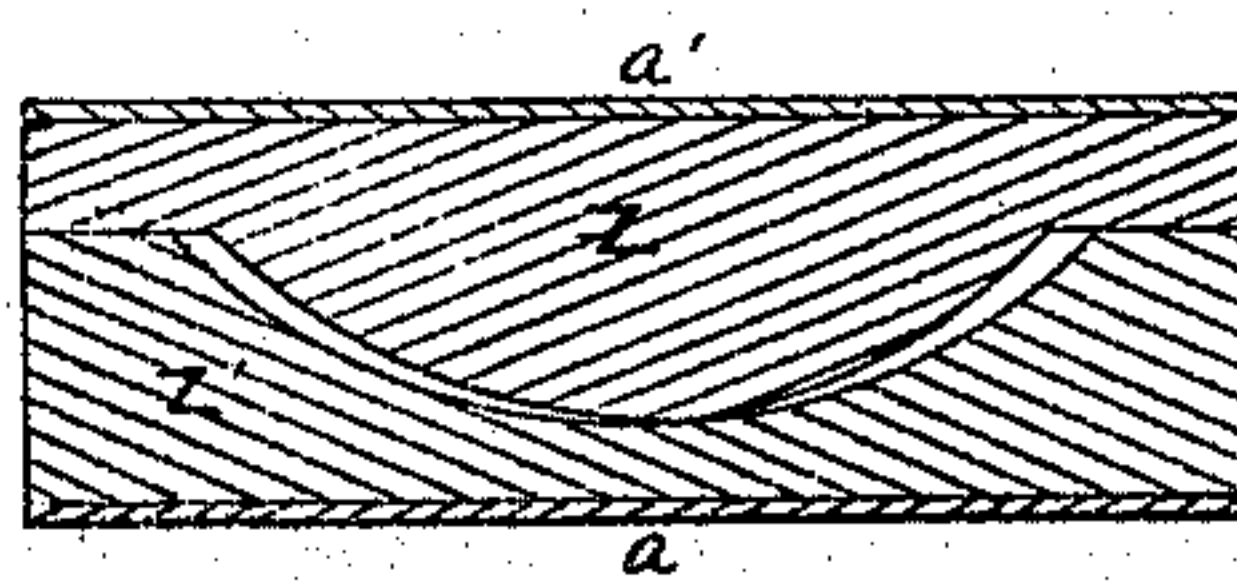


FIG. 11.

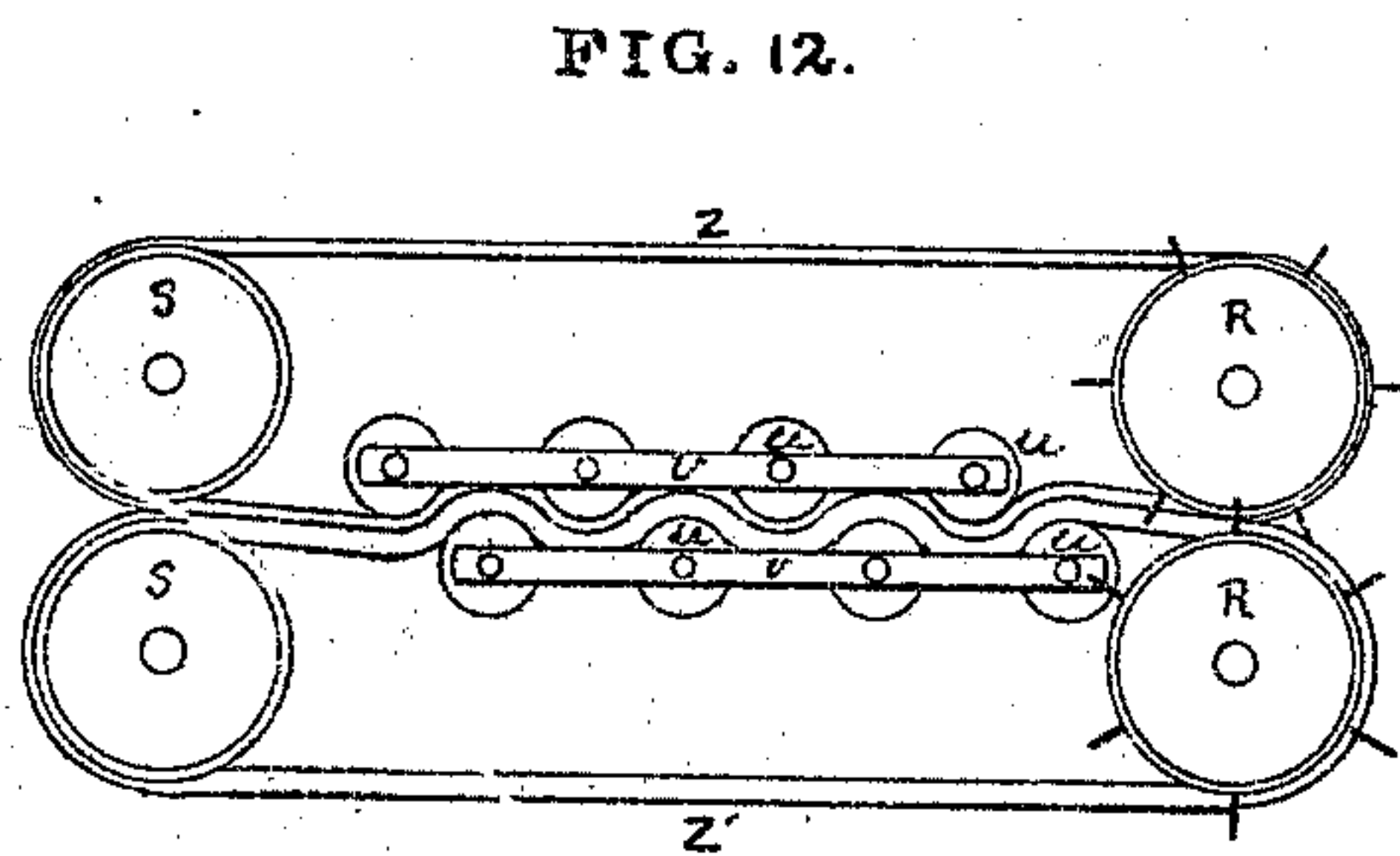
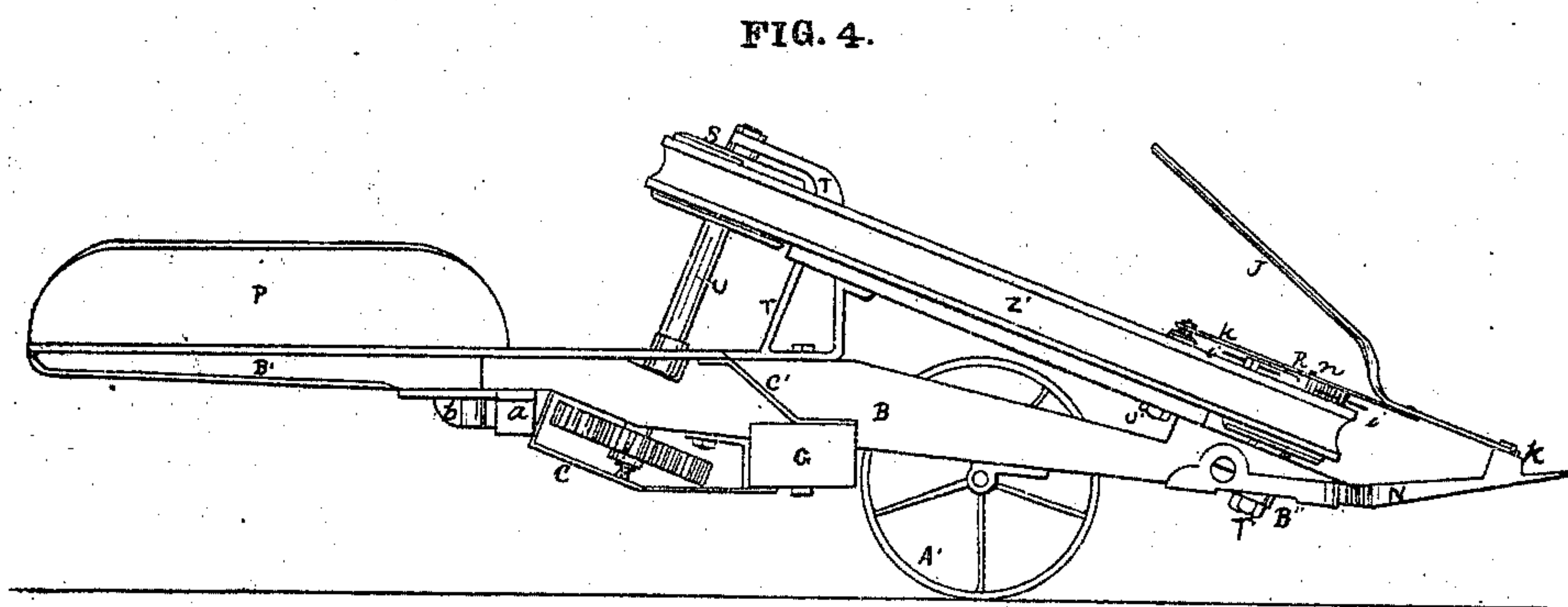
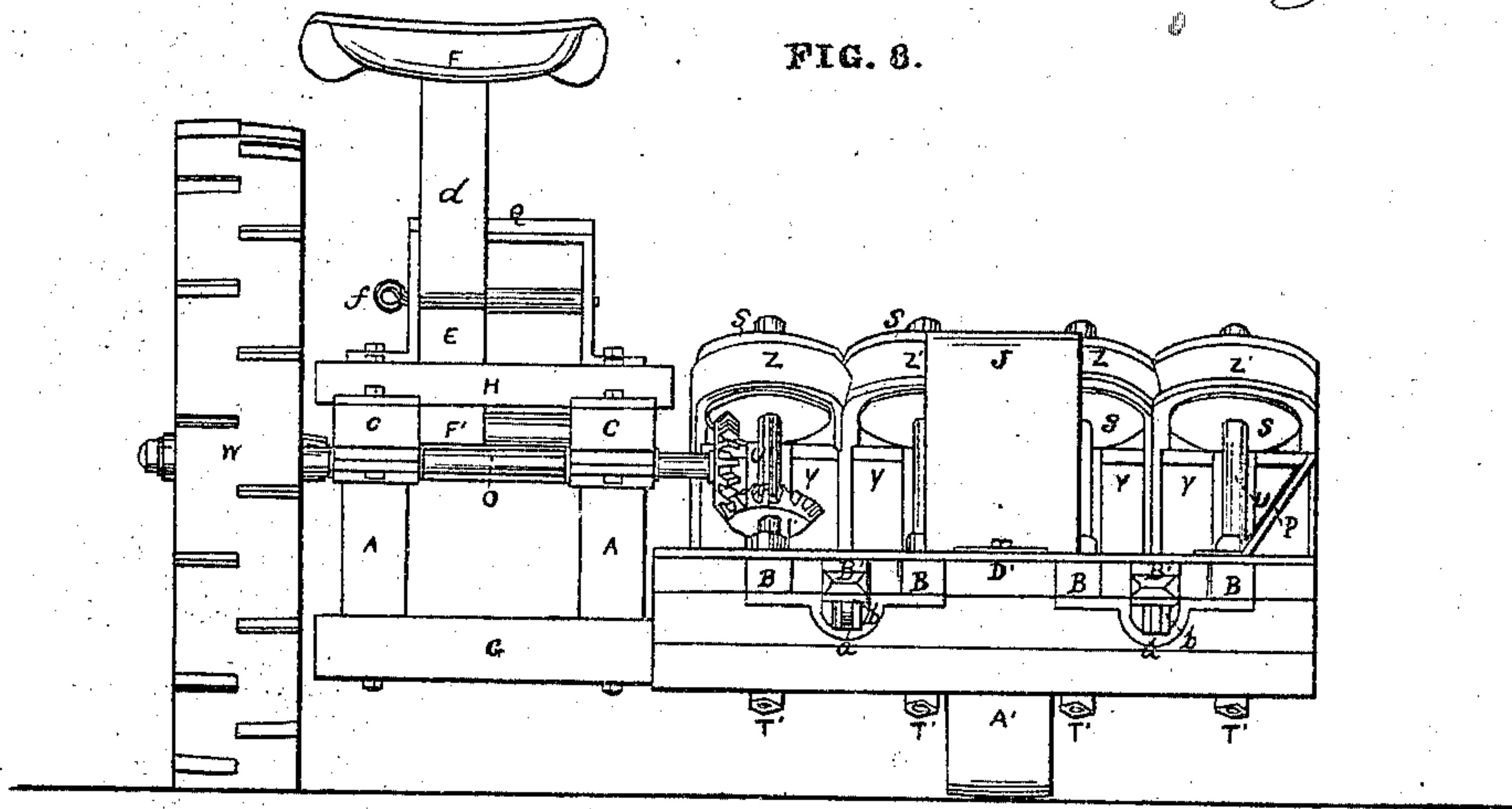




S. W. Tyler.  
Hemp & Flax Harvester.

N<sup>o</sup> 68132

Patented Aug. 27, 1867.



S. W. Tyler.  
Hemp & Flax Harvester.

N<sup>o</sup> 68132

FIG. 5. Patented Aug. 27, 1867.

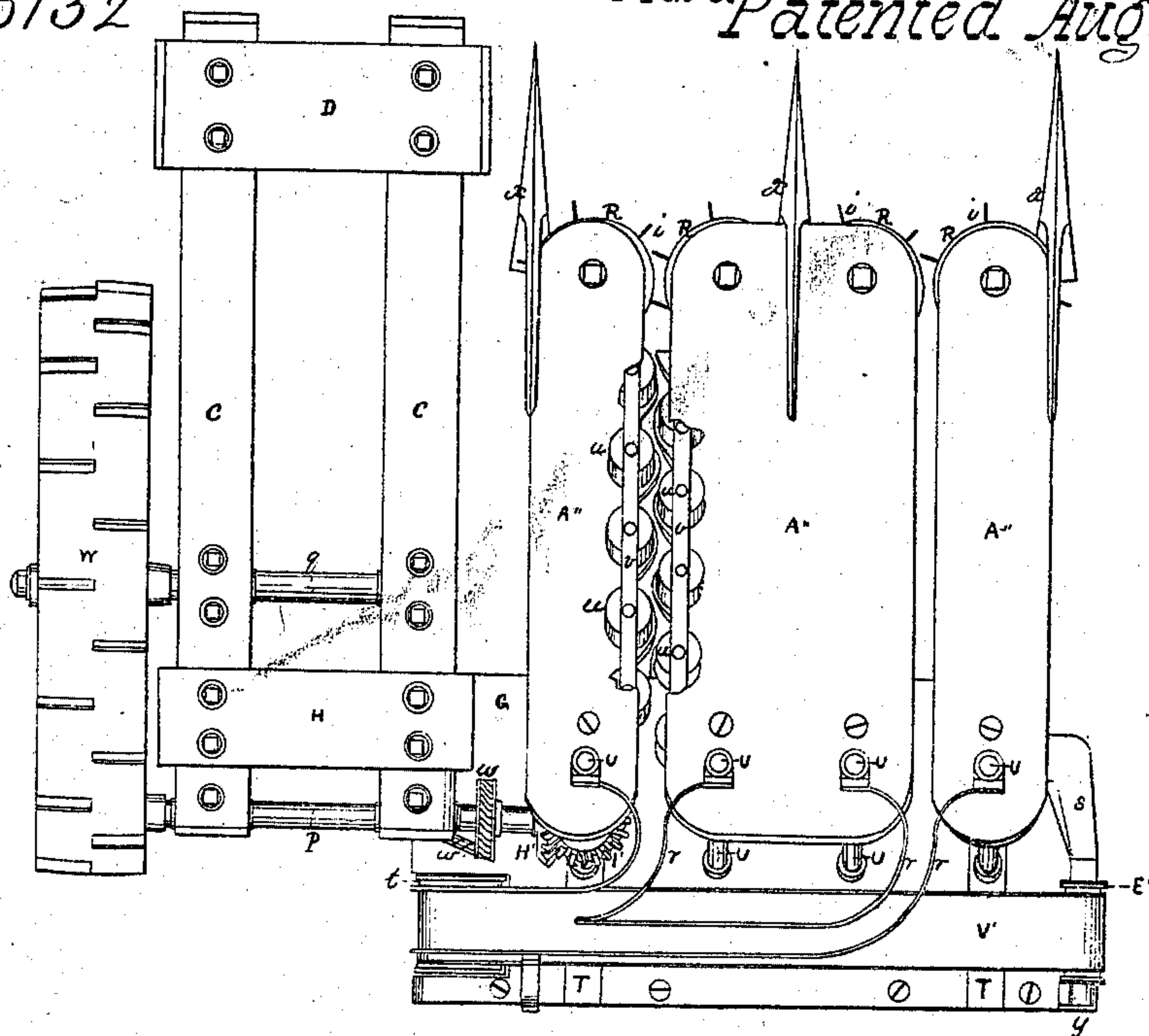


FIG. 6

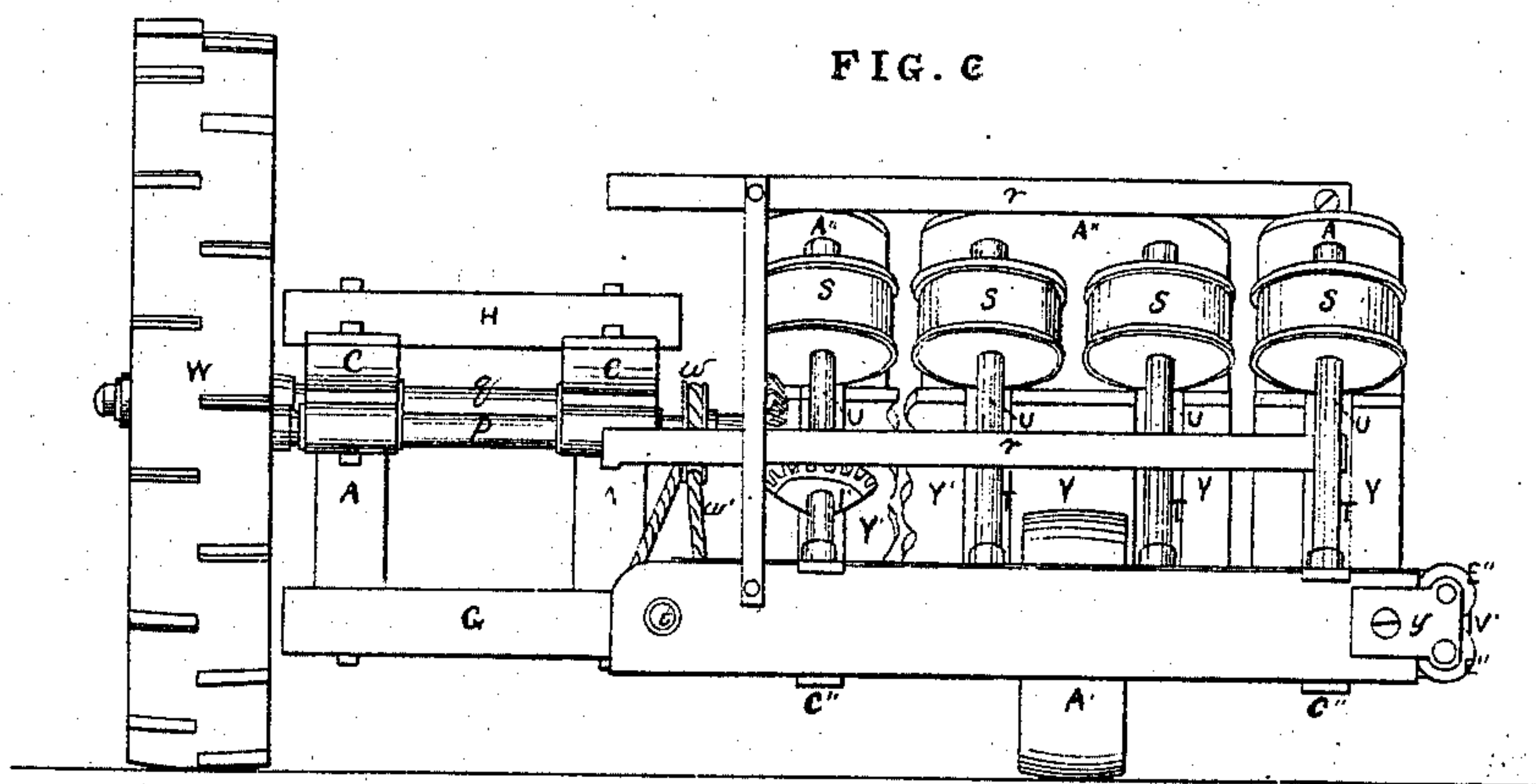
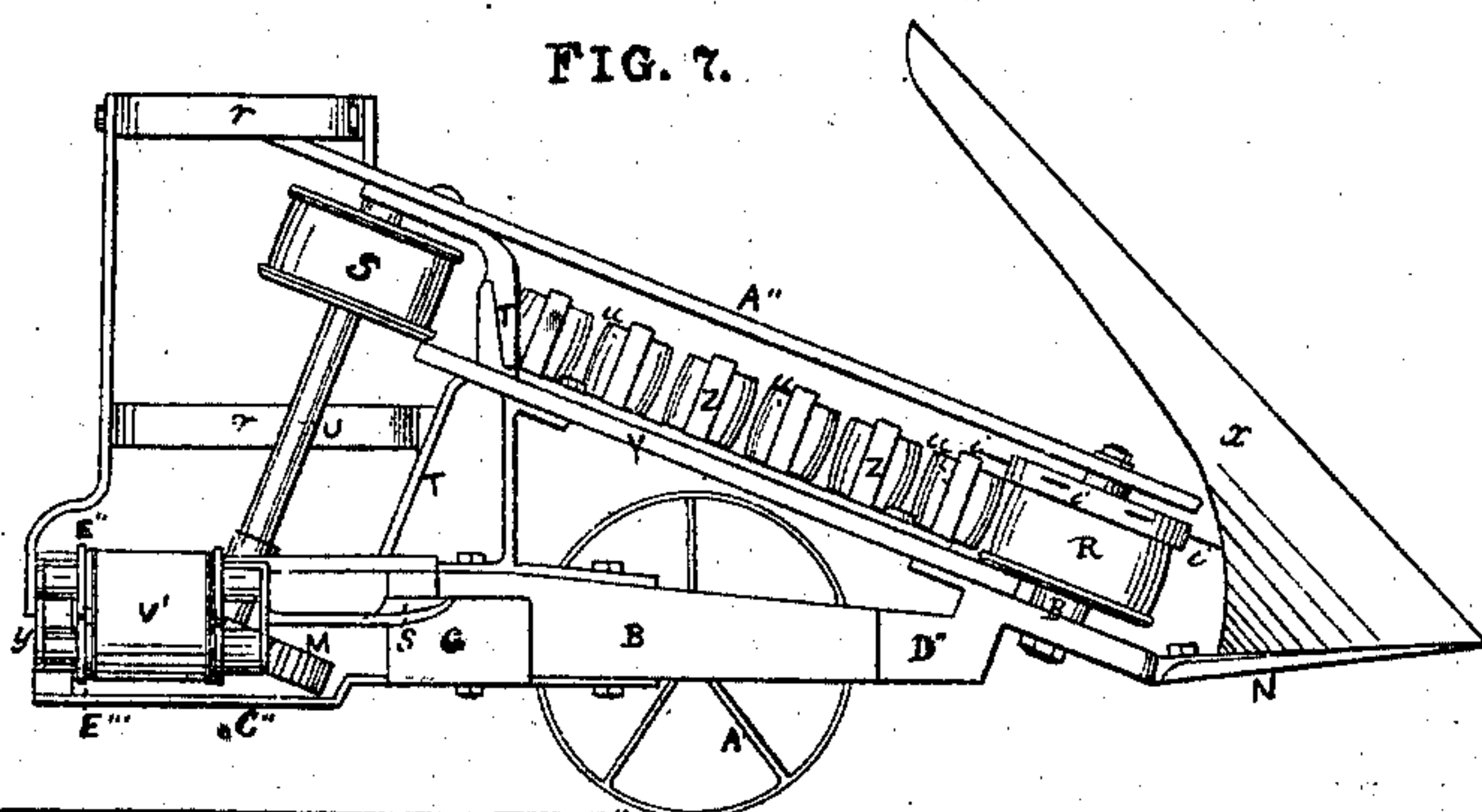


FIG. 7.





# United States Patent Office.

SAMUEL W. TYLER, OF TROY, NEW YORK.

*Letters Patent No. 68,132, dated August 27, 1867.*

## MACHINE FOR PULLING FLAX.

*The Schedule referred to in these Letters Patent and making part of the same.*

### TO ALL WHOM IT MAY CONCERN:

Be it known that I, SAMUEL W. TYLER, of the city of Troy, in the county of Rensselaer, and State of New York, have invented a new and useful Improvement in Machines for Pulling Flax, and such other crops as require similar harvesting; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, making a part of this specification, in which—

Figures 1 and 5 are plan views of a machine in which my invention is applied.

Figure 2 is an elevation of the actuating side of the same.

Figures 4 and 7 are elevations representing the crop or land-side of the same.

Figures 3 and 6 are rear elevations of the same.

Figure 8 is a sectional plan view of same, showing automatic raking delivery.

Figure 9 is a side elevation of the devices shown in fig. 8.

Figure 10 is a cross-section of the pulley S.

Figure 11 is a cross-section of the belts Z and Z' placed together.

Figure 12 is a plan view of the belts and pulleys, showing a method of obtaining equal pressure upon the belts.

Similar letters refer to like parts of the machine.

Flax-pulling machines have been but inefficient agents to the growers of flax previous to the date of my inventions, for the reason that the pulling devices of such machines have not been constructed so as to be capable of holding the stalks firmly, and at the same time yielding thereto in such a manner as not to crush, bruise, or break them during the pulling operation.

The first patent obtained on a machine which employed "pullers" possessing the qualifications required was patented by me September 1, 1862, but in this instance the yielding surfaces between which the stalks were caught in the operation of pulling the flax out of the ground had no travelling movement themselves after the stalks were clasped, the pullers being firmly fixed in a revolving drum or axle. The impartation of a travelling motion to yielding pullers has been found in practice the essential thing to make machine flax-gathering or harvesting a success.

The nature of my invention, under this patent, consists in pulling flax, or other crops requiring to be harvested in this way, by taking hold of the stalks with yielding substances, such as rubber, gutta percha, or other plastic, flexible material of like nature and properties, and with such substances, by reason of their clasping action and a travelling movement imparted to them, drawing the flax up out of the ground and depositing it in any convenient place for being bundled or otherwise disposed of.

Vulcanized India-rubber belting, made wholly of gum, or of a base of webbing and a surface of gum, may very beneficially be adopted as the substance out of which to make the pullers; or one jaw of each puller may be a moving roller covered with a cushion of gum, and the other jaw may be a travelling rubber-cushioned belt, or a belt made entirely of rubber or analogous substance which will clasp the stalks and still yield to them, so as to allow the stalks to become more or less embedded into it without offering a crushing, bruising, or breaking resistance. Two rubber rollers might answer.

In the drawings I have shown one way of constructing a flax-harvester with my invention applied to it, but as the special construction of this machine, and the special mode of employing yielding travelling pullers therein shown, constitute the subject-matter of another patent, I do not claim the same under this patent, nor do I confine my yielding travelling pullers to this particular machine, as they will be found essential in all flax machines which harvest the flax by pulling it out of the ground.

To enable others skilled in the art to make and use my invention, I will proceed to describe the same with reference to the drawings.

A, B, C, D, H, and G constitute the frame of the machine. The side pieces C C, the cross-pieces D and H, the pendent pieces A, and the transverse beam G are framed and firmly fastened together, forming a rectangular frame, with the transverse beam G extending laterally to any desired width of swath. The longitudinal pieces or arms B and the stanchions T are placed together at proper intervals upon, and firmly fastened to, the transverse beam G, and form supports for the studs B'', shafts U, and boards Y; the whole so arranged as to



form an open space through which the crop may pass unimpeded to the platform. The actuating side of the machine is supported by the wheel W, while its opposite side is supported upon the wheel A', which is placed in such a position as to travel within the path of the machine and not to interfere with the crop as it passes between the belts Z and Z' to the platform D'. The driver's seat F is placed upon the spring d which is attached to the tongue E, which is also attached flexibly to the frame of the machine, and extends within and through the looped stanchion Q, and is held in any desired position by the hand-pin f; the whole so evenly and properly balanced that no important weight falls upon the necks of the team while working the same. The platform D' is attached to the machine by hinges b in such a manner that while it cannot fall below its proper level it may be folded up against the machine for convenient transportation and storage, and while at work it will so yield as to prevent any liability of its being strained or broken by being brought into contact with the ground in consequence of the wheels W and A' being brought into a position lower than the ground immediately under the platform. The pinion O is placed upon the transverse shaft P and intersects with the gear L. Upon the opposite end of the shaft P is placed the gear-wheel H', which intersects with the gear-wheel I' which is placed upon the first of the inclined shafts U. Upon the lower ends of the inclined shafts U are placed gear-wheels M, intersecting one with another in such a manner as to communicate motion of like speed to each of the said shafts. Upon the gear-wheel L is a ratchet, K, and upon an arm of the driving-wheel W is pivoted a pawl, J, which is placed, at will, either in or out of gear with the ratchet K, by means of the combined spring e and lever I, which is also pivoted to an arm of the driving-wheel W. As the machine advances when at work the pawl J is allowed to fall into gear with the ratchet K, by which motion is communicated from the driving-wheel W to the gear-wheel L, and from which motion is communicated to the shaft U through the medium of the pinion O, the shaft P, the gear-wheels H' and I', and the series of gear-wheels M; the motion of each of the shafts U being opposite to that of the one next preceding or next following it in the series, and as indicated by the arrows. The extreme front ends of the arms B are chamfered so as to form a series of inclined planes at right angles to the shafts U, and are slotted for the insertion and adjustment of the studs B''. Upon each of the studs B'' is placed loosely a pulley, R, forming a series of the same, and a corresponding series of pulleys, S, are placed firmly upon the shaft U at an elevation in line with the pulley R. In fig. 7 is shown an attachment of metal, D'', upon the arms B, having an extension which forms the guard N. This attachment is formed in a manner to correspond with the inclined plane, as described above, and is slotted for the reception of the studs B'', as also described. The boards Y are firmly attached at their upper ends upon a projection of the stanchion T, and at their lower ends upon the ledges of the arms B, and form stiffening braces to the arms B, guides to the belts Z and Z', and supports for the intermediate pulleys u. The intermediate pulleys u are placed loosely upon studs which are inserted through the boards Y and made adjustable in transverse slots Y', as shown in fig. 1 of the drawings. The belts Z and Z' are placed around the pulleys S and R, as seen in fig. 1, and are actuated each respectively in directions corresponding with the motions of the pulleys S and shafts U, as hereinbefore described. The guards N are firmly fastened to the arms B, and are used to separate and guide the crop properly towards the points where it is grasped between the belts. The fingers i are inserted in the pulleys R, and by the action of the pulleys are used to comb or incline the crop within the grasp of the belts. The rate of motion given to the belts Z and Z' in their path around the pulleys is made to correspond with the motion of the machine as it advances over the ground; that is to say, the grasping sides of the belts are made to traverse backwardly at the same rate of speed at which the machine is advanced, so that the point in the belts at which the crop is grasped, in relation to the ground, stands still, as by the following will more fully appear. The required amount of pressure of the belts upon the crop, while the same is being lifted out of the ground, is obtained by means of the adjustable pulleys u, and as the machine advances the rear pulleys S exert a continual lifting force upon the grasping sides of the belts, raising them, together with the crop, gradually from the ground, until the pulleys S have advanced to the point at which the crop is grasped, when the crop is discharged from between the belts and deposited by falling backward regularly upon the platform D', or is carried off at the side of the platform by either of the automatic raking devices, as shown in figs. 5, 6, 7, 8, and 9. In figs. 1 and 4 is shown a separating device, j, which is used for separating the swath from the standing crop. The piece j is pivoted to the guard N at k, and is made to vibrate by the action of the pulley R in such manner as shall shake apart the clinging tops of the crops. In figs. 5 and 7 are shown separating swords x, which are rigidly attached to the guards N, and are used to separate the tops of the crops and assist in guiding the same properly between the belts. The guards or shields J' J'' are used to prevent the crop from being drawn between the belts Z and Z' on their return from the pulleys S to the pulleys R, substantially as shown in figs. 1 and 8. The gear-wheels H, I', K'', and G'' are protected from becoming entangled by the crop by the use of the sheet-iron hood or shield P'', substantially as shown in figs. 8 and 9. The covering boards A'' are used to prevent the crop from becoming improperly entangled around the pulleys and among the belts, substantially as shown in figs. 5, 6, and 7. The device used for the automatic delivery of the crop at the side of the platform of the machine, as shown in figs. 5, 6, and 7, consists in the combination of the endless belt or apron V', the guides r, the pulleys t and E'', the pulley w, and the band w'. The apron V' is placed around the pulleys t and E'', and motion is communicated to it from the shaft P through the medium of the pulley w, the band w', and the pulleys t and E'', in such manner that the upper portion of the apron is made to traverse a plane in line from E'' to t. The guides r are fastened rigidly to the stanchions T. As the crop passes from the grasp of the belts Z and Z' and upon the apron V', it is supported in an upright position by the guides r, and is carried along at the bottom by the action of the apron V', while the tops are forced along by that portion of the crop which follows from the belts Z and Z' to the side of the platform, where it is deposited by falling regularly in a swath upon the ground at right angles to the path of the machine, or, by the aid of proper devices, may be deposited in gavels. In figs. 8 and 9 is also shown an automatic raking device, the purpose of



which is to deposit the crop in manner similar to that above described, and may be used in combination with that shown in figs. 5, 6, and 7, and consists in the combination of the upright shafts Q'', placed in line and at either side of the platform, and held in position by the framework N'', the endless bands and fingers O'', the pulleys L'', the brackets or guides M'', the gears G'' and K'', the shaft H'', the bracket I', the band I'', and the pulleys R'' and S''. Motion is communicated from the shaft P to the endless band and fingers O'' through the medium of the gears G'' and K'', the shaft H'' and the pulleys S'' and R'', the band I'' and the shaft Q''. As the crop passes from the grasp of the belts Z and Z' it is supported in an upright position by the guiding brackets M'', while it is carried along to the side of the platform by the fingers O'', and is deposited as hereinbefore described. The pulleys S, as shown in figs. 9 and 10, are each surrounded by a friction-band, F'', for the purpose of securing, when at work, a more tenacious adhesion of the belts to the pulleys. The gear-wheels M are protected from dirt or entanglement with weeds, grass, or other extraneous matter, by the sheet-iron coverings c and c', as shown in figs. 2, 3, and 4. The belts Z and Z' are formed with irregular surfaces upon their face sides, and are made to work by pairs, a portion of the face surface of the belt Z being made convex, and a corresponding portion of the belt Z' is made concave or grooved, both as shown together in fig. 11 of the drawings. This form is given to the belts for the purpose of so bending the stems or stalks of the crop as to secure to the belts tenacious adhesion to it, with less pressure upon them by the pulleys u than would be required were their face surfaces made plain and flat, thereby avoiding much friction that would be produced by such pressure. The pulley u represented in fig. 2 is set upon a spring, X, for the purpose of securing to the pulleys an automatic or self-adjusting pressure upon the belts. In fig. 1 is shown an open space between the grasping sides of the belts at the points X', the purpose of which is to secure free admission of the crop between the belts. The belts are constructed with a foundation of webbing, a', which is comparatively non-elastic, to which are attached the India-rubber cushions Z and Z', substantially as shown in fig. 11 of the drawings. I prefer this mode of making the pullers; but a belt entirely of good rubber, or its equivalent in properties, might be used successfully. Two or a series of pairs of inclined elastic rollers might also be used successfully, if shields or deflectors be properly arranged therewith in a manner to prevent the hemp or flax stalks winding round the rollers, or to insure the passage of the stalks between the rollers in a straight course.

The whole machine, as fully shown, is so arranged and constructed as to form four independent sections, whereby it may be varied to any desired width of swath without changing its plan of construction.

In figs. 5 and 7 of the drawings the guards N are represented as being constructed and attached in a manner to allow the crop to approach the belts at a point upon the opposite side of the line of the axis of the pulleys R to that at which it is received between the belts, and the same is inclined or carried around from the point of its approach to the point at which it is admitted between the belts by the revolving fingers i; the object of which is to allow the machine to enter into the standing crop freely, or without materially disturbing the same by inclining or crowding it over before the belts have advanced sufficiently far to grasp the same.

Having set forth my invention, and shown its practical application and mode of its operation, what I claim as new, and desire to secure by Letters Patent, is—

For harvesting flax and other crops which require pulling from the ground, I claim "pullers" which have a travelling movement of their own, and are made elastic and pliable or yielding on their impinging or grasping surfaces by the use of India rubber, gutta percha, or other suitably elastic material, for the purposes substantially as set forth.

SAMUEL W. TYLER.

Witnesses:

R. T. CAMPBELL,

EDW. SCHAFER.