

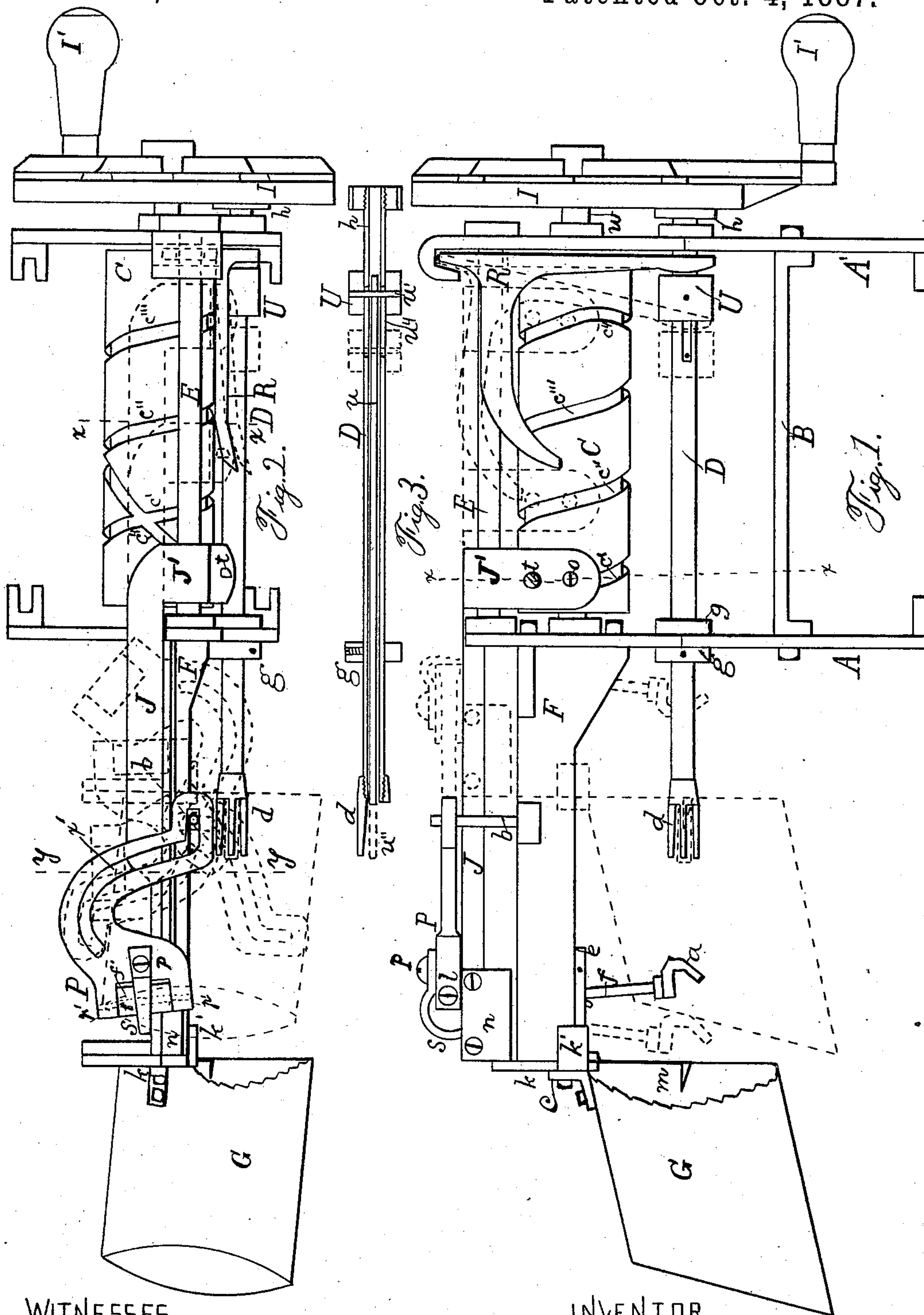
(No Model.)

2 Sheets—Sheet 1.

F. R. WILLIAMS.
FRUIT PARING MACHINE.

No. 370,914.

Patented Oct. 4, 1887.



WITNESSES

Edw. Suydam. W. G. Suydam. R. Williams.

INVENTOR

(No Model.)

2 Sheets—Sheet 2.

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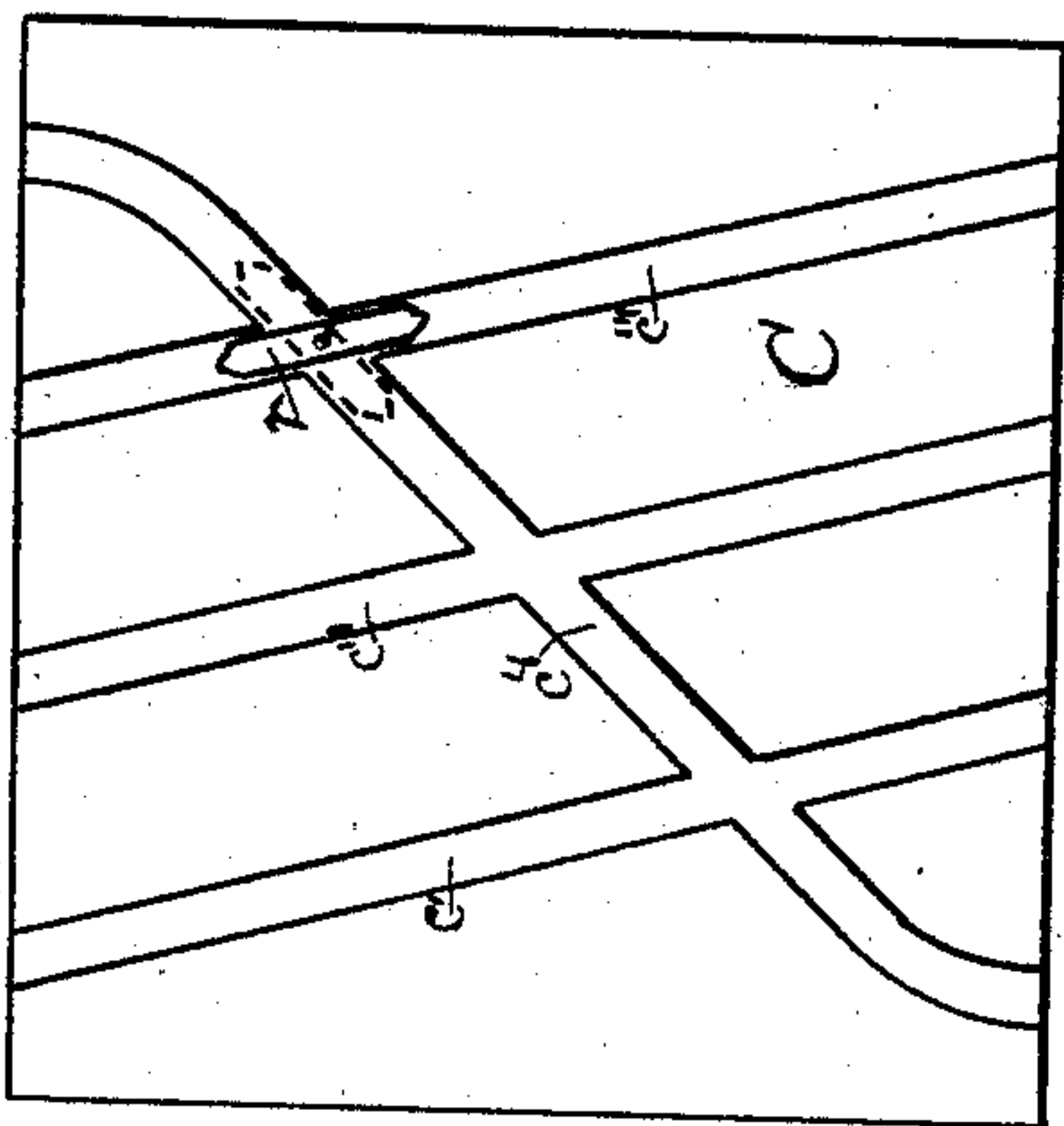


Fig. 8.

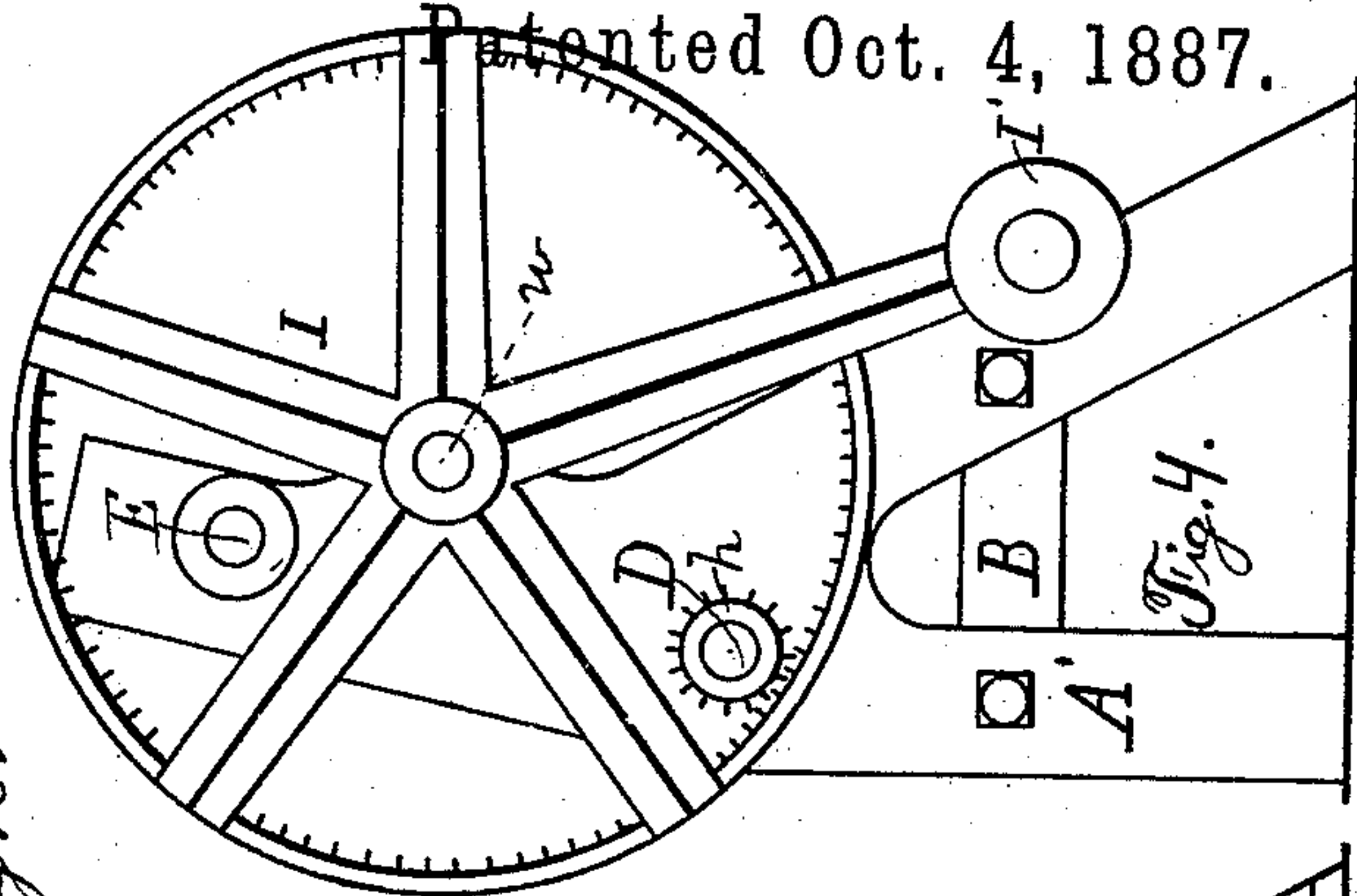


Fig. 4.

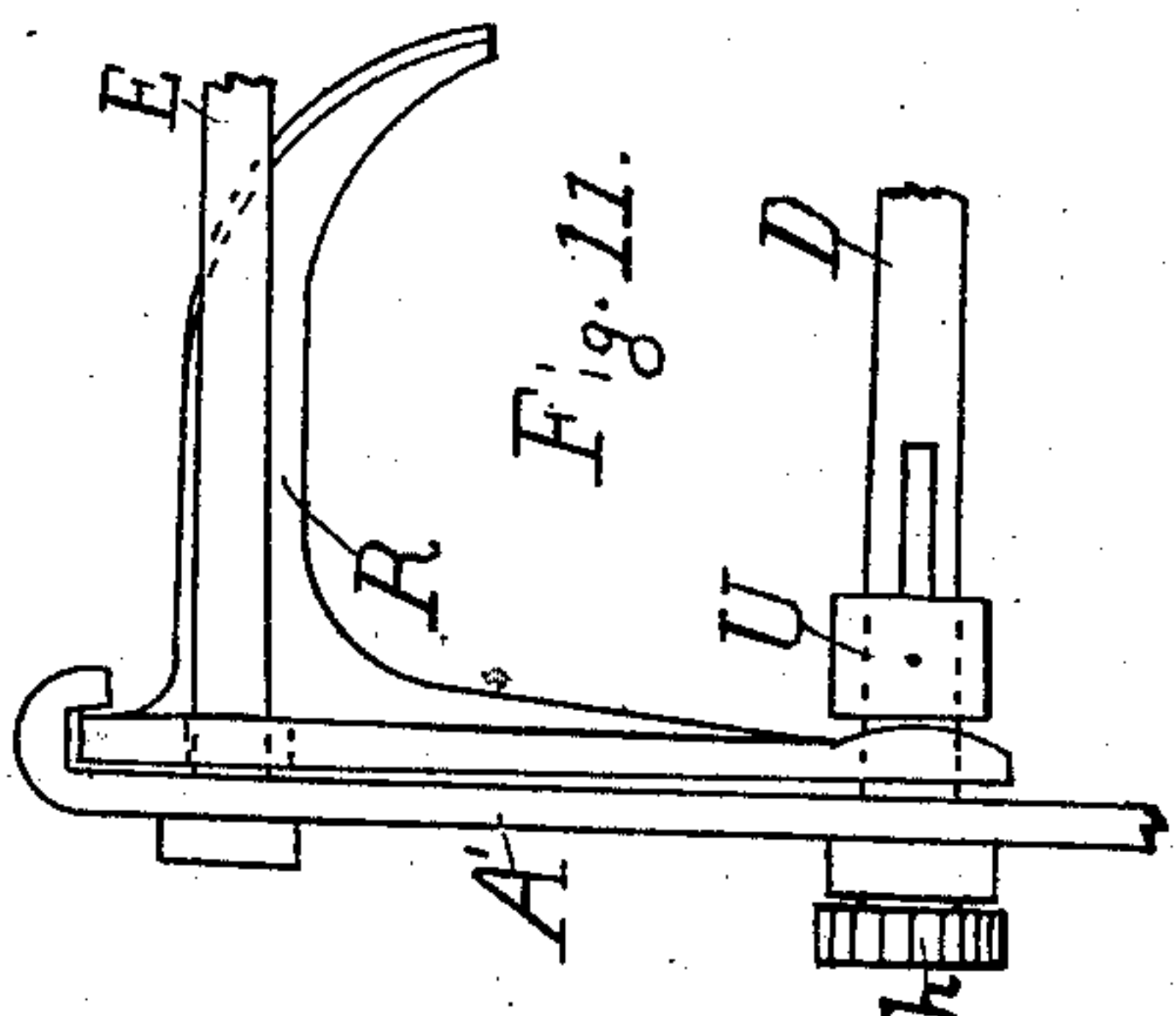


Fig. 11.

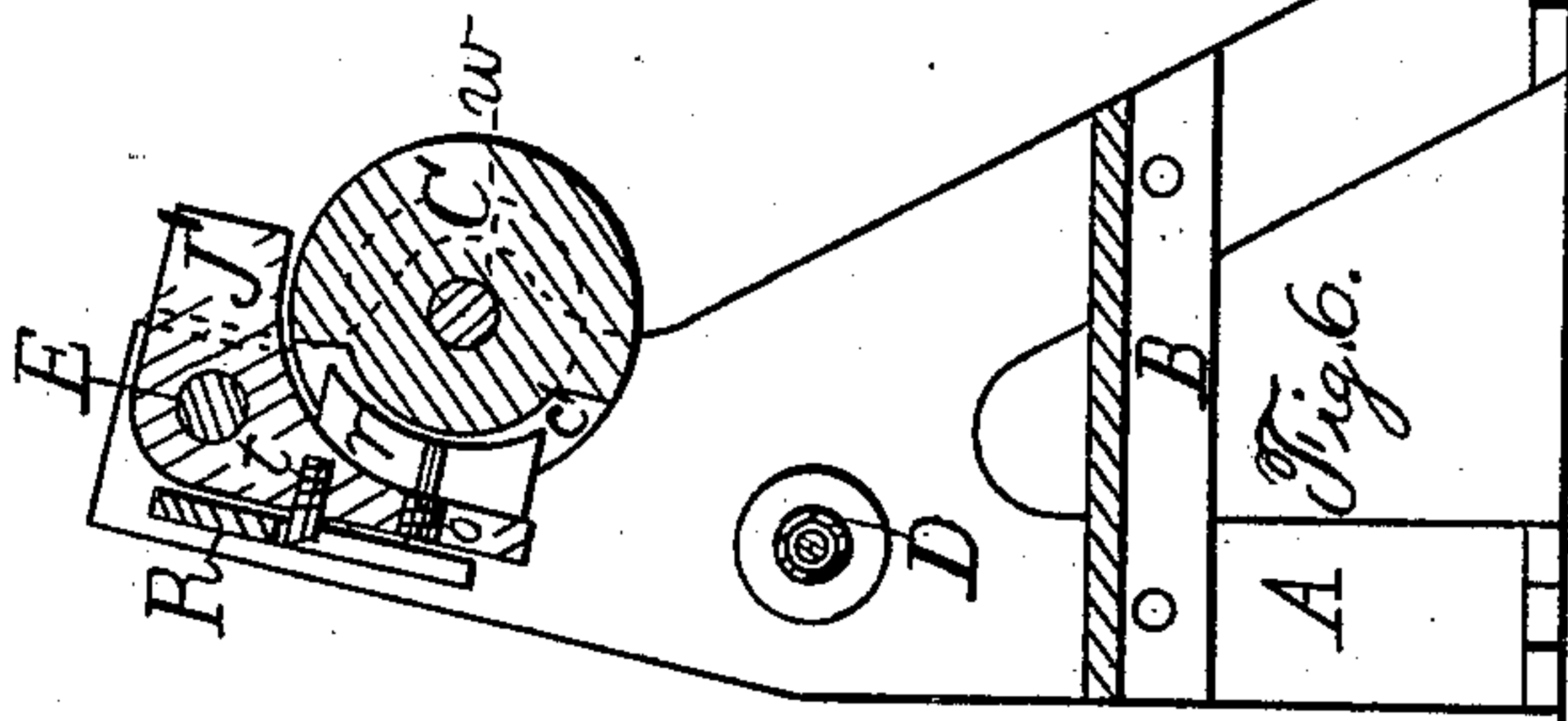


Fig. 6.

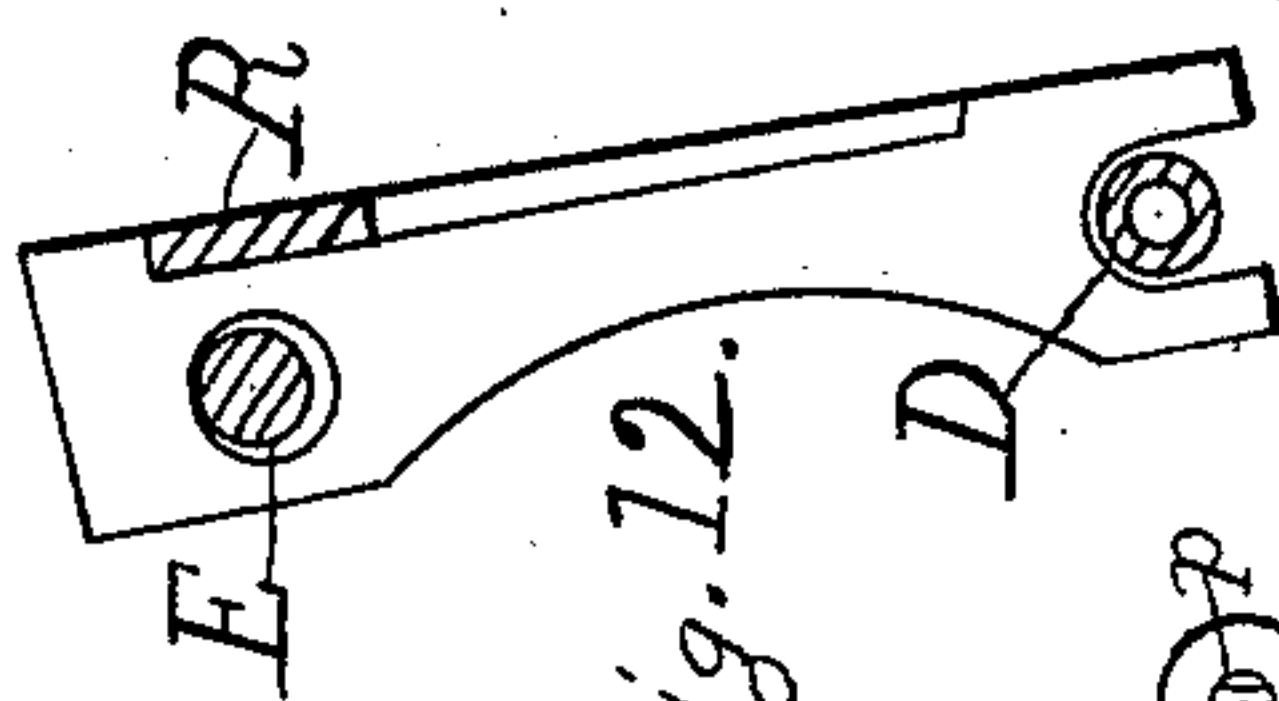


Fig. 12.

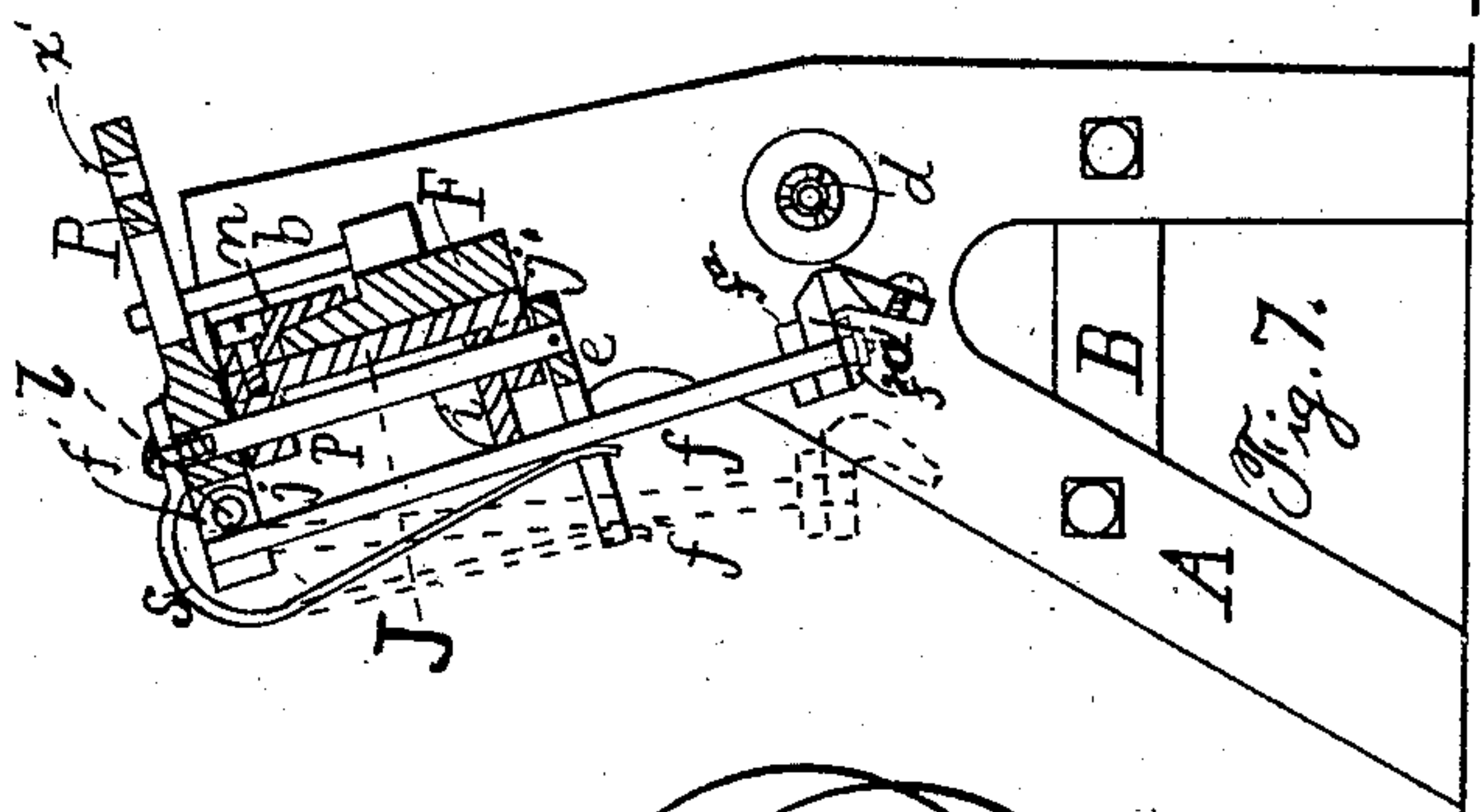


Fig. 7.

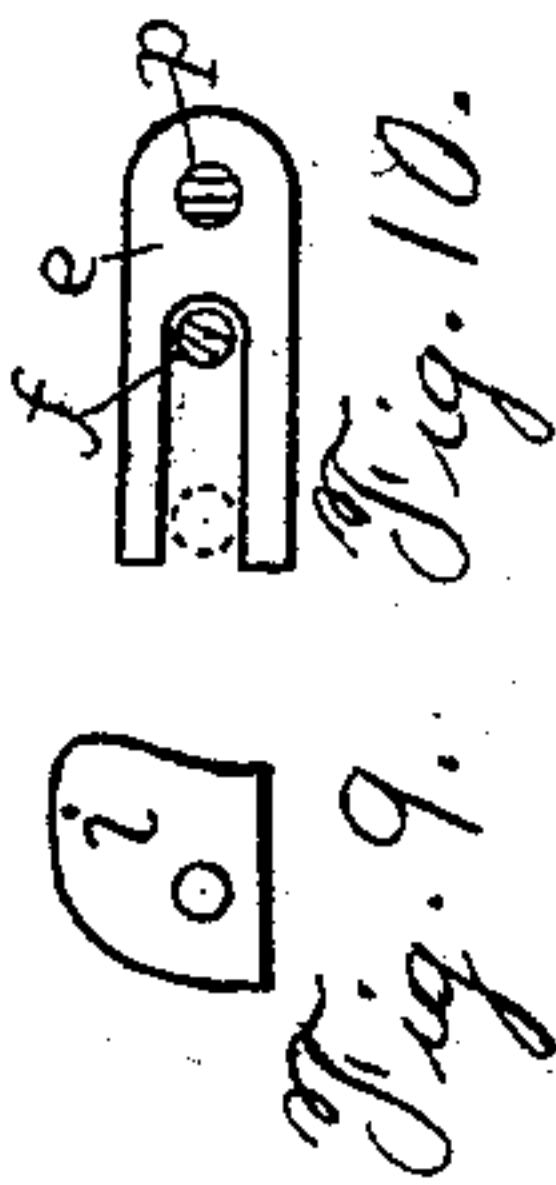


Fig. 9.

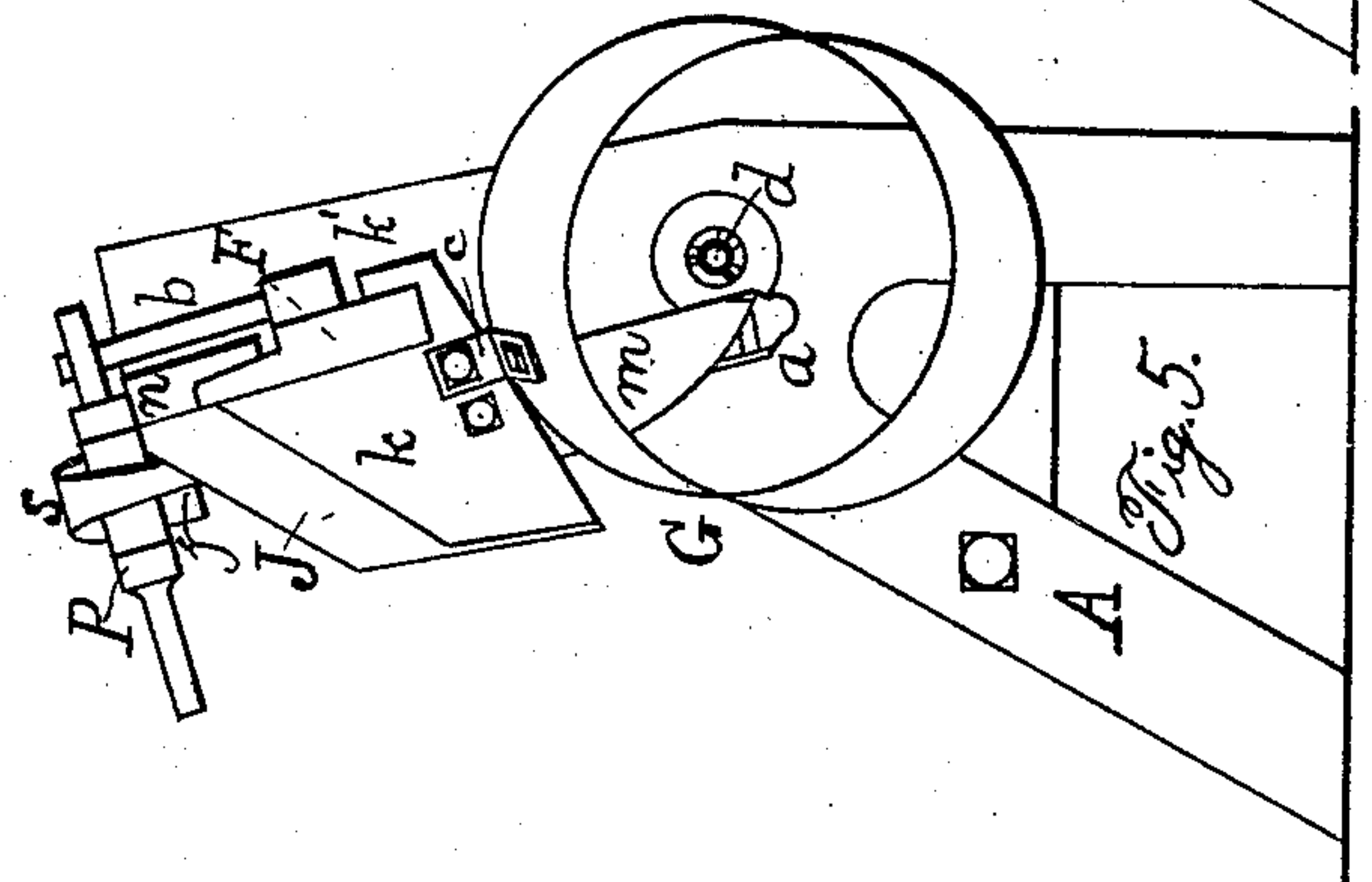


Fig. 5.

WITNESSES.

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UNITED STATES PATENT OFFICE.

FRANK R. WILLIAMS, OF ROCHESTER, NEW YORK.

FRUIT-PARING MACHINE.

SPECIFICATION forming part of Letters Patent No. 370,914, dated October 4, 1887.

Application filed August 15, 1885. Serial No. 174,459. (No model.)

To all whom it may concern:

Be it known that I, FRANK R. WILLIAMS, of Rochester, in the county of Monroe and State of New York, have invented certain new and useful Improvements in Fruit-Paring Machines; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification, and to the figures and letters of reference marked thereon.

My invention relates to improvements in apple-parers, and particularly to that class wherein the fruit operated upon is rotated by suitable mechanism, and the paring, coring, and slicing, or either of them, are performed by suitable mechanism reciprocating longitudinally of the axis of rotation of the fruit; and it has for its object to simplify and improve the construction of such machines, whereby the operations will be carried out in a more certain and expeditious manner, and whereby, also, the operations of paring and slicing, or paring only, may be accomplished by simple mechanism and convenient movements of the operator.

The invention consists, generally, in the novel devices and combination of parts whereby the machine may be run at great speed, if desired, and the certainty of their proper operation will be insured, and in the novel devices for causing the removal of all the skin of the fruit, and, if desired, at the same time cutting the fruit into suitable form to adapt it to be "evaporated" or dried in an expeditious manner.

It further consists in certain novel devices for causing the necessary rotary motion to be given the reciprocating paring-blade, and in permitting the other independent movements of the same necessary to cause the paring of the fruit in the best and most expeditious manner.

It further consists in certain novel devices for causing the operation of the carriage on which the paring-blade and cutting-knife are mounted in a more positive and certain manner than heretofore, and, further, in certain novelties of construction and combinations of parts, all of which I will now proceed to describe and point out in the claims at the end of this specification.

In the accompanying drawings, Figure 1 is a side elevation of my machine; Fig. 2, a top plan view of the same; Fig. 3, a sectional view of the fruit-shaft, showing the doffer; Fig. 4, a view of the right-hand end of the machine; Fig. 5, a view of the left end of the machine; Fig. 6, a section taken on the line *x x* of Fig. 1; Fig. 7, a sectional view taken on the line *y y* of Fig. 2; Fig. 8, a diagrammatic view of the grooves in the cam-drum; Fig. 9, a view of the cam for limiting the motion of the rod carrying the paring-blade; Fig. 10, a view of the plate for guiding the rod carrying the paring-blade; Fig. 11, a side view of the doffer, and Fig. 12 a sectional view of the same.

Similar letters of reference in the several figures indicate the same parts.

I have shown the machine in the drawings and purpose to describe it in this specification as arranged to be operated by hand; but it is obvious that it can as well be operated by power, suitable belting or gearing and suitable clutch devices being employed for causing the necessary connection and disconnection to and from the power, as will be readily understood by one skilled in the art.

The main frame for supporting the operative mechanisms consists, generally, of the two upright end plates or standards, *A' A*, connected near their base by a plate or base-piece, *B*, as shown, and at or near their upper ends by a bearing-rod or stationary shaft, *E*, the ends of which are secured to the standards in any suitable manner.

Supported in bearings in the two standards *A A'*, and extending out on both ends thereof, is a hollow shaft, *D*, having on its forward end a fruit-fork, *d*, or series of prongs, on which the fruit to be operated upon is placed, and upon its rear end is mounted a small gear, *h*, to which motion is imparted from an internally-toothed gear, *I*, mounted on another parallel shaft, to which reference will be made later. Suitable collars, *g*, are secured to the shaft *D* (termed the "fruit-shaft") on opposite sides of the standard *A*, for preventing longitudinal motion in the bearings therein, and within the shaft is mounted a sliding rod or doffer, *u*, extending from the outer to near the inner end, and secured to a sliding collar, *U*, mounted on the shaft by means of a transverse pin, *u'*, as shown. The end *u''* of this

doffer is adapted to be moved out between the prongs of the fork at suitable times to eject the fruit or the core therefrom by means of a bell-crank lever, R, having a perforation through which the rod E passes; or it may have a yoke to one side of its upper end, which rests upon the rod E and is confined thereon by a depending projection on the end standard, A'. The lower end of this lever is formed with a yoke, the arms passing on either side of the shaft D and in rear of the collar U, so that when the forward end of the lever is lifted the collar and connected rod are moved to the left, causing the doffer to project between the prongs of the fork and remove the fruit or core therefrom.

Formed with or secured to the standard A is a projection or arm, F, in which the forward end of a carriage, J, carrying the paring, coring, and slicing devices, is supported, its rear end being sleeved upon the rod E in the main frame. For causing the reciprocation of this carriage backward and forward, so as to bring the devices mounted thereon into position to operate upon the fruit on the shaft D, I provide the carriage with a depending portion, J', near the lower end of which is pivoted at a crescent-shaped switch, r, (shown in Fig. 6,) adapted to operate in slots c' c'' c''' c^4 in a cam-drum, C. This drum is mounted in bearings in the standards A A', and the other end of its shaft is extended beyond the standard A' and provided with an internally-toothed wheel, I, provided with an operating-handle, I', and the teeth of which engage the gear h on the fruit-shaft D, so as to cause its rotation in the same direction, but at greater speed. The grooves c' c'' c^4 are connected with each other at each end of the drum; but those running from right to left—that is, c' c'' c''' on the front of the drum in Fig. 1—are of much less pitch than those lettered c^4 , running from left to right, as clearly shown in the plan view of the cam-groove, Fig. 8, so that when the drum is rotated by the handle to the right and the switch r is in the groove, the carriage J being at the extreme left, as in Fig. 1, the side of the grooves c' c'' c''' will engage the switch and move the carriage toward the right at a certain speed relative to the speed of rotation of the handle I', and causing the paring and coring devices to be moved toward the fruit on the shaft and to operate upon them; but as soon as the switch reaches the right-hand end and the paring devices have finished operating upon the fruit the carriage must be returned to its first position, and this is accomplished by the switch turning into the groove c^4 on the drum. This groove is of much greater pitch than the others on the drum, and by continuing the rotation of the latter the carriage is caused to move toward the left again at a much greater speed than the right-hand movement was accomplished. When the switch reaches the end of this groove, it turns into the grooves c' c'' , and is again returned to the right, and so the operation is repeated as long as the handle

is rotated, the carriage being moved in opposite directions at different speeds.

The depending portion J' of the carriage is provided with a pin or lug, t, having the inclined portion on the right-hand side of its face, as shown, and this pin is adapted to co-operate with the bell-crank lever R, causing it to operate as follows: When the carriage is moved from left to right by the rotation of the cam-drum C, as described, the inclined face of the pin t will strike the depending portion of the horizontal arm of the bell-crank lever R, and as the latter is allowed a slight lateral motion on the rod E will cause it to be moved outward, permitting the passage of the pin without operating the lever; but when the carriage is moved in the opposite direction the straight side of the pin will catch under the said depending end of the lever, cause it to turn on its pivot on the shaft E, and the fork on the lower end to push the collar U to the left, projecting the rod u and ejecting the fruit or the core thereof from the fork d, as will be readily understood.

Having now described the main frame and the devices for causing the operation of the carriage, I will proceed to detail the construction of the paring devices and the mechanisms by which they are operated.

The forward end of the carriage J is supported upon the forward extension, F, of the frame by a small lug or bracket, n, secured to its upper side, hooking over the said extension, so as to slide thereon, and on the lower side is a similar lug, k', formed or secured to the carriage K. These two lugs serve to guide the carriage and prevent its displacement. Formed on the carriage near its forward end are two lugs, j j', perforated and forming the bearings for a vertical shaft, p, to the upper end of which is attached a plate, P, having a cam-slot, x', therein, as shown clearly in Fig. 2, and to the lower end of the shaft p is secured an arm, e, having a longitudinal slot therein, as shown. On the side of the plate P opposite the cam-slot x' are provided two projecting lugs, p' p', perforated transversely, and through these lugs is passed a pin or bolt, l, forming the support and bearing for a small casting, f', provided with a perforation, through which the pin l passes, so that the casting is allowed a limited rotary motion thereon. f represents a rod secured to the outer side of the casting f', projecting downward through the slotted arm e on the shaft p, and carrying on its lower end the casting a, in which the paring-blade is secured. This rod f is pressed toward the shaft p by a spring, S, secured to the plate P and passing downward, resting against it in the slot in plate e, as shown. The lug i, forming the lower bearing for the rod f, is formed as shown in Fig. 9, and the rod f is pressed against its cam-shaped periphery by the spring, and therefore as the plate is revolved the rod with the paring-blade on its end is caused to follow, for a portion of its rotation at least, the contour of the cam,

and is prevented from accidentally coming into contact with the fork *d* on the fruit-shaft.

The paring-blade is secured to an angular casting, *a*, loosely mounted on the lower end of the rod *f*, adjustable thereon, and secured in adjusted position by suitable means. I do not wish to limit myself to this particular arrangement of blade-supporting device, as any other may be employed instead without departing from the spirit of my invention. As a means for causing the rotation of this shaft *p* and the paring-blade secured thereto through the plate *P*, I locate upon the arm *F* a pin, *b*, passing up through the cam-slot *x'* in the plate *P*, and maintaining the same relation to the fruit-shaft all the time, so that as the carriage and the plate *P* are moved backward and forward by the mechanism before described this pin will cause the cam to follow the lines of the cam-slot, cause the knife to move around the fruit on the fork *d*, and insure the proper paring thereof.

To the outer end of the carriage, between plate *k* and *k'*, I secure a lip slicing and coring knife, *m*, serving when moved upon the rotating fruit to cut the same into a uniform spiral, in proper form for evaporation or drying, and also to cut the core therefrom at the same time. I also secure a chute or conveying-tube, *G*, to the end of the carriage by means of a lug, *c*, mounted thereon, for the purpose of delivering the sliced and pared fruit to one side of the place where the paring is delivered on the table.

From the above description the operation of the whole apparatus will now be readily understood.

Assuming the device in the position shown in Fig. 1 in full lines, with the carriage projected to the left, the pin *b* in the straight portion of the cam-slot *x'*, and the switch *r* turned into the grooves *c' c''*, &c., the operator places the fruit upon the fork *d* and rotates the handle *I'* in a direction away from him. This causes the carriage to travel to the right and the paring-blade to come in contact with the fruit rotating on the shaft, which will press it back and tend to rotate it slightly; but the spring *S* will allow of the backward movement and the slot *x'* prevent its premature rotation. The carriage moving farther, the paring-blade bears against the fruit by spring-pressure, which permits it to follow all the irregularities in its surface, the angle of the cutting-surface being such that the skin is expeditiously removed, and the slot *x'* and pin *b* causing the proper rotation about it, so as to pare all sides of the fruit. When the knife-bearing rod has made a half-revolution and has finished paring the depression at the end of the fruit, the pin *b* is at the extreme inner end of the cam-slot and upon a continued motion of the carriage to the right the slot causes the blade to move backward nearly parallel with the shaft for some distance until the beginning of the straight portion of the slot is reached. As soon as the paring-blade leaves the rear end of the fruit, the cor-

ing and slicing knife moves against it and cuts it into a spiral, the width of which is regulated by the relative speed of the fruit and carriage. When the carriage reaches the end of its movement to the right, the switch *r* in the cam-drum turns and enters the returning groove *c'*, and as this is of greater pitch the carriage is returned much more rapidly than it moved toward the right, the pin and slot in the cam-plate rotating the paring-blade back to its first position ready for the next paring. The cam-lug *i* on the carriage, against which the rod *f* bears, prevents the movement of the paring-blade inward far enough to come in contact with the rotating fork, and thus damage it, until it gets beyond the end of the same. When the carriage is about half-way on its return movement, the lug *t* on the portion *J'*, passing under the depending end of the bell-crank lever *R*, raises said end, causing the lower end to slide the collar *U* and doffer forward and remove the core from the fork, the chute *G* having passed away from the end thereof by this time.

Of course various modifications of the devices herein shown can be devised without departing from the spirit of my invention, and I therefore do not desire to be confined to the exact forms shown.

The chute *G* and the coring and slicing blade *m* may be dispensed with, if desired, and the paring devices used alone, or either or both of the others may be employed together or separately, as may be desired.

I claim—

1. The combination, with the shaft carrying the fruit and the drum having the cam-grooves therein, of the reciprocating carriage having the projection entering said grooves, a shaft mounted on the carriage, a slotted plate secured to said shaft, the rod for supporting the paring-blade, and a stationary projection in the main frame for co-operating with said slotted plate to cause a rotation of the shaft and paring-blade during the reciprocation of the carriage, substantially as described.

2. The combination, with the main frame, a shaft carrying the fruit, the reciprocating carriage and means for reciprocating it, a shaft mounted on the carriage, a slotted plate secured thereto, and a paring-blade, of a projection on the main frame co-operating with said slotted plate to cause a rotation of the shaft when the carriage is reciprocated, substantially as described.

3. The combination, with the shaft carrying the fruit, of the carriage and means for reciprocating it, the shaft on the carriage, the paring-blade, a slotted plate, and a projection, one of which is stationary and the other mounted on the shaft for causing a rotation of the said shaft when the carriage is reciprocated, substantially as described.

4. The combination, with the rotating shaft carrying the fruit, a sliding doffer for removing the fruit or core therefrom, and a lever for operating said doffer loosely mounted upon a

pivot, so as to be capable of being tilted, and also allowed a slight lateral movement thereon, of the reciprocating carriage having the lug thereon for co-operating with the doffer-lever to tilt it on its pivot when passing by in one direction and to move its end laterally when passing in the opposite direction, substantially as described.

5. The combination, with the rotary shaft carrying the fruit, a sliding doffer for removing the fruit or core therefrom, the reciprocating carriage carrying the devices for operating upon the fruit, the lug thereon, and means for reciprocating the carriage, of a pivoted lever so arranged with reference to said lug as to permit its passage without being operated when moving in one direction, but to cause its operation when moved in the other direction, substantially as described.

6. The combination, with the rotary shaft carrying the fruit, a sliding doffer for removing the fruit or core therefrom, the reciprocating carriage having the lug thereon, and means for reciprocating said carriage, of the pivoted lever for operating said doffer, having the incline on one side and permitted a slight lateral movement, adapted to co operate with the lug to operate the doffer when moved in one direction and to pass by without operating it when moved in the opposite direction, substantially as described.

7. The combination, with the rotary shaft carrying the fruit, the sliding doffer operating within the shaft and the collar secured thereto, and the bell crank lever pivoted loosely on the frame, having the bent end and provided with the incline on the side, of the reciprocating frame carrying the devices for operating upon the fruit and the lug for co operating with the lever to cause the operation of the doffer, substantially as described.

8. The combination, with the rotary shaft carrying the fruit, of the reciprocating carriage and means for reciprocating it, the plate mounted on the carriage, having the slot, the pivoted paring-blade, the spring for pressing it toward the turning center of the plate, and

a stationary projection co-operating with the slot in the plate to cause the rotation of the same and paring-blade, substantially as described.

9. The combination, with the rotary shaft carrying the fruit, of the reciprocating carriage and means for reciprocating it, the rotary shaft mounted on the carriage, the rod carrying the paring-blade, a leaf-spring pressing the rod and blade toward the center of the shaft, a guide for the end of the rod, and means for causing the rotation of the shaft on the carriage during the reciprocation of the carriage, substantially as described.

10. The combination, with the rotary shaft carrying the fruit, of the reciprocating carriage and means for reciprocating it, the shaft mounted on the carriage, the pivoted rod carrying the paring-blade, and the spring for moving it toward the center of the shaft, means for rotating the shaft during the reciprocation of the carriage, and the cam on the carriage, against which the rod carrying the blade abuts, substantially as described.

11. The combination, with the rotary shaft carrying the fruit, of the carriage and means for reciprocating it, the shaft mounted on the carriage, the pivoted rod carrying the paring-blade, a spring for moving it toward the center of the shaft, means for rotating the shaft during the reciprocation of the carriage, and a cam mounted on the carriage, against which the rod abuts, so arranged relative to the fruit-shaft as to keep the paring-blade farther removed therefrom during the latter portion of the reciprocation, substantially as described.

12. In an apple-paring machine, the combination of the loosely-supported curved lever R, stud t, carried by a reciprocating part of the machine, fork-shaft D, and sliding sleeve U, connected to the doffer, substantially as set forth.

FRANK R. WILLIAMS.

Witnesses:

S. E. HARTLOVE,
L. A. OAKS.