

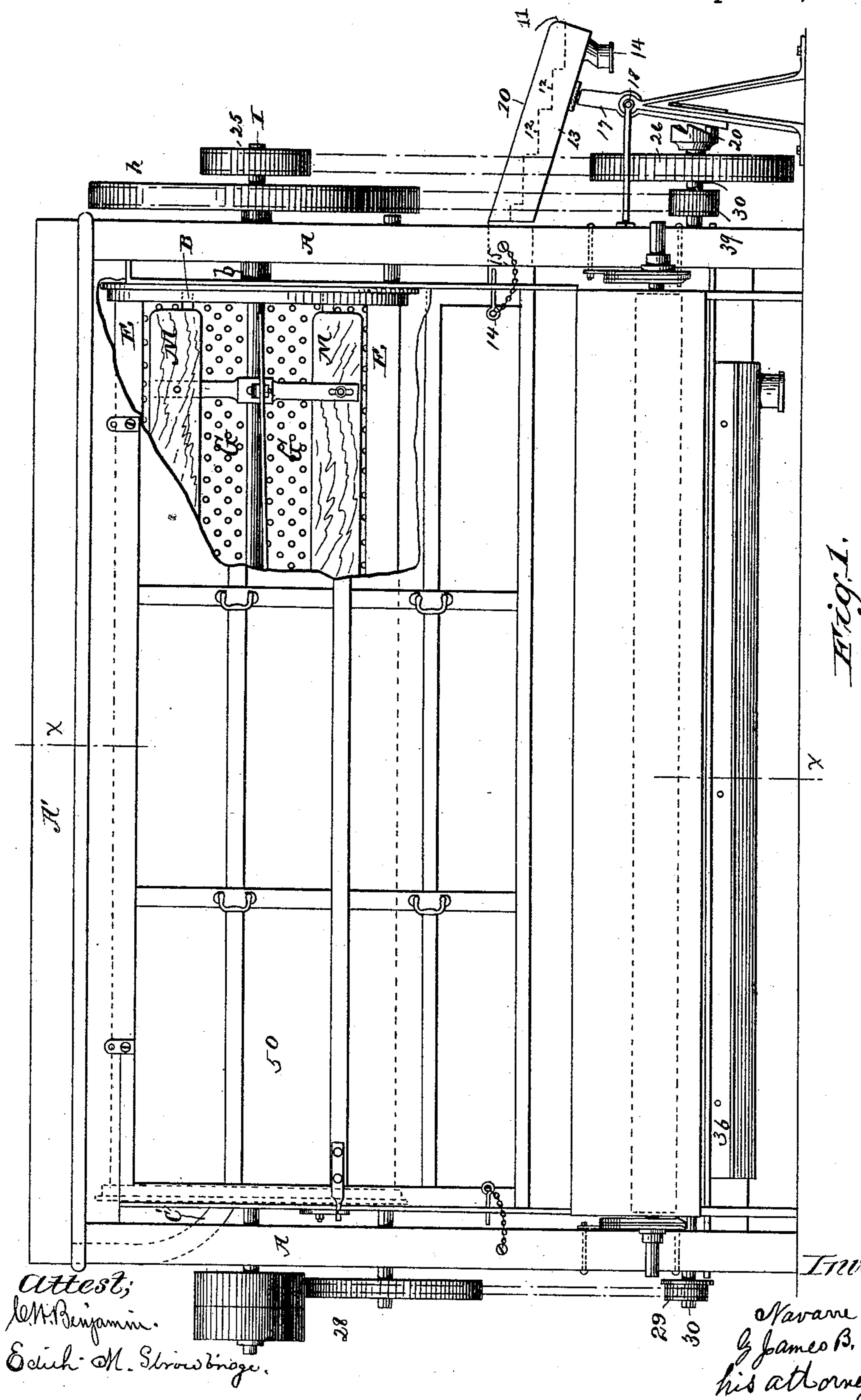
(No Model.)

4 Sheets—Sheet 1.

N. PLACIDE.  
MACHINE FOR SHELLING PEAS.

No. 496,206.

Patented Apr. 25, 1893.



(No Model.)

4 Sheets—Sheet 2.

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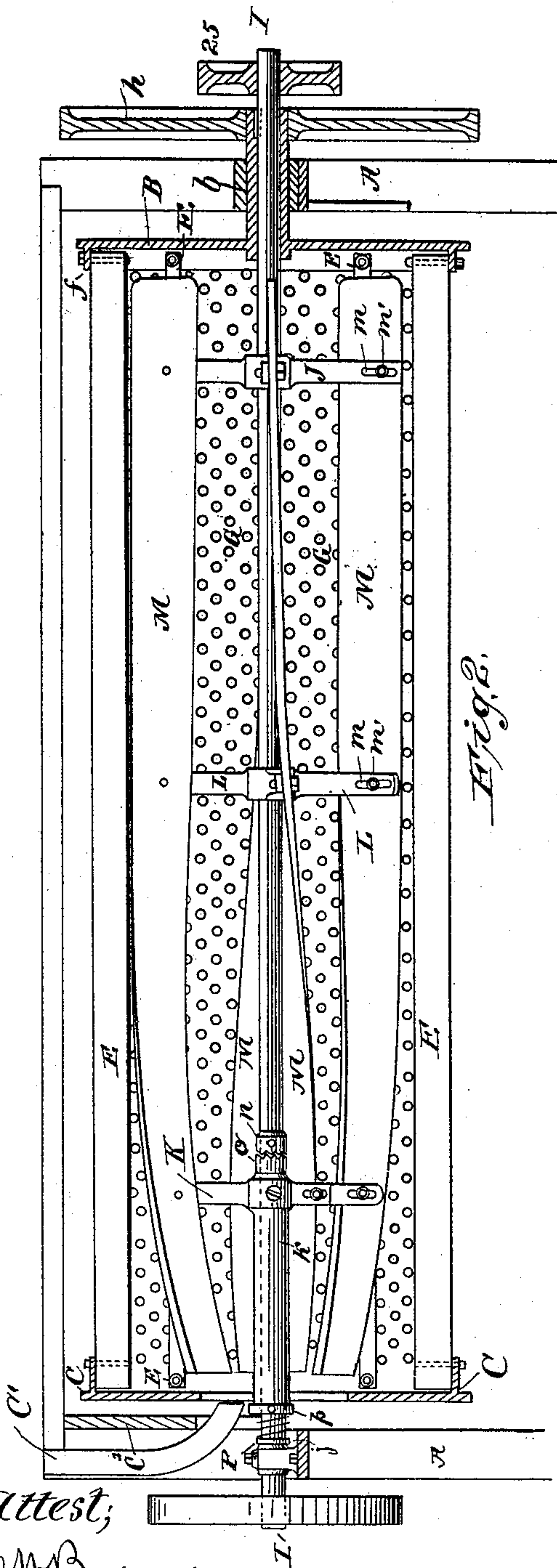


Fig. 2.

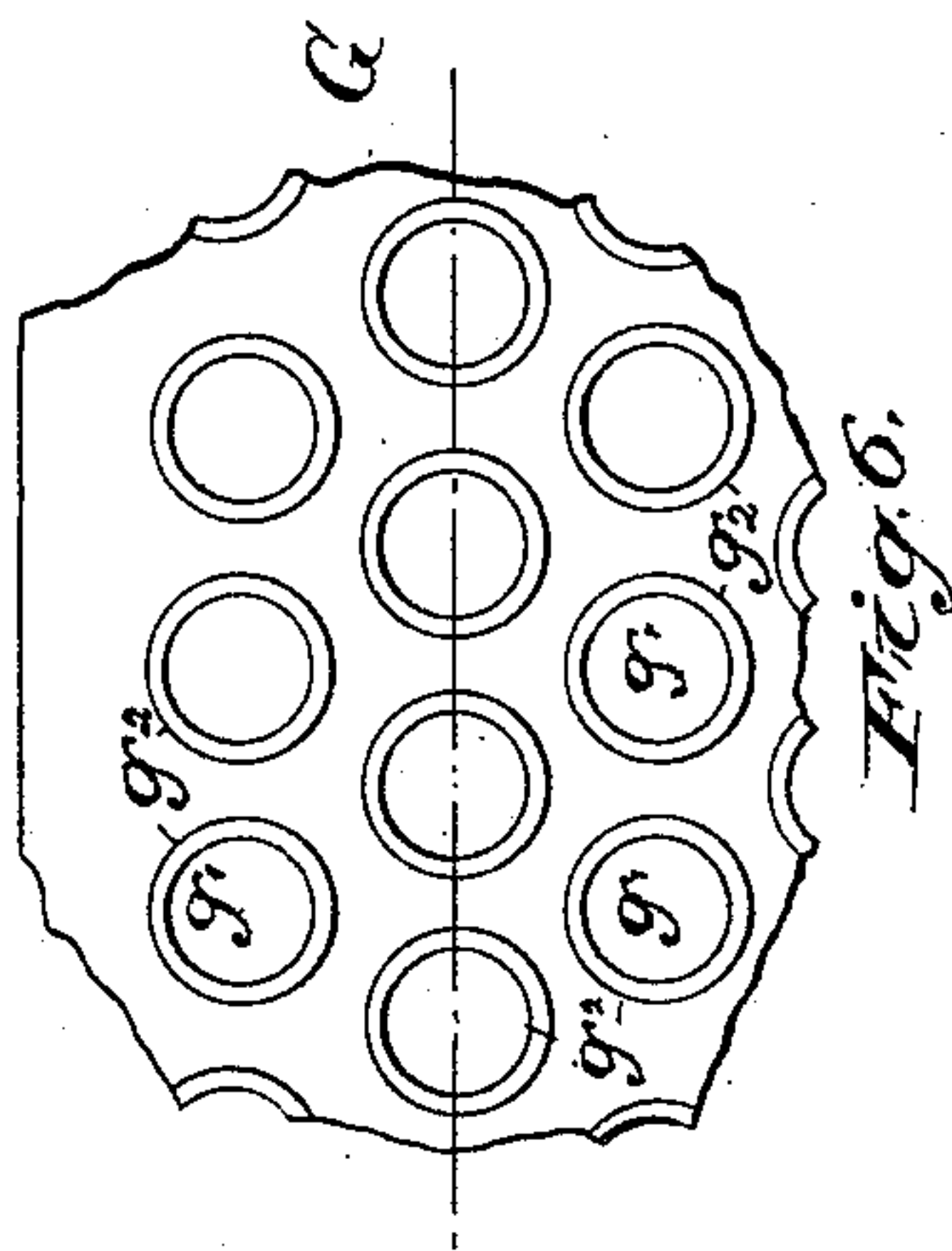


Fig. 6.



Fig. 7.

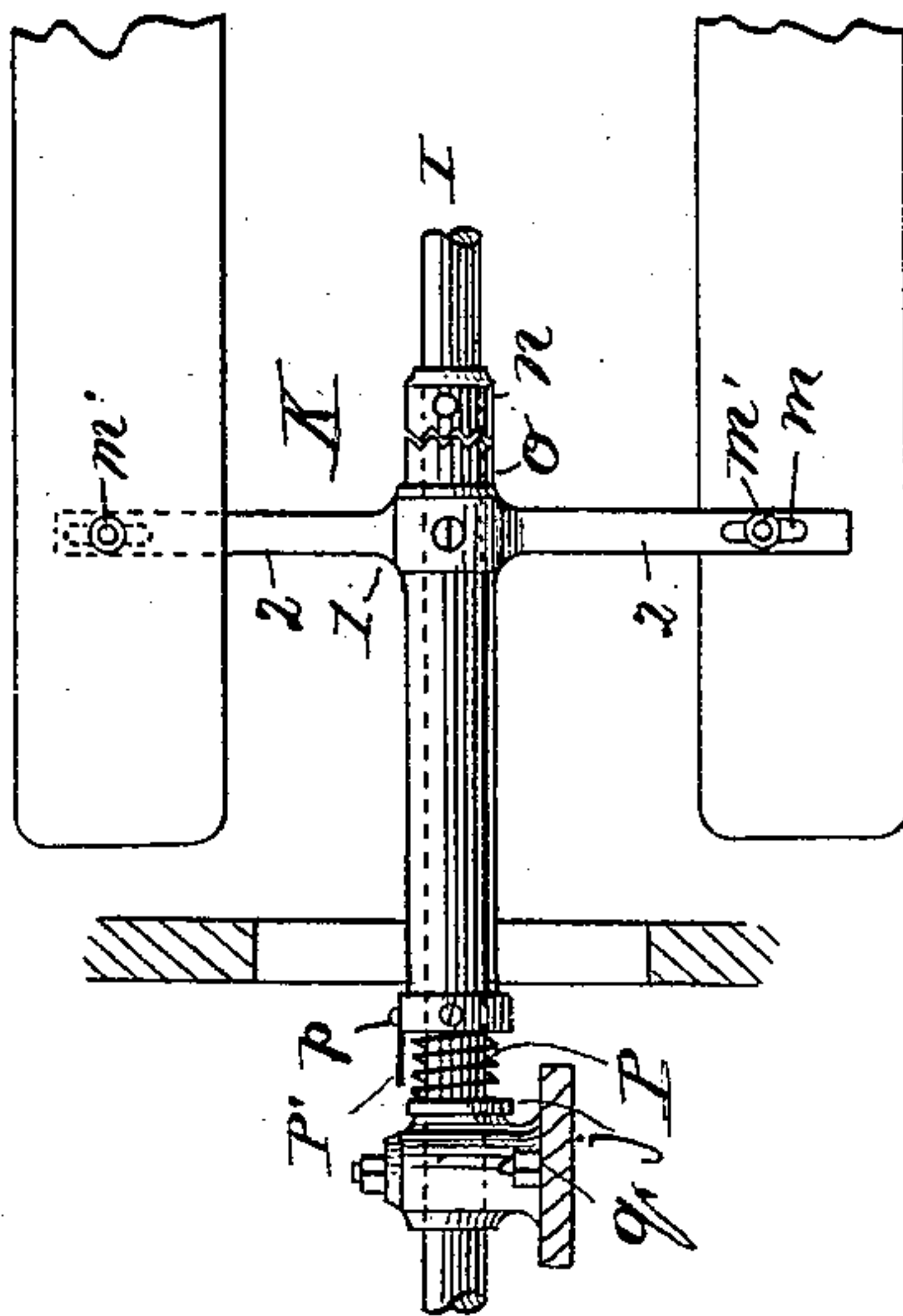


Fig. 5.

Attest;  
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Edw. M. Strawbridge.

Inventor:  
Navarre Placide  
by James B. Dill,  
his attorney.



(No Model.)

4 Sheets—Sheet 3.

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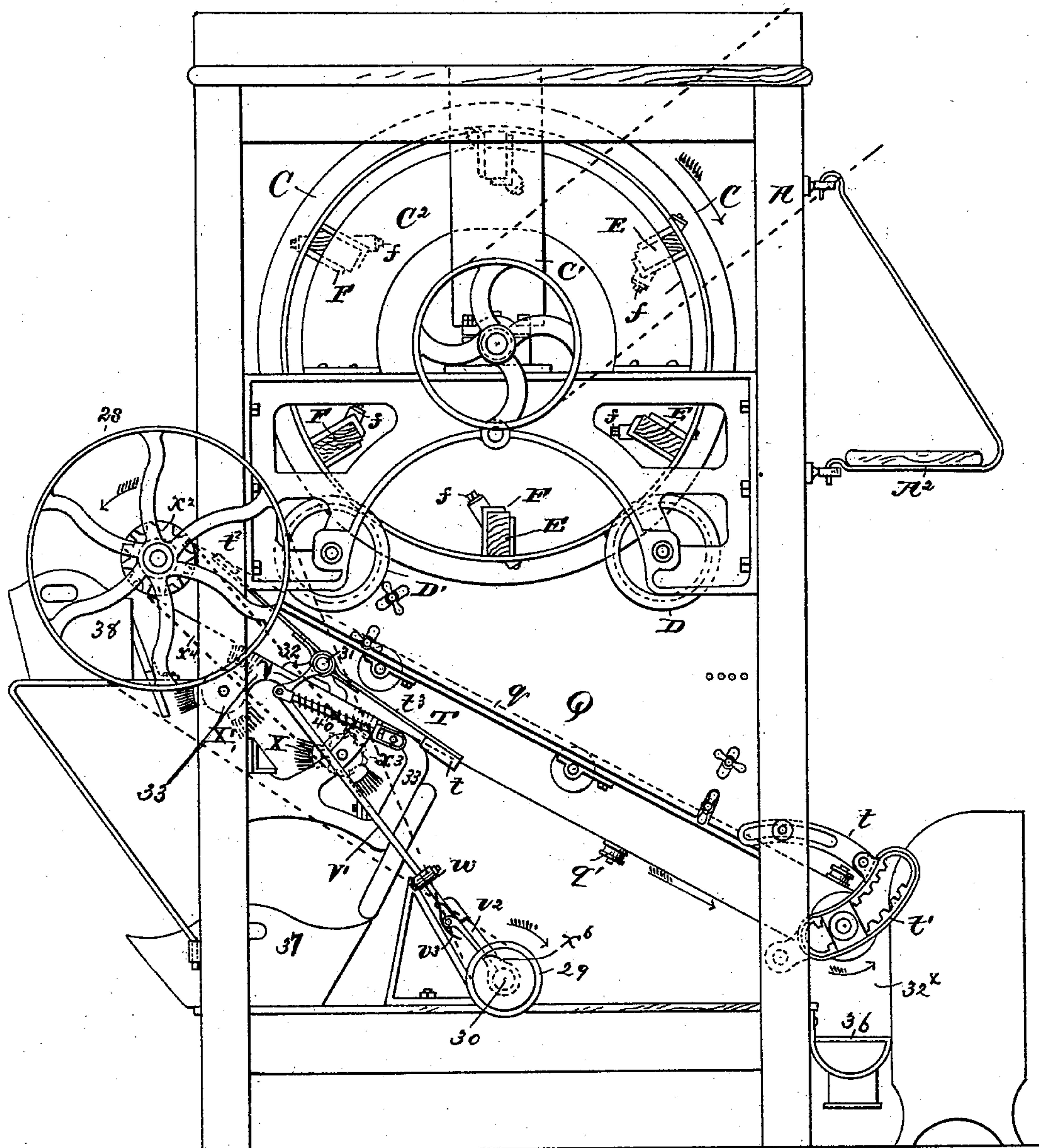


Fig. 3.

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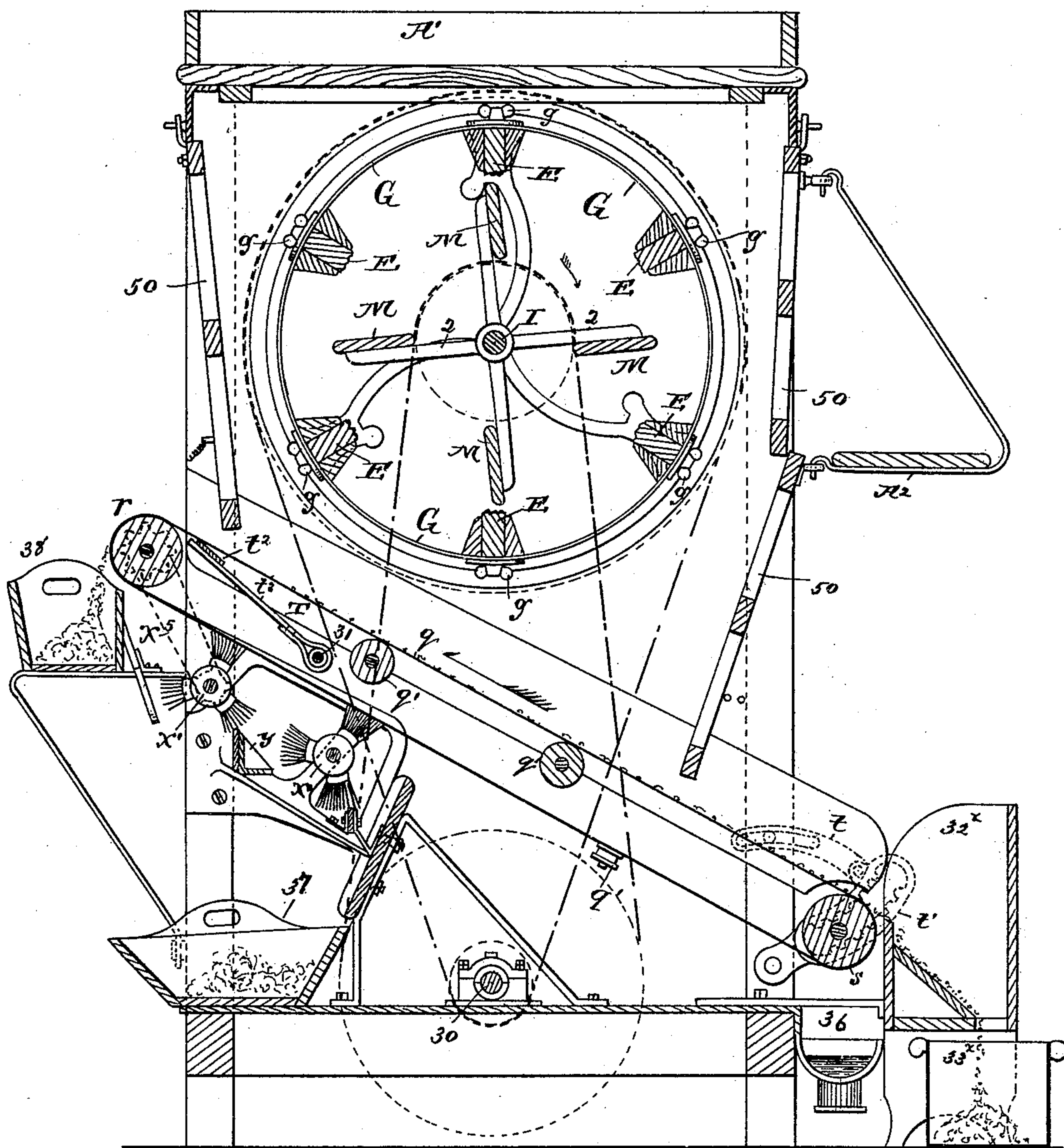
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Attest;

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Edw. M. Snowbridge.

Fig. 4.

Inventor;

Navarre Placide  
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# UNITED STATES PATENT OFFICE.

NAVARRE PLACIDE, OF PARIS, FRANCE, ASSIGNOR TO ALPHONSE BIARDOT,  
OF NEW YORK, N. Y.

## MACHINE FOR SHELLING PEAS.

SPECIFICATION forming part of Letters Patent No. 496,206, dated April 25, 1893.

Application filed February 3, 1892. Serial No. 420,225. (No model.) Patented in France August 23, 1889, No. 200,354.

*To all whom it may concern:*

Be it known that I, NAVARRE PLACIDE, a citizen of the Republic of France, and a resident of Paris, France, have invented a certain new and useful Improvement in Machines for Shelling Peas, (for which I have obtained a patent of the Republic of France, No. 200,354, dated August 23, 1889,) of which the following is a specification.

My invention relates to improvements in machines for shelling peas, beans, and similar vegetable products.

The improvement refers to the organization and co-operation of pod breaking and crushing devices and cleansing and separating devices, by which in the first place the pods are crushed open, and in the second place the peas are separated from the débris of the pods.

In particular, the improvement relates to means for varying the angle of the crushing surfaces with each other, so as to adapt a machine to the various sizes, hardness, &c., of peas: it being necessary that the angle of the crushing surfaces should be variable, and the same not having been heretofore successfully accomplished. Finally my improvement also relates to the construction of the perforated partitions, by which peas are separated from the pods and sorted.

Referring now to the drawings which accompany the same, to aid in the description, Figure 1. is a longitudinal elevation of the machine, the framing being partly broken away to show the interior. Fig. 2. is a longitudinal elevation of the interior of the crushers, one side of the frame and of the perforated sheet metal cylinder being removed, to show the interior. Fig. 3. is an elevation of the main pulley end of the machine. Fig. 4. is a cross section on the line  $x-x$  of Fig. 1. Fig. 5. is a detail of the clutch for varying the angle of the crushers. Figs. 6 and 7, are a broken plan and section respectively of the perforated sheet metal lining of the external crusher.

The machinery, contained in the frame A, A, consists, first, of the external and internal pod crushers. The external crusher consists of two cylindrical flanged metal heads B, and C; whereof head B, is fixed on the hollow shaft

$b$ , supported in pillow blocks on the frame A, and through which passes axially the driving shaft I, and head C, (which is annular in shape, being open in the center,) is supported on the rolls D, D'. Said heads B, C, are connected by the longitudinal crusher bars E, E, preferably made of wood, with corrugated inner surfaces, (see Fig. 4) and attached to the heads B and C, by clamp irons F, F, and bolts  $f$  (Fig. 3). On said heads B, C, and on the outer edges of the crusher bars E, E, is secured by bolts  $g$ ,  $g$ , a sheet, (or sheets) of perforated metal G, said sheet G filling the interval between the bars E, E, and constituting substantially a perforated cylindrical shell. The perforations  $g'$ ,  $g'$ , are of a size to permit the largest pea to fall through but to prevent the pods from falling through, and said perforations are formed with very smooth edges, so as not to injure the peas, by turning back the metal rims,  $g^2$ ,  $g^2$ , formed at the punching of the perforations, and then tinning the sheets G. This formation gives a very smooth rim to the perforations  $g'$ ,  $g'$ , so that the tender peas are not injured, and it is a very useful part of my invention, and applicable to various separating machines. I prefer to turn back the said rims  $g^2$ ,  $g^2$ , on the inside of the shell, so as to offer an obstacle to the pieces of pods falling through and by reason of the roundness and smoothness of said rims, this can be done without injuring the peas. Said external crusher is rotated by the pulley  $h$ , to which power is communicated from any suitable motor.

The internal crusher consists of longitudinal helicoidal crusher arms M, M, preferably four in number and of wood, and fixed on a longitudinal shaft I, in the following manner: Near each head, B, and C, is a cross head, J, and K respectively, on the shaft I. Each of said cross heads consists of a hub 1 and arms 2, 2, and said cross head J, is fixed on the shaft I, but cross head K is set on a hollow shaft  $k$ , which has a clutch face  $o$  on its inner end, and corresponding with the other member  $n$ , of the clutch, which is fixed on shaft I, and a ring and stumps  $p$  on its outer end, beyond head C, to be engaged by a tool for the purpose of turning the cross-head K, on the shaft I.



P, is a spiral spring between the hollow shaft K and the shoulder *j*, on the shaft I, so as to force the clutch face *o* into engagement with the clutch *n*. The aforesaid crusher bars M, M, are bolted on the arms of the cross heads J, K, by slots *m*, and bolts *m'*, equidistant from the shaft I and very near to the corrugated surfaces of the bars E, E, and there may be a middle cross head L, turning loosely on the shaft I, and having its arms bolted to the crusher bars M, M. Now it is evident that by drawing cross head K a little to the left so as to disengage the clutch face *o* from the clutch *n*, and then turning the cross head K, the crusher bars or blades M, M, will take varying helicoidal or screw-like curves, (see Fig. 2) according to the angle to which the cross head K is deflected. The spring P will then hold the hollow shaft *o*, engaged in the clutch *n*, so as to keep the cross head K at any given angle; P' is a pointer indicating the degree of deflection. The curvature of the blades M, M, is such that when the machinery is running forward, as indicated by the arrow in Fig. 3, the blades M, M, will tend to work the contents of the crusher toward the right and expel them at that end, and the curvature of said blades M, M, needs be but slight, but in Fig. 2 said curvature is exaggerated for sake of clearness. Said external and internal crushers are rotated in the same direction but at different velocities by pulleys *h*, 26 25, and 39, or they may be rotated in opposite directions; or the external crusher may be stationary and the inner crusher only revolved, it only being necessary that their angular velocity around shaft I shall be different.

The pods are put into the trough A', and shoveled by a workman who stands on bracket A<sup>2</sup>, into the spout C' which delivers them through the end plate C<sup>2</sup>, at the open annular head C, into the crusher. Then as the crushers revolve the pods are caught between the crusher arms or blades E, E, and M, M, and broken open, falling with the peas on the perforated metal sheet G. The peas fall through the perforations *g'*, *g'*, upon the cleaner and separator Q, but the pods are pushed by the arms M, M, out at the right of the crusher upon the shaker, 10. Said shaker 10, consists of the inclined trough 11, with stepped perforated metal bottom 12. Said bottom 12 is preferably formed with smooth orifices as hereinbefore described, and beneath the bottom 12 is another bottom 13, connecting with spout 14, the space between bottom 12 and 13 being closed at its lower end. Said shaker 10 rests at its upper end loosely on the frame A, a chain and pin 15, serving to prevent removing said shaker 10 entirely from frame A, and its lower end is engaged by the upper end of the lever 17, which is pivoted at 18 and has its lower end actuated by the cam wheel, 20, on shaft 30. Thus the shaker 10 is vibrated to assist the pods to fall down the stepped bottom and to sepa-

rate any peas that may have fallen into the shaker 10; such peas drop through the perforated bottom 12, and are discharged by spout 14 into receptacles. As hereinbefore said the peas fall from the crushers upon the cleaner and separator Q, which consists of an endless apron *q*, of any suitable elastic water proof fabric, extending along under the entire length of the crushers and stretched at an inclination over the rollers *r* and *s*. Roller *r*, is driven by pulley 28, from pulley 29, on shaft 30, in such direction that the top surface of the apron *q* moves up the incline, and roller *s* is adjustable to the links *t*, *t*, at either end of the said roller; which links *t*, *t*, are also adjustable by means of the arms *t'* *t'*. Thus the position of the roller *s* may be shifted to vary the tension or inclination of the apron *q*. Said apron *q*, has guide rollers *q'*, *q'*, which are secured to the inner side of the apron *q*, at proper intervals to prevent said apron from rubbing against the uprights of the frame. The said guide rollers *q'* *q'* are conveniently attached to the apron, *q*, by being set on metal strips that are riveted to webs which are stitched to the inner side of the apron, the said metal strips of course being arranged transverse of the apron. The drawings do not show the strips or webs because this is a well understood method of construction.

Adjacent to, and under the extent of the apron *q*, are beaters T, which consist of heads *t*<sup>2</sup>, on arms *t*<sup>3</sup>, set on shaft 31, supported in the bearings 32 and having a lever or crank *v*, said lever *v*, being connected with a rod *v'* which passes through a guide *w*, and said rod *v'* having a hinged end piece *v*<sup>2</sup>, with spring *v*<sup>3</sup>, so that said piece *v*<sup>2</sup>, can turn downward, but not upward. Said piece *v*<sup>2</sup>, has a cam faced end, that is engaged at each revolution of shaft 30, by cam X<sup>6</sup> on said shaft 30, so that the rod *v'* is pushed up lengthwise by said cam X<sup>6</sup>, thereby oscillating the lever *v* and causing the beaters T to strike the under side of the apron *q*; 40 is a spring to draw back the rod *v'*. The bearings 32 of said shaft 31 are shiftably attached to the frame 33 by slots and bolts, so that said bearings 32 can be moved toward or from the pulley 29, and thereby the force of the blow of the beaters T, or the apron *q*, can be varied.

The use of the apron *q*, is as follows: Peas with some fragments of pods fall from the crushers on said apron *q*. The peas roll down the incline of the apron *q*, into receptacle 32<sup>x</sup>, being assisted thereto by the beating of the apron, and any very small peas, known as "superfine" are by said beating prevented from clinging to the apron *q*, but are made to roll down into the receptacles 37. From receptacles 32<sup>x</sup>, the peas fall into vessels 33<sup>x</sup>, and may be thereafter sifted if necessary. But the fragments of pods cling to the apron *q*, are carried up the incline and over into the receptacles 38. In Fig. 3 one of the said heads, *t*<sup>2</sup>, is shown projecting below the under side of the apron, *q*, thereby indicating the posi-



tion of said head  $t^2$  when its blow upon said apron is finished. It will be understood that said apron will be at that instant depressed below the head  $t^2$ .

5 The apron  $q$ , is cleansed by brushes  $X$ , on shafts  $X'$  extending the width of the belt  $q$ , and which are revolved by sprocket wheels  $X^2$ ,  $X^3$ , actuated by the pulley 28, and chains  $X^4$ ,  $X^5$ , or similar means. The brushes  $X$  clean themselves on blades  $y$ , as they revolve. I may also use sponges disposed in a manner similar to the brushes alone or in connection with the brushes, to cleanse the apron, and in that case will provide jets of water to wet the sponges. The water and dirt are collected in the receptacle 37.

36 is a trough to catch the drippings from the lower end of the apron  $q$ .

To facilitate examining the machine panels 50 are provided in the framing  $A$ ,  $A'$ , which are removable at will.

Having now described my improvement, I claim as my invention—

1. In separating machines, a crusher consisting of rotatably supported heads, crusher-bars connecting said heads, and screens filling the intervals between said bars and having orifices with rims rounded back and being tinned, as and for the purpose described.

30 2. In pod separating machines, a crusher consisting of a rotatable shaft, a cross head fixed on said shaft near one end of the crusher, a cross head placed loosely on said shaft near the other end of said crusher, a coupling device on said second crosshead adapted to engage with a coupling on the shaft, and a spring to press the crosshead coupling into engagement with the shaft coupling, substantially as described.

40 3. The combination in separating machines of an external crusher consisting of heads, longitudinal bars connecting the heads, and screens filling the spaces between said bars and having orifices formed with rounded rims and said screens being tinned, and an internal crusher consisting of helicoidal arms set

on a rotatable shaft that is axially disposed in said external crusher, as and for the purpose described.

4. In separating machines, the combination 50 of an endless traveling apron set at an inclination to the horizontal and with its upper surface moving up the incline, beater heads,  $t^2$ , on arms  $t^3$ , oscillated by a rotatable shaft, having a crank,  $v$ , connecting rod  $v'$ , cam-faced end piece,  $v^2$ , rotating cam,  $x^6$ , and retractile spring 40, substantially as described. 55

5. In separating machines, a shaker consisting of a trough having a perforated stepped bottom and a lower imperforate bottom, and 60 a discharge pipe in said lower bottom, in combination with a lever which bears at one end under said lower bottom and at its other end on a cam wheel, substantially as described.

6. In separating machines, a screen or 65 screens consisting of sheet metal having orifices punched therein, the rims of said orifices being rounded back and being tinned, as described.

7. In separating machines, the combination 70 of an external crusher consisting of rotatably supported heads, longitudinal crusher bars connecting said heads, a cylindrical envelope of perforated sheet metal around said bars and an internal crusher consisting of a cross head fixed on an axial shaft within said cylindrical envelope a cross head loose upon said shaft near the middle thereof, a cross head set movably on said shaft at the end thereof opposite to said fixed cross head, a 80 clutch to fix said last named cross head, a spring to actuate said clutch, and longitudinal arms secured on said three cross heads by slots and bolts, as described.

In testimony that I claim the foregoing as 85 my invention I have signed my name, in presence of two witnesses, this 21st day of September, 1891.

NAVARRE PLACIDE.

Witnesses:

ROBT. M. HOOPER,  
G. CHATEL.