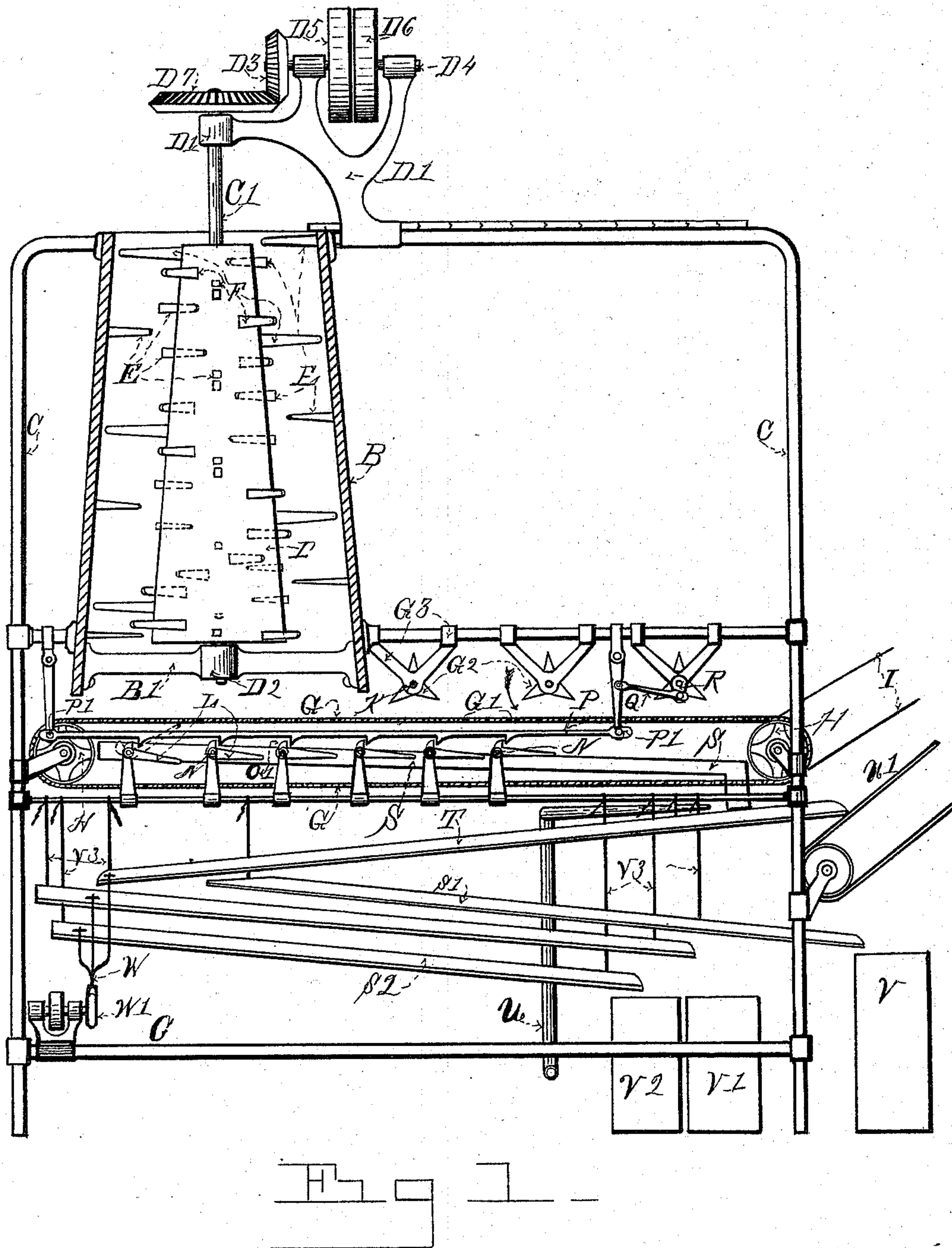


2 Sheets—Sheet 1.

No. 527,955.

Patented Oct. 23, 1894.



Witnesses

L O Scott

John E. Sweet

Inventor

By his Attorney John H. Empson

A. S. Bailey.

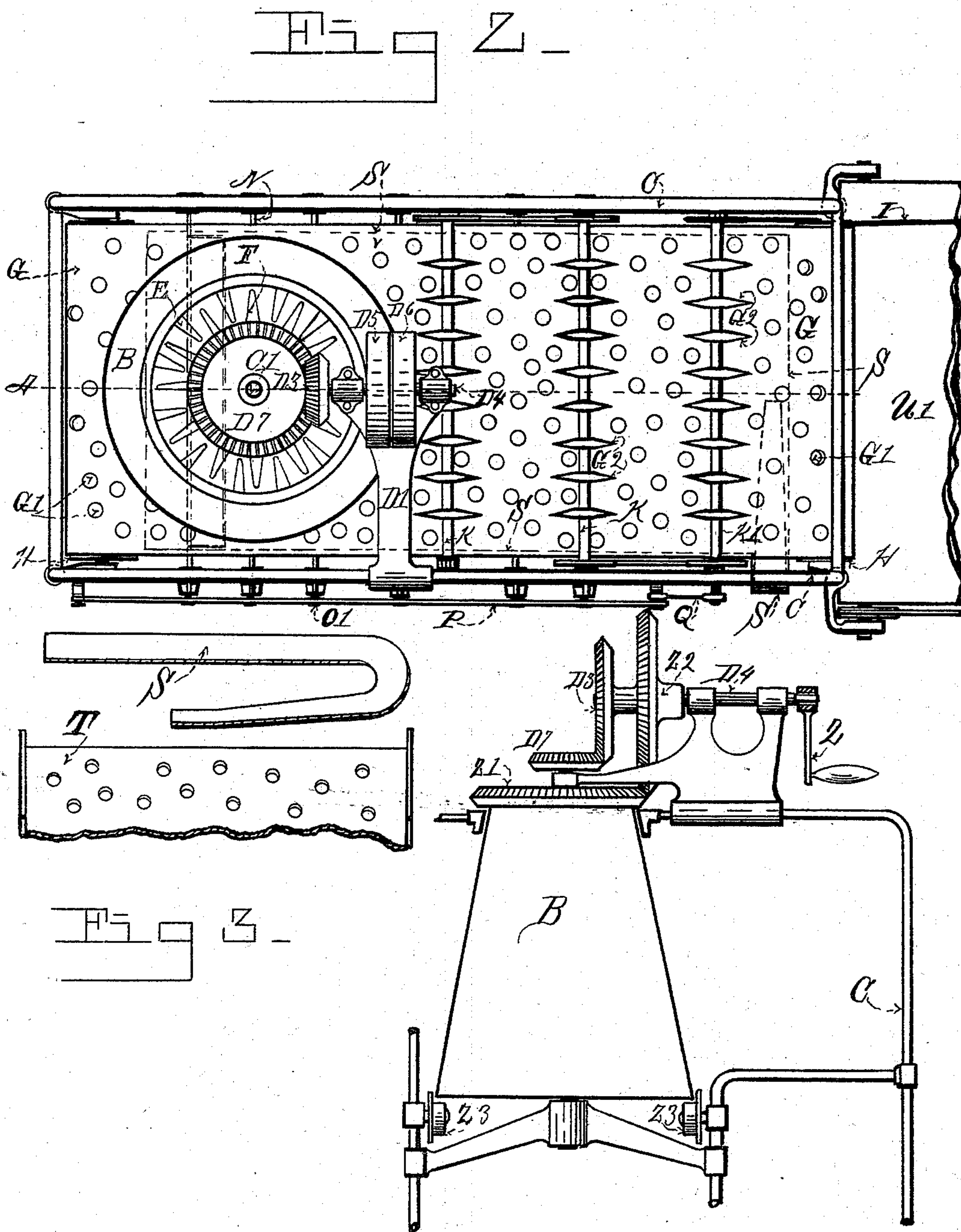
(No Model.)

2 Sheets—Sheet 2.

J. H. EMPSON.
PEA SHELLING MACHINE.

No. 527,955.

Patented Oct. 23, 1894.



Witnesses
L. O. Scott
John E. Meier

Inventor
John H. Empson
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UNITED STATES PATENT OFFICE.

JOHN H. EMPSON, OF LONGMONT, COLORADO.

PEA-SHELLING MACHINE.

SPECIFICATION forming part of Letters Patent No. 527,955, dated October 23, 1894.

Application filed September 4, 1893. Serial No. 484,769. (No model.)

To all whom it may concern:

Be it known that I, JOHN H. EMPSON, a citizen of the United States of America, residing at Longmont, in the county of Boulder and State of Colorado, have invented certain new and useful Improvements in Pea-Shelling Machines; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

My invention relates to improvements in machines for shelling or hulling peas from the vines, and also from the pods after they have been picked from the vines.

The objects of my invention are first, to provide a machine of greater shelling capacity than any at present in use; second, to provide a machine embodying several novel improvements which have suggested themselves by practical experience with them. I attain these objects by the mechanism illustrated and described in the accompanying drawings and specification, in which—

Figure 1 represents a longitudinal, sectional view through the center of Fig. 2 on line A. Fig. 2 represents a plan view of my improved pea shelling machine with the feed table removed. Fig. 3 represents a fragmentary end view of a portion of the pea sorting mechanism. Fig. 4 represents a side view of a portion of the machine showing it arranged for shelling peas from the pods by hand power.

Similar letters of reference refer to similar parts throughout the several views.

During several years of practical experience with pea shelling machinery as operated in a canning factory I have been led to believe that the principle of separating them from the pods and vines by "impact in air" or by striking them with beaters as they fall by gravity from the top of a revolving cylinder arranged to carry them partially around, is at fault both in theory and practice, first, because machines constructed on this principle do not do the work thoroughly; second, their action on the peas is slow and consequently the capacity is small; third, the

beaters do not thoroughly separate the vines, and consequently numerous pods secreted among them escape action; fourth, in straight, horizontally arranged cylinders the vines frequently choke up, necessitating a stoppage of the plant and the loss of considerable time. To obviate these difficulties it is necessary to start with an entirely new principle of treatment, which consists of rapidly rotating the vines in a stationary, vertical, conical cylinder and tearing them apart by means of spirally arranged thrasher blades or arms. To carry this principle into effect I proceed as follows:

Referring to Fig. 1, B. represents a stationary, vertical conical shell of any convenient form of cross section or material. It has been the practice in pea shelling machinery to make this outer shell revolve, also to fill it full of holes for the shelled peas to drop through. I find that much better results are attained by dispensing with both of these devices. Consequently I make this shell stationary and with the sides entirely closed, leaving both ends entirely open with the exception of suitable spokes, B', which support the lower end of the shaft, C', of the inner cylinder or drum D. Upon the inner surface of said shell I arrange in the form of a screw thread one or more rows of thrasher blades E, one row being shown in the cross section, Fig. 1.

A frame work of pipe, C, supports the shell and cylinder, and also the numerous driving pulleys, belts and shafts that are necessary to transmit motion to the various operating parts, which will be described hereinafter more in detail.

D. designates a conical cylinder or drum journaled centrally in the above mentioned shell in bearings D' and D². The lower bearing D² is attached by the spokes B' to the outer shell, and the top bearing D' to one of the pipes of the frame. The shaft C' of said inner cone extends above the bearing D', and carries a bevel gear D⁷ in which meshes a like bevel gear, D³, supported by a shaft D⁴, journaled in the said bearing. This shaft D⁴ also carries driving pulleys D⁵ and D⁶. By means of this arrangement which is illustrated and is one of many that might be adopted, a rotative motion is given to the said

inner cylinder D. The surface of this inner cone is also provided with one or more rows of thrasher blades F. arranged in the form of a screw or thread, but preferably arranged
5 with the pitch opposite from that of the blades E of the outer shell B.

The blades on both shell and cone are arranged a short distance apart and this distance is successively diminished through the
10 length of the said shell and cone. The blades on the cone are also arranged to pass between the blades of the shell and to approach close to its surface so as to catch and keep all vines in rapid rotative motion. The object of de-
15 creasing the distance between the blades as they proceed through the shell is to subject the vines to an increasing finer treatment as they travel through the shell, which is necessary, as they are fed into the shell in tangled
20 masses and are quickly torn apart, and small pieces carrying one or more pods are very apt to escape treatment. It is also for this reason that the shell and cone are made conical.

It is found in practice that some pods re-
25 quire more severe action, or a higher rotative and concussive treatment than others to separate the peas from them. I accomplish this by increasing the diameter of both shell and cone from the feed end to the exit end. This
30 gives the blades or arms at the exit end a higher rate of speed, and together with the variable arrangement of the blades completely separates the peas from the pods. The shelled peas and the vines drop from the shell onto
35 the endless belt G, which may be made of canvas, leather or rubber. It is stretched on drums or on sprocket wheels H. journaled at opposite ends of the frame, and receives motion from a belt I or similar means connecting
40 to any kind of motive power. This belt G. is allowed to sag slightly at the center and its entire surface is perforated with holes G' for the peas to fall through. In order however to facilitate the lateral movement of the vines
45 and to sift from them such shelled peas as may lodge among them, I arrange across the belt G, several rotary tedders G², which are journaled in suitable bearings G³, attached to the frame. These tedders as shown consist of
50 a series of forks G², arranged a short distance apart on the shafts K. They should be arranged to pick up and let fall the vines on the belt as they travel along with it, which action tends to loosen the peas lodged among them.

55 On the under side of the top part of the belt I also arrange a series of belt agitators L. These may consist of a loop L, of metal or wood pivoted to each side of the frame at N.

On the pivoted ends of the levers L, a slight
60 projection O' is formed, which extends in the path of an oscillating lever P, which is provided with a number of like projections arranged to abut against the projections O' violently so as to throw the loops L against
65 the under side of the perforated belt. The oscillating lever or arm P, is pivoted at P' and receives motion from a pitman Q, pivoted

to a crank arm R, secured to the end of the shaft K'.

Between the folds of the belt I arrange a
70 chute S. to catch the peas as they drop. The peas are led by this around the edge of the belt to the center of the sieve T, upon which they are dropped, passing by a current of air from the pipe U. which may connect with a
75 blower attached to the frame, or be located at some remote point while the chaff drops on the conveyer U', and is carried away. Fig. 3 is an end elevation of a fragmentary section of this chute and the sieve T.
80

Several perforated sieves may be arranged below the belt with chutes S' and S² arranged below each to catch the peas that drop through them and convey them to the boxes V, V' and V², thus dividing them into sizes, which is nec-
85 essary for commercial purposes. These sieves are preferably hung on straps V³, which allows them to be adjusted to secure the proper pitch. They receive agitation from a pitman W and eccentric W', or any similar arrangement.
90

This machine built of suitable size to allow its being readily handled, can be used in hotels and large restaurants for shelling peas from the pods, the operation by hand being very tedious and requiring considerable time
95 where several bushels have to be prepared for the table. Only slight modifications are necessary. For instance the bevel gear on the shaft C', could be reduced to a small pinion and the gear enlarged on the shaft D⁴,
100 and a crank Z placed on the end of said shaft in place of the pulleys. The outer cylinder may be made to revolve which can be done by an additional pair of gears Z' and Z², as shown in Fig. 4. Rollers, Z³, may be used if
105 desired to support the outer cylinder. The perforated endless belt, or a like operating device should be retained, but the sieves can be dispensed with, and the machine simply reduced to miniature form.
110

Having described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A pea sheller having a frame, a stationary shell on said frame, a rotatable drum in
115 said shell, thrasher blades on said shell and drum, a series of tedders in line with the discharge end of said shell, and a rotating endless belt below said tedders said parts being combined substantially as described.
120

2. The combination with the shell and inner drum in a green pea sheller, of an endless, perforated rotating belt arranged below said shell and drum; of a series of tedders arranged to agitate the vines; of an arm or
125 arms arranged below the top of said belt and adapted to intermittently violently contact with it; of a chute arranged to catch the peas from said perforated belt and conduct them to the sieves; of a pipe communicating with
130 a blower and adapted to produce a current of air intercepting the peas between the chute and sieves and the belt and chaff conveyer, operating to separate the chaff from the peas;

of a series of sieves arranged to separate the peas into sizes, all arranged as herein set forth and described.

3. The combination in a green pea shelling machine of a frame preferably of tubing supporting a vertical conical shell arranged stationary or revoluble, having inwardly projecting arms arranged spirally and spaced successive diminishing distances apart; of an inner conical drum journaled in said shell, and provided with projecting arms spaced to pass between the arms of said outer shell; of an endless, perforated, revolving belt arranged below said shell; of tedders arranged across said belt and means for rotating them; of agitators arranged to agitate said belt by contact with it; of a blower with pipe producing a current of air arranged to separate the

chaff from the peas and a series of perforated sieves arranged to separate the peas into sizes, all arranged as and for the purpose herein set forth and described. 20

4. In a pea sheller, a traveling belt in combination with a pivoted lever having a projection on its pivoted end, of an oscillating lever with a projection thereon adapted to abut against the projection on the first mentioned lever, and mechanism substantially as described, connecting said oscillating lever with a rotary shaft, substantially as described. 25 30

In testimony whereof I affix my signature in presence of two witnesses.

JOHN H. EMPSON.

Witnesses:

L. O. SCOTT,
JOHN E. MEEK.