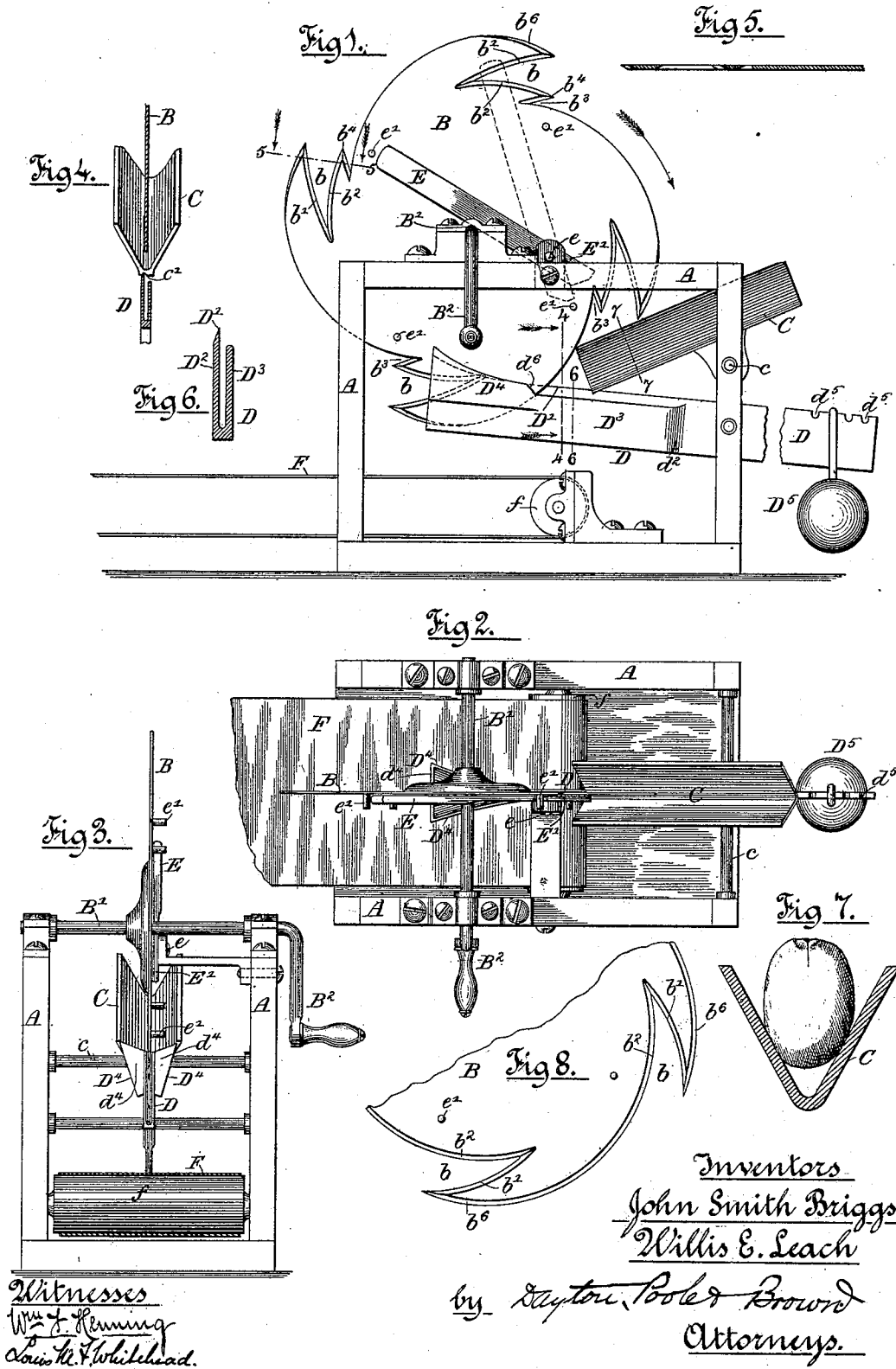


J. S. BRIGGS & W. E. LEACH.
FRUIT STONING MACHINE.

No. 404,517.

Patented June 4, 1889.



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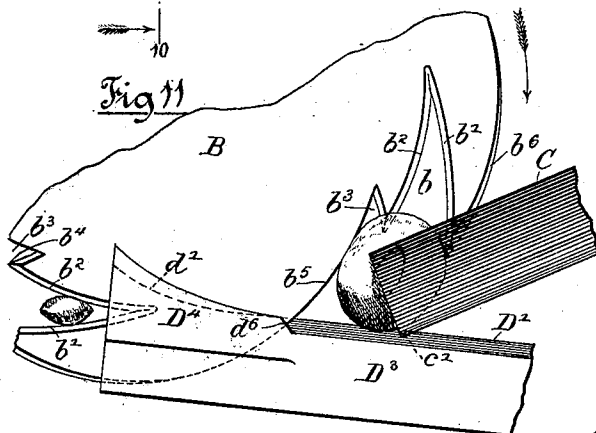
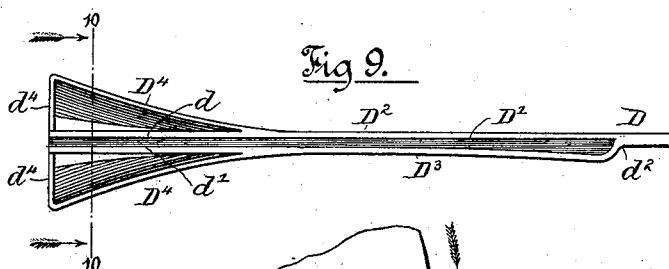


Fig 12.

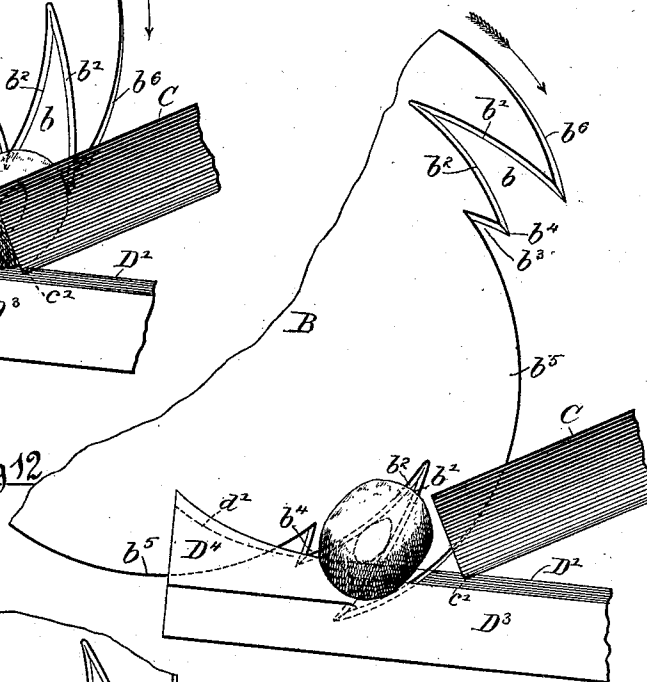


Fig 13.

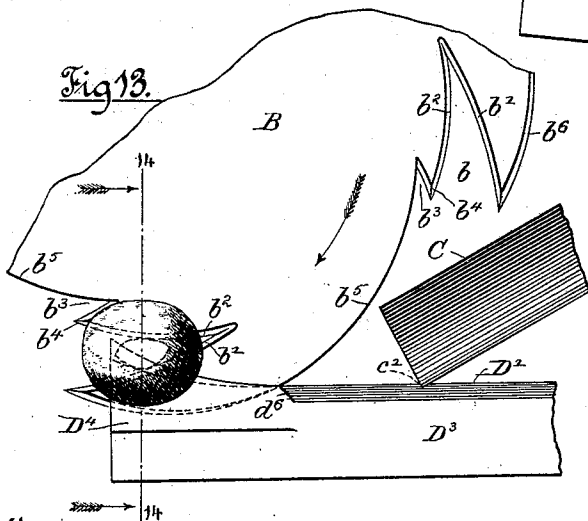
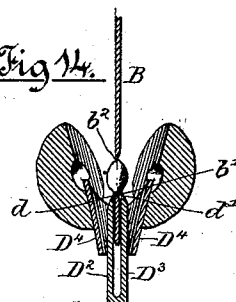


Fig 14.



Witnesses

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UNITED STATES PATENT OFFICE.

JOHN SMITH BRIGGS AND WILLIS ELGIN LEACH, OF SAN BUENAVENTURA,
CALIFORNIA.

FRUIT-STONING MACHINE.

SPECIFICATION forming part of Letters Patent No. 404,517, dated June 4, 1889.

Application filed December 4, 1888. Serial No. 292,587. (No model.)

To all whom it may concern:

Be it known that we, JOHN SMITH BRIGGS and WILLIS ELGIN LEACH, of San Buenaventura, in the county of Ventura and State of California, have invented certain new and useful Improvements in Fruit-Stoning Machines; and we do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to an improved machine for cutting and stoning or removing the pits of fruit, such as apricots, peaches, plums, and the like.

The invention consists in the matters described, and pointed out in the appended claims.

In the accompanying drawings, illustrating our invention, Figure 1 is a side elevation of a machine embodying the same. Fig. 2 is a plan view thereof. Fig. 3 is an end elevation thereof. Fig. 4 is a detail section taken upon line 4 4 of Fig. 1. Fig. 5 is a detail section taken upon line 5 5 of Fig. 1. Fig. 6 is a section taken upon line 6 6 of Fig. 1. Fig. 7 is a detail section of the feed-trough, taken upon line 7 7 of Fig. 1. Fig. 8 illustrates a modified form of the revolving cutting-disk. Fig. 9 is a detail plan view of the lower movable knife of the machine. Fig. 10 is a cross-section of the same, taken upon line 10 10 of Fig. 9. Figs. 11, 12, and 13 illustrate the cutting-disk, movable cutting-knife, and feed-trough in different positions during the action of the same upon the fruit. Fig. 14 is a detail section taken upon line 14 14 of Fig. 13.

As illustrated in the said drawings, A is the frame for sustaining the several parts of the machine, said frame herein shown as consisting of suitably-arranged horizontal and vertical parts forming a frame of rectangular form.

B is the revolving cutting-disk of the apparatus, which is mounted upon a horizontal shaft B', having suitable bearings in the frame A. Said disk B is provided with a plurality of long and acutely-pointed forwardly-

projecting hooks or knives, the inner edges of which form, with the opposite knife-edges upon the adjacent parts of margins of the disk-proper, V-shaped notches *b b*. In the particular construction illustrated in the drawings four of said notches *b b* are present; but a greater or less number of such notches may be used in practice, as found convenient or desirable. The inner edges of the said knives are provided with sharpened edges *b'* *b'*, and the adjacent parts of the disk with sharpened edges *b'' b''*. In the particular construction illustrated in Figs. 1, 5, 11, 12, and 13 the disk is provided also with secondary knives or points *b⁴*, formed by V-shaped notches *b³* at the side of the notches *b* nearest the body of the disk. As illustrated in Fig. 8, however, the secondary notches *b³* and points *b⁴* are absent, the same being desirable for certain reasons, as will hereinafter appear, but not essential, inasmuch as under some circumstances the machine will operate in a satisfactory manner without said secondary knives.

C is a feed-trough, which is pivotally supported upon the frame A by means of a pivot-rod *c*, the free end of which is located partially beneath and adjacent to the edge of the disk B. Said trough C is of V shape in cross-section, and its central line or longitudinal axis is located in the same plane as the disk B, so that in the revolution of the disk the peripheral knives thereof pass centrally through the lower part of the trough and come opposite or in alignment with the angle at the bottom of the same.

D is a horizontally-arranged lever pivoted upon the machine-frame beneath the trough C, said lever being also located and arranged to swing in the same vertical plane as the disk B. In its part adjacent to the lower end of the trough C the lever D supports a knife or cutter D', which acts, in connection with the sharpened cutting-edges *b'* *b'* of the disk B, to cut the fruit. Said lever D is also provided adjacent to and in advance (referring to the direction of motion of the disk B) of the knife with two parallel pit-guides, preferably sharpened at their upper edges and

arranged to allow the passage between them of the margin of the disk. One (d) of said pit-guides forms a continuation of the edge of the knife D' . As herein shown, the pit-guide d is formed by the upper edge of a vertical plate D^2 , which is made integral with the knife D' , while the pit-guide d' is formed by the upper edge of a plate D^3 , arranged parallel with the plate D^2 and secured thereto at its bottom edge. The plate D^3 is desirably extended rearwardly past the end of the trough, and is connected with the main part of the lever D at a point at the rear of the lower end of the said trough, as indicated at d^2 , Fig. 1. The upper edge of the plate D^3 in its part adjacent to the knife D' is blunt, and is arranged below the knife D' , as clearly shown in the drawings, Fig. 1, such blunt edge of the plate being adapted to enter the cut made by the knife D' .

D^4 D^4 are outwardly-diverging guides or spreaders attached to the lever D outside of and adjacent to the pit-guides d d' , said spreaders being attached to the plates D^2 D^3 at their rear ends, or those nearest the trough C , and being arranged to diverge or spread apart, so that adjacent to the extreme ends of the pit-guides they stand at a considerable distance from the said pit-guides. For convenience of construction the free ends of the spreaders D^4 D^4 are supported by transverse pieces d^1 d^1 , connecting the same with the said plates D^2 D^3 in the manner illustrated in Fig. 9.

D^5 is a weight applied to the end of the lever D remote from the disk B , said weight being adapted to depress the outer end of the lever and lift the end of the same which carries the knife D' and other parts described, thereby carrying said parts toward the center of the said disk B . The lever D is herein shown as provided with notches d^5 d^5 to receive the ring supporting the weight by which the pressure or force exerted by the weight may be controlled as necessary in operating upon fruit having different characteristics as regards hardness, toughness of skin, &c. It will of course be understood, however, that a spring may be substituted for the weight, and that when a spring is used the lever D need not be arranged horizontally, as shown.

Motion may be given to the disk B for turning the same in the operation of the machine either by hand or any suitable motor. As herein shown, the shaft B' is provided with a hand-crank B^2 , by which the same may be turned.

The free end of the trough C , or that nearest the disk B , is supported in position for operation by the resting of its said inner end upon the upper edge of the lever, so that as the lever rises and falls in the operation of the machine the end of the trough will have a corresponding movement. It follows that the trough is held in proper position for operation at all times during the action of the machine through the medium of the said lever. The knife D' is desirably extended to

if not somewhat beyond the inner end of the trough, and in order to provide suitable engaging-surfaces between said parts the end of the trough is desirably provided with a notch c' , Fig. 4, which is engaged by the edge of the said knife.

The operation of the machine in splitting the fruit and removing the pit or stone therefrom is more clearly shown in Figs. 11 to 14, and is as follows: It is desired that the fruit should be split flatwise or through the crease and the point of attachment of the stem, and for this purpose the inclined walls of the trough C are arranged at an angle with each other less than a right angle, as shown in Fig. 7, this construction causing the fruit to pass or roll through said trough with its flatter sides in a vertical plane and with its crease in the same plane with the disk B . After the passage of each knife of the disk past the end of the trough the fruit in the trough—as, for instance, a number of apricots—will rest against the blunt edge b^5 of the disk intervening between the two knives, and the lowermost apricot will slide down through the trough in contact with said blunt edge as the latter recedes toward the center of the disk in approaching the notch until the same comes in contact with the knife D' , which at this time is at the upper limit of its movement, owing to the action of the weight D^5 upon the lever D . After the fruit has reached the position shown in Fig. 11 a continuation of the rotary movement of the disk B advances the cutting-edges b' b^2 into the fruit, and at the same time presses the fruit down upon the knife D' , and this action will continue until the said sharpened edges b' b^2 come in contact with the pit and the latter is brought against the said knife D' . At this time the fruit will be nearly cut in two or severed, as shown in Fig. 12. As soon as the said edges b' b^2 come in contact with the pit, the downward pressure of the said pit against the knife D' , caused by the rotary movement of the disk, will obviously tend to press or jam the pit between the converging sharpened edges thereof, and will thereby hold the pit strongly in place between the said sharpened edges and the knife D' . The degree of pressure thus exerted upon the pit to force the latter between said sharpened edges is of course regulated by the weight D^5 upon the lever D , the said lever yielding downwardly as the disk turns, so as to allow the pit to slide along first upon the knife D' and then upon the knife-edges d d' . As soon, however, as the fruit thus moved by the disk is brought into engagement with the diverging guides or spreaders D^4 D^4 , said spreaders tend to pull apart the halves of the fruit which have been severed by the action of the disk and knife, so that before reaching the end of said spreaders the halves of the fruit will be entirely separated from each other and from the pit, which will be held between the said edges b' b^2 of the notch and the pit-guides. During the sepa-

ration of the halves of the fruit from the pit by the action of the spreaders D^4 the pit will move or slide along the pit-guides, as clearly shown in Fig. 14, and will be thereby held additionally from lateral displacement. The said pit-guides are desirably upwardly curved as they approach the end of the lever, as clearly shown in Figs. 11, 12, and 13, and thereby aid in pressing the pit between the converging sharpened edges b' b^2 in the manner before described. The position of the parts just before the pit reaches the end of the lever is shown in Figs. 13 and 14, the pit at this time being gripped or held between the several sharpened edges of the disk and the pit-guides, as shown in Fig. 14, while the halves of the fruit have been separated from the pit and are about to drop or fall to the supporting-surface placed beneath the lever to receive them.

It will be observed that the plate D^3 supports the end of the spreader D^4 nearest the knife, and that said spreader is continuous with said plate and connected with the same at its side face by a smooth or gradual curve, so that the cut halves of the fruit may slide freely from the plate to the spreader as they are carried forward by the disk. As shown in the drawings, furthermore, the blunt edge of said plate D^3 is arranged below the edge of the knife, and the spreader is provided at its advance end with an oblique blunt edge d^6 , joining the top edge of the spreader with the said blunt edge of the plate D^3 . It follows from this construction that the said plate D^3 forms in effect a part of the spreader, and that the said blunt edge of the plate D^3 forms a part of the advance edge of the spreader, by which the spreader is enabled to enter the cut made by the knife, the blunt edge of the plate D^3 and the edge d^6 being continuous. It is not essential, however, that the said plate D^3 , arranged to support the forward edge of the spreader, should be extended past the knife D' and attached to the lever D in the manner shown, but said plate may be attached in any manner to the knife D' or lever, provided the plate is rigidly supported parallel with the knife in such manner as to allow the passage of the edge of the disk B between the knife and said plate. It is to be noted, furthermore, that the edge of the plate D^3 nearest the cutting-edge of the knife over which the fruit passes after it is cut by the knife and which enters the cut made by the knife, as above stated, may be arranged parallel with the edge of said knife, as shown in the drawings, or may be otherwise arranged, as desired, it being entirely obvious that the edge of the said plate will enter the cut made by the knife, and thus cause the spreader D^3 to carry the cut half of the fruit outwardly away from the pit, whether the said edge of the plate is placed at a greater or less distance from the advance end of the spreader, said edge of the plate which enters the cut made by the knife, inasmuch as it forms a continua-

tion of the edge d^6 of the divergent guide, forming in effect the advance edge of the spreader itself.

In the construction herein shown, wherein the plate D^3 is carried along the knife to a point beyond the end of the trough C , said plate is made to diverge slightly, Fig. 9, so that the slot between the plate and knife is widest at the point at which the knives of the disk B enter said slot. This construction insures the entrance of the points of the knives into said slot, notwithstanding slight irregularity in the movement of the parts.

An important advantage is gained by making blunt the edge of the plate D^3 , which enters the cut made by the knife, for the reason that if such edge were sharp it would cut into the fruit and act in connection with the knife to take from the latter a thin slice—an operation which would be highly disadvantageous in preparing fruit for drying. After the pit has been carried past the pit-guides d' , as shown in Fig. 11, the said pit will remain between the sharpened edges b' b^2 of the disk, from which it may be removed in any suitable manner—as, for instance, by an automatically acting device herein shown, and which will now be described.

E is a swinging lever arranged at one side of the disk B and mounted upon a pivot e , so arranged that the lever will swing in a plane parallel with the side face of the disk. Said lever E is so located that when moved or swung upwardly its free end will move forward past the notches b and so near the latter as to strike and dislodge pits or stones held therein. Any suitable device may be employed for swinging or moving the said lever E at the proper time to remove the stones or pits from each notch in the rotation of the disk. As herein shown, the disk is provided with studs e^2 , arranged to engage an arm E' of the lever E as the disk revolves, said pins e^2 being so located or arranged as to encounter the arm E' and throw the lever E upwardly toward the notches b as each notch reaches a position convenient for the movement of said lever past it for dislodging the stone therein. It will of course be understood, however, that any one of a great variety of actuating devices may be employed for actuating the knocker, operating substantially in the manner above described, and my invention is not, therefore, limited to any particular construction in such actuating devices for the knocker.

F in the drawings is a traveling apron or belt located beneath the revolving disk B and lever D , and adapted to receive the pieces of fruit separated from the pit by the machine. Said apron is herein shown as supported upon a roller f , which is mounted upon the frame A beneath the lever D . The apron F is intended for taking the fruit to a point some distance from the machine, where it is picked from the apron by hand and placed upon suitable drying-trays.

In the use of a disk shaped as illustrated in Fig. 8 the cutting of the inner side of the fruit, or that nearest the center of the disk, is accomplished by the pressure of the sharpened curved edge b^2 at the inner side of the notch b , which sharpened edge is in this instance extended considerably beyond or past the notch, so that it will act upon the fruit before the latter is embraced by the hook or knife of the disk. In some fruits, especially such as have a comparatively tough skin, and when the fruit is soft, the cutting-edge b^2 , formed as shown in Fig. 8, may not cut or sever the skin with sufficient promptness, a knife-edge thus made, in the case of very soft fruit, sometimes simply pressing the skin inwardly without cutting it. To insure the prompt and equal cutting action of the disk upon both sides of the fruit, I preferably employ therefor a construction embracing a secondary notch b^3 , which forms a sharpened point b^4 , adapted to puncture the skin when it strikes the fruit, and then cut the skin both outwardly and inwardly in the manner clearly shown in Fig. 11. The hooks or knives of the disk, or those parts outside of the notch b , are also provided with exterior sharpened cutting-edges b^6 , affording points which will operate in the same manner as the points b^4 to first puncture and then cut the skin of the fruit.

We claim as our invention—

1. A machine for the purpose described, comprising a revolving disk having forwardly-projecting peripheral hooks or knives and a knife or cutter yieldingly supported and moving in a plane parallel with the disk and in contact with the periphery of the latter, substantially as described.

2. A machine for the purpose stated, comprising a revolving cutting-disk having forwardly-projecting peripheral hooks or knives, a knife yieldingly supported and moving in a plane parallel with the disk and in contact with the periphery of the latter, and a movable inclined trough or guide for feeding the fruit to the disk and knife, substantially as described.

3. A machine for the purpose stated, comprising a revolving disk having forwardly-projecting peripheral hooks or knives, a knife yieldingly supported and moving in a plane parallel with the disk and in contact with the periphery of the latter, and divergent spreaders located at opposite sides of the disk adjacent to the end of the knife, substantially as described.

4. A machine for the purpose stated, comprising a revolving disk having forwardly-projecting peripheral hooks or knives, a knife yieldingly supported adjacent to the periphery of the disk, and yieldingly-supported parallel pit-guides arranged at opposite sides of the disk and adjacent to the said knife, substantially as described.

5. A machine for the purpose stated, com-

prising a revolving disk provided with forwardly-projecting peripheral hooks or knives, a knife yieldingly supported and moving in a plane parallel with the disk and in contact with the periphery of the latter, yieldingly-supported parallel pit-guides located adjacent to and at opposite sides of the periphery of the disk, and divergent spreaders located adjacent to and outside of the pit-guides, substantially as described.

6. A machine for the purpose stated, comprising a revolving disk having forwardly-projecting peripheral hooks or knives, a knife yieldingly supported adjacent to the periphery of the disk, and a movable feed-trough having its end nearest the knife sustained in position for operation by and movable with the latter, substantially as described.

7. A machine for the purpose stated, comprising a revolving disk having forwardly-projecting peripheral hooks or knives, a knife yieldingly supported adjacent to the periphery of the disk, and a weighted lever carrying said knife, substantially as described.

8. A machine for the purpose stated, comprising a revolving disk having forwardly-projecting peripheral hooks or knives, a knife yieldingly supported adjacent to the periphery of the disk, yieldingly-supported pit-guides located at opposite sides of the periphery of the disk, and a weighted lever sustaining said knife and pit-guides, substantially as described.

9. A machine for the purpose stated, comprising a revolving disk having forwardly-projecting peripheral hooks or knives, a knife yieldingly supported adjacent to the periphery of the disk, yieldingly-supported pit-guides arranged at opposite sides of the periphery of the disk, yieldingly-supported divergent spreaders arranged at opposite sides of the said pit-guides, and a weighted lever supporting said knife, pit-guides, and spreaders, substantially as described.

10. A machine for the purpose stated, comprising a revolving disk having forwardly-projecting peripheral hooks or knives and sharpened points b^4 , a knife yieldingly supported adjacent to the periphery of the disk, and a guide-trough, substantially as described.

11. A machine for the purpose stated, comprising a revolving disk provided with forwardly-projecting peripheral hooks or knives, a knife yieldingly supported adjacent to the periphery of the disk, and a V-shaped inclined feed-trough having its sides arranged at an acute angle with each other, substantially as described.

12. A machine for the purpose stated, comprising a revolving disk having forwardly-projecting peripheral hooks or knives, a knife yieldingly supported adjacent to the periphery of the disk, a feed-trough, and a movable knocker for dislodging pits or stones from the said disk, substantially as described.

13. A machine for the purpose stated, comprising a revolving disk having forwardly-projecting peripheral hooks or knives, a knife yieldingly supported adjacent to the periphery of the disk, and spreaders for separating the halves of the fruit, one of said spreaders being continuous with the yielding knife and the other having a blunt edge adjacent to the knife adapted to enter the cut made by the knife, substantially as described.

In testimony that we claim the foregoing as

our invention we affix our signatures in presence of two witnesses.

JOHN SMITH BRIGGS.
WILLIS ELGIN LEACH.

Witnesses to signature of J. S. Briggs:

C. CLARENCE POOLE,

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