

No. 709,658.

Patented Sept. 23, 1902.

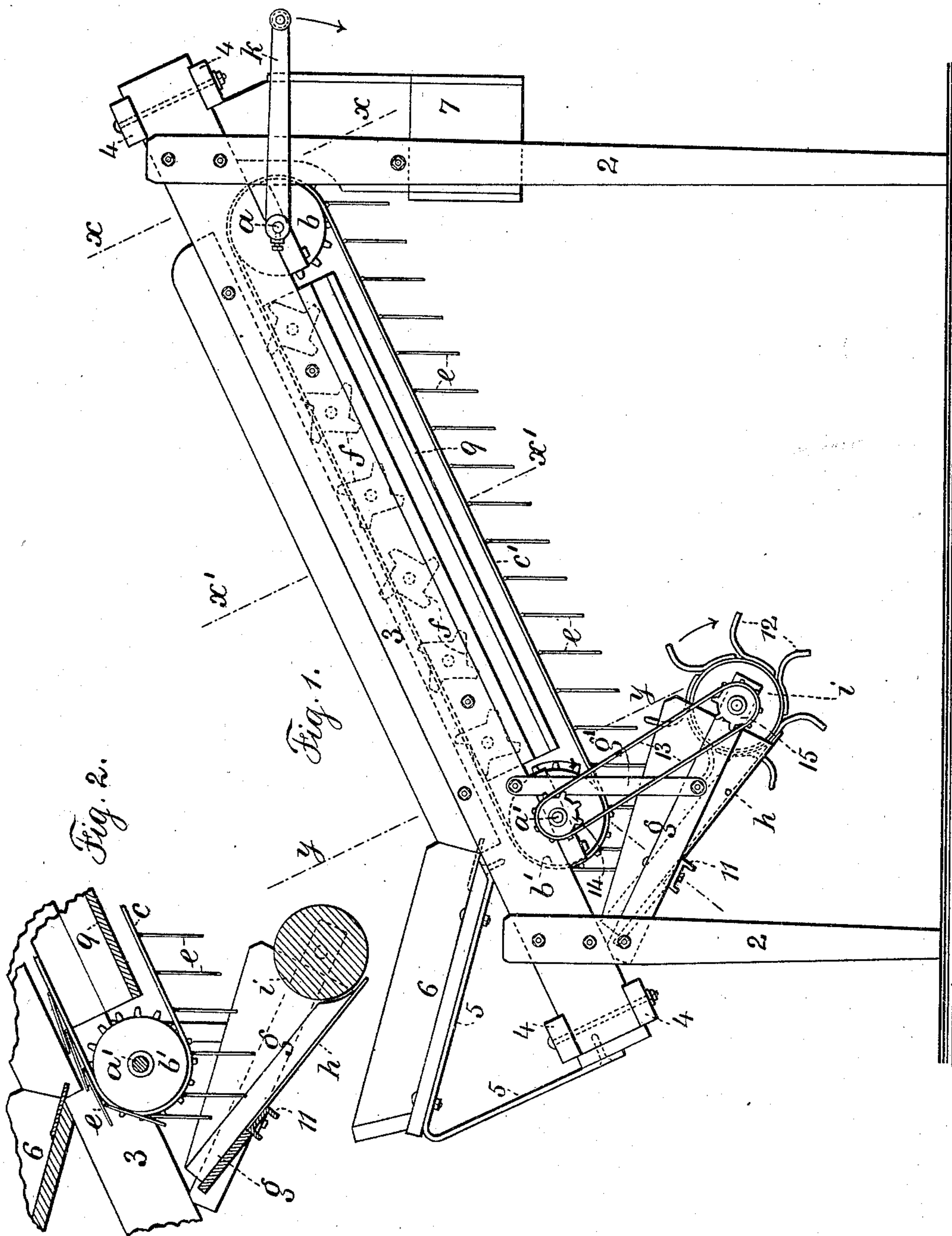
L. A. ASPINWALL.

POTATO SORTER.

(Application filed Sept. 28, 1901.)

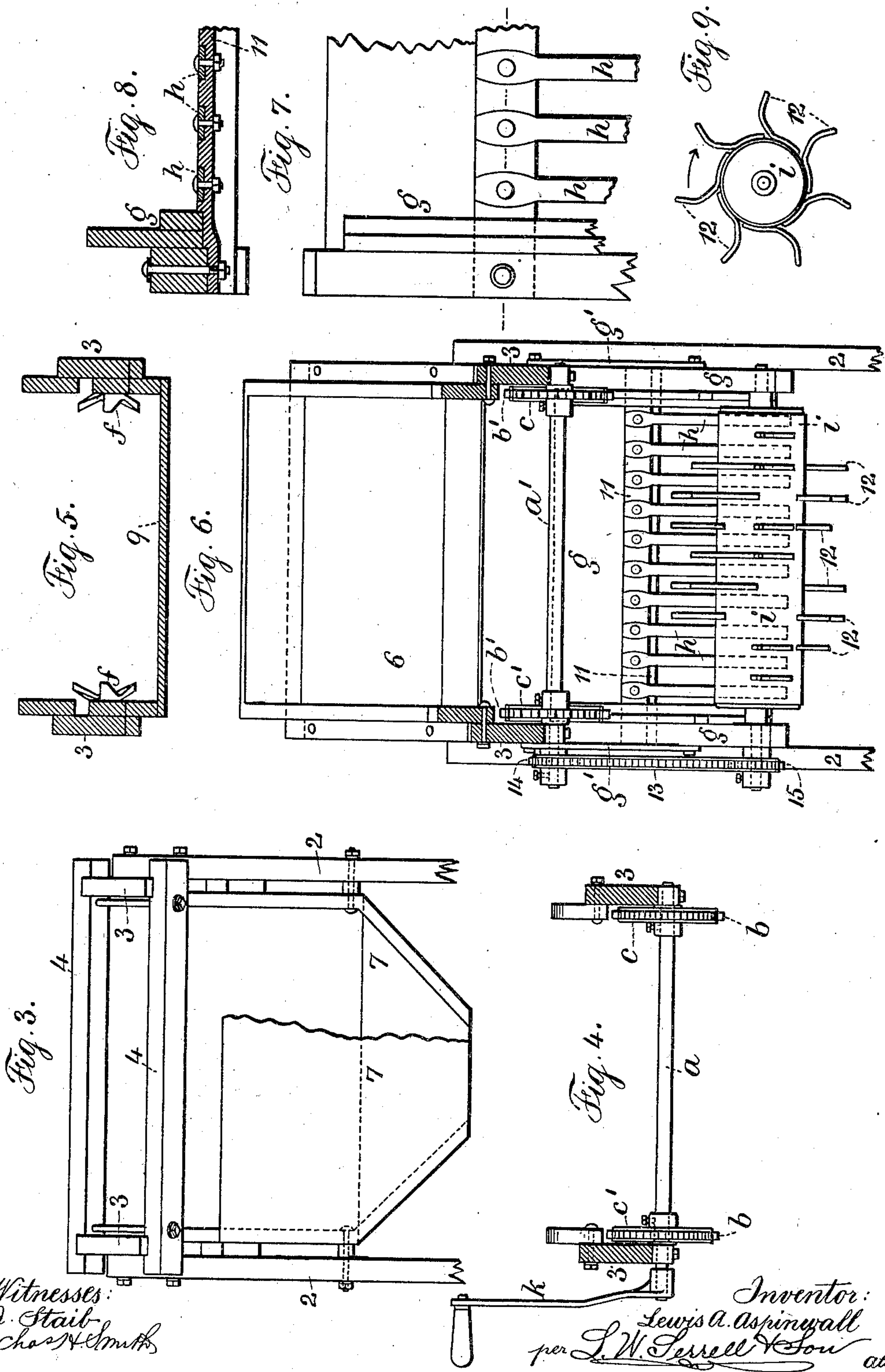
(No Model.)

3 Sheets—Sheet 1.



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3 Sheets—Sheet 3.

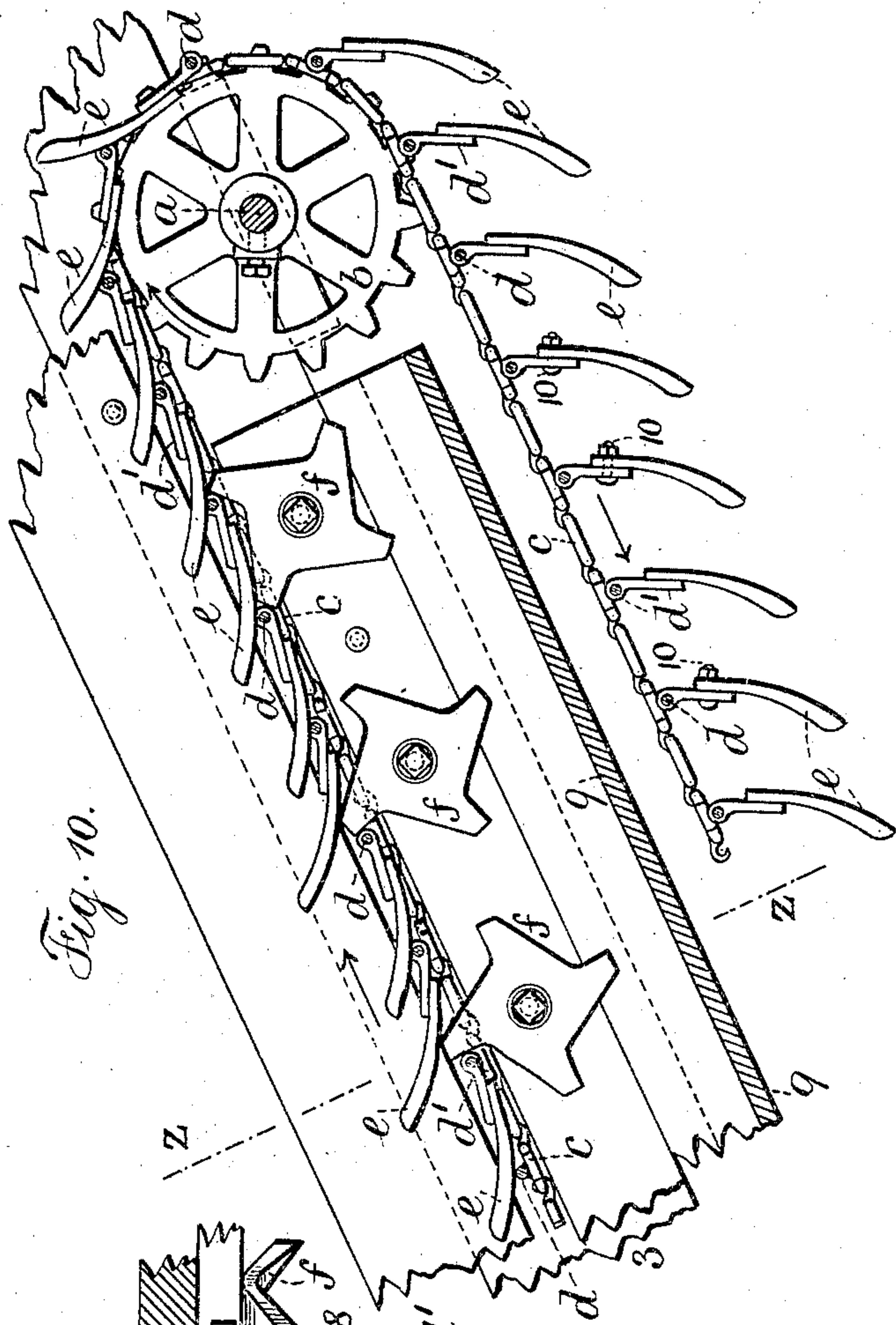


Fig. 10.

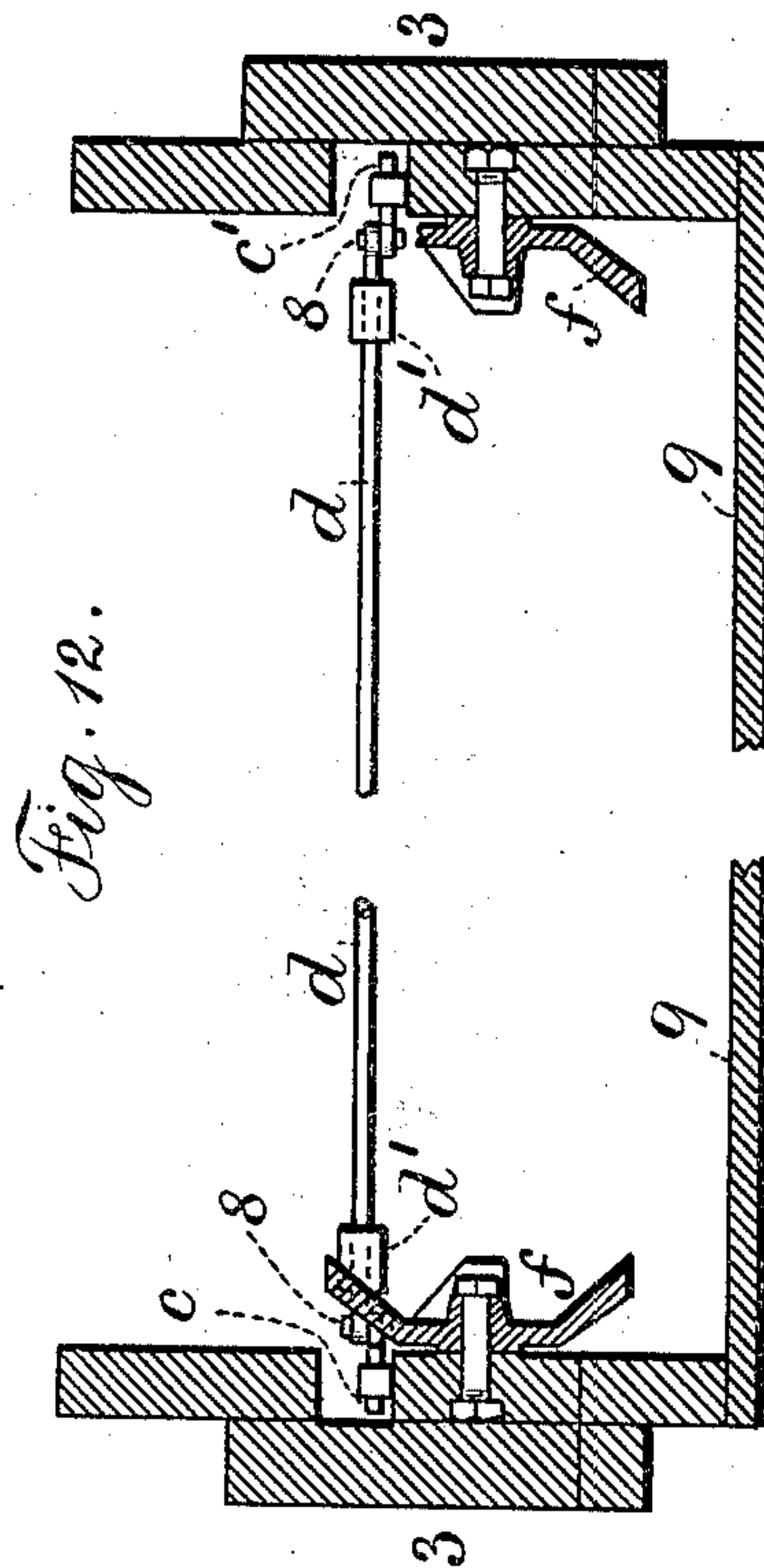


Fig. 12.

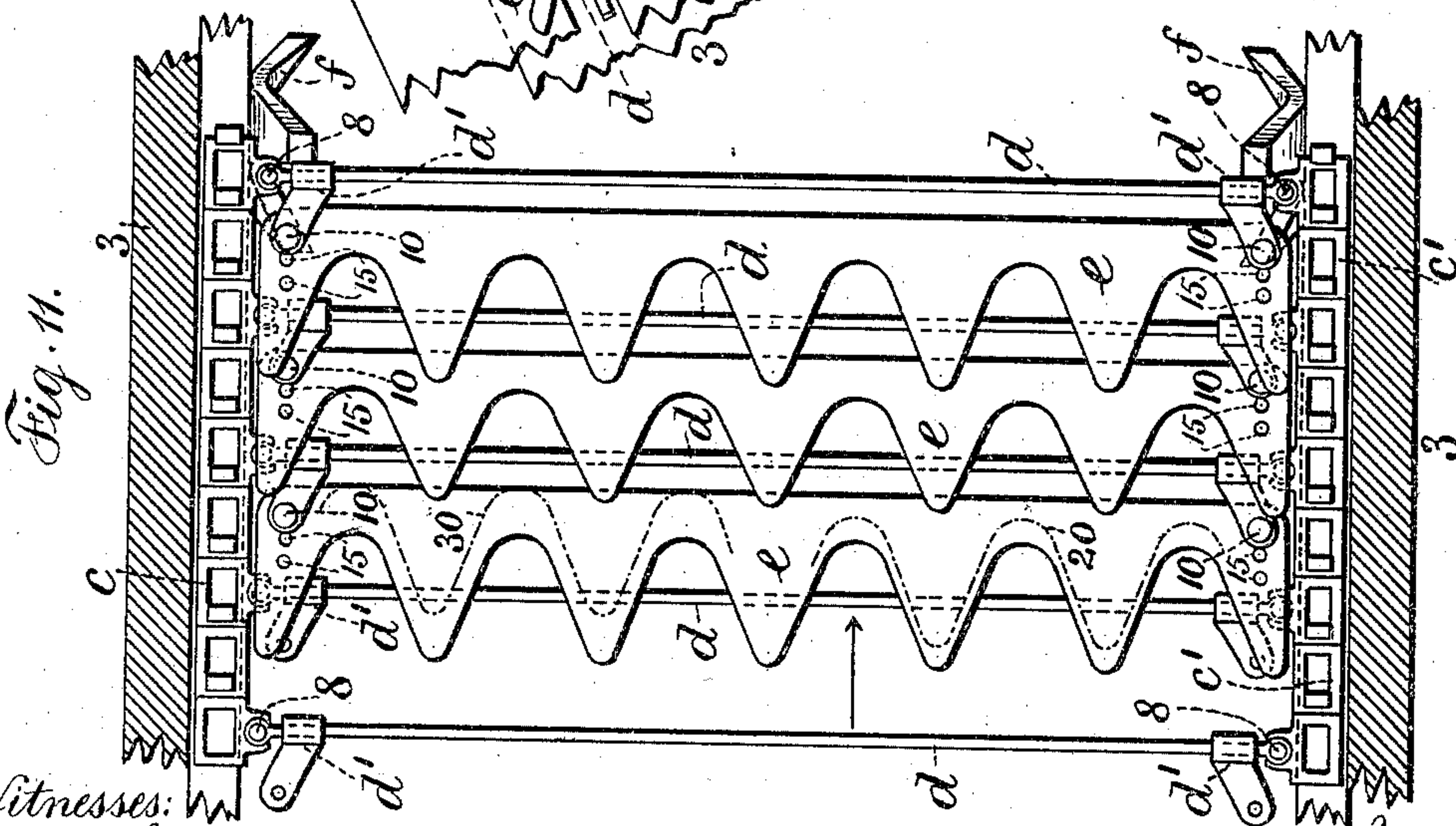


Fig. 11.

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UNITED STATES PATENT OFFICE.

LEWIS AUGUSTUS ASPINWALL, OF JACKSON, MICHIGAN, ASSIGNOR TO
ASPINWALL MANUFACTURING COMPANY, OF JACKSON, MICHIGAN,
A CORPORATION OF MICHIGAN.

POTATO-SORTER.

SPECIFICATION forming part of Letters Patent No. 709,658, dated September 23, 1902.

Application filed September 28, 1901. Serial No. 76,824. (No model.)

To all whom it may concern:

Be it known that I, LEWIS AUGUSTUS ASPINWALL, a citizen of the United States, residing at Jackson, in the county of Jackson and State of Michigan, have invented an Improvement in Potato-Sorters, of which the following is a specification.

My present invention is an improvement upon the devices shown and described in Letters Patent granted to me July 10, 1900, No. 653,332.

My invention relates to mechanical devices for sorting potatoes into several sizes and for separately delivering the sizes as assorted, and in the operation of sorting the potatoes those that are decayed and otherwise imperfect can be readily detected and removed by hand.

I provide a suitable frame, and mounted thereon are parallel shafts and sprockets. Two endless parallel chains carrying adjustable sorting devices extend around the pairs of said sprockets and are operated thereby, and I provide devices actuated by a movement of said chains for agitating the same progressively. The chains and sorting devices connected thereto carry along and deliver the larger potatoes and permit the smaller ones to fall through between the parts thereof upon a suitable incline. These sorting devices are preferably made with one edge scalloped or serrated, and said devices are adjustably connected to the chain, so as to provide openings of various dimensions through which all but the larger potatoes are free to pass. The potatoes falling through are received upon and move down an incline onto an inclined hopper and parallel set of inclined bars, the smaller potatoes passing through between the bars and the medium-sized potatoes are received by pickers, as in my aforesaid patent, upon a revolving cylinder and are delivered into a receptacle separate from that receiving the smaller potatoes, the larger potatoes meanwhile being delivered from the sorting devices into a chute provided therefor.

In the drawings, Figure 1 is side elevation representing my improved potato-sorter. Fig. 2 is a partial elevation and longitudinal section of the lower end of the machine. Fig. 3 is an end elevation of the higher end of the

machine. Fig. 4 is a cross-section at the line $x x$ of Fig. 1. Fig. 5 is a cross-section at the line $x' x'$ of Fig. 1. Fig. 6 is a cross-section at the line $y y$ of Fig. 1. Fig. 7 is a partial plan of the inclined hopper and bars. Fig. 8 is a cross-section of the parts shown in Fig. 7. Fig. 9 is an end view of the picker-cylinder. Fig. 10 is a partial section and elevation of the sorting device at the higher end of the machine. Fig. 11 is a plan and partial section representing a part of the sorting devices and chains carrying the same, and Fig. 12 is a cross-section at the line $z z$ of Fig. 10. Figs. 10, 11, and 12 are of exaggerated size for clearness, and in the other figures of the drawings some of the parts have been omitted also for clearness and to avoid unnecessary duplication.

The frame of the machine comprises the legs or supports 2, the bar sides 3, and the end bars 4. These bar sides are inclined, and at the lower end bracket-arms 5 are provided, and an inclined supply-hopper 6 is connected to these bracket-arms and rests at its lower forward edge upon the bar sides 3. The bar sides 3 are in reality three pieces, two parts being within the outer parts and extending above and below the same and connected thereto, so that between the inner parts there are ways provided for the endless chains $c c'$, upon which they bear and over which they are moved.

At the upper end of the machine I provide an end chute 7, and shafts $a a'$, parallel to one another, are placed transversely of the machine at the respective ends and are mounted in suitable bearings, the upper shaft at one end being provided with an operating-handle and crank k . Upon these shafts $a a'$ and near their ends between the bar sides I provide pairs of sprockets $b b'$. The endless chains $c c'$ are of any desired link construction and extend around the pairs of sprockets $b b'$. The alternate links of these endless chains are provided with lugs, and cross-bars d extend between the chains and are connected by bolts 8 to these alternate links. Between the bar sides 3 I provide an incline 9, extending lengthwise of the machine between the pairs of sprockets, and the endless chains and sort-

ing devices on the return movement pass below this incline 9.

I provide sorting-plates *e*, having one straight edge and the opposite edge scalloped or serrated. The ends of these sorting-plates are provided with a series of holes 15, and on each cross-bar *d* at the respective ends I provide hubs *d'* with arms, the hubs being loose on the cross-bars *d* and the ends of the arms being perforated for bolts 10, which pass through the same and through one hole of the series at the respective ends of the sorting-plate *e*. It will be apparent that if the bolts pass through holes in the sorting-plates nearest to their straight edges said straight edges will be farthest away from the adjacent cross-bars and that the serrated edges will be nearest to the next cross-bars, which are those adjacent to the serrated edges, and, as will be seen from Fig. 11, there are series of openings between the incurves of the serrated edges and the cross-bar upon which said serrated edge rests, which openings are approximately of triangular form. It will be also noticed that if the bolts 10 are shifted to the second or third holes of the series the said openings between the serrated edge and the cross-bar will be increased, the straight edge of the sorting-plate coming nearest to the cross-bar, to which it is pivoted. In this way the openings in the serrated edge of each sorting-plate and between the same and the cross-bar on which such plate rests may be increased in size. Potatoes that are small enough pass through these openings, and those that are too large are carried upon the sorting-plates from the inclined supply-hopper 6 up the inclined sorting-plates and are delivered over into the end chute 7. The sorting-plates *e* being freely pivoted by hubs *d'* and arms to the cross-bars *d* normally rest upon said bars, and I provide means for agitating these sorting-plates, so as to move the potatoes as they are conveyed along to insure the smaller ones passing through the aforesaid openings. For the purpose of agitation I employ toothed wheels *f*, that are pivotally connected to the inner opposite faces of the bar sides 3. (See specially Figs. 5, 10, and 12.) These toothed wheels or agitators are of dishing form, and, as shown in the drawings, each one is provided with four teeth and each tooth formed by a short radial edge and an inclined edge. These agitators are so set that they are acted upon and turned by the hubs *d'* on the cross-bars *d*, which come in contact therewith as the endless chains and sorting devices move along up the inclined frame. The object of these agitators is to raise the sorting-plates a short distance to compel a movement of the potatoes supported thereby, and the constant movement of these sorting-plates shifting the potatoes into different positions makes it possible for the smaller potatoes to come into such position that they will be caused to pass through the openings between the cross-bars and the serrated edges. From Fig. 1 of the

drawings it will be noticed that six of these agitators are shown by dotted lines in the length of the machine and that they occupy different positions. Consequently the sorting-plates are irregularly lifted, which has a tendency to increase the agitation and keep the potatoes moving as they are conveyed along. These agitators are necessarily arranged in pairs upon opposite sides of the machine, the one exactly opposite the other and occupying a corresponding position, the forward movement of the endless chains by the sprockets *b* upon the shaft *a* automatically effecting the movement of these agitators, so that the pairs act progressively upon the sorting-plates and as they rotate under each sorting-plate to raise the same with their movement they drop one plate before raising the next plate. In this manner the mass of potatoes moving up the range of sorting-plates is kept in a constant state of agitation, so that the larger potatoes only remain on top and the smaller potatoes find their way down and through the openings hereinbefore spoken of between the incurves of the serrated edges and the adjacent cross-bars. Fig. 11 shows by full lines one position of the sorting-plates, the dotted line 20 shows the second position of adjustment, and the dotted line 30 the next or last position of adjustment.

At the lower portion of the machine I provide an inclined hopper *g*, the higher end of which is securely connected to the legs 2, and the said hopper is also supported from the bar sides 3 by the arms *g'*. This hopper *g* has a transverse metal plate 11, which forms the edge to the hopper, and secured to this metal plate are the inclined fingers *h*. These fingers are preferably let into the plate 11, so that their upper surfaces are flush with the plate, and they are secured thereto by bolts. Figs. 6, 7, and 8 show these parts clearly, and I prefer to enlarge the upper end of the bars *h* where they are let into the plate 11, so as to strengthen the upper end of the bars on account of the bolt-holes.

The lower end of the inclined hopper sides carry the cylinder *i* in suitable bearings connected therewith, and upon the surface of this cylinder *i* there are pickers 12. These pickers 12 each have a portion curved to correspond to the periphery of the cylinder, and at this portion said pickers are connected to the cylinder in any suitable manner. From this portion of each picker there is a rising portion extending outward from the surface of the cylinder and adapted to come in contact with and raise the potatoes that have passed down the fingers *h* and not passed through between the same. The smallest potatoes pass between the fingers *h* and fall into a pile or are received into a receptacle. The larger potatoes remain upon the fingers and are taken up by the pickers 12 and carried over the cylinder *i* and delivered into another pile or into a receptacle provided therefor.

The pickers 12 are not only of the shape here-
inbefore described and shown in the draw-
ings, but they are arranged about the cylin-
der in two spiral sets, so that there are four
5 pickers for the openings between the respec-
tive fingers, except the two outside fingers at
either side, and here there are only two pick-
ers for each space. By this construction it
will be apparent that the larger number of
10 potatoes are lifted over the central portion of
the cylinder rather than at the respective
ends, as the potatoes would be more liable to
be injured by coming in contact with the
sides of the hopper, and this is avoided by
15 moving the larger number of them at the cen-
ter, which consequently causes a movement
of the potatoes toward the center to fill up
the space from which potatoes have already
been taken.

20 The cylinder *i* is provided at one end with
a sprocket 15, and there is a sprocket 14 on
the end of the shaft *a'*, and a chain 13 passes
over these sprockets, the rotation of the cyl-
inder *i* being effected by the rotation of the
25 endless chains from the shaft *a* to the shaft
a' and from the shaft *a'* to the said cylinder,
the parts all rotating in the same direction.

The potatoes that come down the incline 9
shoot off the lower end thereof and readily
30 pass between the vertical hanging sorting-
plates *e* on their return movement, the said
plates not interfering materially with the
movement of the potatoes. By this construc-
tion it will be apparent that the potatoes are
35 sorted out in at least three sizes. The pota-
toes that pass over the chute 7 are usually
those reserved for the market. Those that
pass over the cylinder *i* are usually those re-
served for seed, while the small ones, that pass
40 through between the fingers *h*, are preferably
employed for feeding stock.

I claim as my invention—

1. In a potato-sorter, a sorting device for
separating the potatoes and retaining only
45 larger potatoes, comprising parallel endless
chains, cross-bars extending between and con-
necting the same, a series of sorting-plates
scalloped or serrated along one edge, devices
for loosely pivoting and for adjustably con-
50 necting said plates to said arms so that in use
the scalloped edges rest upon the next adja-
cent cross-bars and on the return movement
the said sorting-plates turn over and hang
freely.

55 2. In a potato-sorter, the combination with
an inclined hopper, of two endless parallel
chains, devices for connecting said chains
and operating the same, cross-bars extending
between the chains and connected to oppo-
60 site links, sorting-plates each having one edge
scalloped or serrated, devices at their re-
spective ends for adjustably and loosely piv-
oting said plates to said cross-bars, so that
each plate is pivoted to one cross-bar and is
65 normally supported by the adjacent cross-
bar, means for agitating said plates as they
are drawn along by the cross-bars with the

forward movement of the chains, whereby the
sorting-plates turn over and hang free from
the chains on the return movement. 70

3. In a potato-sorter, the combination with
an inclined hopper, of two endless parallel
chains, devices for connecting said chains
and operating the same, cross-bars extending
between the chains and connected to oppo- 75
site links, hubs with arms extending there-
from loosely surrounding the said cross-bars
at the respective ends, sorting-plates having
at their respective ends a series of holes by
which with bolts they are adjustably connect- 80
ed to the arms of said hubs, and toothed-
wheel agitators in pairs secured to the frame
of the machine beneath the chains and adapt-
ed to be operated by the movement of the
chains and to come into contact with the said 85
sorting-plates alternately and progressively
for raising the same and agitating the pota-
toes, substantially as set forth.

4. In a potato-sorter, the combination with
an inclined hopper, of two endless parallel 90
chains, devices for connecting said chains
and operating the same, cross-bars extending
between the chains and connected to oppo-
site links, hubs with arms extending there-
from loosely surrounding the said cross-bars 95
at the respective ends, sorting-plates each
having one edge scalloped or serrated and
having at their respective ends a series of
holes by which with bolts they are adjustably
connected to the arms of said hubs, and 100
toothed-wheel agitators in pairs secured to
the frame of the machine beneath the chains
and adapted to be operated by the movement
of the chains and to come into contact with
the said sorting-plates alternately and pro- 105
gressively for raising the same and agitating
the potatoes, substantially as set forth.

5. In a potato-sorter, the combination with
an inclined hopper, of two endless parallel 110
chains, cross-bars connected at their ends to
links of the chains, sorting-plates having one
edge scalloped or serrated, devices pivoted to
the cross-bars and adjustably engaging the
ends of the sorting-plates, the said sorting-
plates at their serrated edges normally rest- 115
ing upon the said cross-bars so that between
their incurves and the cross-bars there are
openings, the sizes of which may be increased
or diminished and through which openings
potatoes may pass, substantially as set forth. 120

6. In a potato-sorter, the combination with
an inclined hopper, of two endless parallel 125
chains, cross-bars connected at their ends to
links of the chains, sorting-plates having one
edge scalloped or serrated, devices pivoted to
the cross-bars and adjustably engaging the
ends of the sorting-plates, the said sorting-
plates at their serrated edges normally rest-
ing upon the said cross-bars so that between
their incurves and the cross-bars there are 130
openings the sizes of which may be increased
or diminished and through which openings
potatoes may pass, and toothed-wheel agita-
tors pivotally connected to the inner faces of

the side frames and rotated by the movement of the chains for raising alternate sorting-plates and so agitating the mass of potatoes carried by the said devices, substantially as set forth.

7. In a potato-sorter, the combination with an inclined hopper, of two endless parallel chains, cross-bars connected at their ends to links of the chains, sorting-plates having one edge scalloped or serrated, devices pivoted to the cross-bars and adjustably engaging the ends of the sorting-plates, the said sorting-plates at their serrated edges normally resting upon the said cross-bars so that between their incurves and the cross-bars there are openings the sizes of which may be increased or diminished and through which openings potatoes may pass, and toothed-wheel agitators securely connected to the inner faces of the bar sides and each tooth of which comprises one radial and one inclined edge, the radial edges being acted upon by the chains and the inclined edges raising the sorting-

plates alternately and progressively with the movement of the parts, substantially as set forth.

8. In a potato-sorter, the combination with the inclined hopper *g*, of the metal plate 11 transversely thereof, the inclined fingers *h* connected to said plate 11 and let into the upper face thereof, the cylinder *i* above the free ends of said fingers, and pickers 12 arranged in two spiral sets about the cylinder so that there are two pickers at the respective ends of the cylinder coming between the end fingers and four pickers in circular rows upon the said cylinder coming between each of the other fingers, substantially as and for the purposes set forth.

Signed by me this 20th day of September, 1901.

LEWIS AUGUSTUS ASPINWALL.

Witnesses:

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W. C. SHANAFELT.