

(No Model.)

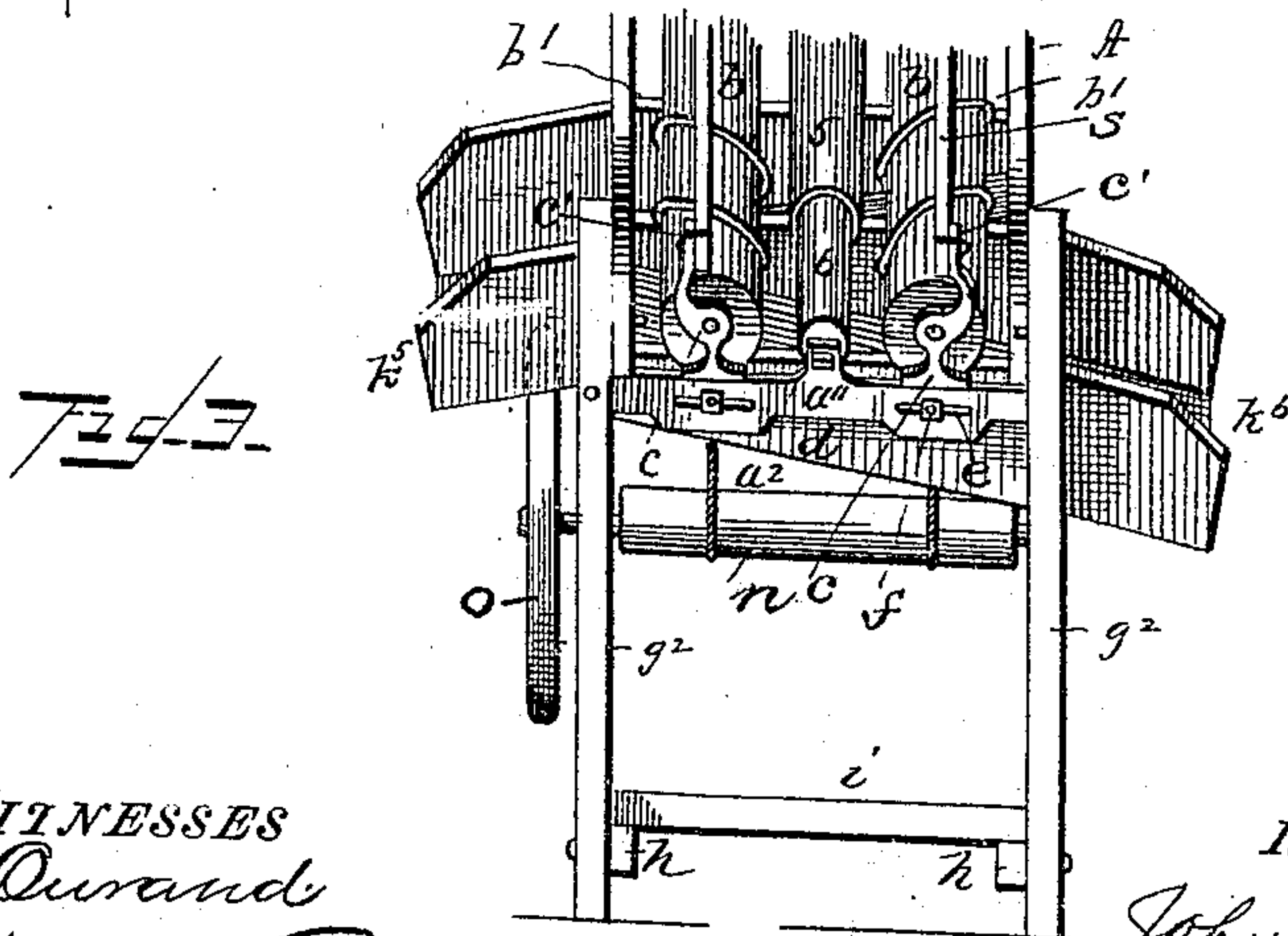
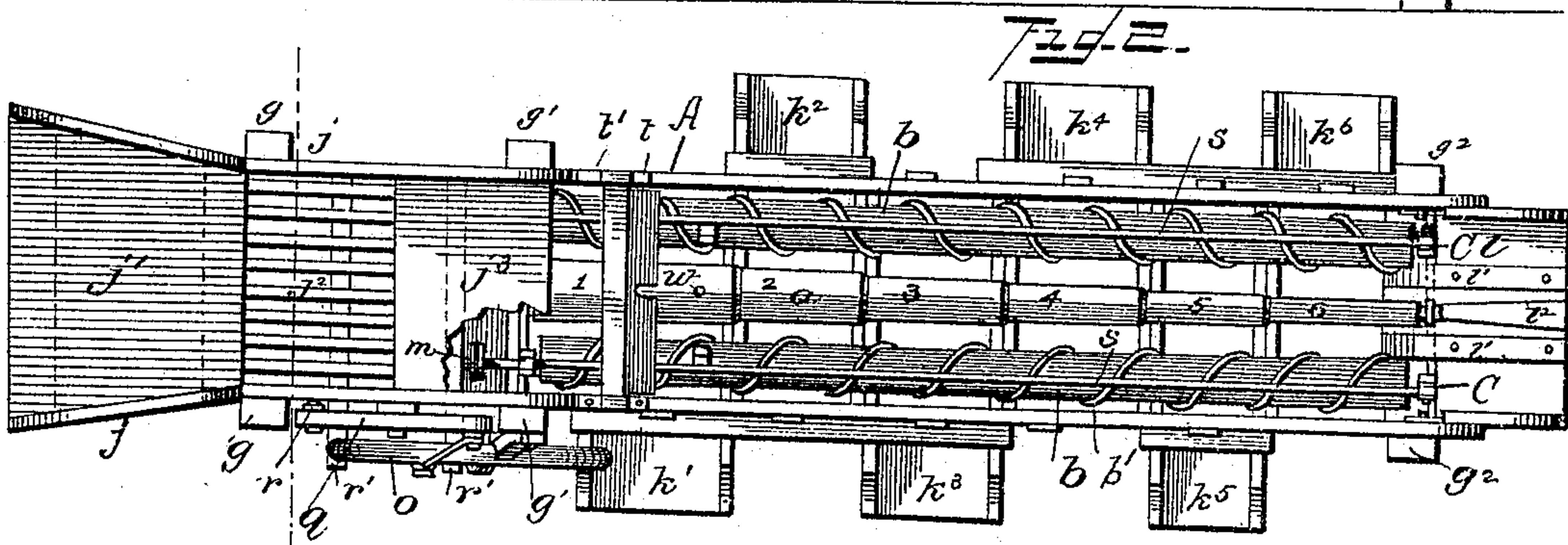
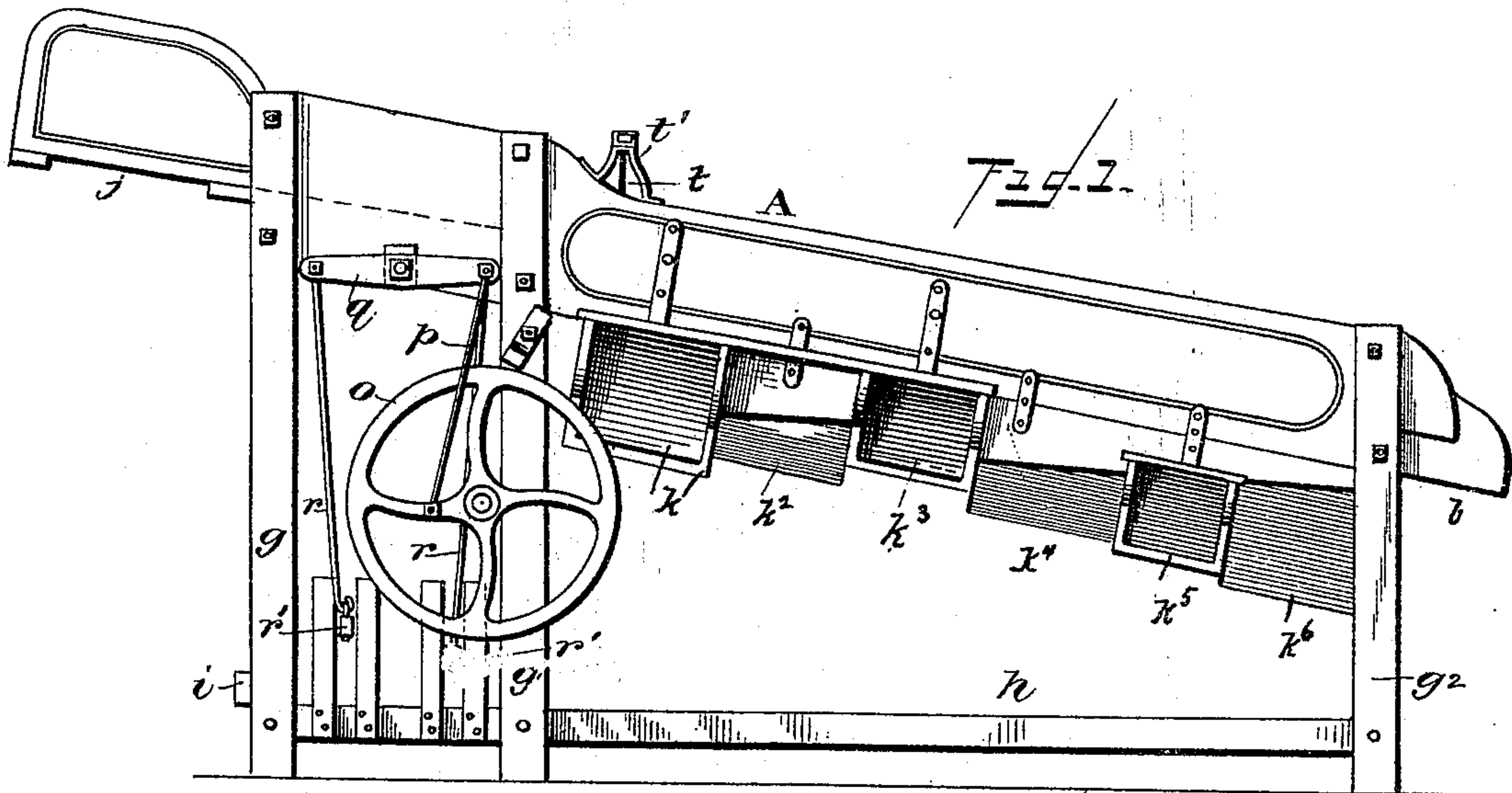
3 Sheets—Sheet 1.

J. A. JONES.

MACHINE FOR ASSORTING OR SIZING FRUIT.

No. 430,031.

Patented June 10, 1890.



WITNESSES  
F. L. Curand  
E. A. Finckel

INVENTOR  
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Fig. 4.

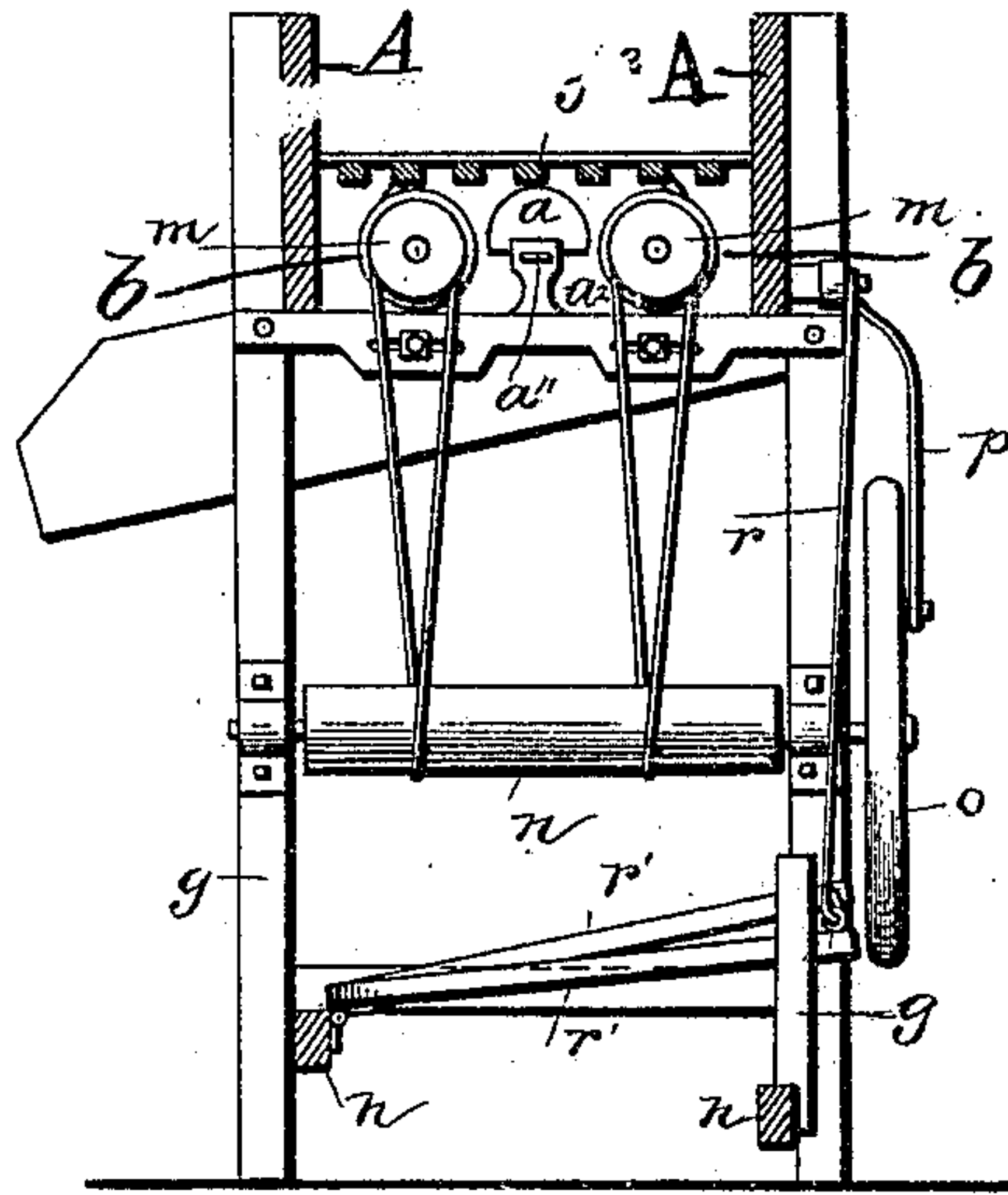


Fig. 5.

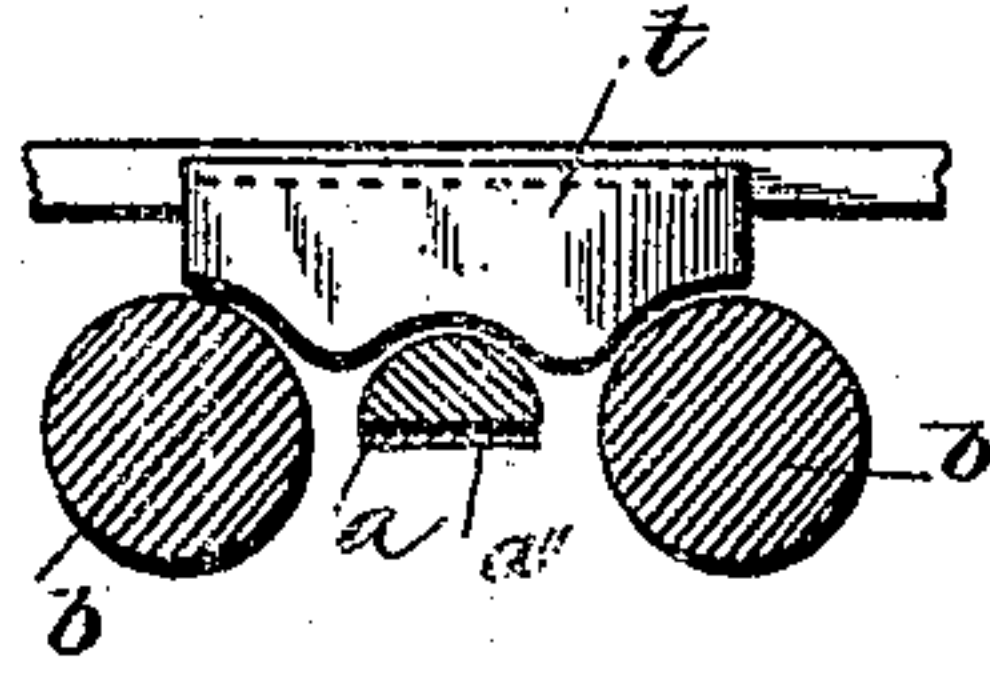


Fig. 6.

Fig. 6.

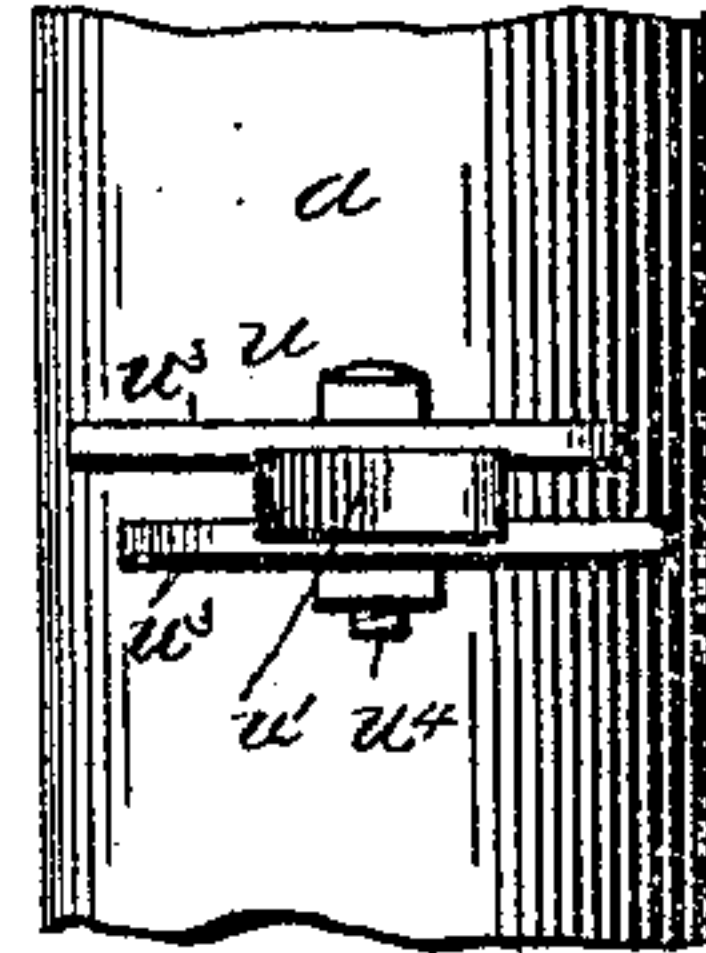
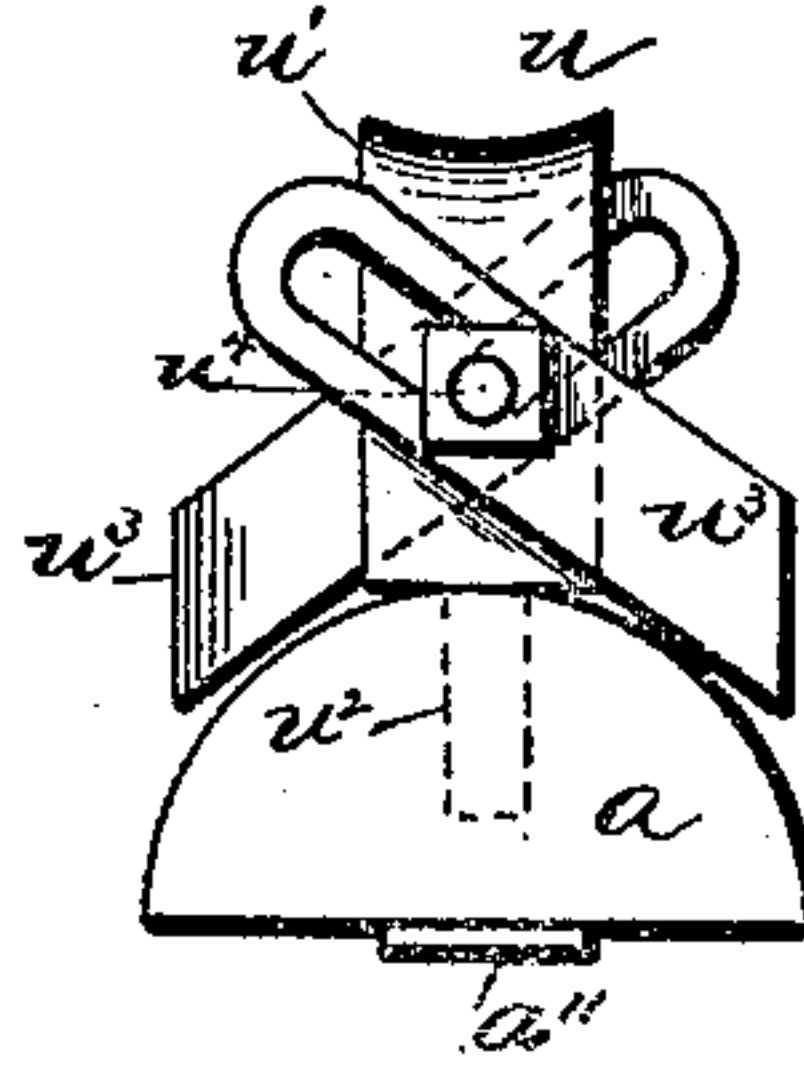


Fig. 8.

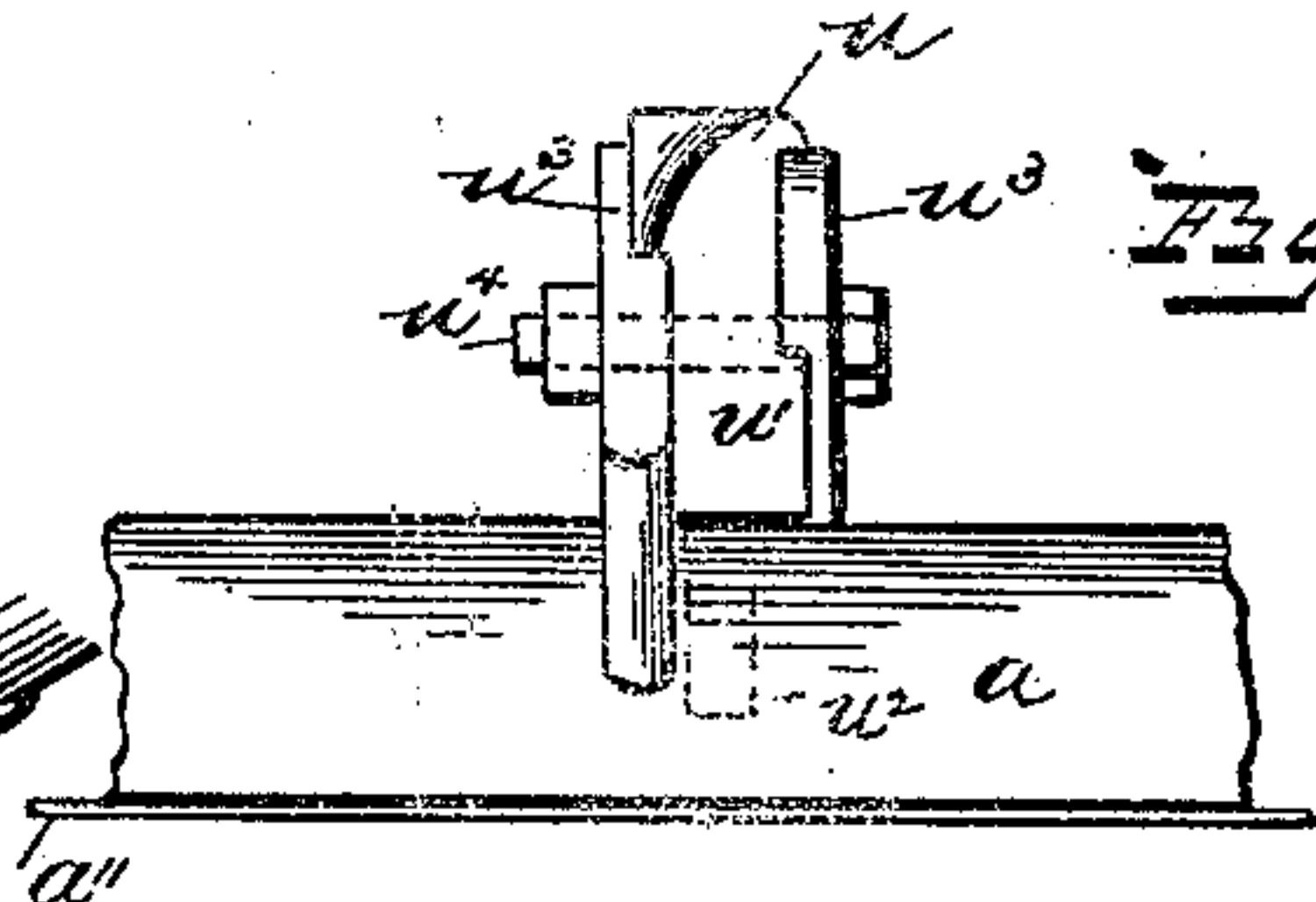
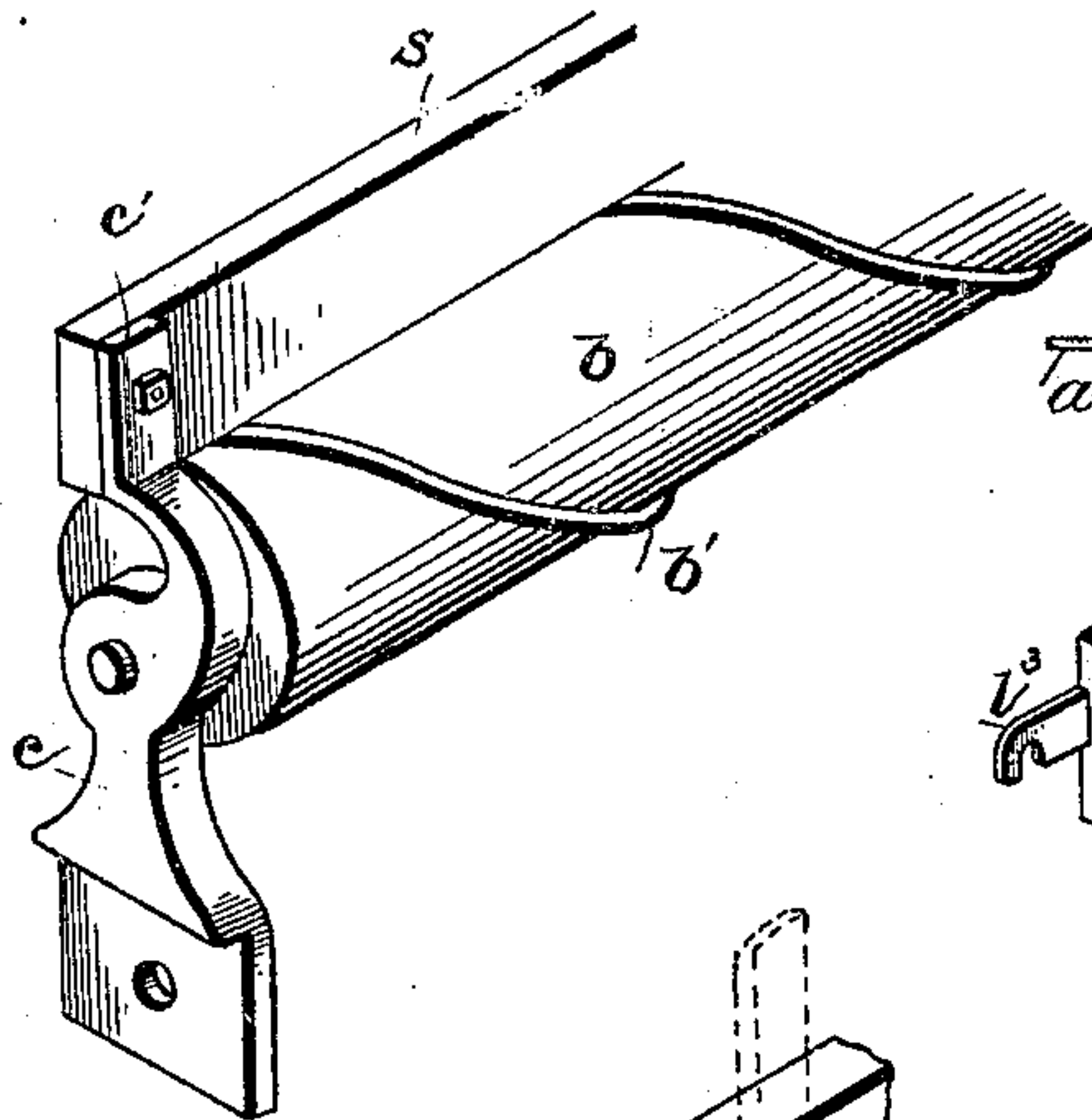


Fig. 9.

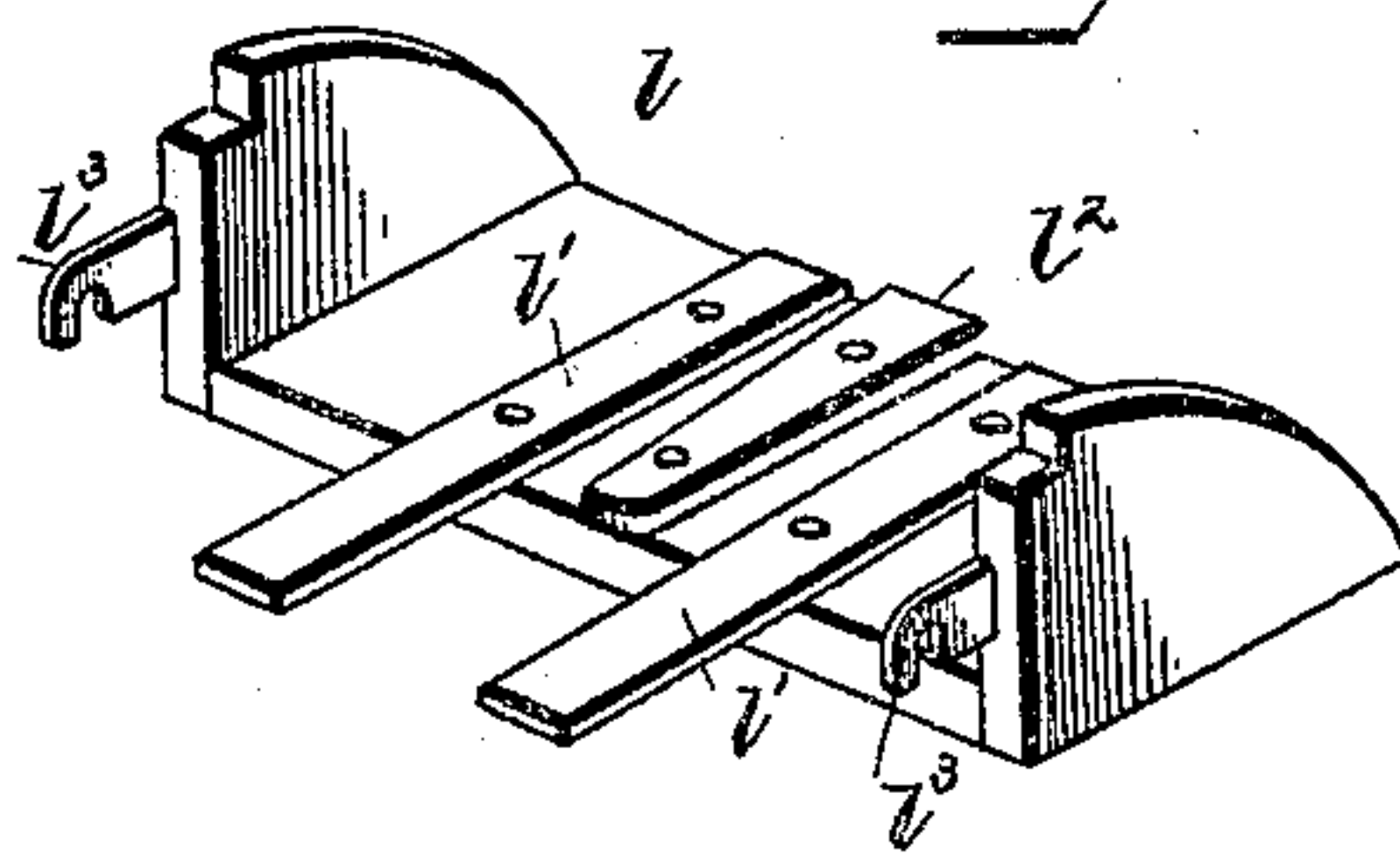


Fig. 10.

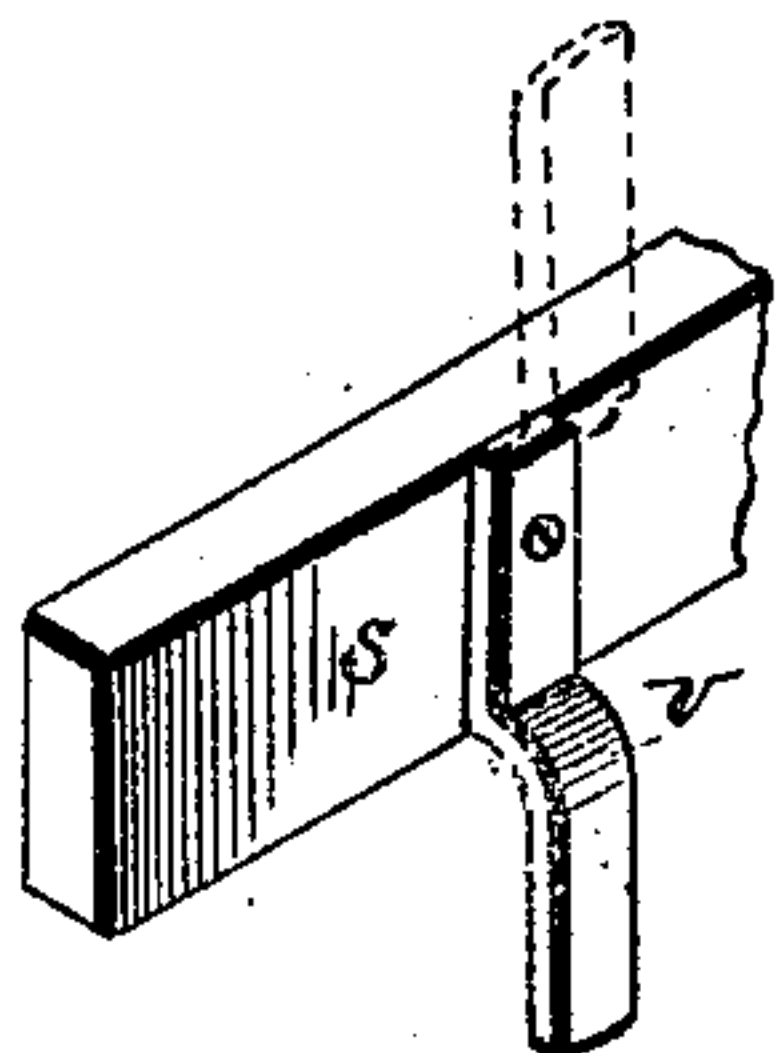
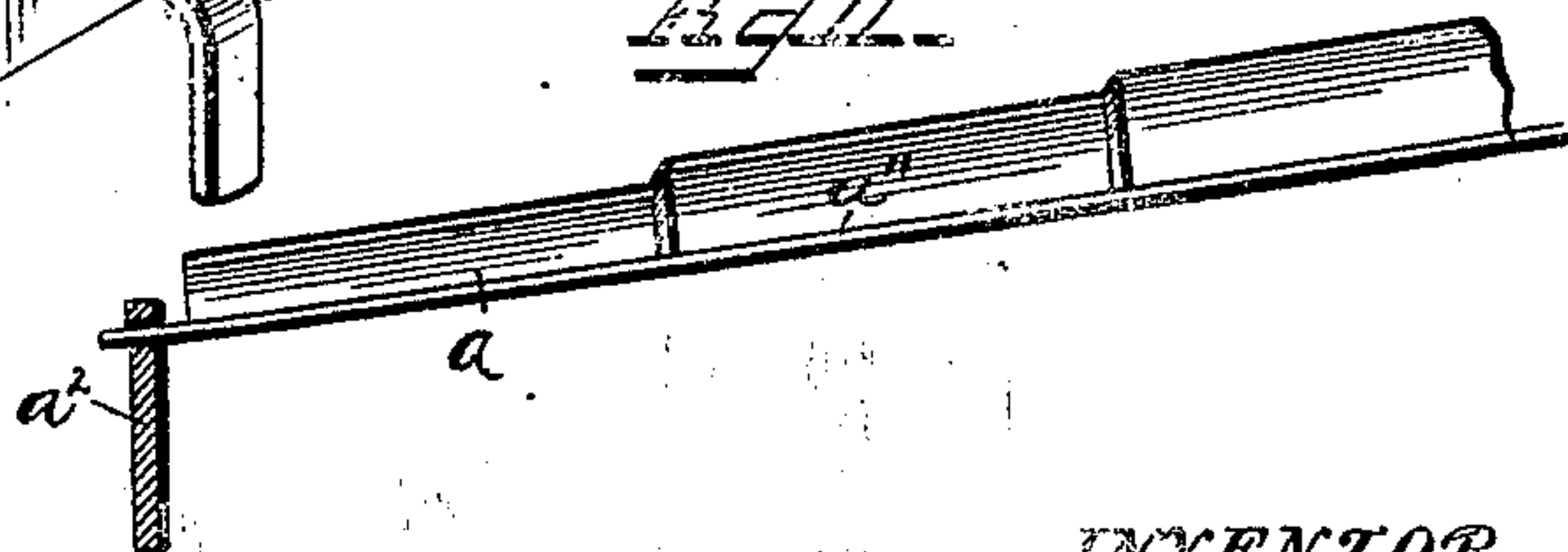


Fig. 11.



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(No Model.)

3 Sheets—Sheet 3.

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Fig. 12.

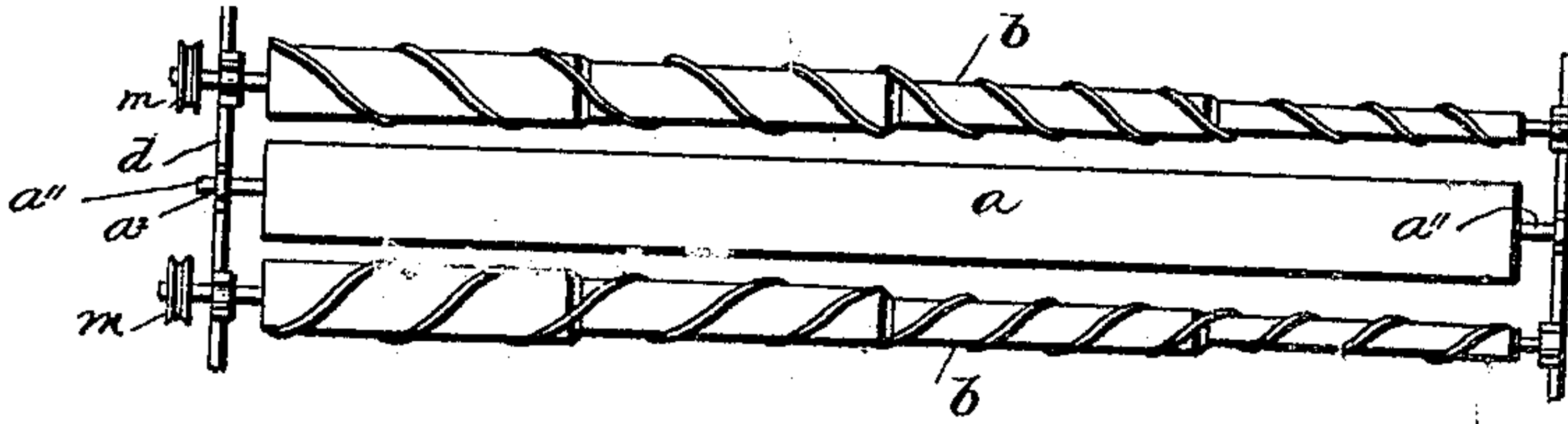


Fig. 13.

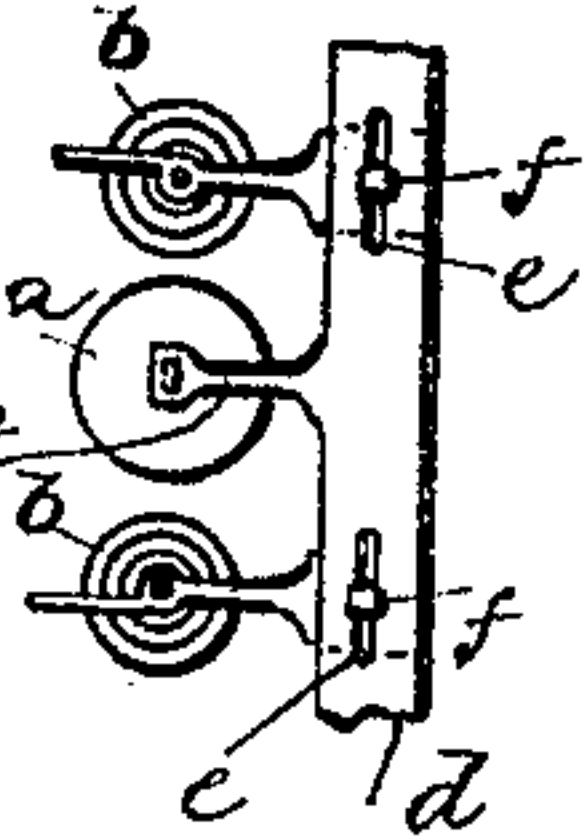


Fig. 14.

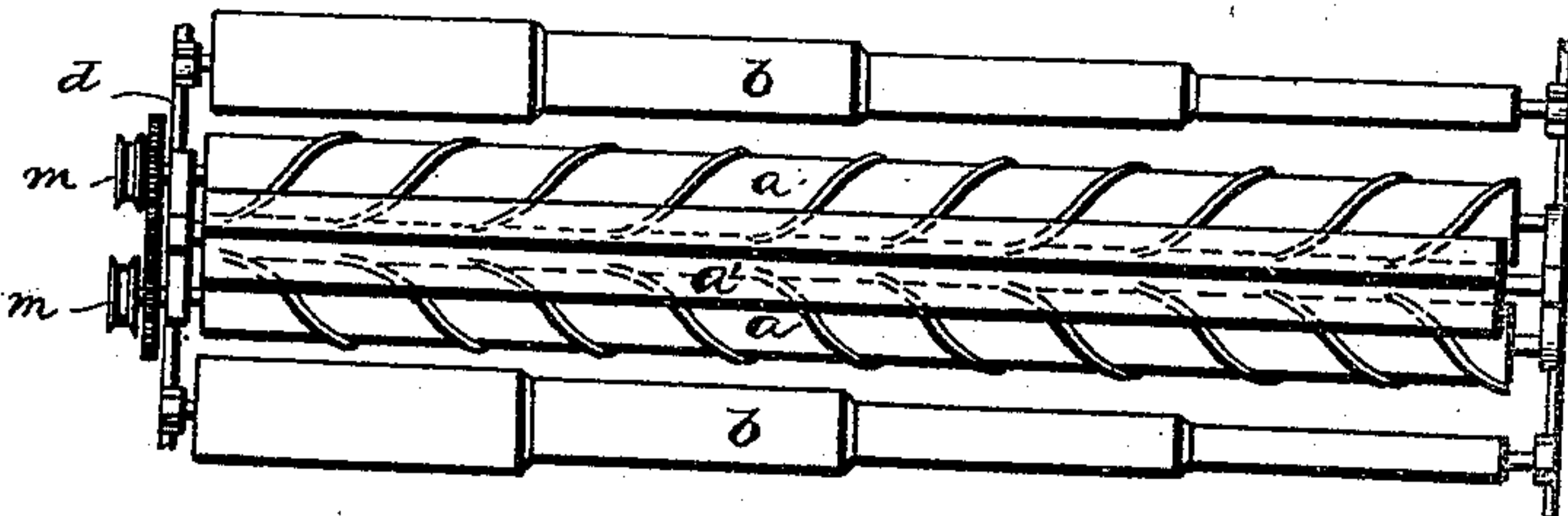


Fig. 15.

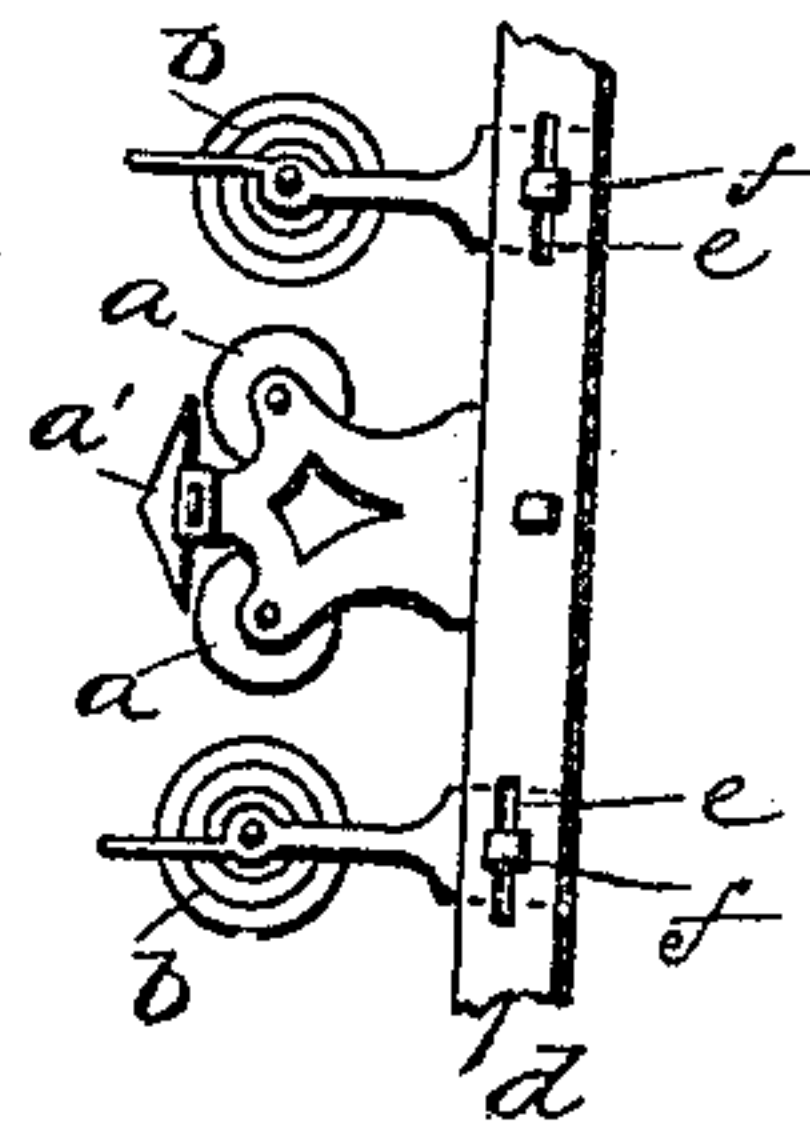


Fig. 16.

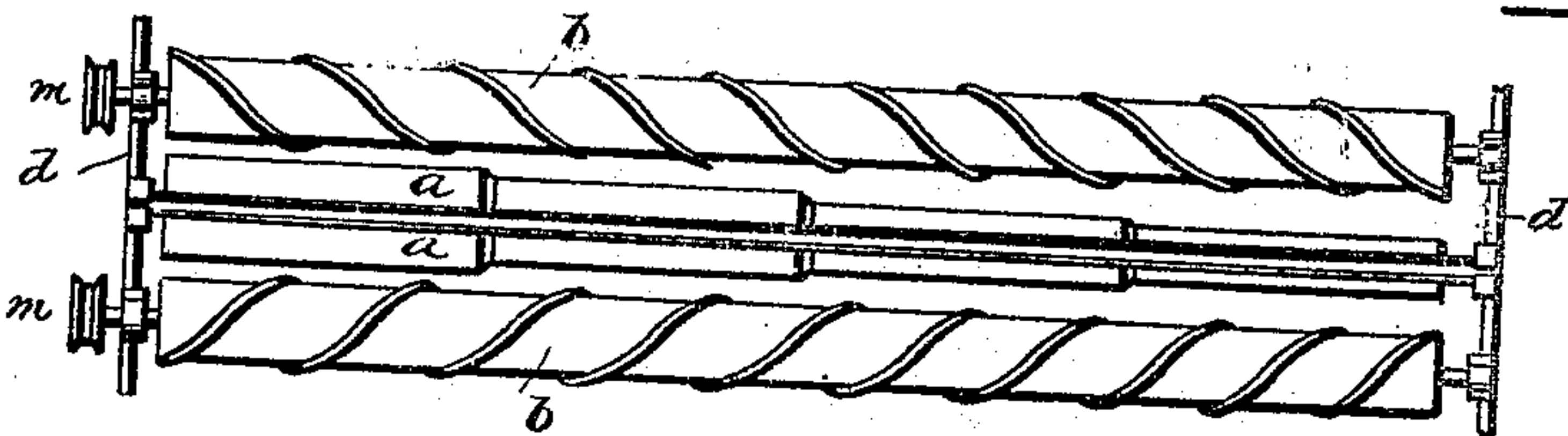


Fig. 17.

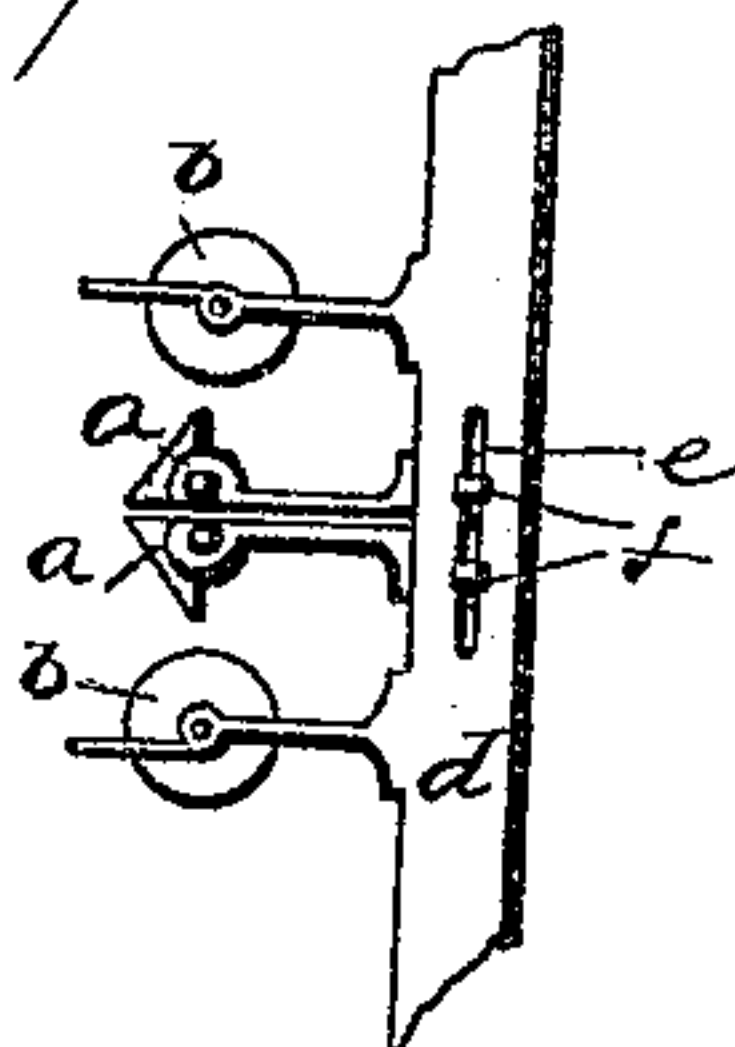
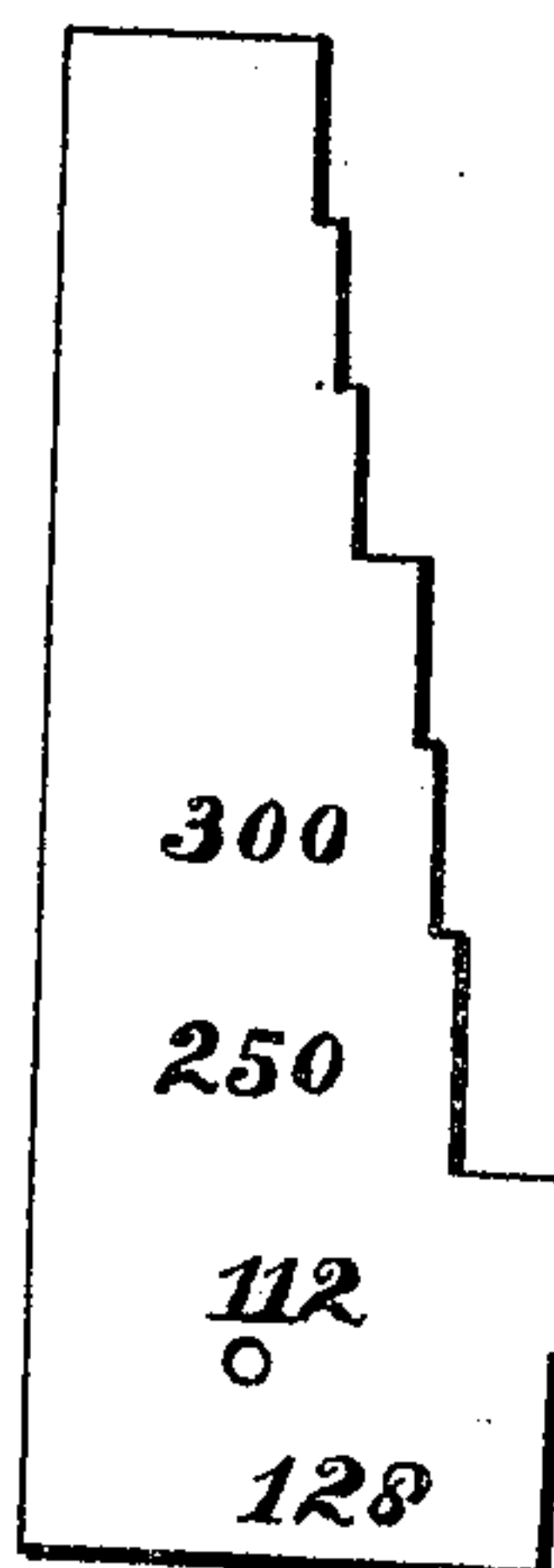
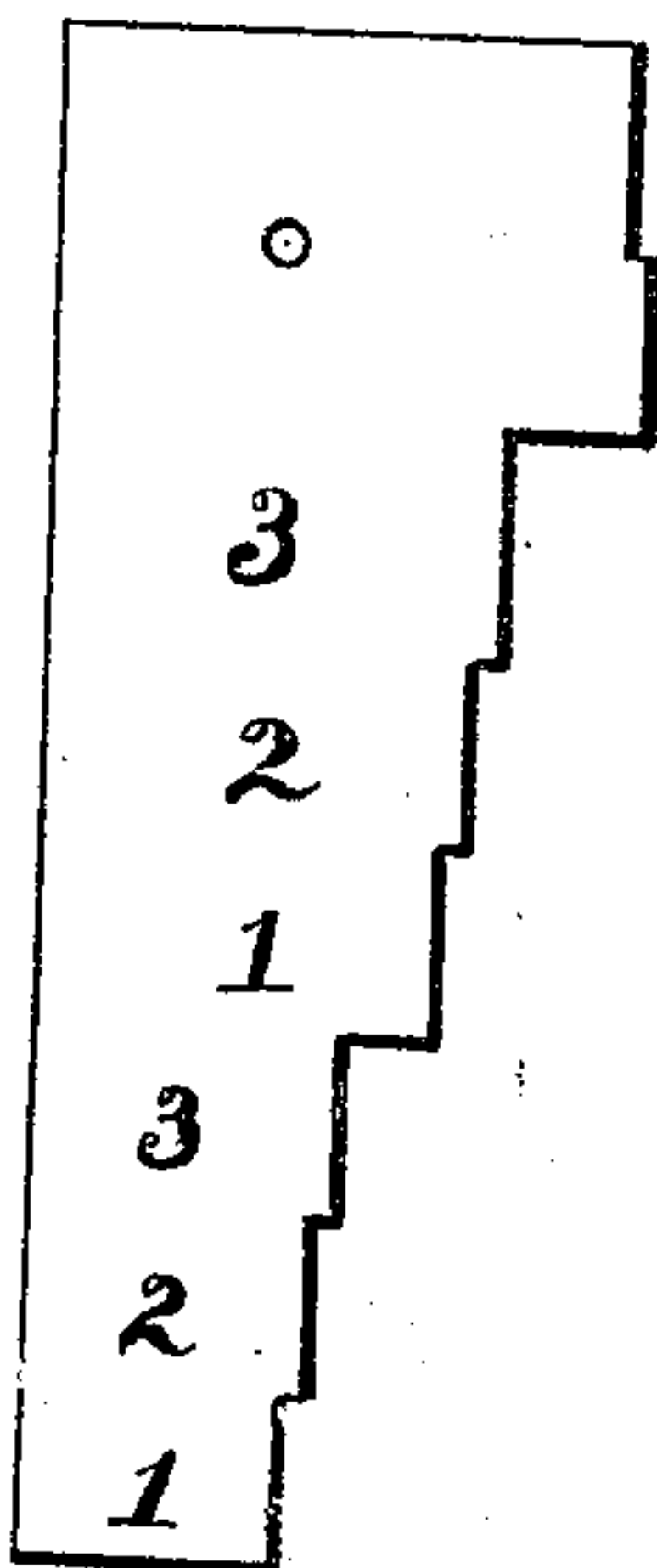


Fig. 18.

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# UNITED STATES PATENT OFFICE.

JOHN A. JONES, OF YORK, PENNSYLVANIA.

## MACHINE FOR ASSORTING OR SIZING FRUIT.

SPECIFICATION forming part of Letters Patent No. 430,031, dated June 10, 1890.

Application filed February 16, 1889. Serial No. 300,137. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN A. JONES, a citizen of the United States, residing at York, in the county of York and State of Pennsylvania, have invented a certain new and useful Improvement in Machines for Assorting or Sizing fruit, of which the following is a full, clear, and exact description.

This invention relates to machinery for separating fruits and vegetables into sizes or grades in accordance with commercial usage or the packer's requirements.

Inasmuch as the invention is in the nature of an improvement upon previous machines having a like general object in view, I will first describe it, and then particularly point out and claim the part or parts constituting my invention.

In the accompanying drawings, illustrating my invention, in the several figures of which like parts are similarly designated, Figure 1 is a side elevation; Fig. 2, a top view; Fig. 3, a delivery end elevation, the feed end being broken away. Fig. 4 is a feed end elevation. Fig. 5 is a section showing the restraining-apron. Fig. 6 is an enlarged front elevation of the lemon-turner. Fig. 6<sup>a</sup> is a plan view, and Fig. 7 a similar side elevation, of the same. Fig. 8 is an enlarged perspective view of a side piece in part, its bearing or box, and restraining-board. Fig. 9 is a perspective view of the end delivery spout; Fig. 10, a perspective view of the auxiliary lemon-turner in working position on the restraining-board. Fig. 11 is a side view of the center piece. Fig. 12 is a top view, and Fig. 13 an end view, of another arrangement of parts; Figs. 14 and 15, similar views of still another arrangement, and Figs. 16 and 17 similar views of still another arrangement. Fig. 18 shows in obverse and reverse a gage used in setting the machine.

The fundamental parts of my machine are a graduated member of one or more parts, stationary or movable in operation, and a straight-edge member of contrary operation relatively to the other member, and one or the other of these members adjustable laterally with relation to the other to vary the distances between them. One example will suffice to illustrate the meaning of this state-

ment of fundamental construction, although I have shown and will describe several.

A center piece *a* has a series of sections 1 to 6, (more or less,) of different cross-sectional area, decreasing in size from the feed to the delivery end of the machine. This center piece is fixed or stationary, and forms one member of the machine, in accordance with the foregoing statement. Rollers *b* are arranged on each side of the center piece, with their surfaces parallel to the central longitudinal plane of the center piece, and said rollers are truly cylindrical; and inasmuch as the parts *b* may be stationary or rotary and of various shapes, as will presently appear, I designate them by the generic term "side pieces," and they constitute the second member of the machine, conformably with the foregoing statement. One or the other of these members *a b* is adjustable laterally and bodily toward and from the other. In the machine shown in Figs. 1 to 4 the cylinders *b* are shown as adjustable, having to this end bearings at each end in boxes *c c*, which are supported upon cross-bars *d*, the bearings and cross-bars being connected by means of slots *e* and bolts *f*. Thus not only are the spaces between the center piece and the cylinders graded and varied by the gradations of the center piece, but they may be further varied by moving the cylinders toward or from the center piece. The relations of these two members may be varied. In Fig. 12 the center piece is a cylinder, while the side pieces are rollers having sections of decreasing diameter and made adjustable, as in the first case. In Fig. 14 the center piece is composed of two cylindrical rollers geared together, so as to revolve toward each other, and surmounted by a triangular strip *a'* to cover the space between the said rollers. The side pieces are graduated, as in Fig. 12, are non-rotative, and are adjustable. In Fig. 16 the side pieces are cylindrical, rotary, and non-adjustable, while the center piece is composed of two quarter-sections graduated and each supported in its own bearings and made adjustable relatively to the side pieces. Moreover, it is obvious that in Fig. 14 the center pieces might be graduated and the side pieces be truly cylindrical. So, also, in Fig. 16 the center piece might be



straight and the side pieces graduated. The center pieces in Fig. 16 might be quarters of a cylinder or a square or other shape, or they might be cylinders, straight or graduated, rotary or stationary, and adjustable or non-adjustable; but in the last case the side pieces should be adjustable.

I have stated thus the principle of my invention; and I will now describe the details as illustrated in the drawings.

A suitable frame is constructed of uprights  $g$   $g'$   $g^2$ , stringers  $h$ , cross-pieces  $i$ , and supports for the cross-bars  $d$ , on which the center piece and side pieces are arranged. A trough  $A$  is supported in an inclined position upon this frame, and this trough contains in its delivery portion the center piece and side pieces. The upper portion of the trough is provided with a hopper  $j$ , having a flexible bottom  $j'$ , a screen  $j^2$ , and a feed-table  $j^3$ , substantially as and for the respective purposes mentioned in my Patent, No. 150,961. Delivery-spouts  $k'$   $k^2$   $k^3$   $k^4$   $k^5$   $k^6$  depend at inclines in alternation from opposite sides of the trough and correspond in number with the number of sections into which the center piece (or side pieces) may be divided. The end of the trough is provided with a spout  $l$ .

It hardly need be said that the center piece and side pieces serve to separate the fruit into as many sizes as there are sections and spouts and that the smallest fruit escapes at section 1 and spout  $k'$ , while the largest goes over the ends of these center and side pieces out at the spout  $l$ .

The spouts  $k'$  to  $k^6$  will have bottoms of flexible or soft material, (preferably canvas or rubber,) which will preserve the descending fruit or vegetables from injurious impact.

The rotary member or members may be provided with pulleys  $m$ , banded to a drum  $n$ . This drum may have a fly-wheel  $o$ , which is connected by a pitman  $p$  with a rock-lever  $q$ , supported on the frame or trough, and this rock-lever is connected by rods  $r$   $r'$  with treadles  $r'$   $r''$ , whereby the drum may be rotated, and thus transmit motion to the side pieces or center pieces, whichever may be rotary.

Above the side pieces are arranged the boards  $s$ , which are secured to brackets  $c'$ , rising from the boxes  $c$ . These boards restrain the fruit, &c., from escaping over the sides.

An apron  $t$  is suspended over the members  $a$  and  $b$ , just next the feed-tables  $j^3$ , to restrain the too free movement of the incoming fruit and let it down gently to the center piece and side pieces, and also to give the operator time to gather and throw out specked stuff. This apron may be made of rubber or other flexible material, and is preferably suspended from a bracket  $t'$ , mounted upon the trough.

The spout  $l$  (see details, Fig. 9) is made with the tongues  $l'$   $l''$  to project under the spaces at the ends of the side pieces, so as to prevent the fruit from dropping on and being injured by the edge of the spout and against

the cross-piece as it leaves the side pieces. A ridge  $l^2$  may also be employed in the spout to keep separate the two outgoing streams of fruit. The spout may have hooks  $l^3$  to engage the trough.

The rotary member is provided with a spiral strip of rubber or other flexible substance or material  $b'$  to assist gravity in the descending motion of the fruit.

The center piece is preferably made of wood, and in order to keep it straight, prevent it from warping, and at the same time afford supports for it, I affix to it longitudinally a strip, preferably of flat steel,  $a''$ , which projects beyond the ends of the center piece and engages lugs  $a^2$ , rising from or affixed to the cross-pieces  $d$ .

In assorting lemons those of elongated or egg shape are apt to go into the machine crosswise of the center piece and side pieces, and in order to turn them lengthwise I provide the device  $u$ , Figs. 6 and 7, which consists of a post  $u'$ , having a foot which is set in a socket  $u^2$  in the center piece. The post is grooved obliquely in opposite directions on opposite sides, and in these grooves are arranged fingers  $w^3$   $w^3$ , which are slotted longitudinally and held together and to the post by a bolt  $u^4$ . The fingers are made adjustable upon the post so as to project more or less beyond the center piece, in order to suit the size of lemons being acted upon. In use this lemon-turner is set in the socket in the center piece, so that its fingers project over the sides of the center piece and into the spaces between it and the side pieces and serve to turn the lemons lengthwise to be fed to the proper egress. When oranges or other round objects are being assorted, this lemon-turner is arranged in the center piece with its fingers extending lengthwise instead of crosswise of the center piece and prevents the objects from riding over one another and directs them into the spaces between the center piece and side pieces, so as to be properly fed along.

$v$  is the auxiliary lemon-feeder; and it consists of a bayonet-shaped device fastened to the restraining-boards, and when not in use it is turned up, as indicated in dotted lines in Fig. 10. The action of this form of lemon-turner is the same as that just described.

In order to properly adjust the side pieces or center pieces, I employ a gage. (Shown in Fig. 18.) This gage consists of a piece of board or other rigid material having a series of steps made in conformity to the sizes into which the fruit is desired to be assorted. For the sake of clearness I will describe my gage as used in assorting oranges. Oranges are assorted or graded according to the number that may be packed in a box, and are designated as follows, beginning with the largest and going down to the smallest that are put upon the market, viz: 96's, 112's, 128's, 146's, 176's, 200's, 226's, 250's, and 300's; but for practical purposes with my machine consideration may be given only to the 96's, 112's, 128's,



250's, and 300's. Those oranges that would escape at section 1 and spout  $k'$  would be the smallest, while the largest would run out at the end of section 6 and spout  $l$ , and sometimes the 96's and 112's are mixed.

The adjustable members are adjusted alike at both ends, and it is the object of this gage to insure such adjustment. Of course if the adjustment at each end is fixed, then a corresponding increase or diminution of width of spaces follows throughout the machine. The upper or feed ends of the movable members are set by the larger numbers on the gage, while the lower ends are set by the smaller numbers on the gage. This setting of the movable members is effected by introducing the gage edgewise between the movable members and then moving up the bearings of said movable members until they come in contact with the gage and then tightening the bolts used to secure such bearings or boxes firmly to the cross-bars  $d$ . For example, if 112's are to be discharged at spout  $k'$ , then the gage will be introduced at No. 112, between the movable members at section 6 of the center piece. The smaller sizes would then be determined by gaging the upper ends of the movable members by sections marked 250 and 300 on the gage. Sections marked 1 2 3 and 1 2 3 on the gage are used in setting the rollers for other fruit smaller than oranges, the narrow 1 2 3 for the upper ends and wide 1 2 3 at the lower ends of rollers.

My machine may be used for assorting round varieties of tomatoes, and also for assorting apricots, olives, and other fruits and vegetables having an approximately regular outline; but it is especially effective in assorting oranges according to already well-known standards. For assorting oranges it is immaterial whether the center piece or side pieces be adjustable or not, and I include in my invention as claimed a machine so constructed.

The strip  $b'$  may be omitted, and in such case the center piece and side pieces would have rather more fall than is indicated in the drawings.

In Fig. 14 the coupled rollers might be graduated and the side rollers straight.

It is to be observed that the several sections of the graduated member have parallel instead of tapering edges, and therefore said sections, in conjunction with the straight-edge members, form rectangular egress-spaces, whereby there is no liability of the objects being assorted being crowded and wedged into a space too small for them. In practice it is found that a tapering edge exit tends to attract objects that are too large to freely pass, and that such objects being forced through these exits are injured or bruised, and thus their prime condition is destroyed and their market value impaired. With my machine, having rectangular openings or exits, this injury is impossible.

Special advantages growing out of placing

the two members in such relation to each other that their working faces or edges would be in precisely the same horizontal plane are that the curved faces of these members flare upwardly and away from the plane from which the fruit escapes or in which it is discharged from the machine, thus enabling gravity alone or assisted by the rubber spiral, when that is used, to effect the discharge of the fruit without other means, such as a movable member. Such second movable member is dispensed with and the motive power required to run the machine to this extent is diminished and the cost of construction correspondingly decreased. Moreover, if the working faces or edges be in the same plane, and one or both of the members be cylindrical, fruit that is the least particle too large to escape at a given exit cannot possibly lodge in such exit, but must go on to its own exit; whereas, if the said working-faces were disposed one below the other there would be below the horizontal or horizontal axial plane of the roller a space greater than the exit, into which the fruit would tend to lodge and from which it could be dislodged only by force and at the risk of injury to its skin and substance, and hence in all other machines to me known, the working members have been made to revolve in opposite directions, or one has a rotary motion on its longitudinal axis and the other a longitudinal bodily movement at right angles to the direction of rotation of the other member, so as to force-feed the fruit and, as stated, at the imminent risk of injuring delicate fruit.

What I claim is—

1. A machine for assorting oranges and the like, comprising a graduated member composed of a number of sections and each section of uniform width throughout its length, and a straight-edge member, one of these members being rotary and the other stationary and one of them being adjustable laterally with relation to the other to vary the distances between them, and the two members forming a series of rectangular exits of different sizes, substantially as set forth.

2. A machine for assorting oranges and the like, comprising a graduated member composed of a number of sections and each section of uniform width throughout its length, and a straight-edge member arranged in the same horizontal plane, the two members forming a series of rectangular exits of different sizes, and one of said members having a rotary motion and the other being stationary and having boxes or bearings suitably supported and adjustable to permit the movement of that member away from or toward the other member to vary the space or spaces between the members, substantially as described.

3. In a machine for assorting oranges and other fruits and vegetables, a center piece provided with a number of sections of different width and each section of uniform width



throughout its length, cylindrical side pieces arranged substantially parallel with the central plane of the center piece and in the same horizontal plane and provided with  
 5 boxes and supports for said boxes, and means, such as slots and bolts, for fixing said boxes at different points on the supports, the said center piece and side pieces forming a series of rectangular exits of different sizes, sub-  
 10 stantially as and for the purpose described.

4. In a machine for assorting oranges, &c., a fixed center piece provided with a series of sections of different width and each of uniform width throughout its length, combined  
 15 with adjustable side pieces having straight edges and arranged upon opposite sides of the center piece and forming with the center piece a series of rectangular exits of different sizes, a trough in which the center piece  
 20 and side pieces are arranged, spouts depending at an incline from the bottom of the trough corresponding in number with the number of sections in the center piece and arranged in alternation on opposite sides of the trough,  
 25 and an end spout, substantially as and for the purpose described.

5. In a machine for assorting oranges, &c., a fixed center piece composed of a series of  
 30 sections of different width and each section of uniform width throughout, substantially as shown, combined with side pieces having straight edges, adjustable boxes for said side pieces, and means to rotate the side pieces, substantially as described.

35 6. In a machine for assorting oranges, &c., the center piece provided with a graduated active face and a flat bottom, and a metal strip secured to such flat bottom and extending beyond both ends, combined with supports  
 40 to receive the ends of the metal strips, substantially as described.

7. The within-described lemon-turner, the same consisting of a post and fingers crossed obliquely and adjustably secured to the post  
 45 and adapted to be applied to a stationary member of a fruit-assorting machine and to co-operate with feeding mechanism in such machine to insure the passage of lemons in proper position through such machine, sub-  
 50 stantially as described.

8. In a machine for assorting fruit, the com-

bination of the center piece and the side pieces forming feeding and discharging means, restraining-boards arranged above said side pieces to prevent the escape of objects being  
 55 acted upon, and fingers arranged, respectively, on the center piece and the restraining-boards to turn lemons from a crosswise into a longitudinal direction, substantially as described.  
 60

9. The bayonet-shaped piece *v*, adapted to be applied in a fruit-assorting machine having a stationary support therefor, and also having feeding devices to turn lemons and such like oblong fruit into proper position to  
 65 be discharged, substantially as described.

10. In a machine for assorting oranges, &c., the combination, with the trough and assorting mechanism therein, of a detachable end spout *l*, constructed with projecting pieces *l'*  
 70 *l'*, substantially as and for the purpose described.

11. In a machine for assorting oranges, &c., a fixed center piece provided with a series of sections of different width and each of uniform width throughout its length, combined  
 75 with side pieces having straight edges and arranged upon opposite sides of the center piece and forming with the center piece a series of rectangular exits of different sizes, a trough in which the center piece and side  
 80 pieces are arranged, spouts depending at an incline from the bottom of the trough corresponding in number with the number of sections in the center piece and arranged in alternation on opposite sides of the trough, and  
 85 an end spout, substantially as and for the purpose described.

12. A machine for assorting oranges, comprising a graduated member and a straight-  
 90 edge member, one or the other of such members being rotary and the other stationary and all arranged in the same horizontal plane and forming a series of exits of different width and rectangular in outline, substan-  
 95 tially as described.

In testimony whereof I have hereunto set my hand this 14th day of February, A. D. 1889.

JOHN A. JONES.

Witnesses:

J. JESSOP,

WALTER B. WHITE.