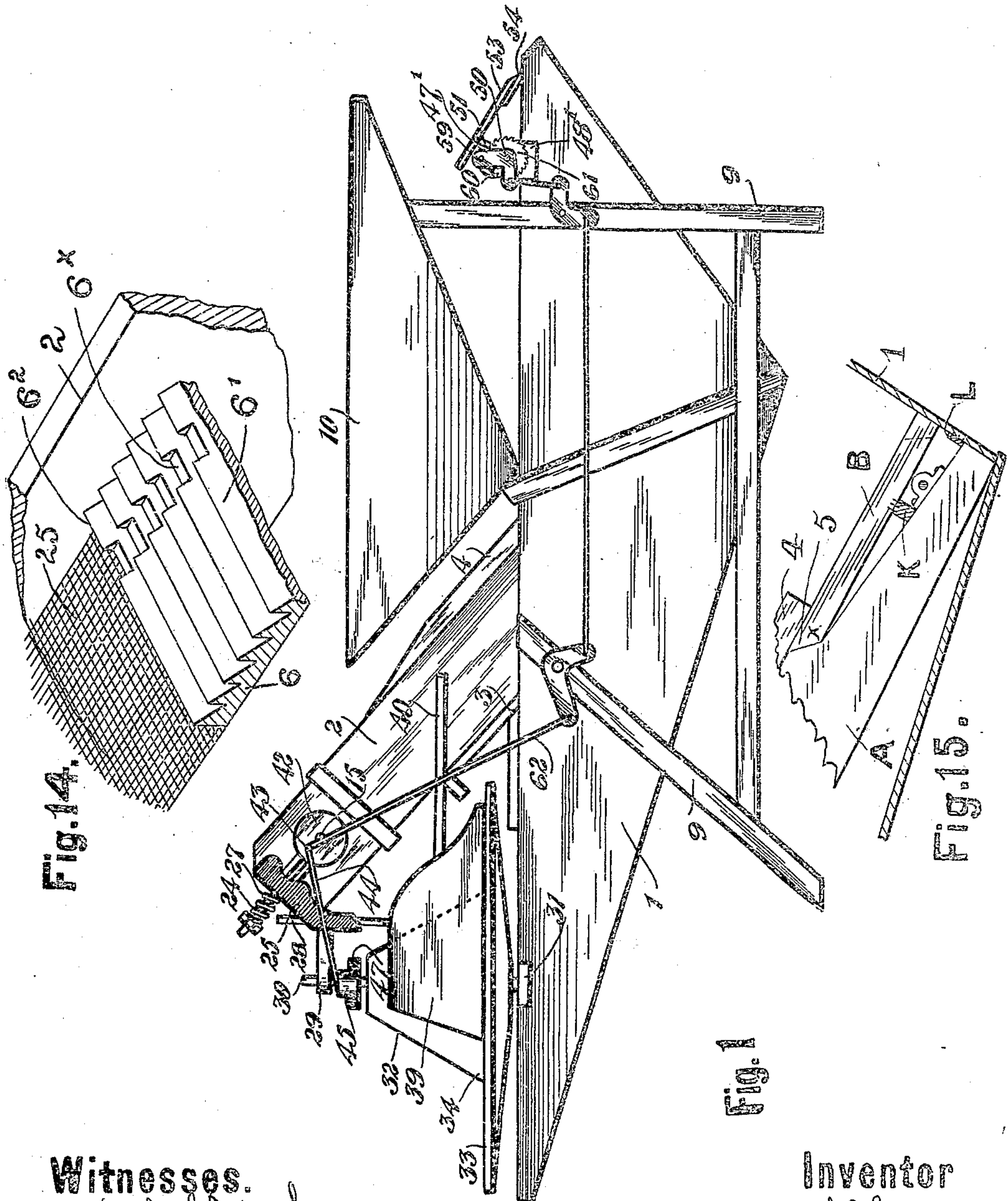


J. A. COWAN.  
GRAIN PICKLING AND CLEANING MACHINE.  
APPLICATION FILED OCT. 1, 1907.

958,097.

Patented May 17, 1910.

5 SHEETS—SHEET 1.



Witnesses.

*Gerald S. Foxburgh*  
*Jas. M. Topley*

Inventor

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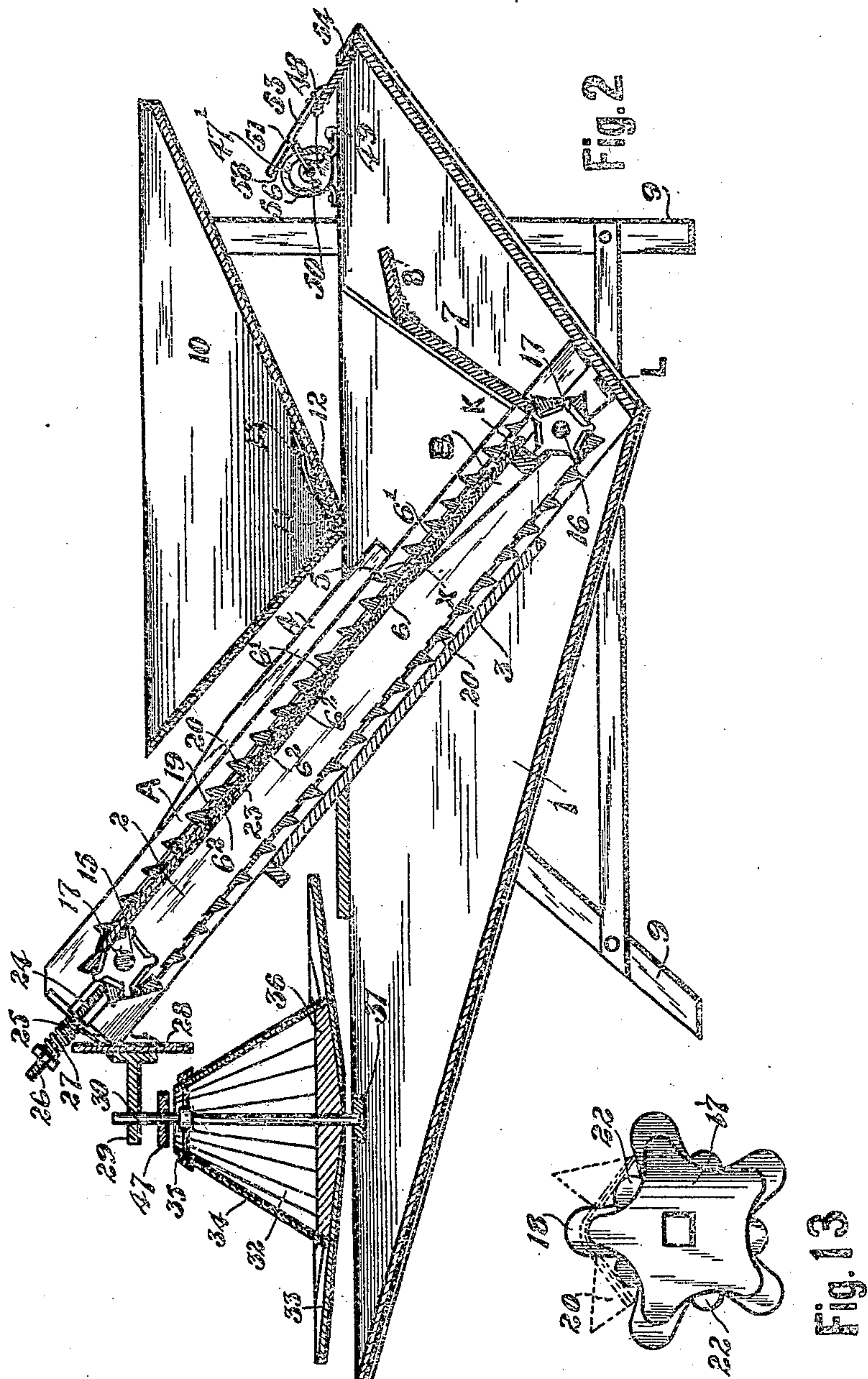
By *Frank Salustianoff*  
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5 SHEETS—SHEET 2.



Witnesses.  
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5 SHEETS—SHEET 3.

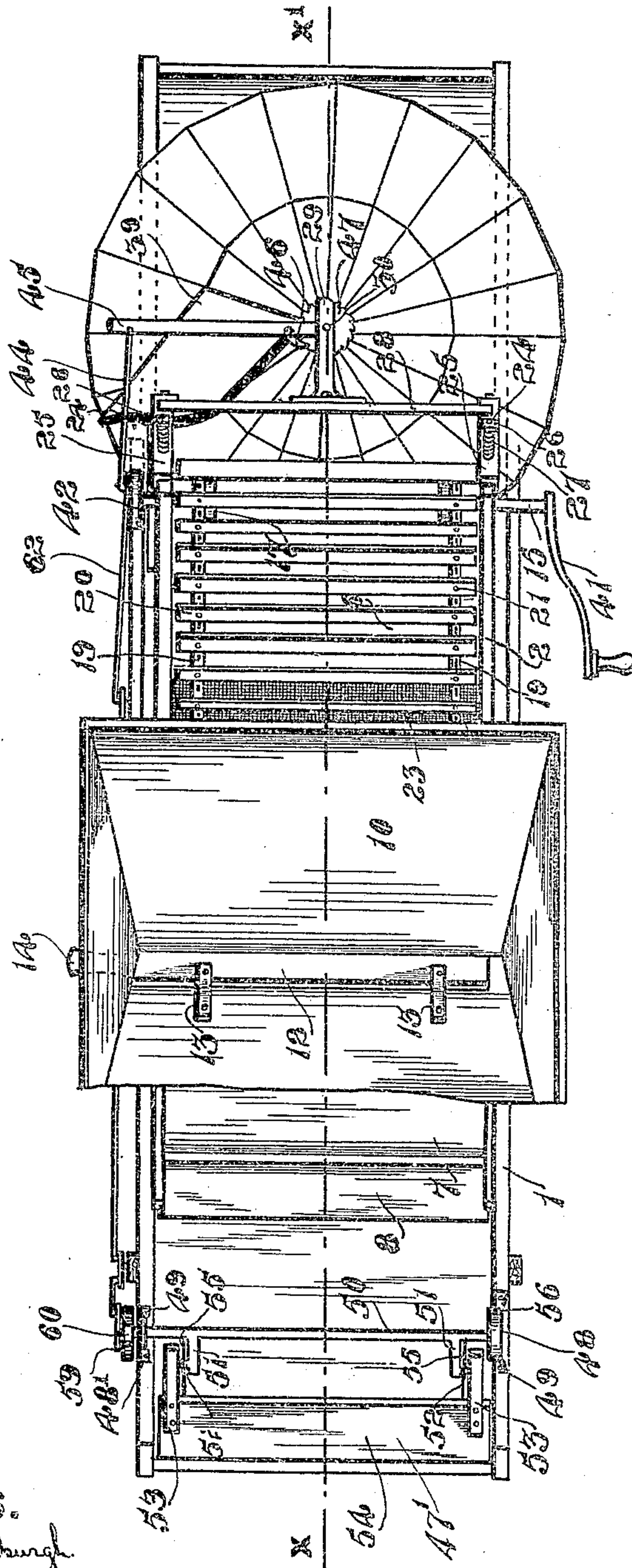


Fig. 3

Witnesses.

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5 SHEETS—SHEET 4.

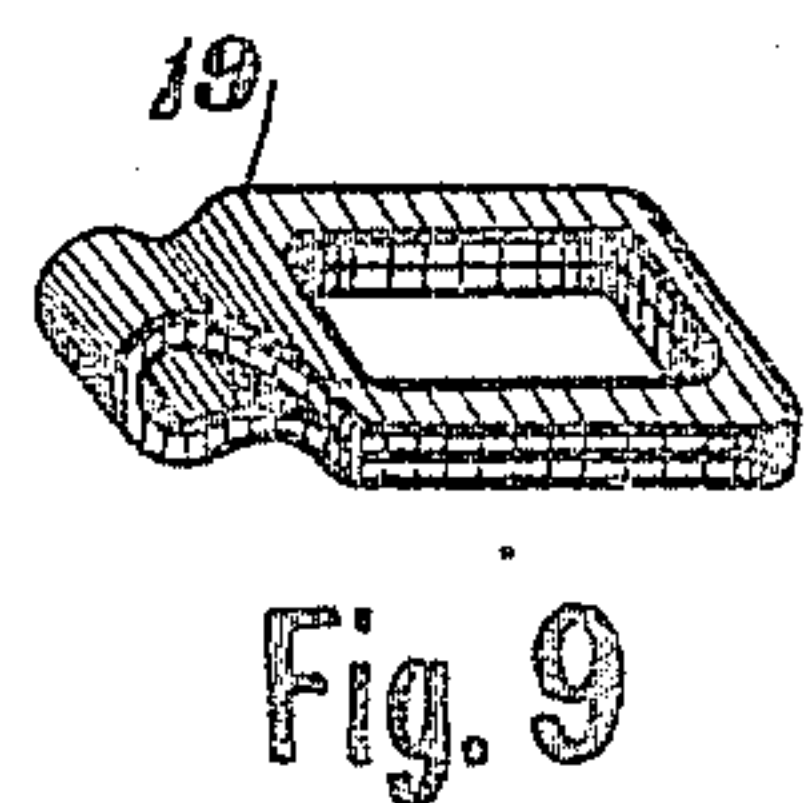
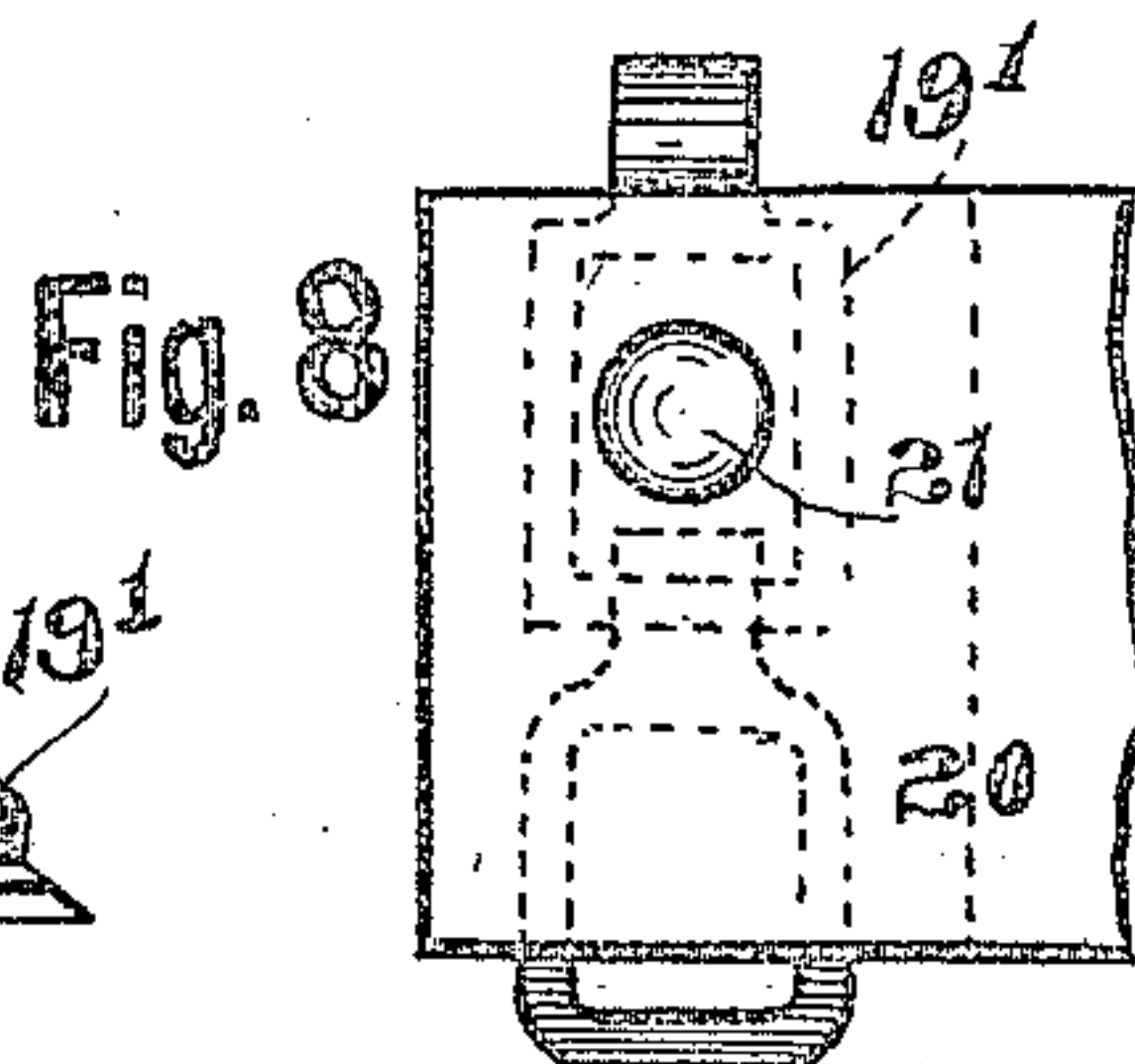
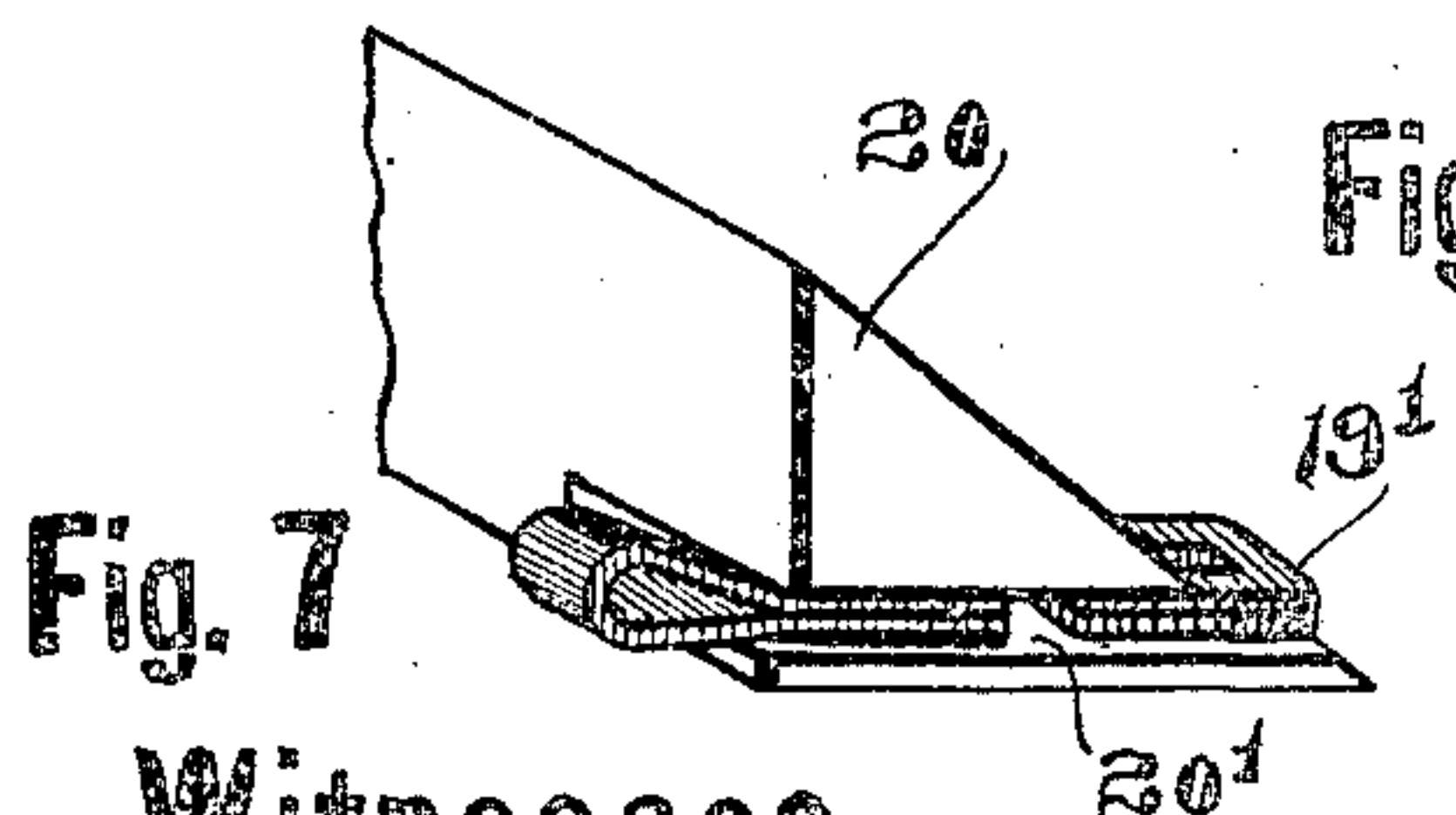
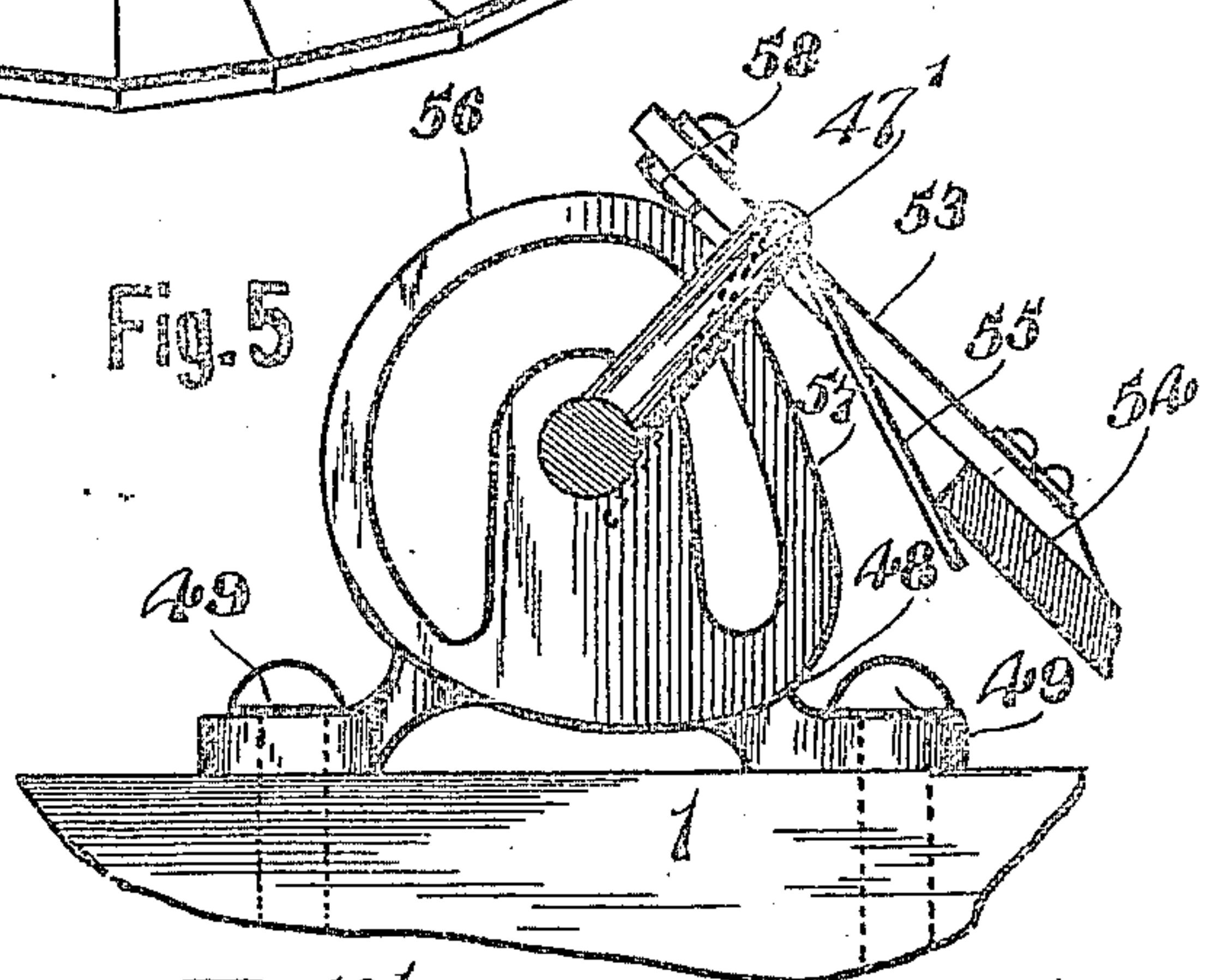
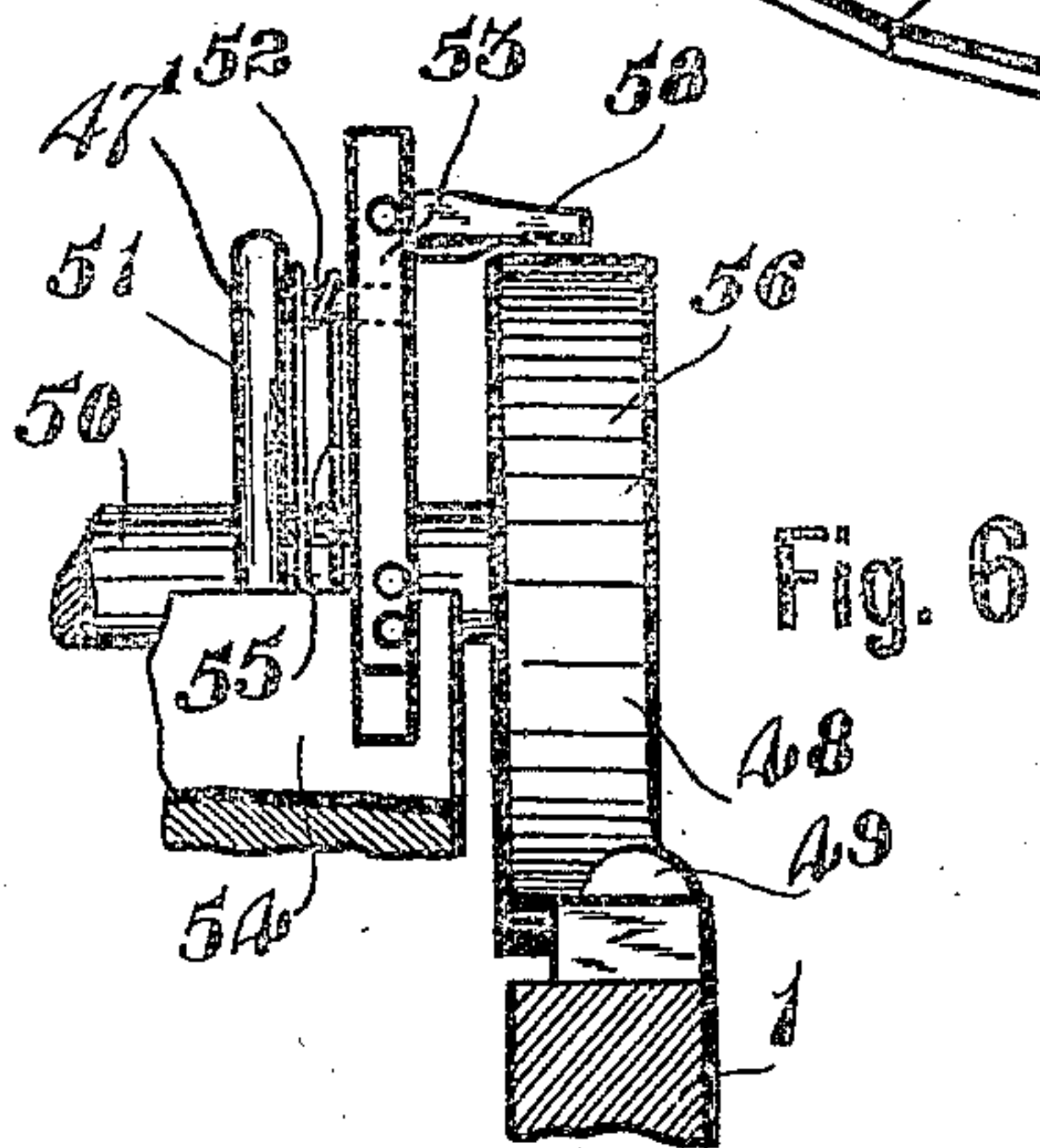
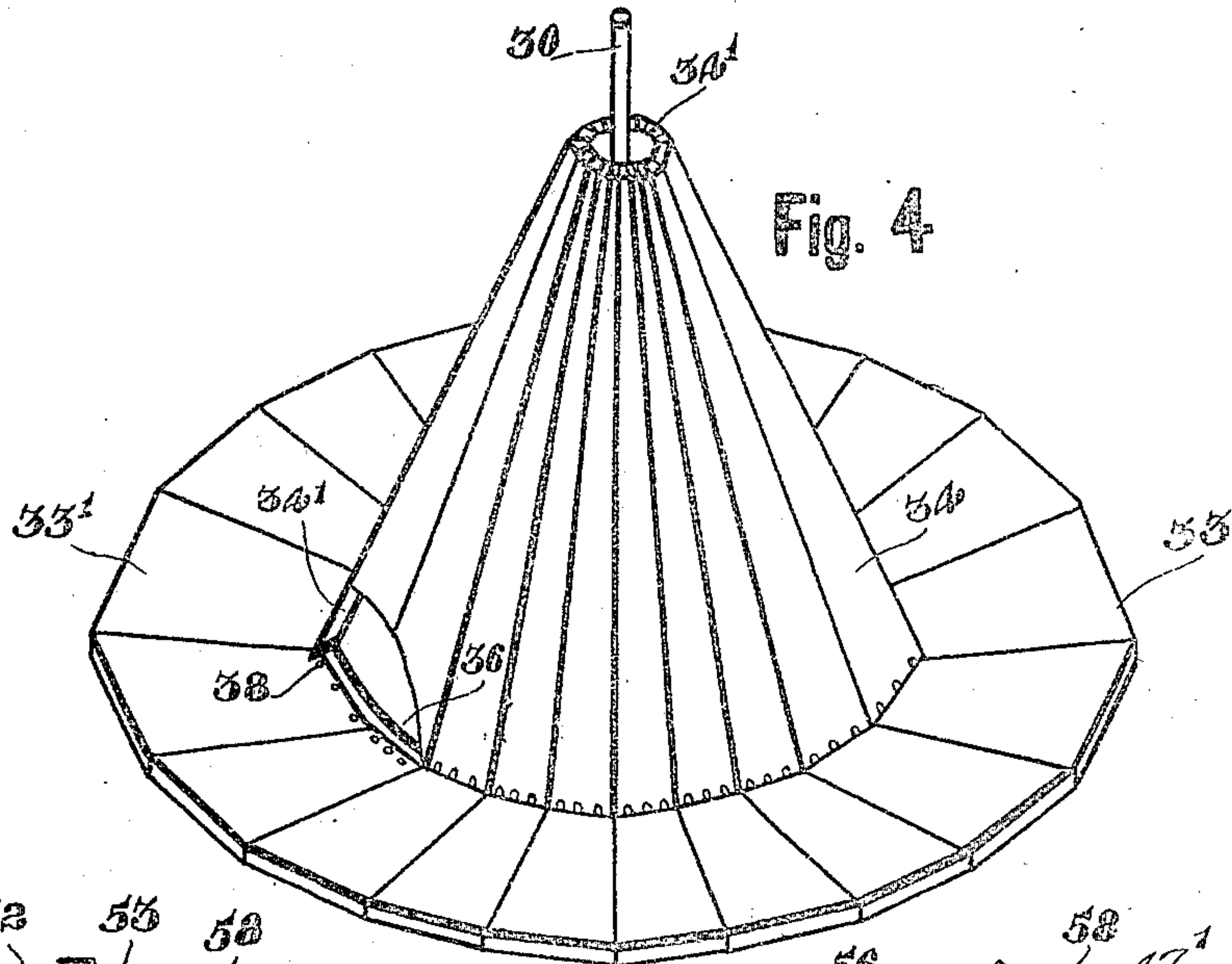


Fig. 7

Fig. 8

Fig. 9

Witnesses.

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5 SHEETS—SHEET 5.

Fig. 10

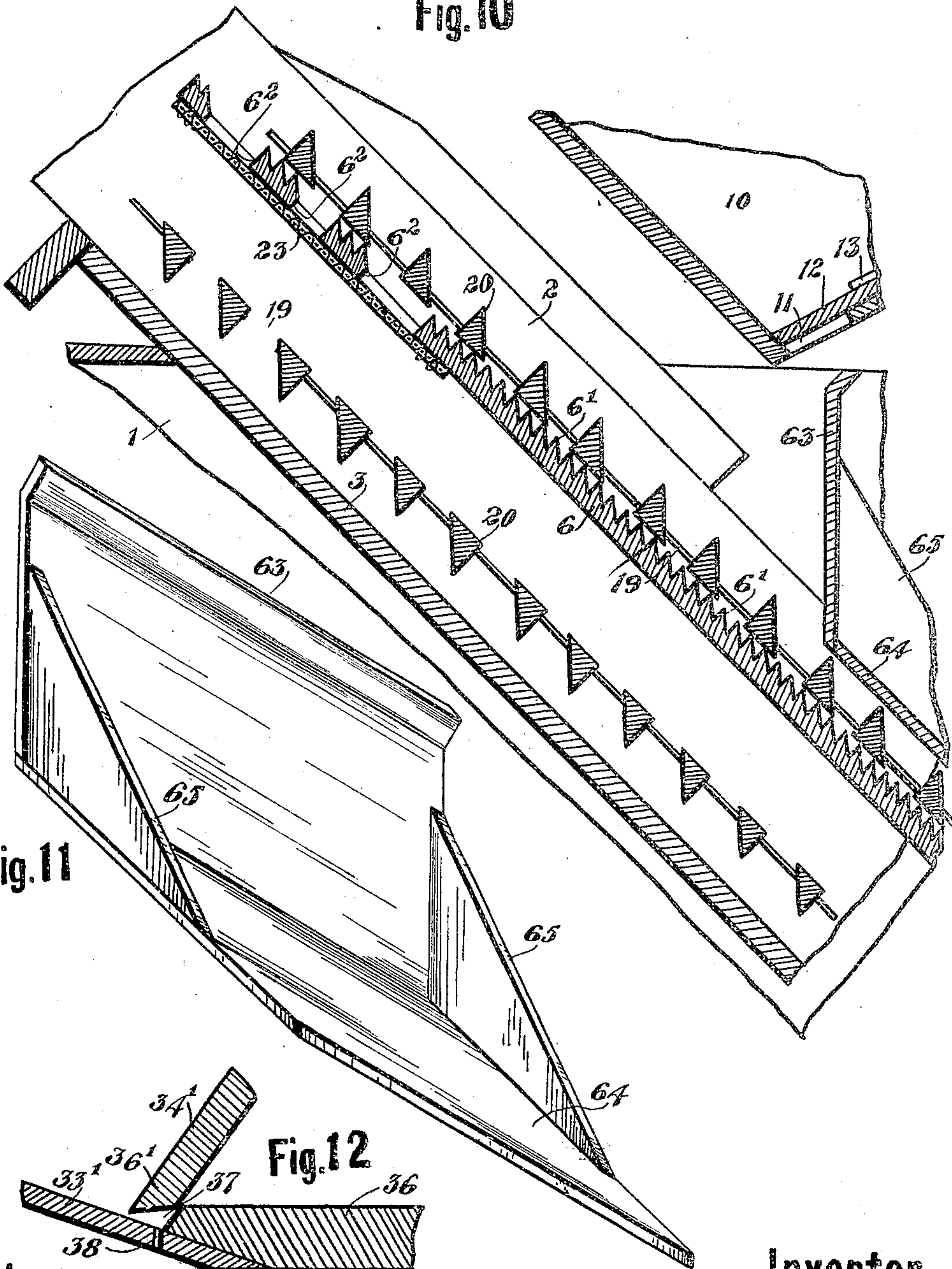
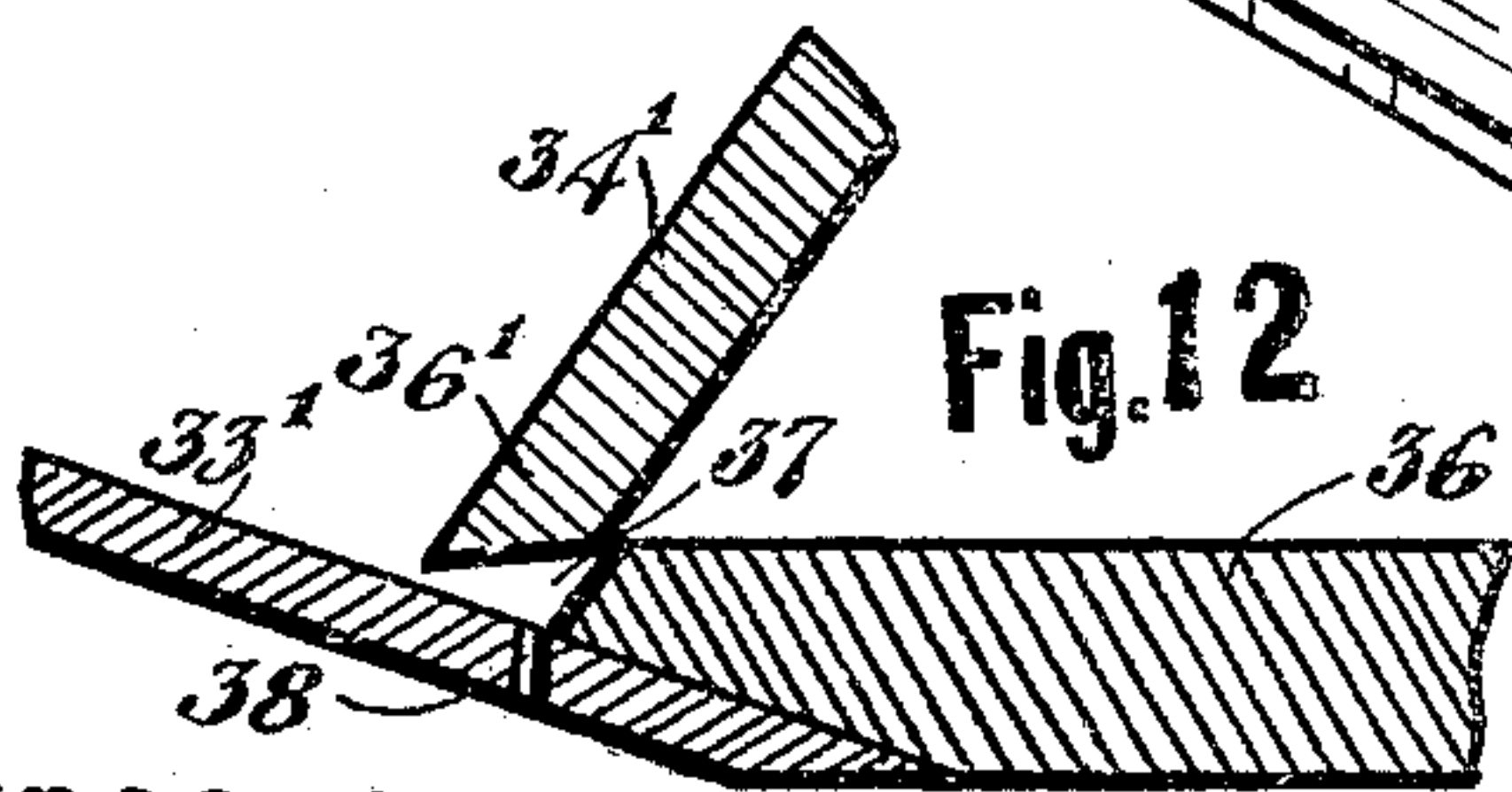


Fig. 11



Witnesses

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*Jas. M. Topley*

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*By his Atty*  
*J. A. Cowan*  
*Frederic B. Talbot*



# UNITED STATES PATENT OFFICE.

JOHN ALEXANDER COWAN, OF WINNIPEG, MANITOBA, CANADA.

GRAIN PICKLING AND CLEANING MACHINE.

958,097.

Specification of Letters Patent.

Patented May 17, 1910.

Application filed October 1, 1907. Serial No. 395,387.

*To all whom it may concern:*

Be it known that I, JOHN ALEXANDER COWAN, of the city of Winnipeg, in the Province of Manitoba, Canada, manufacturer, have invented certain new and useful Improvements in Grain Pickling and Cleaning Machines, of which the following is the specification.

My invention relates to grain pickling and cleaning machines, and the objects of the invention are to provide a machine in which the parts, including the hopper, the elevator, and the draining and drying board, do not extend or overhang beyond the ends of the tank, and in which such members, including the tank, are designed to keep the entire machine as low as possible, making it considerably easier to operate, and more suitable in the many cases where a high machine would be disadvantageous, secondly to provide an improved system for cleaning, draining, and drying the grain, thirdly, to provide a means for removing the cleaned grain from the machine, as well as a means for entrapping, and for removing the useless material or impurities, and it consists of the features of construction and combination and arrangements of parts hereinafter described and particularly pointed out in the claims.

Figure 1 is a side elevation of my complete invention. Fig. 2 is a vertical sectional view in the plane denoted by the line X X', Fig. 3. Fig. 3 is a plan view as in Fig. 1, a portion of the tank being broken away for the sake of clearness. Fig. 4 is an enlarged perspective view of my improved combined draining and drying board. Fig. 5 is an enlarged detailed side elevation of the right hand bearing and guide ring of the skimmer. Fig. 6 is an end elevation, as shown in Fig. 5. Fig. 7 is an enlarged detailed perspective view of a portion of a cross flight or blade, showing a portion of the chain fastened thereto. Fig. 8 is a bottom plan view as in Fig. 7. Fig. 9 is an enlarged detailed perspective view of one of the links of the chain connecting the cross blades. Fig. 10 is an enlarged, detailed, vertical, sectional view through a portion of the hopper, showing the dripping and straining board beneath the carriers, and also showing an attachment for use when removing smut from oats. Fig. 11 is a rear perspective of the attachment. Fig. 12 is an enlarged detailed vertical sectional view through the joint

formed between the members of the combined draining and drying board. Fig. 13 is an enlarged detailed side elevation of the sprocket carrying the endless carrier chains. Fig. 14 is a part perspective view showing the formation of the portion 6. Fig. 15 is a sectional view showing one side of the elevator.

In the drawings like characters of reference indicate corresponding parts in each figure.

In the present invention the application or outline of the machine is considerably different from those in general use, especial modification being found in the form of the tank, which has been considerably lengthened in order to give a large working surface of water, as well as to allow for my revoluble conical shaped draining and drying board.

Referring to the drawings, 1 is a vat or tank containing the water or pickling fluid used in washing the grain. 2 are sides of the elevator, said sides being each formed from an upper and lower portion A and B. The portion A is first placed in position with its lower end wedged against the bottom of the tank and the block L secured to the tank. Then portion B is placed in position with its inclined end X bearing against the inclined portion 5 on the part A and its other end resting against the bottom of the tank. The block K secured to the portion B prevents said end from going down too far as said block K rests on the part A. The part B is held in position by the out boards 4 resting against its upper end. A cross board 3 may form a bottom for the sides but it is not absolutely necessary, only in so far as it forms a bearing on which the upper member A of the sides rest when it is in position against the lower member B.

4 are outboards fastened to the face of the sides being joined wholly to the member A and extending slightly beyond the lower end of the upper side of such member, in this way forming at 5 a slight lock holding the sides in place.

6 is a combined dripping and straining board which extends longitudinally between the sides and is supported thereby, its length being somewhat less than the sides, and its position toward the upper edge, from the center of the sides. The board has the upper face of practically the lower one-half cut



rough or toothed in cross section at 6' forming transversely extending channels, as will readily be seen in both Figs. 2 and 10, of the drawings. Toward the upper end of the board there are cross slits or openings 6<sup>2</sup>, the purpose of such being more fully explained hereinafter. The board is formed of two parts in order to allow complete removal of the lower members of the sides.

7 is a board extending completely across the tank, considerably below the water line and is fastened to the sides of the tank, the lower edge bearing against the face of the lower member B of the sides, in this way holding them in position if they are not removably bolted within the tank.

8 is a flap secured to the cross board 7 at the upper edge and it is formed of a material which will float in the solution in the tank, and its upper tip is just below the surface of the water, due to the current, when the machine is in operation, and it is accordingly self adjustable to the height of the water. The flap is hinged so that when floating it is inclined toward the back end of the machine, and cannot go forward farther than in a line with the cross board 7.

9 are legs of any form supporting the tank, the rear set extending beyond the upper edge and forming a support for the hopper 10 bearing forwardly on the tank slightly to the rear of the carriers. The hopper has an opening 11 emptying directly to the tank.

12 is a gate swung on arms 13 and operated by a handle 14. In order to open the gate all that it is necessary to do is to pull the handle outwardly, which swings the gate on the arms, allowing the grain to pass from the hopper.

15 and 16 are shafts extending transversely across between the sides, one toward either end, the upper member A carrying one set of bearings and the lower member B the other set.

17 are chain wheels on the shafts of the form, most clearly shown in Fig. 13, where it will be noticed that they have extending lugs or teeth 18 adapted to engage with the cross blades to drive the chain.

19 are continuous chains extending around the sets of chain wheels, and 20 are transverse blades, preferably wooden, suitably disposed and secured at their extremities to opposing links in the chains. Referring to Fig. 7 it will be noticed that the ends of the blades have an incision 20' cut therein to receive the links 19' of the chain, and the blades are held to the chains by rivets 21.

In order to allow for the heads of the rivets extending beyond the lower face of the blades longitudinal slots 6<sup>x</sup> are cut in the board 6 across the teeth and these do not in the slightest detract from the value of the board. In the operation of the carriers the

overhanging ends of the blades beyond the chains are carried by small lugs 22 on the chain wheels, and the teeth 18 as aforesaid are of such a pitch that the cross blade can pass therebetween.

23 is a screen passing across the openings 6<sup>2</sup>, and is fastened to the under side of the board 6, completely covering the openings. The object in forming the cross partition 6 and the carriers as described is to give me a strong current over the tips of the blades, and to minimize the backward current under the blades, and also by virtue of the screened openings to allow for the grain to partially drain, back to the tank when passing up over the board. To understand better these advantages it will be seen that the lower faces of the blades pass immediately over the upper tips of the toothed face of the board, and that consequently there is no opening for the pickling solution to rush under the blades over the face of the board. The result is that the solution that is carried up with the grain initially is thrown over the upper tips of the blades and causes a backward flow or current of the solution in the tank. When the machine has been running a short time the openings 6<sup>2</sup> are completely filled with loose grain, as also are the channels formed between the teeth 6' on the upper face of the board. On the board above the openings there is also a layer of grain gathered, as the heads of the rivets extending beneath the blades keep them clear of the board, and allows grain to accumulate. This is considered distinctly advantageous, as the solution returning to the tank through the openings has to pass through a layer of grain, which prevents the screen from filling up with seeds, lint, etc., and gives an especially good draining surface, which adds materially to the operation of the machine.

24 are rods extending outwardly from the upper shafts 17, and 25 are face plates at the end of the sides of the elevator through which the rods pass, terminating in threaded ends.

26 are nuts on the rods and 27 coil springs between the nut and the face plate 25, the nut and screw allowing for adjustment of the shaft 17, and the spring for any slight variation which may be required in operating. The face plates 25 have extending arms carrying channels in which is secured a deflector 28 carrying an outwardly projecting arm 29.

Referring to the drawings it will be seen that the center line joining the axles 15 and 16 passes beneath the position of the lock 5. It is on account of this when the upper member B is put in position the tendency is for it to remain flush against the upper member A, being held by the endless chains. There is, however, enough give in the chains



to allow the lower end of the member B to be sprung out and removed.

30 is a vertical shaft supported on a cross bar 31, secured at the forward end of the tank and bearing at its upper end in a journal formed in the arm 29. 32 is my combined draining and drying board, formed preferably of wood, and as hereinafter described.

33 is a circular tray, forming the lower portion of the board, such tray having the individual members 33' inclining downwardly toward the center, that is, with the center in a plane lower than the edges. This is so the water or liquid will run toward the center.

34 is a conical shaped center piece formed from individual members 34' which are secured at their upper ends to a small ring 35 carried by the shaft 30 and fastened at their lower end to a central circular block 36 carried by the lower end of the shaft. The individual members 34' are cut with their lower ends slanting as at 36' (Fig. 12) and the object of this is in order to form a trap 37 for any liquid carried by the grain.

38 are openings passing through each of the individual members 33', immediately below the lower end of the members 34'. It will be noticed that the conical center 34 does not fit closely with the tray 33 as it leaves a space between, through which the liquid can enter the trap and grain can not pass. The openings 38 are simply for draining the liquid back into the tank which is immediately below.

39 is a blade or shovel having a slant end fitting the face of the conical center 34, the lower edge being practically horizontal and carried directly above the outer edge of the tray 33.

40 is an arm secured to the blade and on the outer face of the sides of the elevator.

41 is an operating handle, attached to the upper shaft 15, to one side, and 42 is a wheel carrying an eccentric pin 43 connected through a link 44 with an arm 45 pivoted on the shaft 30 and carrying a pawl 46 adapted to engage with the ratchet wheel 47 keyed on the shaft 30.

47' is my improved skimmer for cleaning the impurities from the tank and it is secured across the rear end and operated through a link and bell-crank mechanism, by the handle 41.

48 and 48' are bearings secured by bolts 49 to the sides of the tank and carrying a shaft 50 running transversely thereacross.

51 are arms, one toward either end of the shaft, extending rearwardly, and in the same plane, the said arms having side projections or spindles 52, on which are pivoted second similar arms 53, to which is attached a cross board 54. The length of the cross board is sufficient to allow it to nicely clear the inner

side faces of the tank when the arms 51 are revolved.

55 are wire springs formed from single pieces of wire having a central coil the extending ends of which in the individual cases pass, respectively, forwardly under the board 54 and rearwardly beneath the shaft 50. The objects of the springs will be explained hereinafter.

56 is a block having a cam-shaped periphery carried by the bearing 48 and has a flattened side 57 and other irregularities in its outline dependent on the position required to be taken by the cross board 54. The object of the block will be quite obvious when I describe the operation of the skimmer.

58 is an arm secured to the upper end of the arm 53 adjoining the block and extending toward the block, being adapted to operate on its face. It will be noted that the block is so placed on the bearing that the arm 58 can pass completely around in its travel.

59 is a bell-crank pivoted on the shaft 50 and carrying a gravity pawl 60 adapted to engage with a ratchet wheel 61 rigid with the shaft. The bell crank is connected as hereinbefore stated with the handle 41 through connecting rods and bell-cranks, the final connecting rod 62 passing to the wheel 42. By simply changing the position in which the links 44 and 62 are secured to the wheel the operation of either the drying and draining board or the skimmer can be materially changed to either fast or slow.

The actual operation of the machine is as follows:—Assuming the gate 12 open, the operator in turning the handle 41 rotates the carriers, elevating the grain from the tank, and at the same time revolves the shafts 30 and 50, respectively. The elevated grain is directed by the deflector to the conical center 34 and then to the tray of the drying and draining board, where it rests for approximately a complete revolution of the board before being swept to the floor by the blade 39. The grain banks up on the conical center, the amount depending on the quickness of feed, and drains to the tray, the liquid finding egress through the trap 37, back to the tank. The backward current set up within the tank by the solution passing over the tip of the blades carries all the impurities, which do not descend to the bottom of the tank, such as noxious seeds, oats, etc., over the flap 8, where they are entrapped, and if no means is provided for their removal, they accumulate, until they have to be cleaned out by hand. The skimmer as herein described affords a blade, which carries all the impurities rearwardly and discharges them on the floor. Referring to the drawing it will be seen that when the shaft 50 rotates, the arms 51 carry the pivoted arms 53 with them. The block 56 is for a portion of its length such that when the



tip of the cross board 54 is in contact with the bottom of the tank and ascending upwardly, the arm 58 is free of the block, the cross board being held to the bottom of the tank by virtue of the springs. When the cross board clears the edge of the tank the springs throw the arms 52 upwardly and the arm 58 again engages with the block with a sudden jarring motion. This clears all the impurities from the face of the blade that would otherwise tend to stick to it. In Fig. 5 I have shown the cross board in a position where the arm 58 is about to strike the block after the cross board has been released. The remaining outline of the block is simply such that the cross board will be guided free of the hopper and the flap by means of the arm 58 operating on the face of the block.

I wish to draw particular attention to the means above employed, whereby the jarring effect is given to the board, as I find it particularly desirable.

In Figs. 10 and 11 of the drawings I have shown an attachment which I have found it advisable to use where it is required to treat oats with my machine.

63 is a cross partition adapted to fit within the tank immediately above the carriers and directly beneath the opening in the hopper.

64 is a second cross partition within the tank fastened to the lower end of the latter partition and inclining downwardly, slightly off-set from the tips of the blades.

65 are corner braces between the partitions 63 and 64. The position of the partition 63, relative to the hopper is such that grain passing from the hopper passes down its forward side. In using, the oats are fed down against the front face of the partition 63 and immersed in the solution, being carried upwardly by the blades and deposited on the tray in the same manner as is wheat. When using the attachment it is unnecessary to have the cross partition 7 and flap 8 in position in the machine.

What I claim as my invention is:

1. In a device of the class described, the combination comprising a tank; an inclined endless slotted conveyer having its upper portion moving upwardly and its lower portion moving downwardly, a feed hopper adapted to deposit grain in the path of the upwardly movable portion of the conveyer; a cross partition located directly beneath the upwardly movable portion of the conveyer and upon which the grain deposited from the hopper is received, the said partition having its upper portion smooth with a series of screened openings therein, and its lower portion formed with a continuous series of transversely extending channels, as and for the purpose specified.

2. In a device of the class described, the

combination comprising a tank, an endless conveyer adapted to have the upper portion carry the grain upwardly, a cross partition in proximity to and beneath the upper portion, the said cross partition having a portion of its upper face ratchet shaped in cross section, as and for the purpose specified.

3. In a device of the class described the combination with the elongated sides and the endless chain conveyer of a cross partition in proximity to and beneath the ascending side of the conveyer, the said cross partition having a series of screened openings therein and having a portion of its upper face ratchet shaped in cross section, as and for the purpose specified.

4. In a device of the class described the combination with the elongated sides, and the carriers formed from cross blades and a continuous chain riveted within an incision in the ends of the cross blades, of a cross partition extending between the sides, said cross partition having screened openings therein, and a portion of its upper face ratchet shaped in cross section and longitudinal channels cut in the upper toothed face to receive the extending ends of the rivets, as and for the purpose specified.

5. In a device of the class described the combination with the tank and the endless carriers, of a combined draining and drying board consisting of a lower revoluble tray carrying a conical shaped upwardly extending center piece, and means for allowing for drainage from the tray, as and for the purpose specified.

6. In a device of the class described the combination with the tank and the endless carrier of a combined revoluble drying and draining board adapted to receive the grain from the carriers, and consisting in a base adapted to drain toward the center, a central member having an inclined face adapted to receive the grain from the carriers and means for allowing of drainage from the base member to the exclusion of grain, as and for the purpose specified.

7. In a device of the class described the combination with the tank, the elongated sides and the endless carrier, of a combined draining and drying board rotatably supported beneath from the tank and above by an arm extending from an adjustable deflector carried by the sides and consisting of a central circular block mounted on the supporting shaft, a circular tray formed from similar members fastened to the central block, the said tray draining toward the center, a conical center piece formed from similar members fastened to the circular block, and converging upwardly, the lower end of the latter members being cut slanting to form with the block and the tray a trap, means for draining the liquid from the tray



passing from the trap, and means for rotating the tray, as and for the purpose specified.

8. In a device of the class described the combination with the tank and the elongated sides supporting the endless carrier, of end plates to the sides, having guides to receive a vertically adjustable deflector, an arm extending from the deflector, a cross bar within the tank and below the aforesaid arm, a vertical shaft mounted in bearings formed in the cross bar and the aforesaid arm, respectively, a combined draining and drying board, rotatable with the shaft, having a circular base draining toward the center, and a conically shaped center member extending upwardly from the base, there being means provided for entrapping the grain, and withdrawing the liquid, a ratchet wheel mounted on the shaft, an arm pivoted on the shaft and carrying a ratchet adapted to operate on the ratchet wheel, a link connecting the extending end of the arm with an eccentric pin mounted on the upper shaft of the carrier and means for rotating the latter shaft, as and for the purpose specified.

9. In a device of the class described the combination with the tank, of a skimmer consisting in a cross shaft supported in bearings at either side of the tank, a set of arms secured to the shaft and extending out-

wardly in the same direction, a set of pivoted arms carried by the aforesaid arms, a cross blade passing across the latter arms and at their lower ends, a block having a cam shaped periphery carried by one of the bearings, a stub arm extending from the upper end of the pivoted arm adjacent the said periphery, the said stub arm operating on the said periphery, springs holding the stub arm to the said periphery the said periphery being so formed that the stub arm leaves its face when the cross blade is passing upwardly over the bottom of the tank, as and for the purpose specified.

10. In a device of the class described, the combination with a tank, of a skimmer comprising a cross shaft, arms secured thereto, and extending at right angles thereto, arms carried by said arms and projecting downwardly and outwardly from the shaft, a blade carried by said latter arms, a block on the tank having a cam shaped periphery, means for rotating the shaft, and a projecting portion on the skimmer adapted to operate on the said periphery.

Signed at Winnipeg, in the Province of Manitoba, this 20th day of September, 1907.

JOHN ALEXANDER COWAN.

Witnesses:

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GERALD S. ROXBURGH.