

No. 783,387.

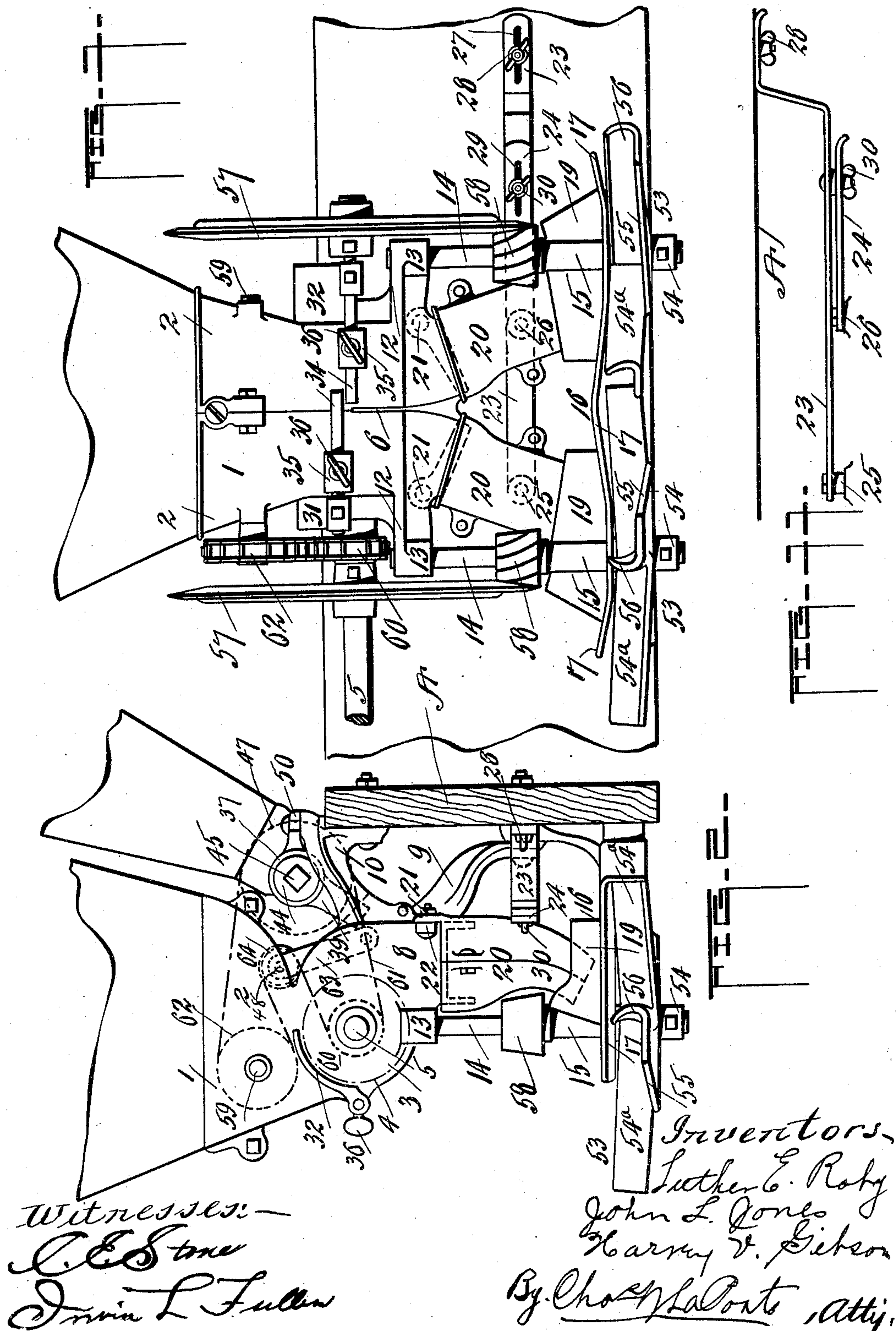
PATENTED FEB. 21, 1905.

L. E. ROBY, J. L. JONES & H. V. GIBSON.

BROADCAST SEEDER.

APPLICATION FILED DEC. 23, 1903.

3 SHEETS—SHEET 1.



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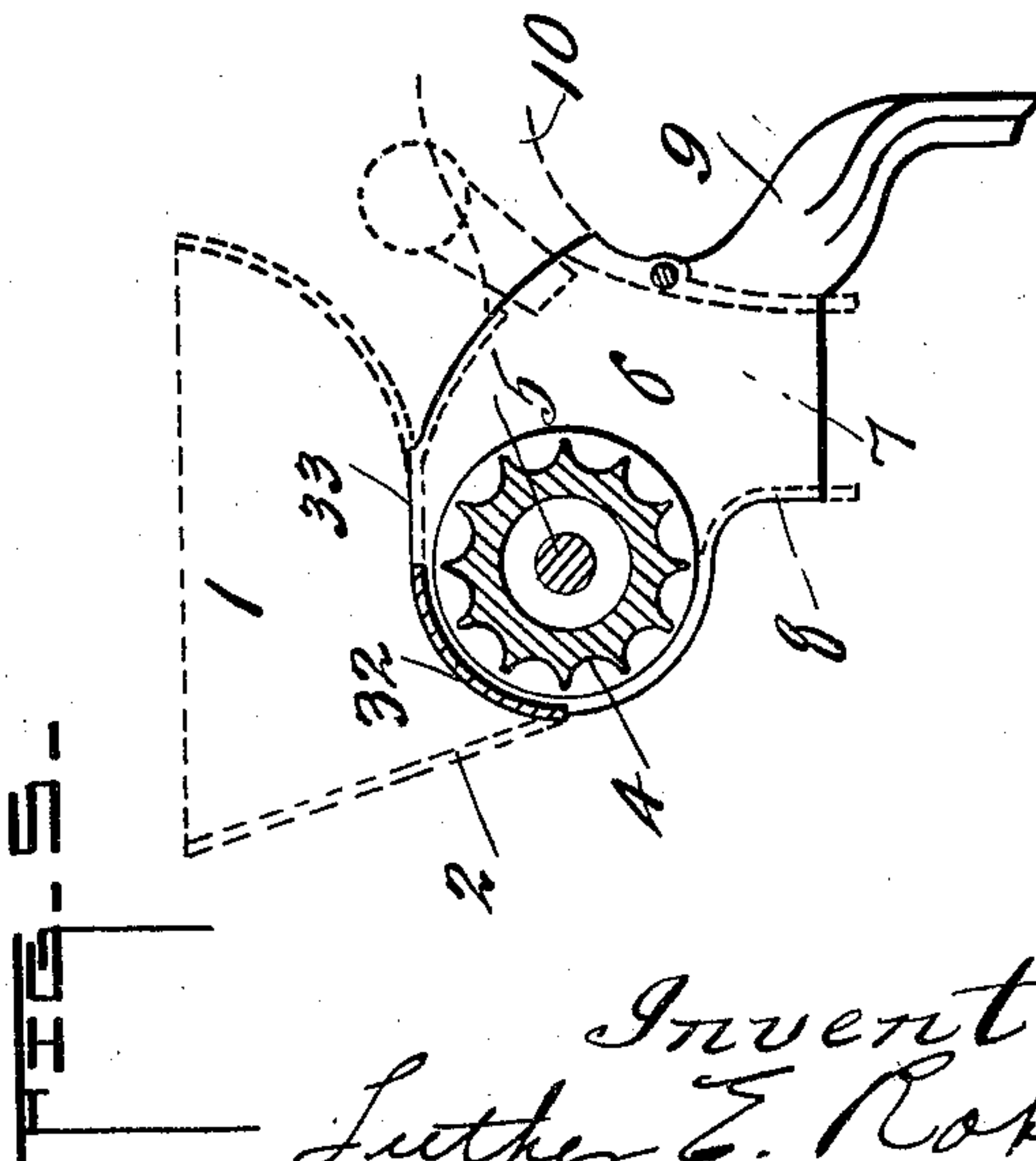
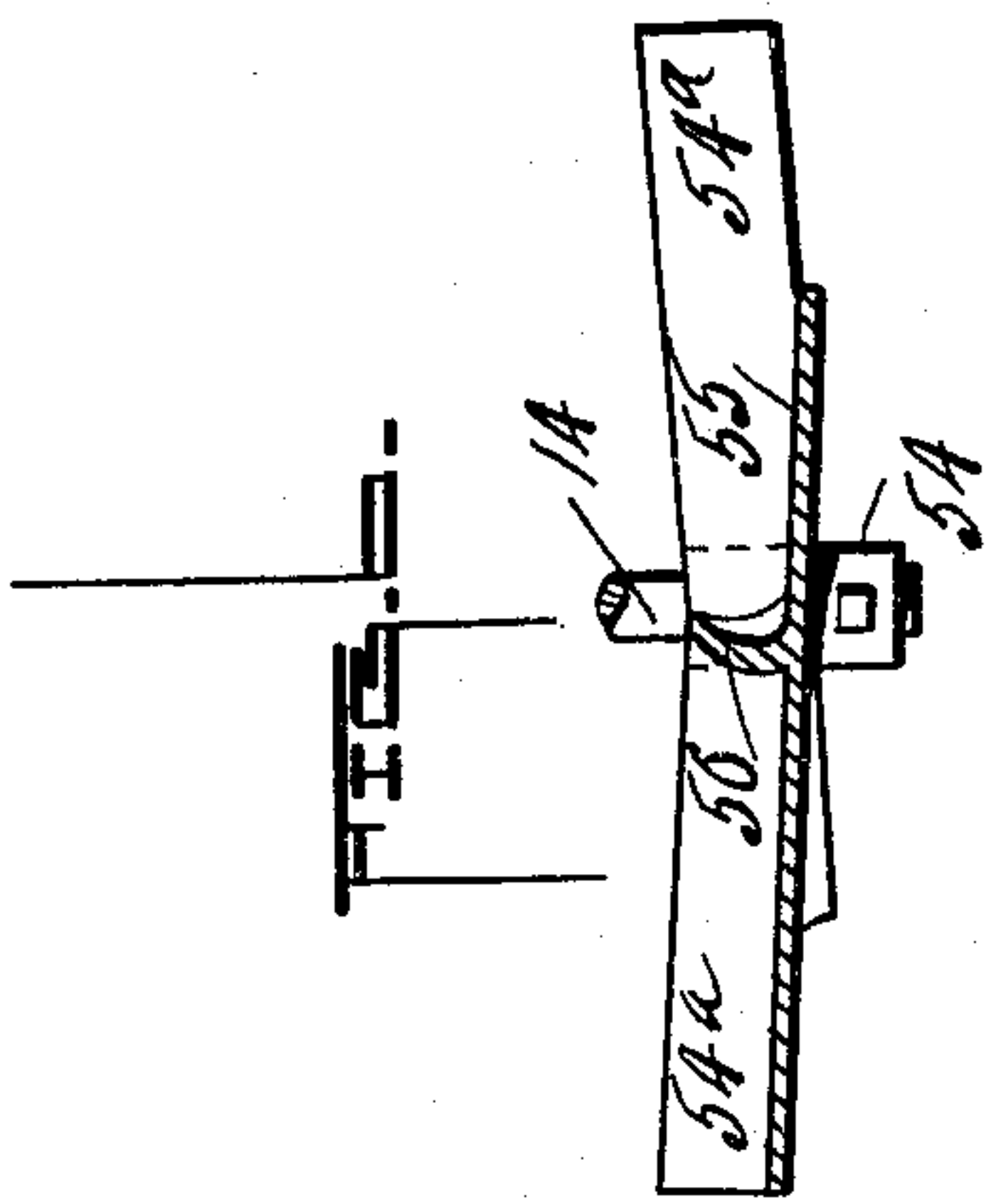
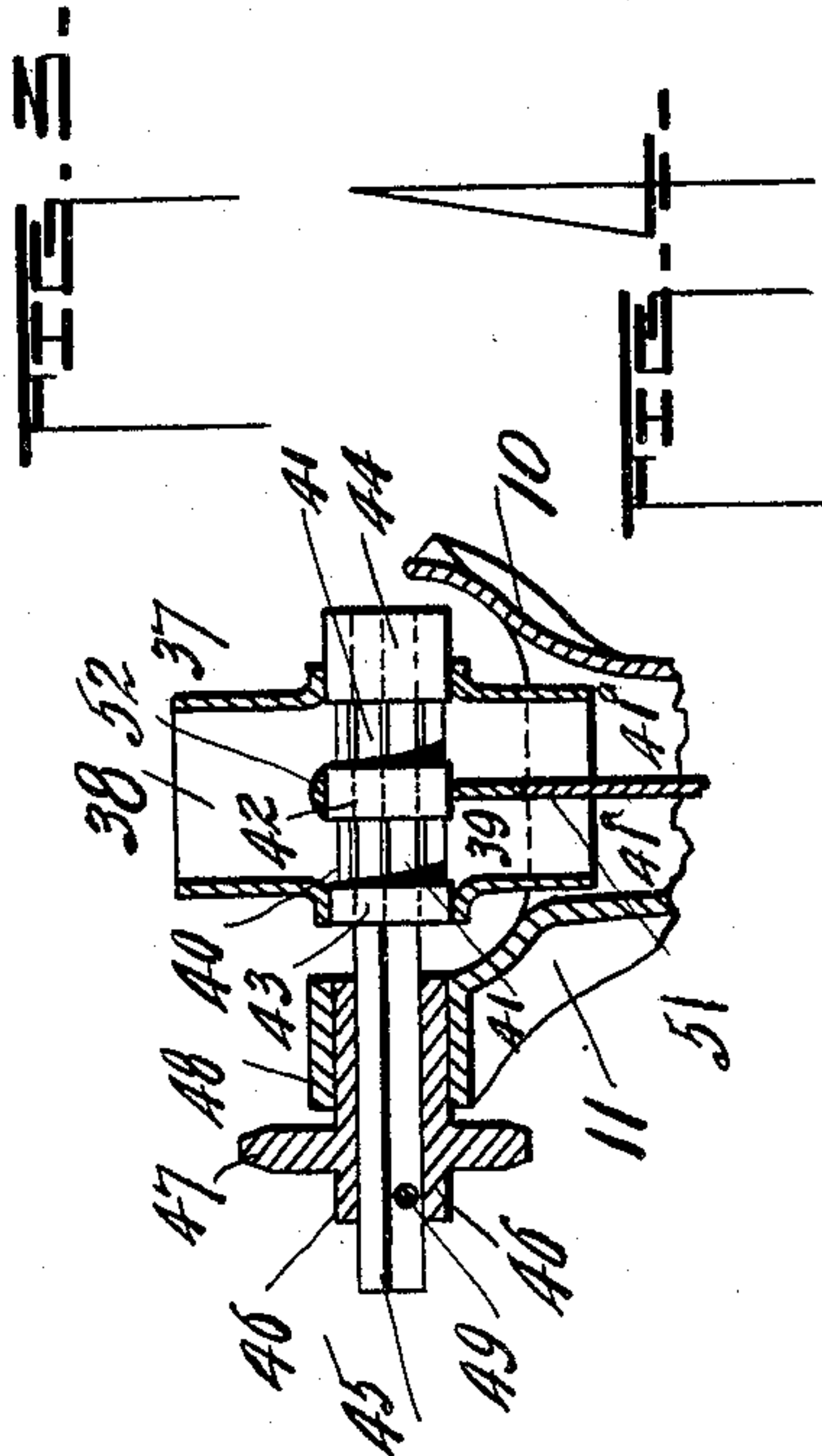
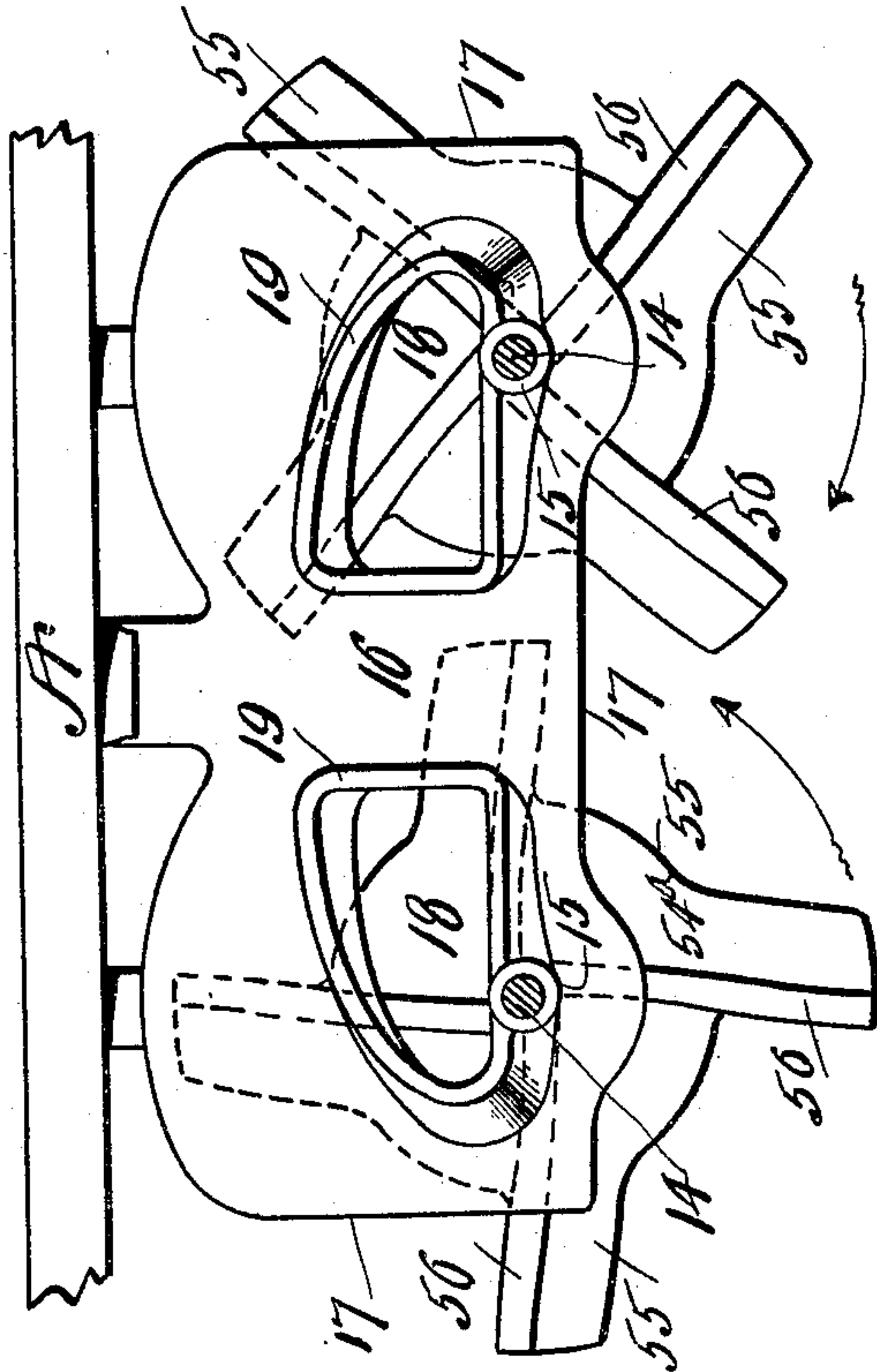
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3 SHEETS—SHEET 2.



Witnesses:
L. E. Stone
J. L. Jones

Inventors:
Luther E. Roby
John L. Jones
Harry V. Gibson
By Chas. A. Port, Atty.

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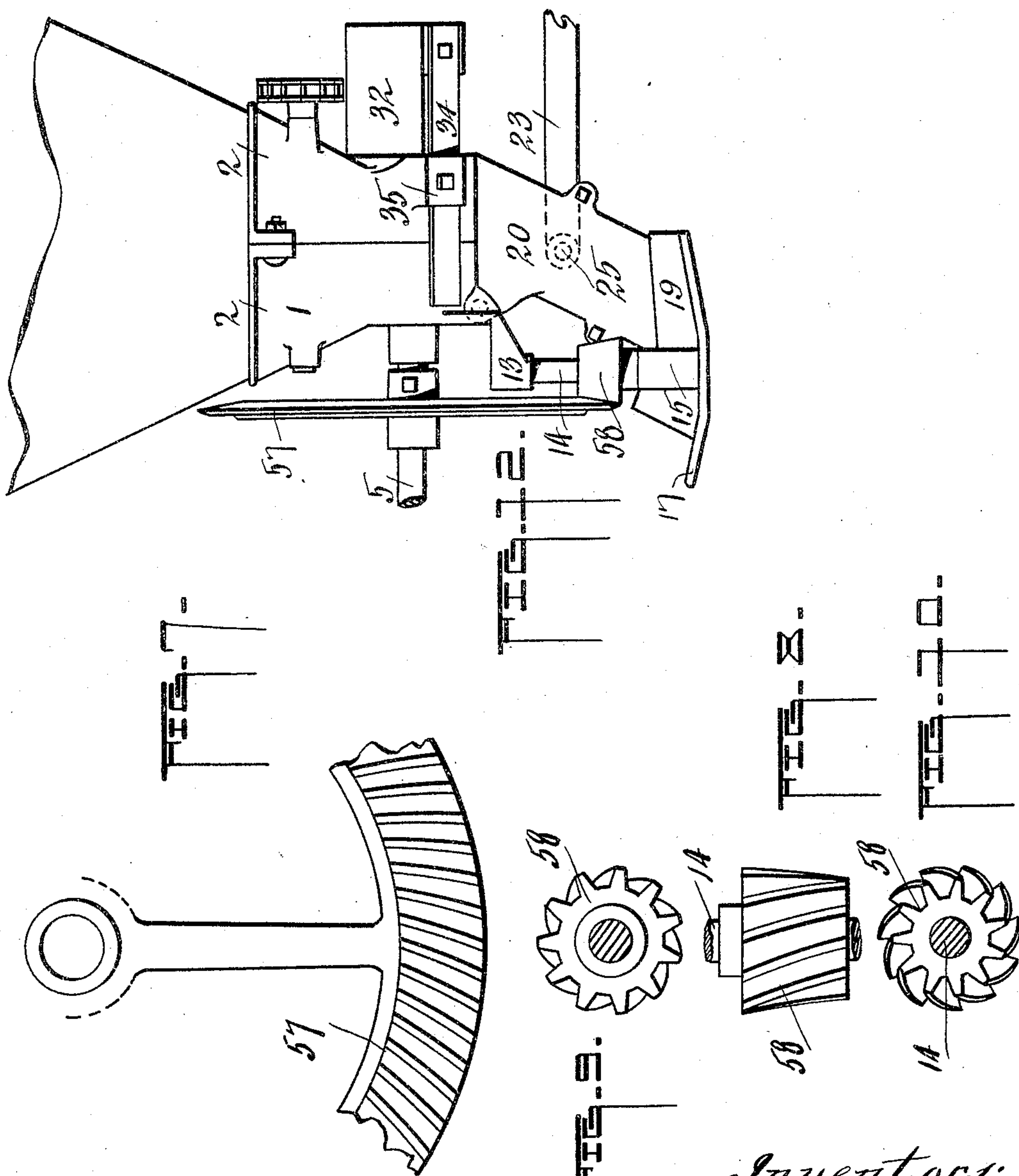
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3 SHEETS—SHEET 3.



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Luther E. Roby.
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By Chas. LaPorte Atty.

UNITED STATES PATENT OFFICE.

LUTHER E. ROBY, JOHN L. JONES, AND HARVEY V. GIBSON, OF PEORIA, ILLINOIS; SAID JONES AND GIBSON ASSIGNORS TO SELBY, STARR & CO., OF PEORIA, ILLINOIS, A CORPORATION OF ILLINOIS.

BROADCAST SEEDER.

SPECIFICATION forming part of Letters Patent No. 783,387, dated February 21, 1905.

Application filed December 23, 1903. Serial No. 186,358.

To all whom it may concern:

Be it known that we, LUTHER E. ROBY, JOHN L. JONES, and HARVEY V. GIBSON, citizens of the United States, residing at Peoria, in the county of Peoria and State of Illinois, have invented certain new and useful Improvements in Broadcast Seeders; and we do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same.

This invention has reference to broadcast seeding-machines, and has for its object a seeding-machine of the type known as "end-gate" seeders; and the improvements herein are designed to be applicable to a single distributing-seeder, as well as to the double or twin distributor type.

A further object of the invention is a seeding-machine provided with a driving-shaft passing through a hopper, carrying fluted force-feed rollers adapted to convey seed or grain from the hopper to a distributor through a spout or spouts.

A further object is to provide a spout or spouts which may be shifted to change or adjust the delivery therefrom onto a fan beneath, the spout or spouts having a pivotal connection with the hopper from which they are supported and means provided for shifting the spout, or if two spouts be used then both simultaneously, and means for adjusting the shifting devices.

A further object of the invention is an improved grass-seeding attachment comprising a fluted force-feed roller rotatably and slidably arranged in a suitable hopper, provided with a spout communicating with the hopper for the grain. The fluted roller may be formed with a dividing partition and is carried on a shaft capable of being moved longitudinally in gearing with which it is operatively connected.

Another object of the invention is the provision of bevel-gearing for the driving and fan shafts, which said gears are of the helical-gear type, employed because of their perfect driving contact and noiseless action.

Other objects and aims of the invention will become apparent from the following specification and drawings, forming a part thereof, in which—

Figure 1 is a front elevation of a seeding-machine embodying our improvements supported by an end-gate. Fig. 2 is a side elevation from one side of the machine, also showing the end-gate in cross-section and with the gear on the driving-shaft removed. Fig. 3 is a plan of the base-plate, beneath which the fans are carried for rotation and which also serves as a shield for the fans and the lower ends of the spouts. Fig. 4 is a sectional elevation of the grass-seeding attachment and a portion of the hopper. Fig. 5 is an elevation of the partition for dividing the hopper, also showing in dotted lines an outline of the hopper and with a fluted roller in cross-section. Fig. 6 illustrates, detached and partially in section, our improved fan or distributor. Fig. 7 is an enlarged detail of a portion of the helical gear on the driving-shaft. Figs. 8, 9, and 10 are enlarged details of the helical bevel-pinion on the fan-shaft. Fig. 11 shows a detached view in plan to illustrate the shifting mechanism for the spouts, and Fig. 12 is a front elevation showing a seeder with one spout and a single distributor or fan.

The seeding-machine proper comprises a hopper-support (indicated as 1) formed of the two half-sections 2, providing a cup portion 3, in which rotates fluted force-feed rollers 4, carried by a driving-shaft 5, which passes through the cups 3 and is journaled in bearings in the walls of sections 2, and a partition 6, which in a double seeder divides the cups 3 into two parts, in which case two rollers 4 are employed, separated by the partition. The cups 3 extend into the depending chambers 7, formed in a casing 8 by the two depending portions integral with the hopper portions 2. The partition 6 is somewhat of the shape as seen in Fig. 5 of the drawings, having the rearwardly-curved portion 9, adapted to be bolted to the body of an end-gate, (denoted as A,) while from the rear of the casing or por-

tions 8 of the hopper extend the ears or extensions 10 and 11, adapted to engage and be bolted to the upper portion of the end-gate.

From the sections 2 are extended the portions 12, having bearings 13, in which the upper end of fan-shafts 14 are journaled, the lower ends of the shafts being journaled in bearings 15 of a base-plate 16, forming a shield for the upper portions of the fans to be described, and for the rear sweep thereof, the base-plate having upwardly-converging portions 17, conforming to the angle at which the wings of the fan are directed, all of which will be described, and the plate 16 is provided with the openings 18, through which grain and grass-seed is dropped as it is delivered to the fans beneath, the openings surrounded by the vertically-extended shields 19, which are to protect the lower portions of the wind-shifts or spouts 20, which depend from and are supported by the depending portions of the casing 8 of the hopper proper. The spouts 20 are pivoted at 21 to the ears 22, provided on the casing 8, as will be noted in Figs. 1 and 2. The spouts are made in two sections, preferably, and bolted or otherwise suitably connected together, and when in position as shown in the figures receive grain and grass-seed passed through the chamber 7 and discharge the same onto the fans beneath and are capable of being swung on their pivots 21 by means to be described, the lower ends swinging over the openings 18 of the base-plate and within the shields 19.

To shift the spouts or wind-shifts 20, we have provided the bars 23 and 24, pivotally attached to opposite spouts at 25 and 26. The bar 23 at its outer end is provided with a slot 27, through which is passed a bolt which is also carried through the end-gate, and 28 is a thumb-nut for securing the bar 23 in position, and by means of the slot 27 permits the bar 23 to be adjusted. The bar 24 has a similar connection with the bar or ear 22 by slotting the same, as at 29, and using a bolt and thumb-nut 30 to adjust the bar 24. By this arrangement both spouts 20 may be shifted simultaneously or singly and the angle at which the spouts are carried adjusted by the means described.

The shafts 14 are spaced at such a distance apart that the wings of the opposite fans in rotating interlock, as it were, or overlap. (See Fig. 3.) This is done for the purpose of doing away with flatness in the spouts and also enables us to carry the spouts at an angle approximately vertically and not so far apart as is usual in this type of machine.

The feed of the grain from the hopper to the spouts is regulated by slide-valves 31 and 32, which overlie a portion of the feed-rolls 4, the wall of the hopper also overlying the rolls at 33 and meeting the valves. The valves slide through openings in the side walls of the hopper, which conform to the contour of the

valve-plates and are attached to slidable rods 34, sliding in the boxings 35 and held by means of the thumb-nuts 36.

The grass-seed attachment which we employ is indicated as a whole as 37, formed of a casing having the hopper portion 38 with the divided lower extension 39.

40 denotes a fluted force-feed roller having fluted portions 41, divided by the smooth cylindrical portion 42 and having the opposite cylindrical portions 43 44, and the said roller is carried by a shaft 45, preferably square, slidable in a sleeve 46, which carries a sprocket-pinion 47, and the said sleeve is journaled in a bearing 48, forming a part of the extended portion 11 of the section 2, the shaft 45 being retained in adjusted positions by a bolt 49, carried in the sleeve 46 and engaging the shaft.

The grass-seed attachment is supported to the rear of the main seeding hopper or casing by placing the divided lower extension 39 down into the main casing or into the spouts 41, formed by the ears or extensions 10 and 11, the ears 50 of the attachment being secured to the ears 10 and 11. (See Fig. 2.) The spouts 41 are divided by the partition 6, which is adapted to be carried up into the slot 51, formed in the portion 39. Through the connection thus formed any seed passing from the attachment 37 will find its way through the spouts of the portion 39 into the main casing.

The hopper portion 38 of the attachment is provided with a shelf 52, overlying the portion 42 of the roller for dividing and directing the seed to the portions 41 of the roller. To regulate the quantity of seed sown to an acre, the feed-roller is moved in its bearings by shifting its shaft 45, which causes the portions 42 and 44 to partially or wholly close the openings through the attachment 37, and thereby regulate the quantity of seed passing therethrough, all of which it is believed will be understood.

Referring now to the fans employed by us, the same are indicated as a whole as 53, having hubs 54 carried on the shafts 15 and rotating beneath the base-plate or shield and from which radiate the conjoined radial wings 54^a, with shelf portions 55 and the backs or walls 56, which may be curved or otherwise suitably shaped to form a grain-shed to hold the grain adjacent to the wall 56 until the centrifugal force frees it at the ends or outer sweeps of the wings. The wings of the fans extend from their hubs and are inclined vertically or slope upwardly from the hub to the outer sweep thereof. This occasions the raising of the base-plate 16 at 17 to permit the fans to rotate beneath the same and yet bringing the wings in close proximity to the plate 16 during its revolving. It has been demonstrated that with the raised wings a much broader cast can be obtained than with the use of a fan whose wings line horizontal or

which slope downwardly from the hubs to the outer sweeps thereof. The wings of the opposite fans interlock, as shown and for the purposes set forth.

5 The means for driving the shaft 5 is accomplished in manner common to driving end-gate seeders, and the means for driving the fan-shafts from the driving-shaft is by means of helical gears 57 and corresponding pinions 58,
10 meshing therewith, which, as stated, embody the principles of constant perfect contact and noiseless action. The advantages of helical gearing in seeding-machines of the broadcast type are numerous. By their use there is ob-
15 viated the necessity of having to use means for yieldingly holding the gears in contact, such as a spring for relieving the strain on the teeth when the ordinary bevel-gearing is thrown into mesh or for holding friction-gears
20 to their work. Frictional gearing will slip both in starting and stopping and in damp weather are useless. Ordinary cast gears have too much play, and therefore their driving contact is im-
25 perfect, creating the necessity for a spring-clutch, producing an irregular movement of the fans which they drive, and interlocking the fans as we do, that must be obviated.

In gearwork the pitch-line is considered the correct driving contact. At the pitch-line
30 there is a straight pressure along the tangent-line, with no slipping of the surfaces of the teeth, while outside and under the pitch-line there is more or less of a sliding motion of the teeth. The use of a helical gear maintains the
35 driving contact at the pitch-lines at all times, as the pitch-line of each tooth of the wheel is advanced a degree so as to leave off where the next tooth begins, presenting an approxi-
40 mately unbroken surface, as seen in the figures, which insures two teeth being in mesh at all times and with the teeth of the gear and pinion sliding into and out of mesh, producing a practically noiseless seeder, accomplishing
45 what is claimed for the friction-drive without slipping and avoiding the use of springs.

For driving the grass-seeder and an agitator-shaft 59 in the hopper 1 there is provided a sprocket 60 on the shaft 5, connected
50 by chain 61 with the sprocket 47 on the shaft 45 and from thence to a sprocket 62 on the shaft 59, around an idler 48, supported by a pivoted bracket 63, and to the sprocket 60.

Fig. 12 illustrates a single seeder embodying substantially all the features of the dou-
55 ble seeder, and is shown to illustrate substantially the form in which it may be made.

Referring again to the grass-seed attachment, it is to be noted that the fluted rollers, with their smooth cylindrical portions or cut-
60 offs, are cast integral. This reduces the cost of making a feeder of this kind to the minimum and is less complicated than those heretofore employed, made in several parts. As the shaft 45 is shifted the roller 40 is moved
65 sidewise, causing the cylindrical portions or

cut-offs 42 and 44 to partially or wholly close the mouth of the openings in the casing through which the seed passes, which will to a more or less extent limit the amount of seed
70 gathered and fed by the fluted portions 41, as has been described.

Having thus fully described our invention, what we claim, and desire to secure by Letters Patent of the United States, is—

1. In a seeding-machine, the combination of 75 a hopper, the longitudinally-disposed driving-shaft, seeding devices within the hopper actuated by the driving-shaft, the fan-shaft having its axis in a vertical plane passing through the driving-shaft, the fan on the fan-shaft, a
80 gear on the driving-shaft having helically-arranged teeth, and a pinion on the fan-shaft having helically-arranged teeth forming a continuous mesh with the teeth of the gear on the driving-shaft, substantially for the purposes 85 specified.

2. In a device of the character specified, the combination of a driving-shaft, the fan-shaft disposed in a plane opposite to the plane of
90 the driving-shaft and having its axis projected through the axial center of the driving-shaft, a fan on the fan-shaft, bevel-gears on each of said shafts having intermeshing helical teeth,
95 to continuously impart power from the driving to the fan shaft, substantially as specified.

3. In a device of the character described, the combination of a seeding-hopper, a drive-shaft and force-feeding mechanism in the hopper actuated by said shaft, a spout depending from
100 the hopper closed on its four sides and having a pivotal connection with the hopper at its upper end, a fan-shaft, means for driving the fan-shaft and a fan on the fan-shaft rotating beneath the spout, substantially as specified.

4. In a device of the character described, the 105 combination of a hopper, feeding devices within the hopper, a closed spout leading from the feeding devices and having a pivotal connection with the hopper, and means for adjusting the spout in desired angles, substantially as 110 specified.

5. In a device of the character described, the combination of a hopper divided by a parti-
115 tion, feeding devices within the hopper and upon opposite sides of said partition, diverging closed spouts leading from the respective feeding devices and having a pivotal connection with the hopper, and means for adjusting the spouts singly or together, substantially as 120 specified.

6. In a device of the character described, the combination of a hopper, feeding devices with-
125 in the hopper, a closed spout leading from the feeding devices and having a pivotal connection with the hopper, a shield supported to incase the lower end of the spout, a fan rotatably supported beneath the spout and shield,
130 and means for adjusting the spout to regulate its discharge onto the fan, substantially as specified.

7. In a device of the class described, the combination of a hopper, feeding devices within the hopper, a closed spout depending from the hopper, a drive-shaft, a fan-shaft, a fan on the lower end of the fan-shaft having con-
 5 joined radial wings sloping upwardly from its hub portion to their outer sweeps, a plate supported above the fan having an opening through which the discharge from the spouts
 10 is carried to the fan, and having portions sloping upwardly to conform to the angle of the wings of the fan, substantially as specified.

8. In a device of the character described, the combination of a hopper, feeding devices
 15 within the hopper, diverging closed spouts depending from the hopper and its feeding devices, a drive-shaft, duplicate fan-shafts, and means for actuating the same, and fans rotatably mounted on the lower ends of the
 20 fan-shafts and rotating in opposite directions with the wings of the fans interlocking as they rotate, substantially as shown and for the purposes set forth.

9. In a device of the character described, the combination of a hopper, feeding devices
 25 within the hopper, diverging closed spouts depending from the hopper and its feeding devices, and pivotally supported from said hopper, means for adjusting the angle of the
 30 spouts, a drive-shaft, duplicate fan-shafts, and means for actuating the same, and fans rotatably mounted on the lower ends of the fan-shafts and rotating in opposite directions with the wings of the fans interlocking as
 35 they rotate, substantially as shown and for the purposes set forth.

10. In a device of the character described, the combination of a hopper, a distributor and means for actuating said distributor, of
 40 a supplemental seeding attachment comprising a casing communicating with the said hopper, a fluted roller revolubly carried in said casing having fluted portions and cut-off portions integral therewith, and slidable
 45 sidewise for the purpose of regulating the supply fed by said roller, substantially as specified.

11. In a device of the character described, the combination of a hopper having two cham-
 50 bers, distributors adapted to receive seed from

said chambers and means for actuating said distributors, of a supplemental attachment comprising a casing having a depending por-
 tion divided into two separate compartments which communicate with the chambers of the
 55 hopper, a revoluble feeding-roller in said supplemental attachment having a series of fluted portions and a series of integral cut-off portions separating the fluted portions, and means for shifting the roller sidewise for the
 60 purpose of regulating the supply fed by said roller, substantially as specified.

12. A seeding device, comprising a casing, a fluted roller revolubly carried in said cas-
 ing and having annular cut-off portions in-
 65 tegral with such roller, a shaft carrying said roller slidable in its bearings and shiftable for the purpose of moving the fluted and cut-off portions of the roller to facilitate in regu-
 70 lating the feed of the roller.

13. In a device of the character described, the combination of a hopper having extended
 portions, feeding devices in the hopper, of supplemental feeding devices comprising a
 75 casing, a fluted roller revolubly carried in the casing and provided with annular cut-off por-
 tions integral therewith, a sleeve having bearing in the extension of the hopper and carry-
 ing a gear, a squared shaft carrying said
 80 fluted roller and passing through a squared opening in the sleeve, and slidably adjustable for regulating the position of the fluted por-
 tions of the roller to regulate the feed thereof, substantially as specified.

14. In combination, a seeding attachment
 85 comprising a casing, a shaft rotatably and slidably journaled in said casing, and a seed-
 roller carried by said shaft having the fluted portions 41 and the cut-off portions 42, 43
 and 44, integral with such fluted portions,
 90 substantially as specified.

In testimony whereof we affix our signatures in presence of two witnesses.

LUTHER E. ROBY.
 JOHN L. JONES.
 HARVEY V. GIBSON.

Witnesses:

JOHN MULLOWNY,
 ROBERT N. McCORMICK.