

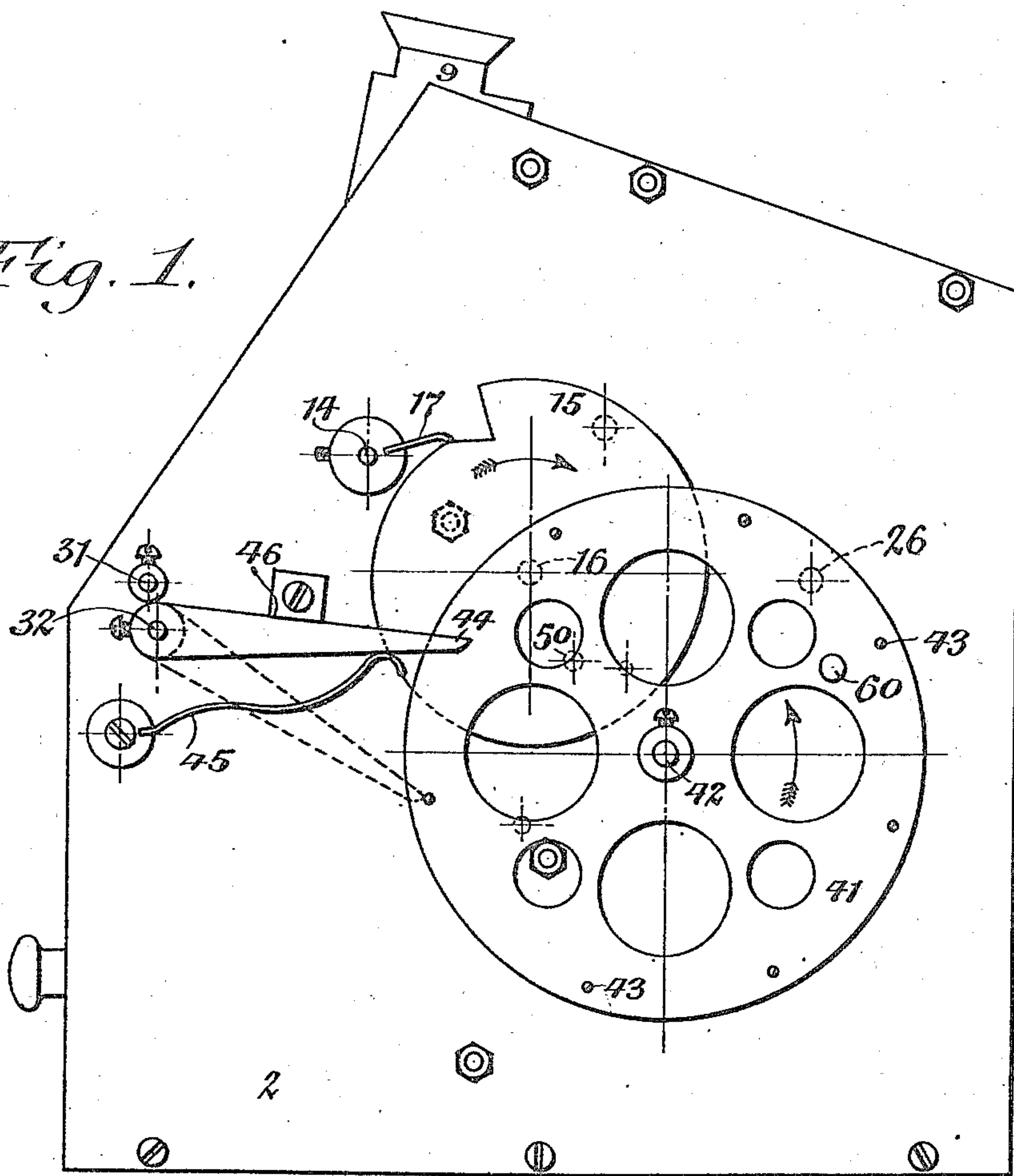
C. T. HALL.
CARD SHUFFLER.
APPLICATION FILED JAN. 26, 1914.

1,154,988.

Patented Sept. 28, 1915.

4 SHEETS—SHEET 1.

Fig. 1.



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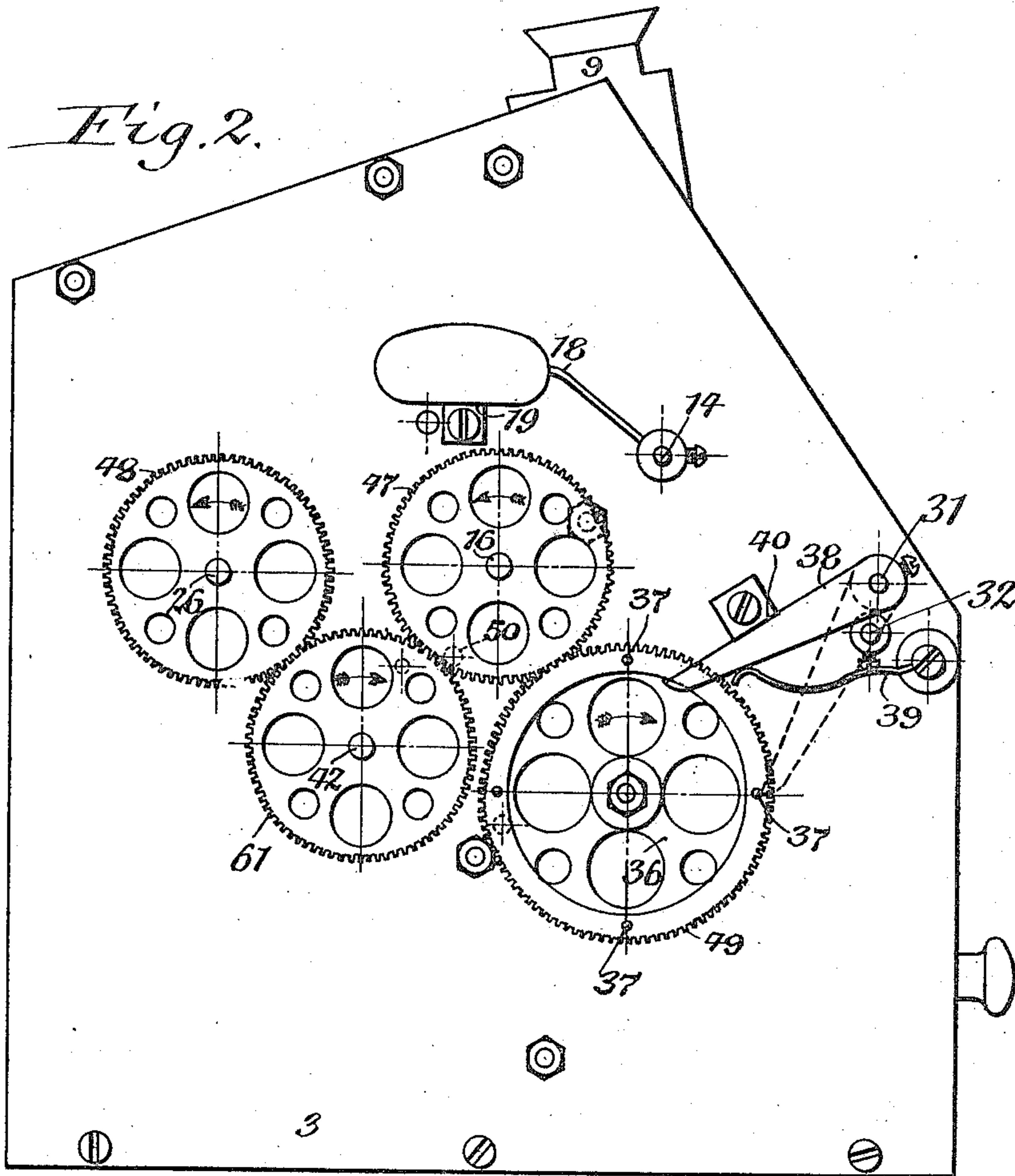
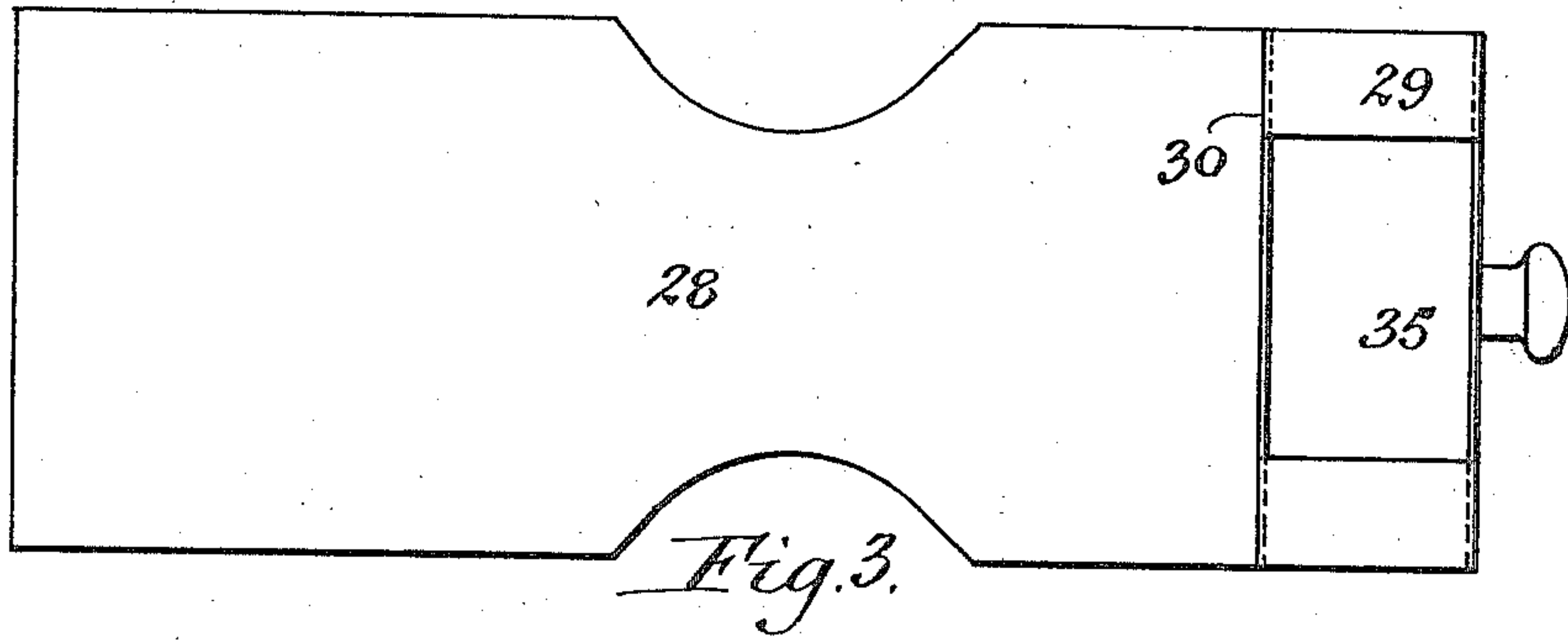
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4 SHEETS—SHEET 2.



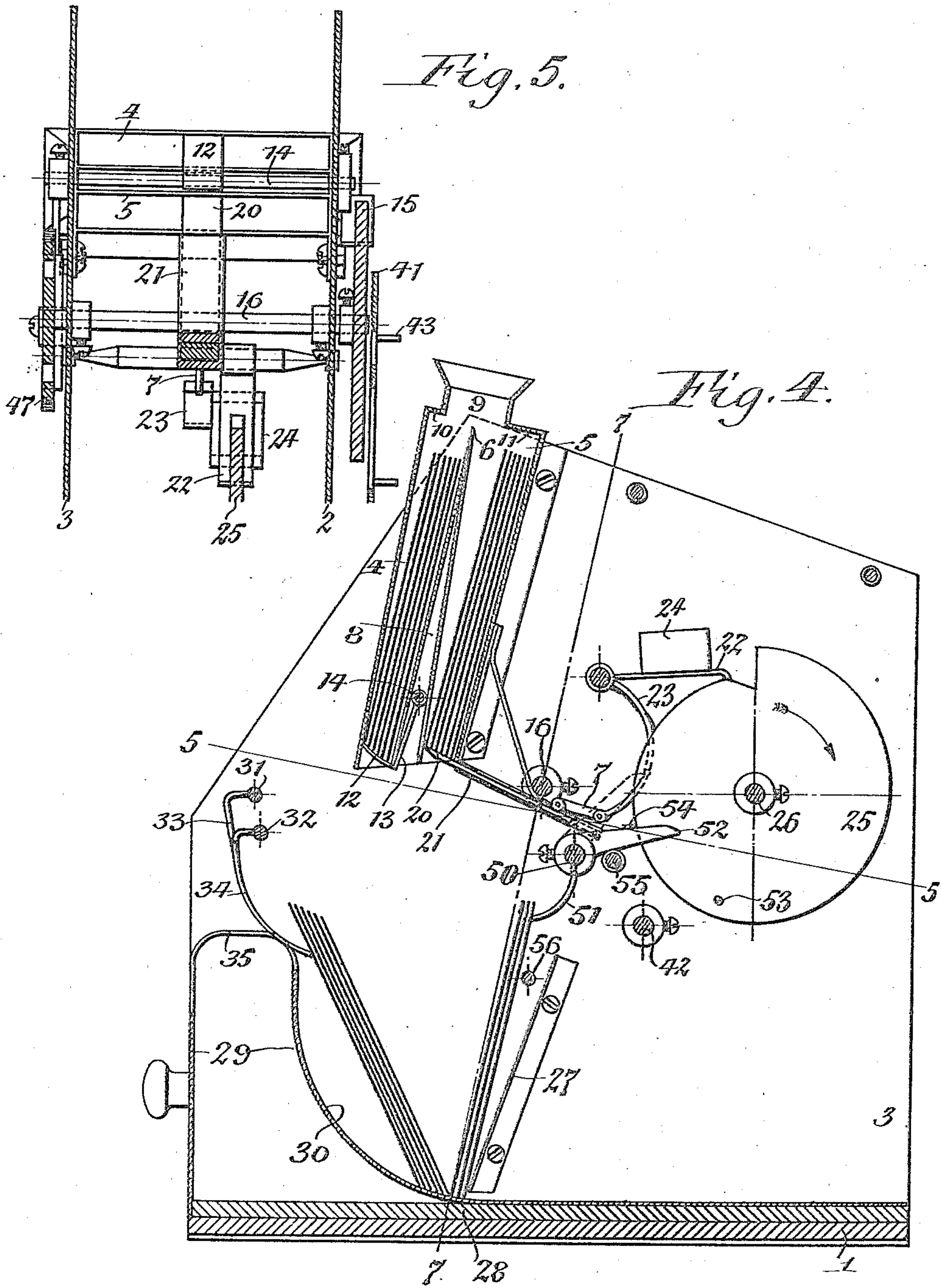
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4 SHEETS—SHEET 3.



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4 SHEETS—SHEET 4.

Fig. 6.

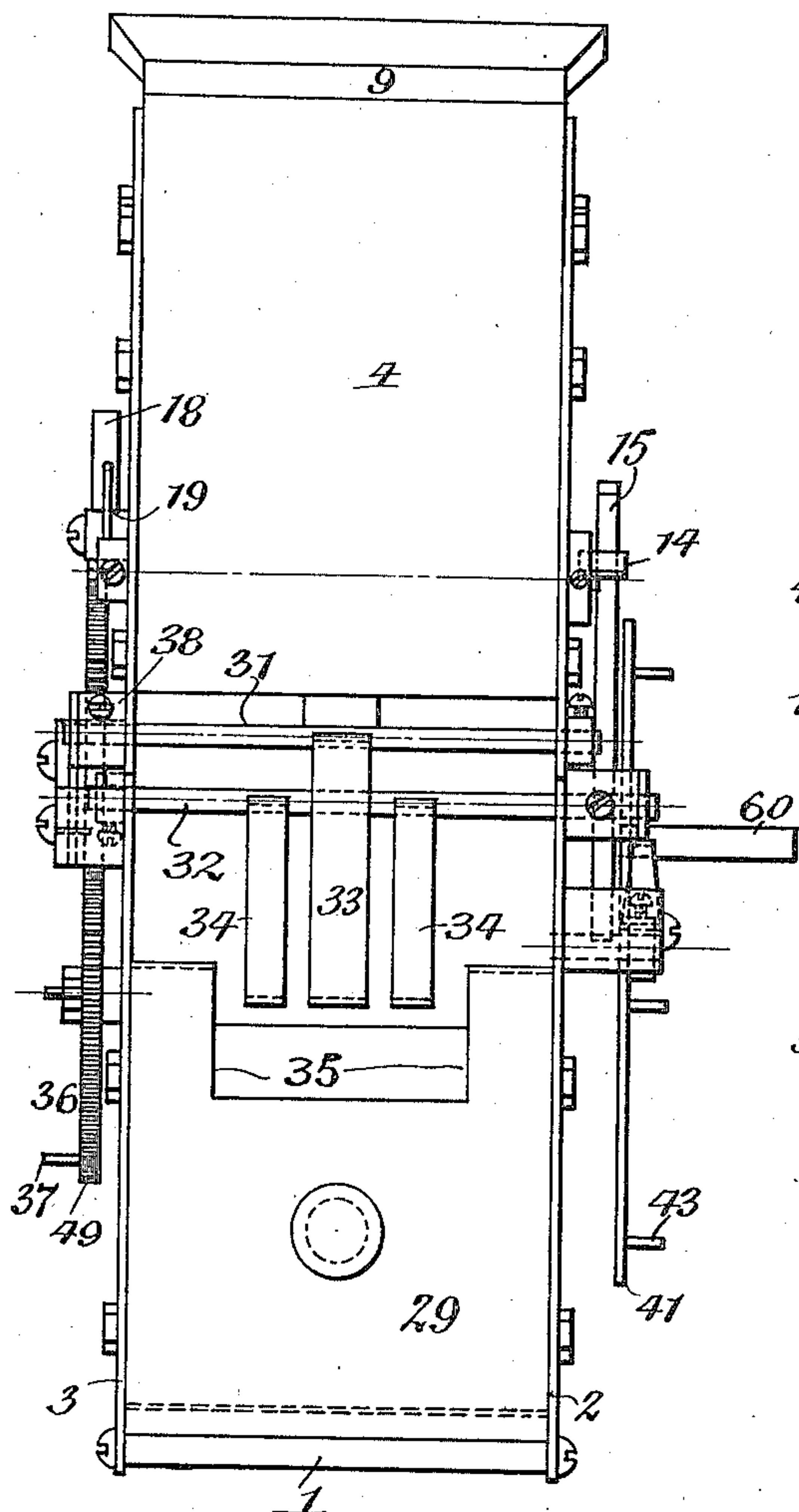
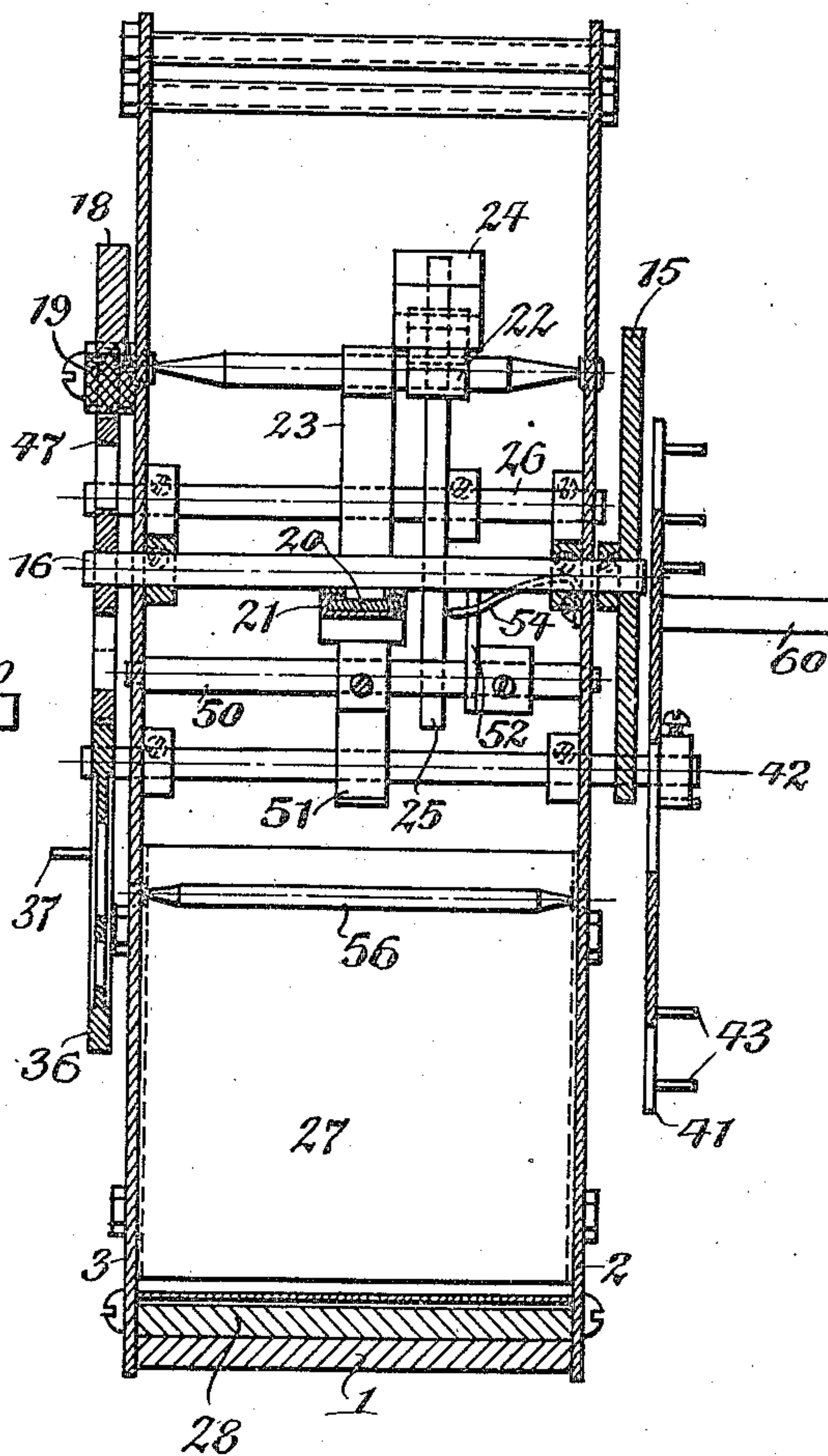


Fig. 7.



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CARD-SHUFFLER.

1,154,988.

Specification of Letters Patent.

Patented Sept. 28, 1915.

Application filed January 26, 1914. Serial No. 814,304.

To all whom it may concern:

Be it known that I, CHARLES T. HALL, a citizen of the United States, residing at Buffalo, in the county of Erie and State of New York, have invented new and useful Improvements in Card-Shufflers, of which the following is a specification.

The object of this invention is the production of a simple, compact and inexpensive card shuffler which will permit of quickly and thoroughly shuffling a pack of cards so as to produce an indeterminate position of the cards in the pack and thus render it impossible for any player to know what particular cards are being dealt to the several players and, thereby insuring a fair deal in the game.

In the accompanying drawings: Figure 1 is a side elevation of my improved card shuffler viewed from the right hand side thereof. Fig. 2 is a side elevation thereof viewed from the left side. Fig. 3 is a top plan view of the receptacle which receives the cards after the same are shuffled or mixed. Fig. 4 is a vertical longitudinal section of the machine. Fig. 5 is a fragmentary horizontal section thereof taken in line 5—5, Fig. 4 and looking upward. Fig. 6 is a front elevation of the machine. Fig. 7 is a vertical transverse section taken in line 7—7, Fig. 4.

Similar characters of reference indicate corresponding parts throughout the several views.

The main frame of the machine may be of any suitable construction to support the various working parts, that shown in the drawings, for example, comprising a horizontal lower part or base 1 and two upright longitudinal side walls or pieces 2, 3 projecting upwardly from the right and left longitudinal edges respectively of the base. Within the upper part of this frame are two upright shuffling pockets 4, 5 which are adapted to receive the pack of cards which is to be shuffled and from which these cards are delivered with more or less irregularity into a receptacle arranged below these pockets, from which receptacle the pack or deck of cards after being shuffled is removed preparatory to being dealt among the several players.

The pockets are arranged one in front of the other in a direction lengthwise of the machine and are inclined slightly from the vertical so that the lower ends of these pock-

ets are slightly in advance of the upper ends thereof. The opposing or adjacent walls of the front and rear pockets form a partition between the same and these walls are united at their upper edges and form a comparatively sharp dividing edge or blade 6, as shown in Fig. 4, while their lower parts are separated somewhat so as to form an intervening space 8 for a purpose which will presently appear.

The introduction of a pack of cards into the pockets is effected through a contracted throat or tubular guideway 9 which is arranged above the pockets so that the dividing blade or partition 6 is about midway between the front and rear sides of this tubular guide and the latter opens partly into the upper ends of both pockets. The width of the tubular guideway lengthwise of the machine is less than the combined width of both pockets in the same direction. At the lower end of the tubular guideway and at the front and rear sides thereof the same is provided with fixed front and rear shoulders 10, 11 which face downwardly and form a closure or stop over the front and rear pockets adjacent to the front wall of the front pocket and the rear wall of the rear pocket. Upon pushing a pack or cards downwardly through the guideway the same will be divided substantially into two equal parts by the division wall or partition 6 between the pockets so that about one half of the cards are delivered into the front pocket and the remainder into the rear pocket. The distance across the guideway or throat in a direction lengthwise of the machine is substantially the same as the thickness of a deck of cards so that upon squeezing the deck close together the same can be readily pushed downwardly through the throat or guideway but when the deck in its divided condition enters the two pockets the section of cards in each of these pockets expands more or less so that some of the cards are arranged underneath the shoulder at the top of the respective pocket, thereby preventing the entire pack from being again readily removed from the pockets and preventing tampering with the arrangement of the same. The two pockets and the tubular guideway therefore produce together a structure resembling a bottle through the neck of which the cards can be passed in compact form while the cards when released within the pockets thereof are permitted to

again expand so that some of them stand under the breast or shoulder of this bottle-shaped compartment.

Each of the pockets is not only open at its upper end for the admission of cards there-
 5 into but is also open at its lower end to permit the discharge of the cards therefrom. This discharge of the cards from the lower ends of the pockets may be controlled by
 10 means which may be of any suitable construction, that shown in the drawings being suitable and constructed as follows: 12 represents a front rocking gate which is adapted to move into and out of the path of the
 15 cards at the lower end of the front pocket in a direction crosswise of the cards but lengthwise of the machine. This gate is secured at its rear end to the lower end of a vertically swinging rock arm 13 which is
 20 mounted at its upper end on a horizontal rock shaft 14 journaled in suitable bearings on the main frame within the space formed between the opposing walls of the front and rear pockets. The movement of this gate
 25 out of the path of the cards is effected by means of a rotatable cam 15 mounted on a transverse shaft 16 journaled on the main frame and engaging with a cam arm 17 secured to one end of the front gate shaft, as
 30 shown in Fig. 1. When the high part of the cam 15 clears the companion cam arm the latter is quickly depressed into engagement with the succeeding low part of the cam for bringing the front gate again across
 35 the path of the cards by means of a weight arm 18 secured to the opposite end of the front gate shaft, as shown in Fig. 2. The movement of the front gate into its operative position is preferably limited by means
 40 of a stop 19 secured to the respective side wall of the casing in position to be engaged by the weight arm 18, as shown in Fig. 2. The cam 15 is so operated that it makes but one revolution for each shuffling operation
 45 of the machine. The cards are placed in the front pocket when its lower end is completely obstructed or closed by the front gate and upon subsequently moving this gate rearwardly by the operation of the cam 15
 50 the support from underneath the cards in this pocket is gradually removed so that the cards fall successively from this pocket into the receptacle below the same and when this gate has cleared the rear side of this pocket
 55 which occurs before the cam arm 17 reaches the end of the high part of its cam surface all of the cards have been discharged from the front pocket into the receptacle below and immediately thereafter the cam arm
 60 drops from the rear end of the high part of this cam to the beginning of the low part of this cam so that the front gate is restored to its operative position across the front pocket ready for the next shuffle.
 65 20 represents a rear longitudinally slid-

able gate adapted to move into and out of the path of the cards in the rear pocket at the lower end thereof. This last mentioned gate is guided in a fixed guideway 21 mounted on the adjacent part of the frame. 70

22, 23 represent the upper and lower arms of a rock lever arranged between the side walls of the frame and pivoted thereto to swing vertically in any suitable manner. The lower arm 23 of this rock lever is connected by means of a link 7 with the sliding gate while its upper arm 22 is provided with a weight 24 and engages with a rotatable cam 25 mounted on a horizontal rock shaft 26 which is journaled transversely in suitable bearings on the side walls of the main frame. While the upper rock arm is in engagement with the beginning of the low part of the cam 25 the front end of the rear gate projects completely across the lower
 85 end of the rear pocket and confines all of the cards therein. As the cam 25 turns and its gradually higher parts engage with the upper arm 22 of the rock lever, the rear sliding gate is gradually withdrawn from
 90 the lower end of the rear pocket, thereby permitting the cards to escape successively therefrom into the receptacle below. Before the highest part of the cam 25 engages with the upper rock arm 22 the sliding gate is
 95 completely withdrawn from the rear pocket and all the cards are discharged therefrom and as the upper arm drops from the highest to the lowest part of the cam 25 the sliding gate is quickly moved forwardly across
 100 the lower end of the rear pocket preparatory to receiving a new batch of cards for the next shuffle.

The receptacle or compartment which is arranged below the pockets and which is
 105 adapted to receive the cards therefrom may be variously constructed but the same preferably comprises two longitudinal side walls which are formed by the side walls or pieces of the main frame, a transverse rear wall
 110 27 connecting the side walls and separated from the base by an intervening space, and a drawer slidable horizontally into and out of the space between the side walls and between the base and the rear wall. This
 115 drawer preferably has a horizontal bottom 28 which slides upon the base and underneath the lower edge of the rear wall, and a front wall 29 which rises from the front part of the bottom and has its rear side or
 120 face 30 so constructed that it curves downwardly and rearwardly in concave form from the upper end of this wall to the bottom thereof. As the cards issue from the
 125 lower ends of the pockets the lower edges thereof strike the curved face of the front wall so that the lower end of each card is deflected rearwardly and its upper end forwardly, whereby the several cards may follow each other in rapid succession from the
 130

pockets and are piled in a forwardly inclined position within the receptacle and no interference occurs in the piling of the cards.

For the purpose of increasing the thoroughness of the shuffle before the cards are removed from the machine by means of the drawer the cards which are arranged in an upright position within the receptacle, are kicked or pushed at irregular intervals forwardly and backwardly in the receptacle so that their position is constantly changed while new cards are being added from the pockets to those which have been previously delivered into the receptacle. This shifting of the cards within the receptacle may be accomplished by a variety of means those shown in the drawings being preferred and constructed as follows: 31, 32 represent upper and lower horizontal rock shafts which are journaled transversely one above the other in suitable bearings on the main frame above the upper end of the front wall of the receptacle. One of these rock shafts, preferably the upper one 31 is provided centrally with a single downwardly and forwardly projecting shifting finger or arm 33 while the lower shaft 32 is provided with two shifting fingers 34 arranged thereon on opposite sides of the central finger 31 and project from their respective shafts downwardly and rearwardly therefrom. In the normal retracted position of the shifting fingers 33, 34, their lower edges project rearwardly beyond the rear face of the front wall of the receptacle so that they form a support for the upper parts of the cards which are delivered from the pockets into the receptacle while the lower edges of these cards rest upon the bottom portion of this receptacle, as shown in Fig. 4. At irregular times the upper and lower rock shafts 33, 34, are slowly turned forwardly so that the lower ends of the front shifting fingers are withdrawn from the cards and then moved quickly rearwardly so as to kick or push the cards from their forwardly inclined position in the receptacle to a rearwardly inclined position in the same adjacent to the rear wall of the receptacle. This slow forward and quick rearward movement of the shifting fingers 33, 34 occurs at irregular or different times relatively to each other so that the single finger of the upper shaft pushes the cards rearwardly at one time and the two fingers of the lower shaft perform this operation at another time but without any definite order or sequence so that the result of the shuffle cannot be calculated. In order to permit the lower or free ends of the front shifting fingers to thus move forwardly and backwardly into and out of engagement from the upper parts of the cards the upper part of the front wall is recessed or cut away, as shown at 35 in Figs. 2, 4 and 6. The rocking movement of the upper

shaft 31 is produced by means of a rotatable trip wheel 36 pivoted on the outer side of the left hand frame wall and provided with a plurality of laterally projecting tappets 37 which are arranged in an annular row and adapted to engage with a rock arm 38 at one end of the upper shaft 31 for moving the companion shifting fingers forwardly, and a return spring 39 mounted on the main frame and engaging with this rock arm for moving the same and the respective shifting finger connected therewith backwardly when this arm is released from a tappet on the trip wheel. This rearward movement of the rock arm 38 is limited preferably by a stop 40 adjacent to the wall of the frame, as shown in Fig. 2. Similar means are employed for actuating the lower rock shaft 32, these means, as shown in Figs. 1 and 6 comprising a rotatable trip wheel 41 mounted on a horizontal shaft 42 which is journaled transversely in suitable bearings on the main frame and provided with a plurality of laterally projecting tappets 43 which are adapted to engage successively with a rock arm 44 secured to the shaft 42 for moving the same together with the respective shifting fingers forwardly, and a spring 45 secured to the adjacent part of the main frame and engaging with the rock arm 44 while turning the same backwardly when released by a tappet on the trip wheel 41 together with the respective shifting fingers. This rearward movement of these parts is limited by means of a stop 46 mounted on the adjacent wall of the frame in position to be engaged by the rock arm 44.

The diameter of the annular row of tappets on the trip wheel 41 is preferably greater than the diameter of the annular row of tappets on the trip wheel 36, and these tappets are not only spaced differently relatively to each other but the wheels carrying the same are also rotated differentially so as to avoid any regularity in the relative operation of the front shifting fingers 33, 34 but insuring instead an erratic or indefinite action of the same which will cause the cards to be shifted or kicked rearwardly in the receptacle with the greater irregularity and thereby render it impossible with any degree of certainty to calculate or determine the outcome of the shuffle.

The various parts heretofore described may be operated in any suitable manner but for the present it may be assumed that the shaft 42 which carries the trip wheel 41 is the main driving shaft and the same may be operated either manually or by mechanical power such as a spring or electrically operated motor. In the drawings, however, the tappet wheel 41 is provided with a handle 60 for turning the shaft 42 as an example of one of the means whereby the machine may be operated. Motion is trans-

mitted from this driving shaft to the shafts 16, 26 which carry the cams 15, 25 by means of a gear wheel 61 secured to the opposite end of the driving shaft 42 and meshing with gear wheels 47, 48 of the same diameter respectively on the shafts 16, 26, as shown in Fig. 2. The trip wheel 36 derives its motion by means of a gear rim 49 formed thereon and meshing with the gear wheel 47, this gear rim being, however, of a larger diameter than the gear wheels 47, 48, 61, in order to secure a rotation of this wheel somewhat slower than that of the gear wheels just referred to.

For the purpose of still further increasing the thoroughness of the shuffle or mixture of the cards preparatory to dealing them to the players the cards after being pushed or kicked backwardly in the receptacle may be kicked one or more times forwardly in the same. As shown in the drawings, means are provided whereby this forward kick or shifting of the cards is effected but once during each shuffling operation which means comprise a horizontal rock shaft 50 journaled transversely in bearings on the main frame above the rear wall of the receptacle and provided with a depending rear shifting finger 51 adapted to engage with the rear side of the pile of cards in the receptacle at the upper end thereof and also provided with a rearwardly projecting shifting or rock arm 52 which is adapted to be engaged by a single tappet 53 projecting laterally from the adjacent cam wheel 25, as shown in Fig. 4. Normally the rock arm is held by a spring 54 down upon a stop bar 55 whereby the rear shifting finger is retained in the position in which it forms a support for the upper parts of the cards which have been pushed rearwardly in the receptacle, as shown in Fig. 4. As the tappet 53 engages with the underside of the shifting arm 52 it raises the same and moves the rear shifting finger rearwardly out of engagement from the rear side of the cards which latter are in the meantime supported by other means. The instant the tappet 53 clears this shifting arm 52 the latter is shifted by the spring 54 into its lowermost position and causes its shifting finger 51 to be moved quickly forward and kick the cards from the rear part of the receptacle into the front part thereof. An additional shuffle is therefore by this means provided which further guards against improper use of the deck.

In order to cause the cards to all lie horizontally and face downwardly upon the rear part of the bottom of the drawer upon withdrawing the latter from the machine a roller 56 is journaled horizontally and transversely on the side walls of the frame in front of the upper part of the rear wall, as shown in Figs. 4 and 7. Upon withdrawing

the drawer from the machine the upper part of the deck first drops against the roller 56 and then leans rearwardly against the rear wall of the receptacle and then slides into a horizontal position upon the rear part of the bottom of the drawer with the faces of the cards downwardly and stacked in a position ready for immediate dealing. No opportunity is therefore afforded to the players as the cards issue from the machine to observe the denomination or value of the cards.

In the drawings the inclosure for the working parts of the machine has been omitted for the sake of more clearly illustrating the mechanism but it is to be understood that any suitable casing for receiving the working parts of the machine may be provided.

I claim as my invention:

1. A card shuffler comprising a receptacle, means for delivering the cards successively into said receptacle, and means for tipping the cards from one side of said receptacle to the other, comprising two shifting members arranged on the same side of the receptacle and adapted to engage the cards on the adjacent side of the receptacle and shift the same to the opposite side of the receptacle, and means for operating said shifting members periodically and differentially.

2. A card shuffler comprising a receptacle, means for delivering the cards successively into said receptacle, and means for tipping the cards from one side of said receptacle to the other, comprising two front shifting fingers arranged adjacent to the front side of the receptacle and adapted to engage the cards on this side of the receptacle and shift the same to the rear of the receptacle, two front rock shafts each carrying one of said front shifting fingers, two tappet arms each secured to one of said rock shafts, two rotatable trip wheels each provided with an annular row of tappets adapted to engage one of said tappet arms for moving the respective shifting arm away from the cards, and springs for moving said shifting fingers toward said cards when the tappet arms clear said tappets.

3. A card shuffler comprising a receptacle, means for delivering the cards successively into said receptacle, and means for tipping the cards from one side of said receptacle to the other, comprising two front shifting fingers arranged adjacent to the front side of the receptacle and adapted to engage the cards on this side of the receptacle and shift the same to the rear of the receptacle, two front rock shafts each carrying one of said front shifting fingers, two tappet arms each secured to one of said rock shafts, two rotatable trip wheels each provided with an annular row of tappets adapted to engage one of said tappet arms for moving the re-

spective shifting arm away from the cards, and springs for moving said shifting fingers toward said cards when the tappet arms clear said tappets, said trip wheels being rotated differentially so that the shifting fingers are operated irregularly.

4. A card shuffler comprising a receptacle, means for delivering the cards successively into said receptacle, and means for tipping the cards from one side of said receptacle to the other, comprising two front shifting fingers arranged adjacent to the front side of the receptacle and adapted to engage the cards on this side of the receptacle and shift the same to the rear of the receptacle, two front rock shafts each carrying one of said front shifting fingers, two tappet arms each secured to one of said rock shafts, two rotatable trip wheels each provided with an annular row of tappets adapted to engage one of said tappet arms for moving the respective shifting arm away from the cards, springs for moving said shifting fingers toward said cards when the tappet arms clear said tappets, a rear shifting finger arranged adjacent to the rear side of said receptacle, a rear rock shaft carrying said rear finger

and provided with a tappet arm, a rotatable member provided with a tappet adapted to engage said rear tappet arm and adapted to shift the same away from said receptacle, and a spring for moving said rear shifting finger toward said receptacle.

5. A card shuffler comprising a receptacle, means for delivering the cards successively into said receptacle, and means for tipping the cards from one side of said receptacle to the other, comprising two front shifting fingers arranged adjacent to the front side of the receptacle and adapted to engage the cards on this side of the receptacle and shift the same to the rear of the receptacle, means for operating said front shifting fingers differentially, and a single rear shifting finger arranged adjacent to the rear wall of the receptacle and adapted to shift the cards forwardly in the same.

Witness my hand this 22nd day of January, 1914.

CHARLES T. HALL.

Witnesses:

MARTIN KAISER,
W. J. RICHARDSON.