

924,458.

F. H. HENRY.
MECHANISM FOR TURNING CAR SEATS.
APPLICATION FILED APR. 25, 1908.

Patented June 8, 1909.
3 SHEETS—SHEET 1.

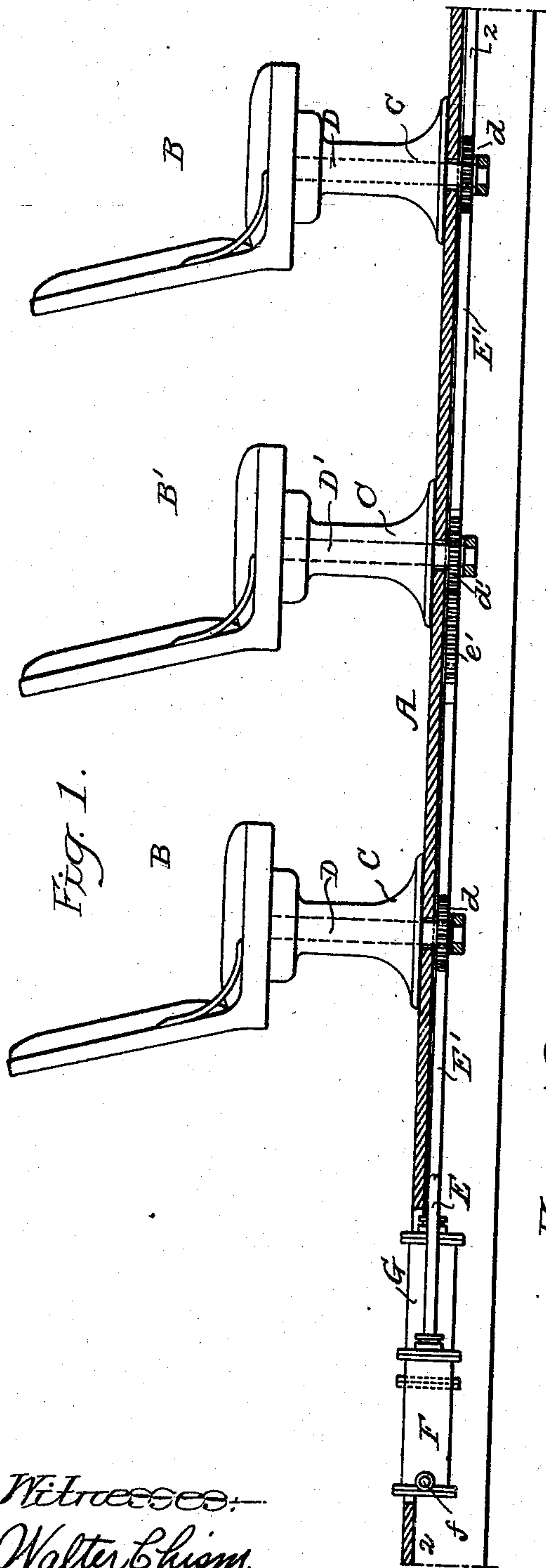


Fig. 1.

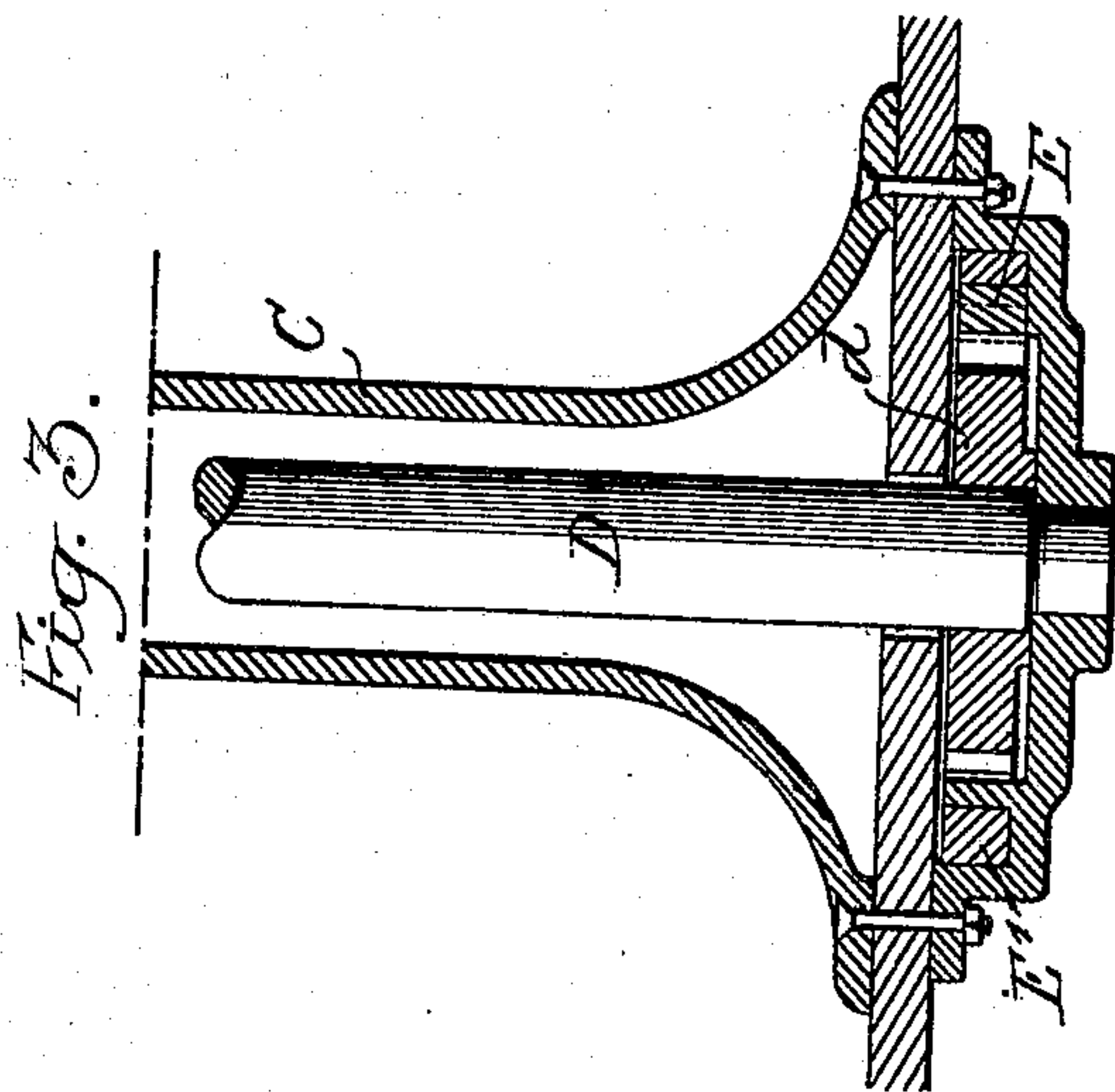


Fig. 3.

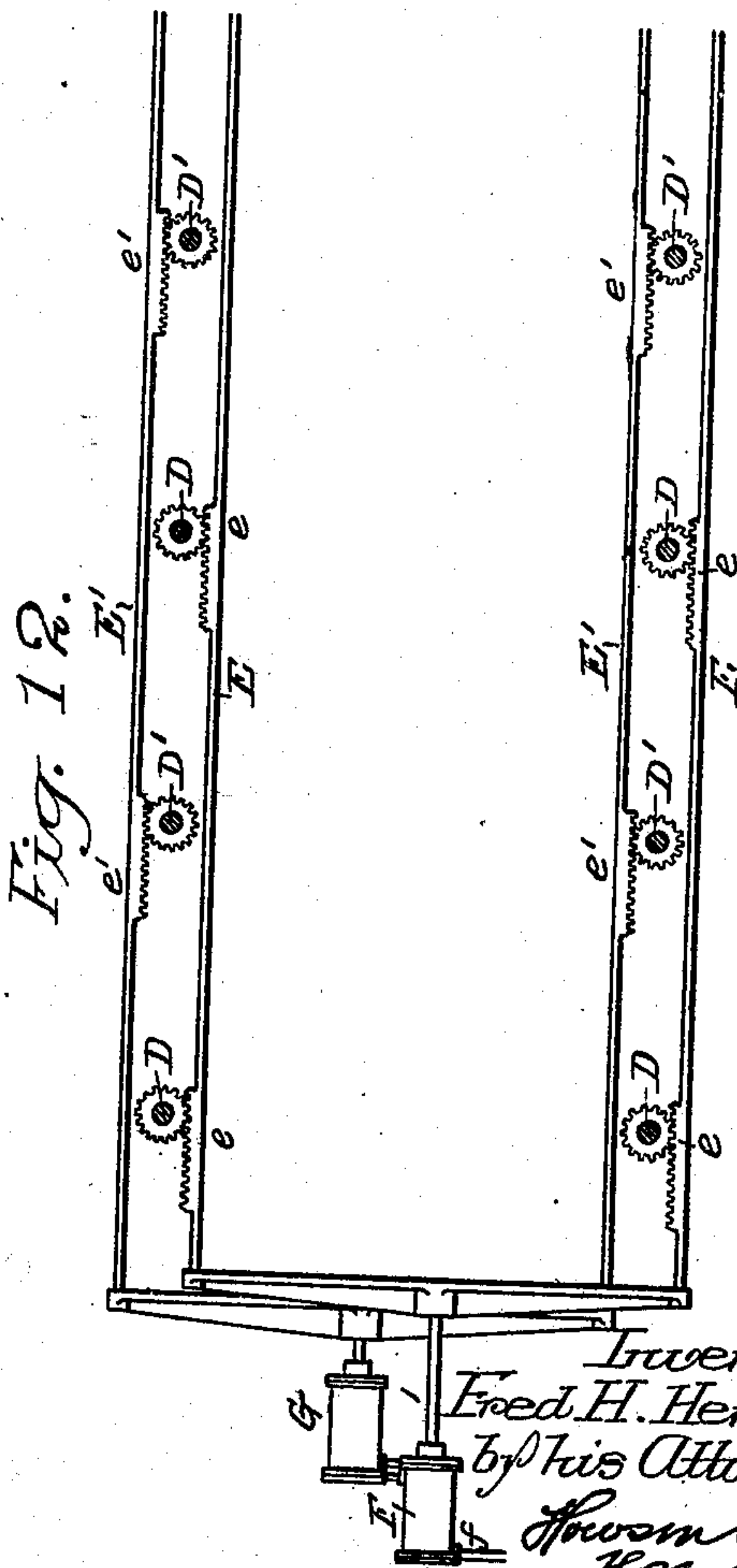


Fig. 12.

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Walter Chism.
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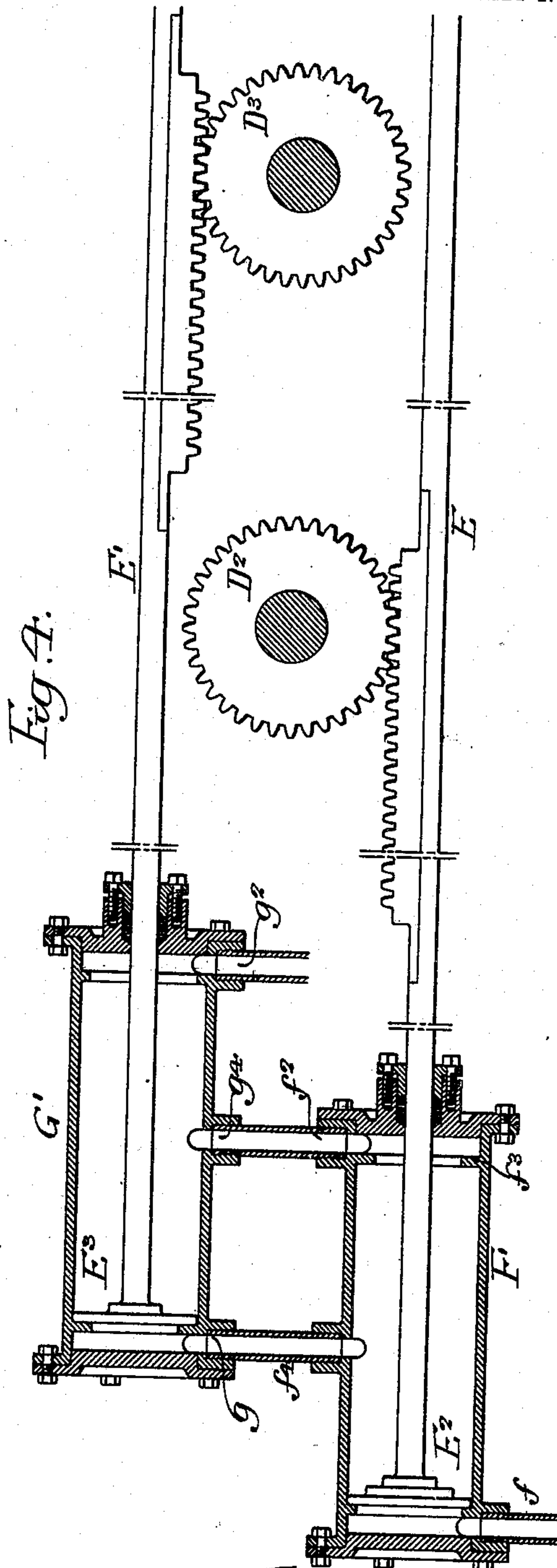
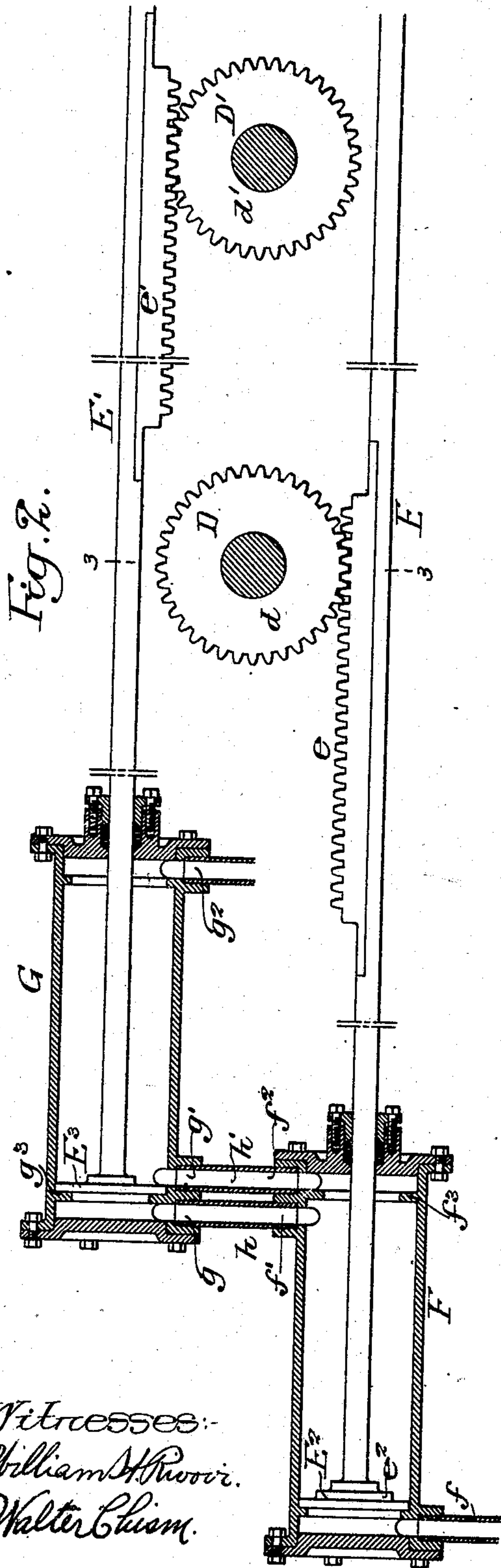
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3 SHEETS—SHEET 2.



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3 SHEETS—SHEET 3.

Fig. 5.

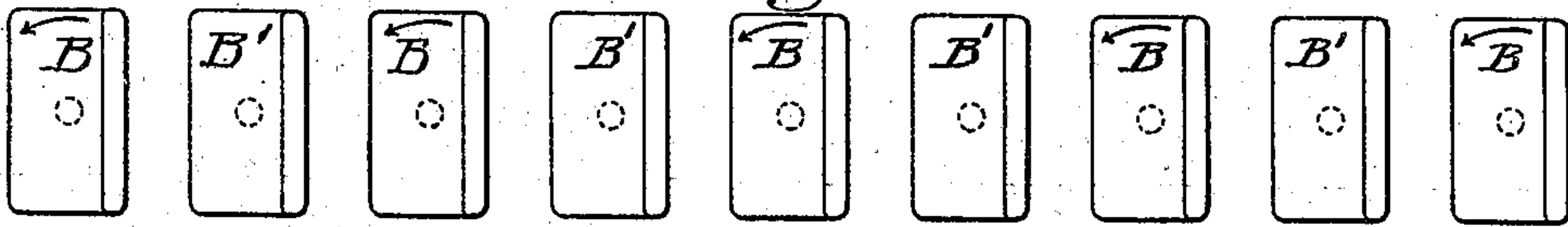


Fig. 6.

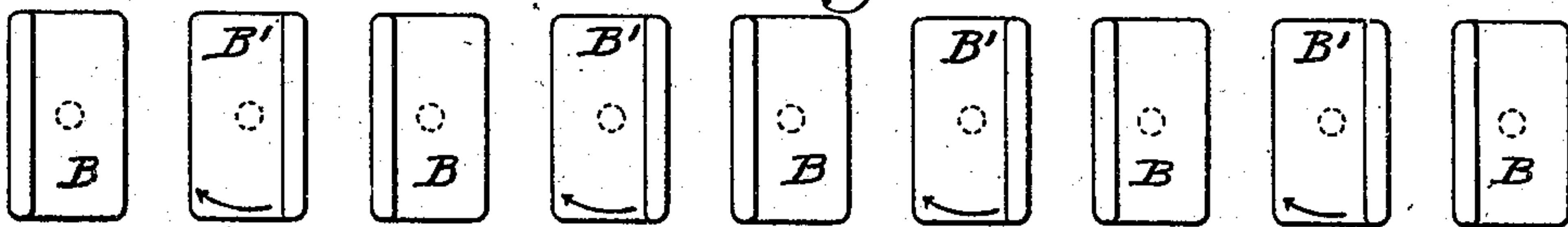


Fig. 7.

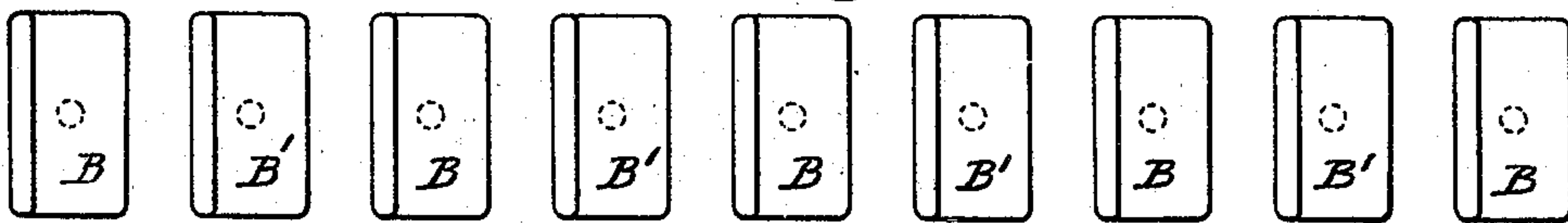


Fig. 8.

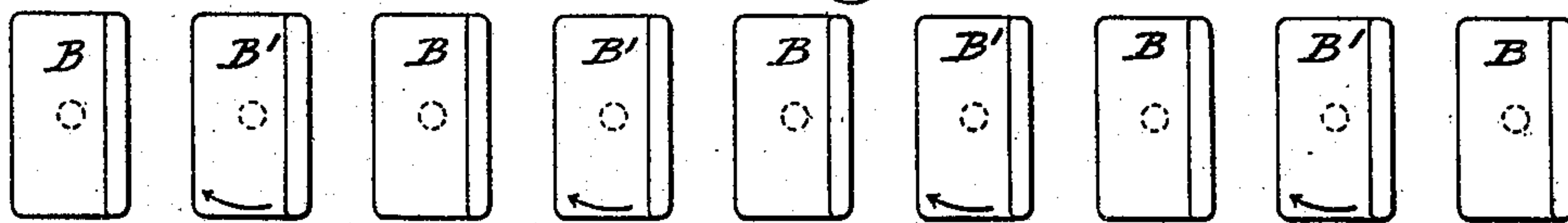


Fig. 9.

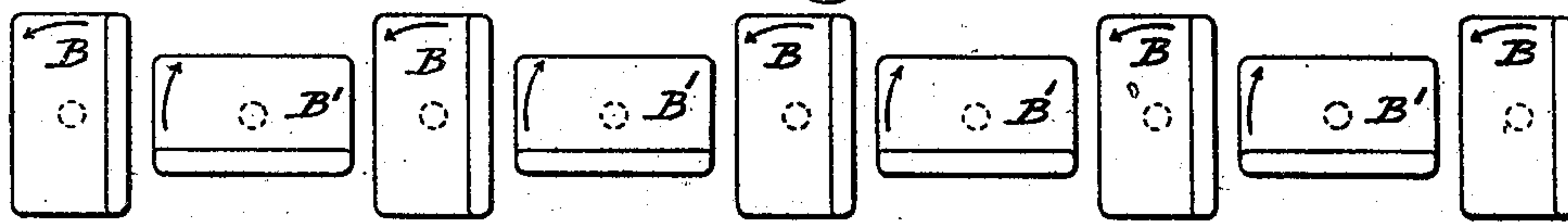


Fig. 10.

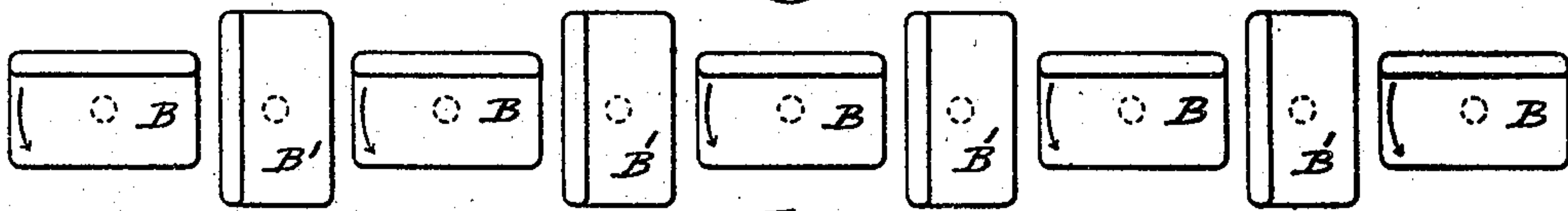
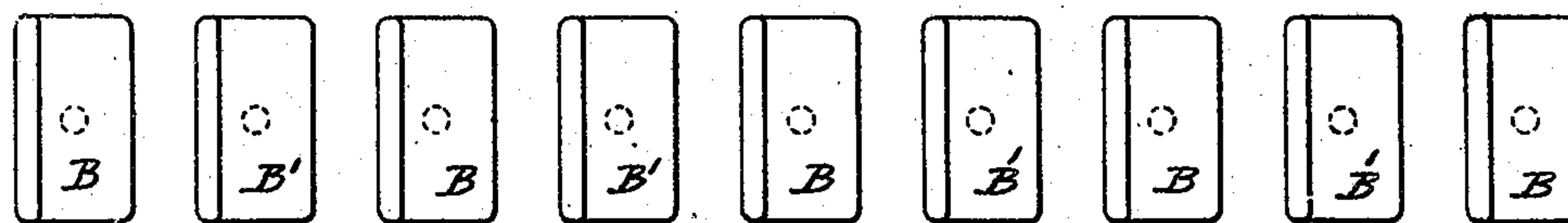


Fig. 11.



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UNITED STATES PATENT OFFICE.

FRED H. HENRY, OF PHILADELPHIA, PENNSYLVANIA.

MECHANISM FOR TURNING CAR-SEATS.

No. 924,458.

Specification of Letters Patent.

Patented June 8, 1909.

Application filed April 25, 1908. Serial No. 429,223.

To all whom it may concern:

Be it known that I, FRED H. HENRY, a citizen of the United States, residing in Philadelphia, Pennsylvania, have invented
5 certain Improvements in Mechanism for Turning Car-Seats, of which the following is a specification.

My invention relates to certain improvements in mechanism for turning the seats
10 of passenger cars, so that the seats can face either end of the car.

Heretofore it has not been practical to turn a series of seats at once in a horizontal plane, as the seats had to be placed so far
15 apart, to allow them to clear each other, that the seating capacity of a car was materially reduced.

The object of my invention is to provide means for turning a series of seats in such
20 a manner that the seats can be arranged close together, and yet they will not interfere with each other in turning. This object I attain by first turning alternate seats and then turning the other seats in the series, or turning one set of seats in advance
25 of the other set, as fully described hereafter.

In the accompanying drawings:—Figure 1, is a vertical sectional view of sufficient of
30 a car to illustrate my improved seat operating mechanism; Fig. 2, is a sectional plan view on the line 2—2, Fig. 1; Fig. 3, is a transverse sectional view on the line 3—3, Fig. 2; Fig. 4, is a sectional plan view illustrating a modification of my invention;
35 Figs. 5, 6 and 7, are diagram views illustrating the action of the mechanism shown in Figs. 1 and 2; Figs. 8, 9, 10 and 11, are views showing the action of the mechanism
40 illustrated in Fig. 4; and Fig. 12, is a view showing one method of turning the seats on both sides of a car by the same mechanism.

In passenger cars it is of advantage to place the car seats close together, so as to
45 increase the seating capacity of the car as much as possible, to do this the seats are placed so close together that it is impossible to turn them in unison in a horizontal plane and consequently seats have to be used in
50 which the seat portion is fixed and the back

is capable of being shifted from one side of the seat to the other. By my invention, however, the seats can be placed close together and mechanism provided whereby a certain seat or set of seats may be mechanically
55 caused to turn in advance of or before others of the seats, so that their movement from one position to the other is possible.

In the drawings, A is the floor of the car constructed in any suitable manner. B, B'
60 are the seats of any ordinary type, preferably with the backs fixed to the seats. These seats are mounted on pedestals C secured to the floor A of the car and are attached to vertical spindles D, D' having, at their lower
65 ends, gear wheels d, d' , respectively, so that on turning the spindles the seats will be rotated on their pedestals C to face either in one direction or the other.

E, E' are two rack bars extending preferably the full length of the car, having short
70 rack sections e, e' , respectively. The teeth of the rack sections e mesh with the teeth of the gear wheels d and the teeth of the rack sections e' mesh with the teeth of the gear
75 wheels d' .

In Fig. 2, I have only shown a single rack section on each bar, but it will be understood that the rack sections E are alternately arranged with the other rack sections, as
80 shown in Fig. 12, so as to mesh with the gears on alternate spindles of the seats, and when the rack bar E is moved longitudinally all the seats B will be turned in unison and when the rack bar E' is moved longitudinally all the seats B' will be moved in
85 unison. These rack bars can be connected to any suitable mechanism for moving them.

In Figs. 2 and 4, I have shown each rack bar having a plunger adapted to a cylinder, 90 which is connected to a suitable air compressor and the ports in this cylinder are so arranged that first one rack bar will be moved and then another so as to turn one set of seats completely around and then turn the
95 other set of seats completely around, or one set of seats may be turned a quarter turn in advance of the other set, as will be fully described hereafter, and while I have shown pistons to be actuated by air under pressure 100

it will be understood that steam or hydraulic mechanism may be used, or the rack bars may be operated by hand.

In the construction illustrated in Fig. 2, the ports of the two cylinders are so arranged that the piston in one will make a full stroke before the other one begins, thus turning the alternate seats completely around before turning the others. F is a cylinder in which is a piston E^2 connected to the rod E. This cylinder has three ports in the present instance, f , f' , f^2 . G is a cylinder in which is mounted a piston E^3 connected to the rod E' and having ports g , g' , g^2 . The ports g , g' are connected with the ports f' and f^2 , respectively, of the cylinder F by tubes h , h' in the present instance. The pistons E^3 and E^2 are shaped to fit against the internal flanges f^3 and g^3 , respectively, of the cylinders so that when they are in position against these flanges the area of one side of the piston is decreased.

It will be understood that I can either keep the pressure on the cylinders after the seats are turned to the position desired, or the pressure can be cut off. When the pressure is on, however, any leakage will be compensated for and the seats will always remain rigidly in the position to which they are adjusted.

The operation is as follows:—Air is admitted into the cylinder F through the port f , causing the piston E^2 to move forward and turning the spindles D carrying the seats B. As the piston moves the full length of the cylinder it will turn the seats a half revolution so as to face in the opposite direction. When the piston completes its stroke its reduced portion e^2 will fit in the flange f^3 of the cylinder F and consequently reduce the area on the forward side of the piston. The air will then pass from the cylinder F through its ports f' , pipe h , through the port g into the rear of the cylinder G, causing the piston E^3 to move forward turning the spindles D' and the seats B'. On the first movement of the piston it uncovers the port g' and as the pressure is in the cylinder G there will be back pressure on the forward end of the piston E^2 , but, owing to the decrease in area of this piston, the pressure will not overcome the pressure on the rear of the piston and consequently will remain in its fixed position, and as the piston moves forward air will escape through the port g^2 .

When it is desired to reverse the seats then air is admitted through the port g^2 at the forward end of the cylinder G, causing the piston to move in a reverse direction, turning the spindle D' and the seats B' and the piston E^3 fitting against the flange g^3 . Air will then pass from the cylinder G through its ports g' , pipe h' , and port f^2 , into the cylinder F and as there is no pres-

sure on the rear side of the piston E^2 it will be moved past the port f' , completing its stroke and turning the spindles D and seats B; the flange g^3 on the cylinder G reducing the area of the rear surface of the piston E^3 so that when the port f' is uncovered the back pressure will not affect the operation of the piston E^3 ; the air at the back of the piston escaping through the port f .

In Fig. 4, the ports are so arranged that first every alternate seat B will be turned a quarter turn, then all the seats B, B' will be turned another quarter turn and then the seats B' will be turned a quarter turn, completing the movement, so that the seats will all face in a position opposite to that in which they were originally.

Instead of the cylinders having their ports arranged as in Fig. 2, the cylinder F' has two ports f , f^2 at each end and a port f^4 midway between the two ports, and this port f^4 is connected to the port g at the rear end of the cylinder G' and a port g^4 midway between the ends of the cylinder is connected to the port f^2 of the cylinder F', so that by this construction when air is admitted to the cylinder F' through the port f the rod E and the spindles D² of the seats are moved until the piston E^2 passes the port f^4 , which will be a quarter turn of the seats. Then air is admitted to the rear of the cylinder G' and both the pistons and their rods E, E' are moved forward in unison until the piston E^2 comes in contact with the flange f^3 the spindles D² and their seats complete a half revolution, while the other spindles D³ and their seats have only made a quarter turn. The piston E^3 and its rod E' continue moving until the piston reaches the end of the cylinder when the spindles D³ and their seats will have completed a full half turn. When it is desired to reverse the seats air is admitted through the port g^2 and the above operation is repeated.

The diagrams, Figs. 5, 6 and 7, illustrate the movement of the seats when the mechanism is constructed as in Fig. 2. Fig. 5 illustrates the seats all facing one way, the arrows indicating the direction of movement of the alternate seats B when they first turn a half turn, the edges of the seats clearing the adjoining seats B' and assuming the positions illustrated in Fig. 6. The arrows in this figure indicate the movement of the alternate seats B' and when these are turned a half turn they assume the position illustrated in Fig. 7, so that all the seats face in the opposite direction to that illustrated in Fig. 5.

The diagrams, Figs. 8 to 11, both inclusive, illustrate the movement of the seats when the mechanism illustrated in Fig. 4 is used.

In Fig. 8, the seats all face in one direction and the arrows on the alternate seats

indicate the direction of movement of these seats. They are each turned a quarter turn, as illustrated in Fig. 9, before the other seats are moved. Then both series of seats
5 are moved in unison until they assume the position shown in Fig. 10; the seats B' having completed their movement while the seats B have still a quarter turn to make, assuming the position shown in Fig. 11.
10 Thus all the seats in Fig. 11 face in the direction opposite that illustrated in Fig. 8.

In Fig. 12, I have shown means whereby the seats on both sides of a car can be operated from a single set of cylinders.

15 The arrangement and detailed construction of the cylinders may be altered without departing from my invention. The location of the operating mechanism will depend materially upon the type of car to which the
20 invention is applied.

I claim:—

1. The combination of two oblong seats placed so close together that one will interfere with the other if these are turned in
25 unison, with means for turning one seat in advance of the other so that the said seats will not interfere in turning.

2. The combination in mechanism for turning seats, of two series of seats, the seats
30 of one series alternating with those of the other series, and mechanism for first turning the seats of one series and then turning the seats of the other series so that they will not interfere in turning.

35 3. The combination of two series of seats, the seats of one series alternating with those of the other series, and means for turning one series of seats in advance of the other, so that the seats can be placed close to-
40 gether and the seats of one series will not conflict with those of the other series.

4. The combination of two series of car seats, the seats of one series alternating with those of the other series, with two fixed cyl-
45 inders, pistons adapted to the cylinders, piston rods, means connecting one piston with one series of seats, means connecting the other piston with the other series of seats, and means for admitting fluid to the cylin-
50 ders so as to turn one series of seats in advance of the other.

5. The combination in two series of car seats, one series alternating with the other, each car seat having a spindle, a gear wheel
55 on the spindle, two rack bars, rack sections on each bar, the rack sections of one bar meshing with the gear wheels on alternate spindles, the rack sections on the other bar meshing with the gear wheels on the other
60 spindles, and means for moving the bars longitudinally to turn the seats.

6. The combination of two sets of pivoted seats, one set alternating with the other, each set having vertical spindles, a gear
65 wheel on each spindle, two rack bars, rack

sections on each bar, the sections of one bar meshing with the gear wheels on alternate spindles, the rack sections on the other bar meshing with the gear wheels on the other spindles, a piston connected to each rack bar, 70 a cylinder in which each piston is mounted, the cylinders having ports for the admission and exhaust of fluid under pressure.

7. The combination of two sets of pivoted seats arranged to turn in a horizontal plane, 75 each seat having a vertical spindle and a gear wheel on the spindle, two rock bars, one extending on one side of the gear wheels and the other extending on the other side of the gear wheels, each bar having rack sections 80 spaced apart, the rack sections of one bar alternating with the rack sections of the other bar and meshing with alternate gear wheels, and means for actuating the bars.

8. The combination of two series of car 85 seats arranged in a single line, one series alternating with the other, two cylinders, pistons in each cylinder, mechanism connecting one series of seats with one piston and other mechanism connecting the other series of seats 90 with the other piston, each cylinder having ports for the admission of fluid under pressure, the cylinders being connected so that the fluid will pass from one cylinder to the other to move the seats. 95

9. The combination of two series of seats alternating with each other and arranged in a single line, spindles on each seat and a gear wheel on each spindle, two series of rack bars each having rack sections spaced a 100 given distance apart, the rack sections of one bar meshing with the gear wheels of one series of seats, the rack sections of the other bar meshing with the gear wheels of the other series of seats, two cylinders, pistons 105 in the cylinders, one piston connected to one rack bar and the other connected to the other rack bar, a series of ports for each cylinder, the two ports of one cylinder communicating with the two ports of another 110 cylinder, internal flanges near one end of each cylinder, the pistons being so arranged that they will enter the flanges and thus reduce the area on one side of the piston in re-
115 spect to the other side, so that the back pressure from one cylinder to the other will not affect the movement of the pistons.

10. The combination in means for turning car seats, of two cylinders, a piston in each cylinder, a piston rod adapted to each pis- 120 ton, said rods being connected to the seat turning mechanism, a port at each end of each cylinder and one some distance from the forward end of one cylinder and the rear end of the other cylinder, the two 125 ports at the end of one cylinder being connected to the two ports at the opposite end of the other cylinder.

11. The combination in mechanism for turning seats, of two series of seats, one 130

series alternating with the other, the seats of each series being mounted upon vertical pivots, and means for turning one series of seats in advance of the other series so that the seats of one series will not interfere with the seats of the other series in turning.

In testimony whereof, I have signed my

name to this specification, in the presence of two subscribing witnesses.

FRED H. HENRY.

Witnesses:

WM. A. BARR,
JOS. H. KLEIN.