

No. 619,052.

Patented Feb. 7, 1899.

C. S. STAFFORD.
ADVERTISING DEVICE.

(Application filed Jan. 11, 1898.)

(No Model.)

3 Sheets—Sheet 1.

Fig. 1.

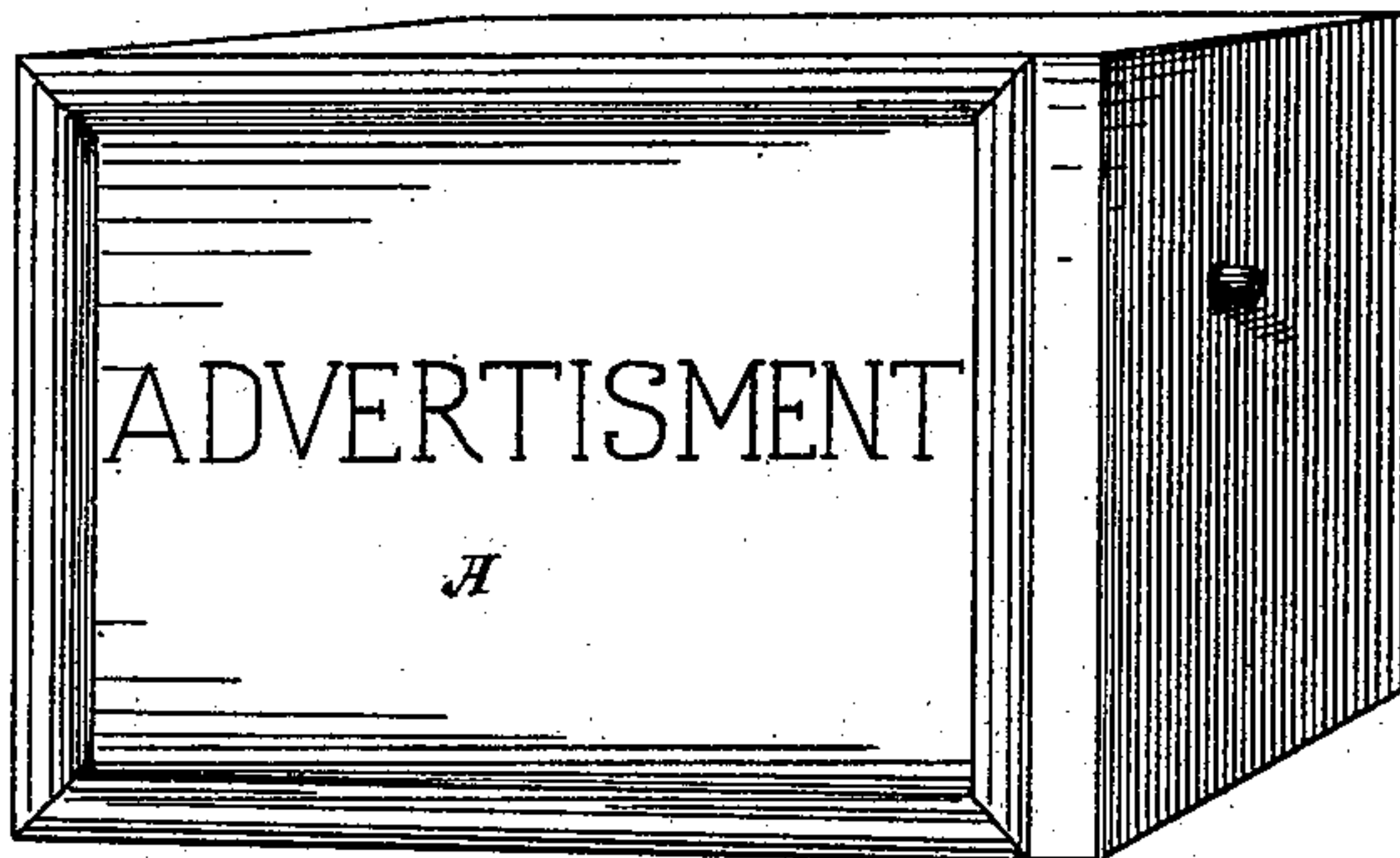
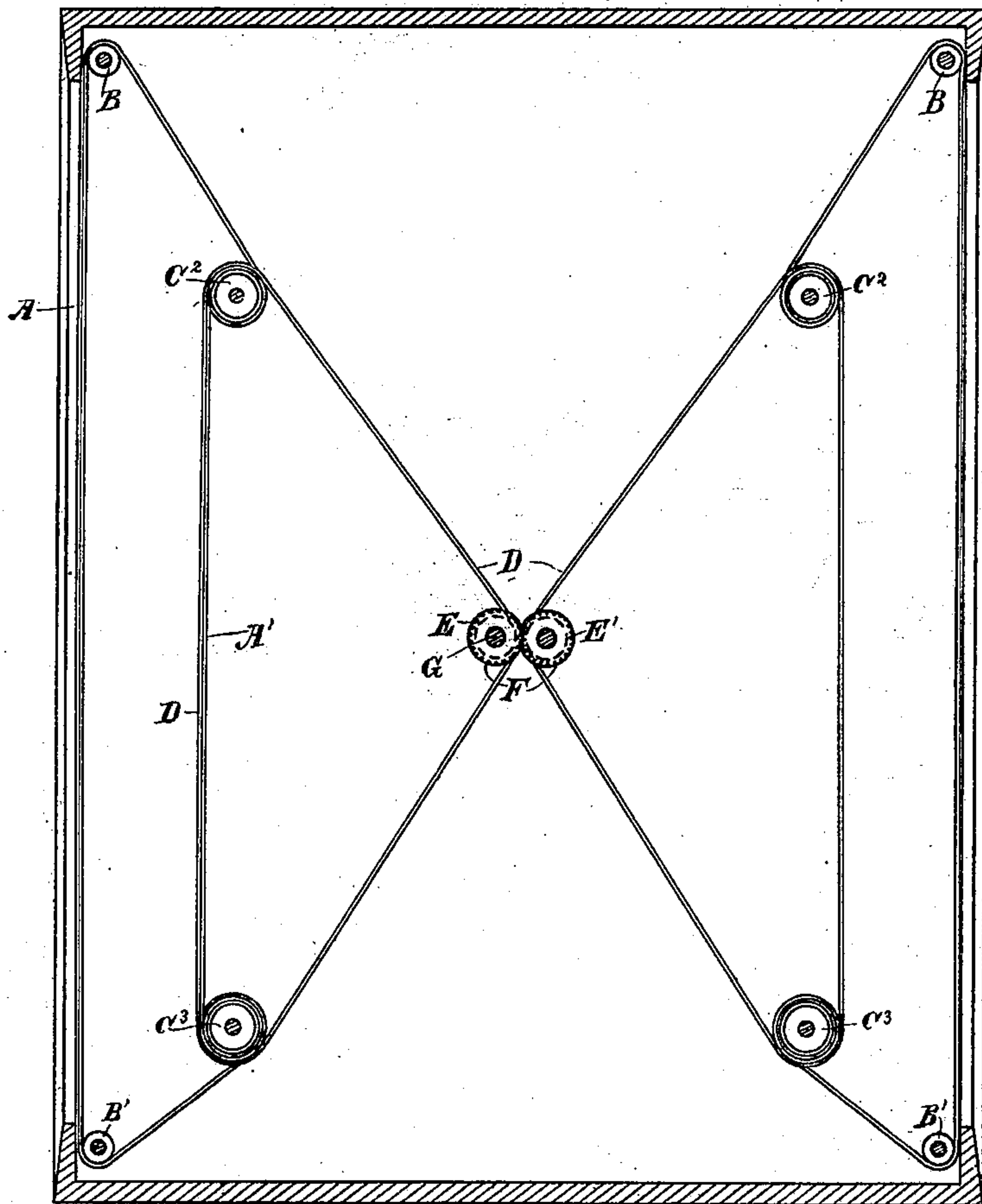


Fig. 2.



Witnesses,
J. H. Brown
H. F. Aschbeck

Inventor,
Charles S. Stafford
By Dewey & Co.
attys

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3 Sheets—Sheet 2.

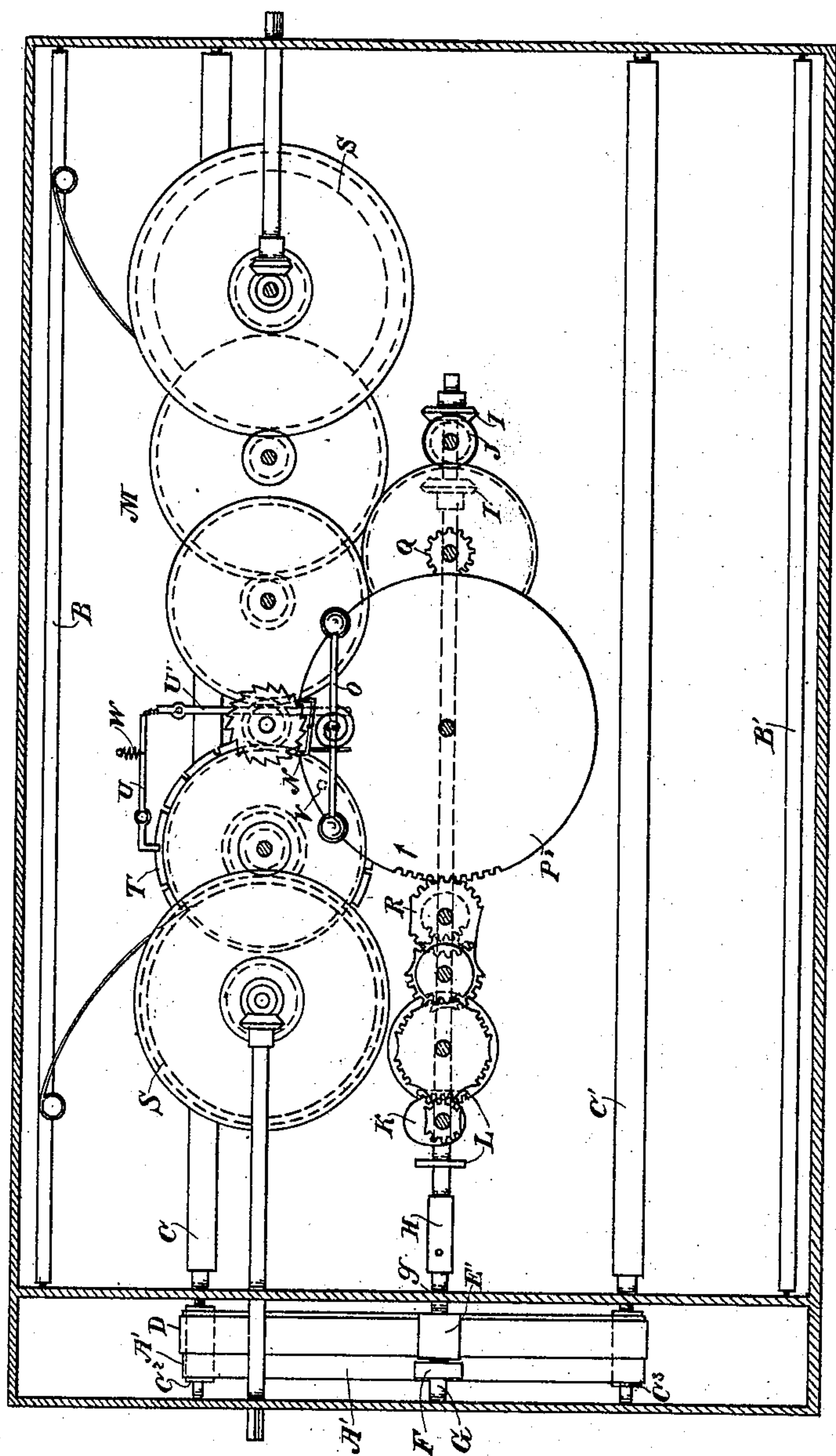


Fig. 3.

Witnesses,
J. H. Nourse
H. F. Aschek

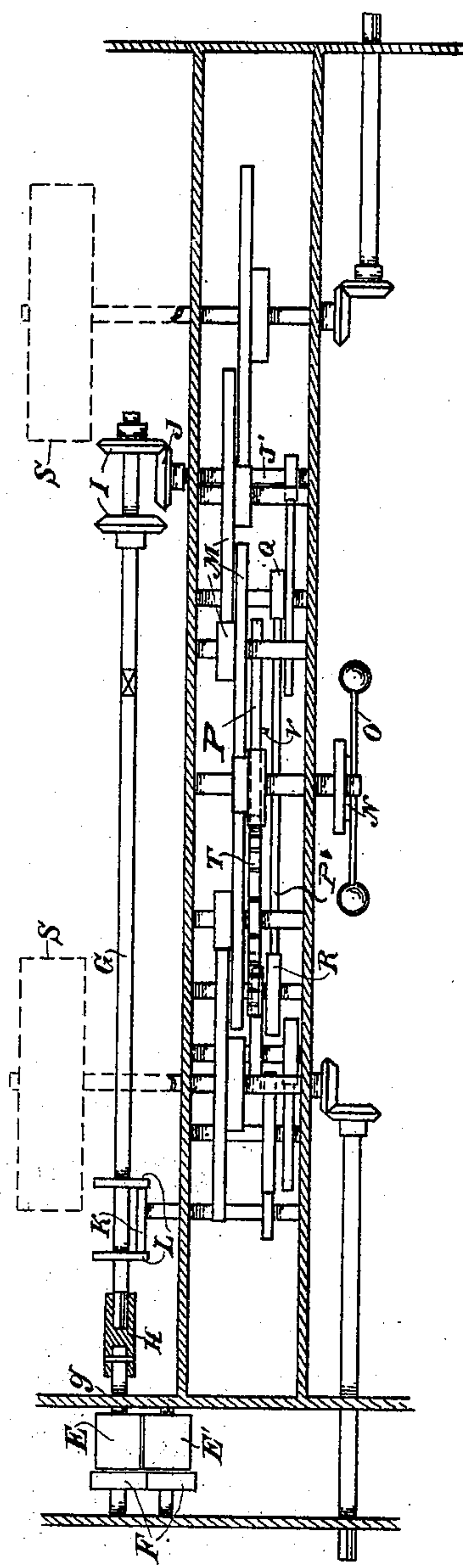


Fig. 4.

Inventor
Charles S. Stafford
By Dewey & Co. atty

No. 619,052.

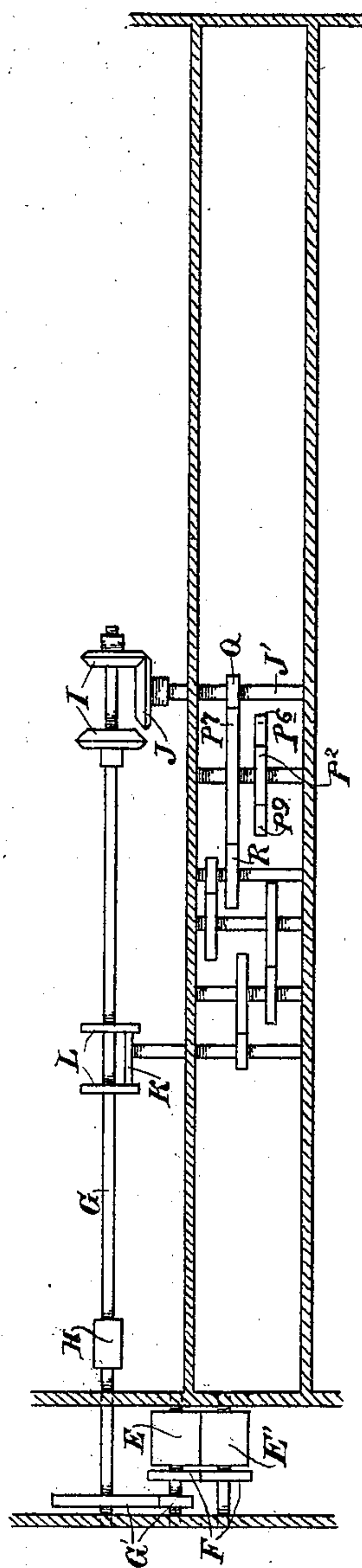
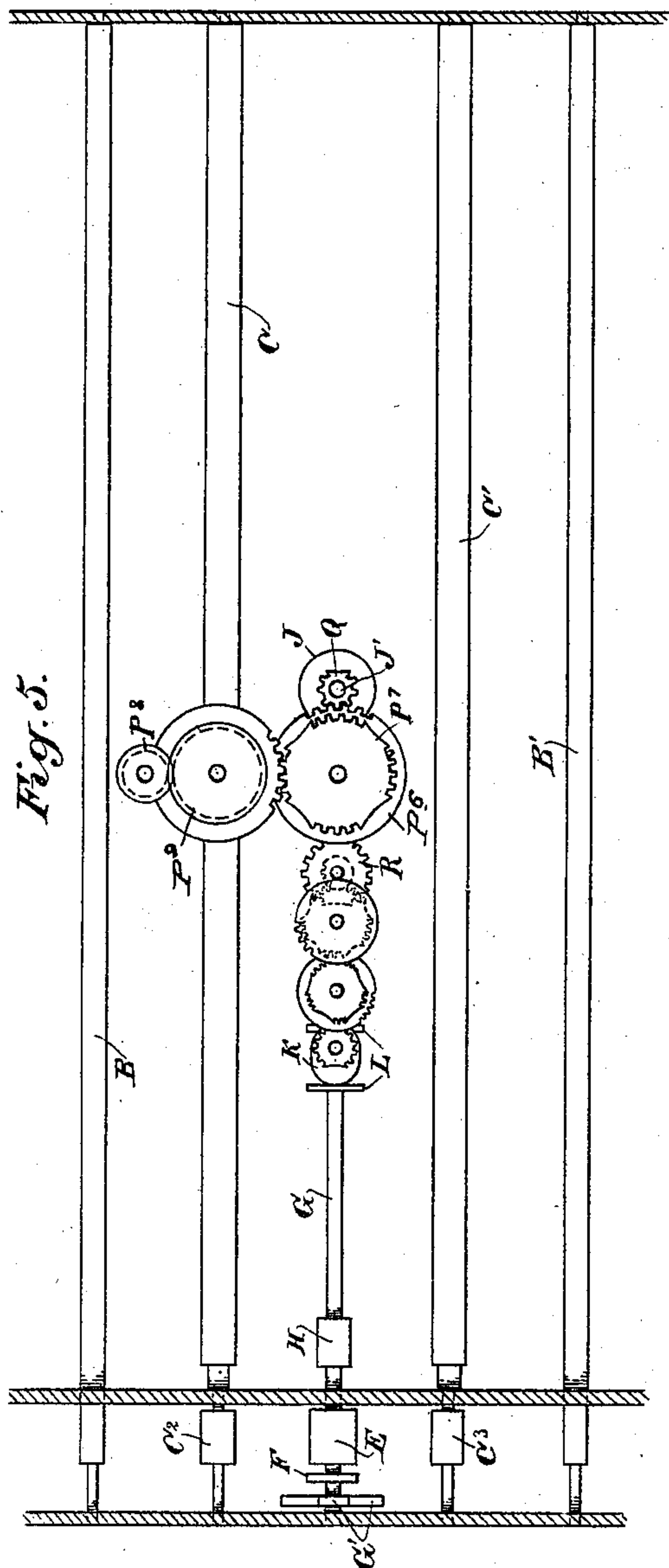
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(No Model.)

3 Sheets—Sheet 3.



Witnesses,
J. H. Nurse
H. F. Aschbeck

Inventor,
Charles D. Stafford
By Dewey & Co. Atty

UNITED STATES PATENT OFFICE.

CHARLES S. STAFFORD, OF SAN FRANCISCO, CALIFORNIA, ASSIGNOR OF
ONE-THIRD TO THOMAS LEACH, OF SAME PLACE.

ADVERTISING DEVICE.

SPECIFICATION forming part of Letters Patent No. 619,052, dated February 7, 1899.

Application filed January 11, 1898. Serial No. 666,332. (No model.)

To all whom it may concern:

Be it known that I, CHARLES S. STAFFORD, a citizen of the United States, residing in the city and county of San Francisco, State of California, have invented an Improvement in Advertising Devices; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to a device which is especially designed to exhibit advertisements or other displays which are printed or carried upon a sheet of considerable length; and it consists in mechanism by which the advertisements are intermittently advanced and stopped for a period of time until the whole sheet has been exhibited, then turned, and the movement thus alternately continued.

It also consists in details of construction, which will be more fully explained by reference to the accompanying drawings, in which—

Figure 1 is an external view of my device. Fig. 2 is an end view of the sheets and belts, showing their respective locations. Fig. 3 is an elevation of the driving mechanism. Fig. 4 is a plan view of the same. Figs. 5 and 6 are an elevation and a plan of a modification of the driving mechanism.

A is a sheet of any suitable flexible material, and B B' are guide-rollers suitably journaled in the top and bottom of a framework, which may either be stationary or adapted for transportation, as upon a car or wagon. These rollers B B' are sufficiently separated to exhibit as much of the advertisement or other display as it may be desired to show at any one time. From these rollers the sheet extends rearwardly and winds upon drums C C', which are also suitably journaled within the frame. It will be seen that as the sheet is moved from one of the drums, as C, and coiled upon the other drums C' the diameter of one of the drums is constantly decreasing, while the diameter of the other is constantly increasing. It is therefore necessary to provide some means for driving the mechanism which will compensate for the varying diameters of the drums and will act in unison therewith to move the sheet. This is effected by extending the shafts of the drums C C', and upon

these shafts are fixed rollers C² C³, having a corresponding diameter. Around these rollers C² C³ is a band A', which is adapted to unwind from one of the rollers and wind upon the other one in unison with the movements of the advertising-sheet. It will thus be seen that as one of the rollers grows smaller by the unwinding of the band the other roller grows larger and the proportionate size of these rollers to the drums upon which the advertising-sheet is rolled is always maintained the same. Thus whenever the apparatus is driven the movements of these rollers will be essentially in unison.

The driving of the mechanism is effected by means of a belt D, which passes around the rollers C² C³ exterior to the band A' and thence passes around the driving-roller E. In the present case this driving-roller E runs essentially in contact with another roller E', with which it is turnable by means of intermeshing pinions F upon the ends of the respective shafts. The driving-band D passes between these rollers E E', and the compression upon it is sufficient to prevent its slipping and to allow power to be transmitted to drive the belt and through it to rotate the band advertising-sheet rollers. By duplicating the display mechanism upon the opposite side and employing another driving-belt D, which also passes between the rollers E E', both displays can be driven from one set of driving mechanism. The arrangement of mechanism is such that the sheet will be driven in one direction until the whole length has been withdrawn from one of the drums and coiled upon the other, and the mechanism then automatically reverses and returns the sheet from the larger to the smaller drum until it has all been returned, thus running it alternately in opposite directions as long as the apparatus is kept in motion. In order to drive the reverse-drums which propel the belt, I have shown a shaft G, which is in continuous connection with the drum-shaft E and which is also slidable longitudinally in its journals or bearings g. This may be effected by making the end of the shaft polygonal and entering it into a correspondingly-shaped socket in the coupling H, by which it is united with

the shaft of the belt-wheel E by a keyway and feather, or the pinions I, which are mounted upon it, may be carried by a sleeve which is slidable upon the shaft. Upon this shaft
 5 are fixed the pinions I, and these pinions, facing each other, are at a distance apart somewhat greater than the diameter of the gear J, with which they alternately mesh, and the shaft extends diametrically across the face
 10 of the gear J. When it is moved in one direction, one of the pinions I carried by it will engage with the gear J upon one side, and this will rotate the shaft in one direction. When shifted in the opposite direction, the
 15 first-named pinion will be disengaged and the other one will be engaged with the opposite side of the gear J, and as power is constantly applied to drive this gear J in one direction it will act through this second pinion
 20 I to reverse the movement of the shaft and with it the parts driven thereby. This alternate shifting of the two is effected by means of a cam K, which is fixed upon the end of a pinion-shaft, driven by mechanism to be here-
 25 inafter described, and at certain intervals, or when the entire length of the advertising-sheet has been coiled from one of its carrying-drums to the other, this cam will be turned, and as it rotates between two collars L, fast
 30 on shaft G, it will press upon one of these collars, so as to move the shaft in the direction of the pressure. A complete rotation of the cam will have moved the shaft so as to first engage one of the pinions I with the driving-gear J and then will have moved the shaft
 35 to disengage the first pinion and engage the other one, as previously described.

The driving mechanism consists of a train of clockwork mechanism, as here shown at
 40 M, having an escapement N and an oscillating balance, either consisting of weighted arms, as shown at O, or it may be in the form of a balance-wheel. Power may also be applied, if desired, from some other well-known source
 45 to rotate the train-gearing and through it communicate power to drive the large gear-wheel P. Upon the same shaft with the gear-wheel P is a mutilated gear-wheel P', which is journaled to rotate between the
 50 mutilated pinions Q and R. Through the pinion Q and any other desired connecting mechanism power is transmitted to drive the gear J, and through it the shaft G, which transmits motion to the belt-driving roller,
 55 while through the pinion R and a suitably-arranged connecting train of mutilated wheels power is transmitted to actuate the cam K, by which the shaft is alternately shifted, as before described. The relative
 60 arrangement of these two trains of gearing is such that the mechanism for turning the cam and reversing the movement of the shaft and the advertising-sheet will be actuated only when the entire length of the sheet has been
 65 unrolled from one of its drums and transferred to the other, while the mechanism for advancing the sheet is actuated at intervals,

so that each advertisement will be exposed upon the face of the sheet for any desired length of time.

The gearing by which the proportioned speed of movement of the advertising-sheet is produced may either be arranged between the main driving mechanism and the shaft J', which transmits the power to move the sheet,
 70 as shown in Fig. 4, or the power may be transmitted from this shaft directly to the shaft of the belt-roller E through shaft G and speed-gears G', as shown in Fig. 6.

When springs are used for driving the mechanism, as here shown, I have employed two of these springs S, and one of them is so connected as to be in action all the time, while the other is only operating when the intermittent mechanism acts to turn the
 80 shaft and advance the advertising-sheet, so that the additional power is applied where it is needed and is cut off when it is not needed. This is effected by means of a notched or toothed wheel T and a pawl-lever U, one end
 85 of which is adapted to drop into the notches of this wheel and hold it stationary. The other end is connected with a lever U', which is so fulcrumed that it is actuated by the movement of the intermittent gear P, and
 90 by means of a pin V the levers are moved so as to disengage the pawl U from the notched wheel, and thus throw the second spring into action. As soon as the pin V releases the lever U' the parts drop into their normal posi-
 95 tion, and by means of the spring W the end of the pawl-lever U is held in contact with the smooth periphery of the notched wheel T, so that as soon as the next notch comes in line with it the pawl will drop into it and ar-
 100 rest the movement of the wheel, holding it in this condition until the mutilated gear-wheel has made another revolution.

A gong or bell may be so placed that it will be struck by a hammer carried by one of the
 110 levers, and thus give notice whenever the display-sheet is moved.

Where the springs are used and in order to conveniently wind them without interfering with the front and back of the apparatus, the
 115 winding-shaft extends out at one end of the framework and may be geared at right angles with the operating mechanism by means of bevel or crown gears.

The drum-shafts are so mounted at one end
 120 that they can easily be removed by disengaging this end, so that different sheets can be substituted upon the drums.

In order to vary the speed to suit the power without making the gears P⁶ P⁷ of Figs. 5 and
 125 6 too large, a speed-reducing train may be introduced, as shown at P⁸ P⁹, Fig. 5.

Having thus described my invention, what I claim as new, and desire to secure by Letters
 130 Patent, is—

1. An advertising and display device, consisting of a flexible sheet, drums upon which said sheet is adapted to coil and uncoil, mechanism by which said drums are rotated, con-

sisting of pulleys over which a driving-belt is adapted to pass and supplemental bands which are adapted to coil and uncoil upon the drum in unison with the coiling and un-

5 coiling of the sheet which they drive.

2. An advertising and display device consisting of a flexible sheet carrying the matter to be exhibited, drums with which the opposite ends of the sheet are connected and

10 upon which it is adapted to coil and uncoil, belt-rollers fixed to the drum-shafts having a band extending from one to the other and adapted to coil alternately from one roller to the other in unison with the movement of the

15 sheet upon its drums, whereby the belt-rollers are maintained constantly of the same diameter as the drums, an endless belt passing over said rollers, a roller through which power is transmitted to drive the belt, and

20 mechanism connecting with said driving-roller through which motion is imparted to it.

3. An advertising device consisting of a flexible sheet, drums to which the ends of the sheet are connected so that it is alternately

25 coiled from one drum to the other, belt-rollers fixed upon the drum-shafts having a band extending between them and coiling from one roller to the other in unison with the movements of the larger sheet, an endless belt

30 passing over said rollers and the transferable band, a third roller over which the belt passes, fixed upon a power-transmitting shaft and a roller driven in unison and contacting with said power-roller, whereby the band is com-

35 pressed between the two and prevented from slipping.

4. In an advertising device, a flexible advertising-sheet, drums to which its ends are connected so that it may be alternately trans-

40 ferred from one to the other by their rotation, belt-pulleys fixed upon the ends of the drum-shafts, a band connected with said pulleys and adapted to coil from one to the other in unison with the movements of the larger

45 sheet, an endless driving-belt passing over said band and rollers, a pair of contact-rollers between which said band passes and through which power is transmitted to move it, a shaft connected with the driving-roller,

50 mechanism by which the shaft is rotated in one direction to transfer the flexible sheet from one roller to the other and mechanism by which it is automatically reversed after the transfer is completed so as to return the

55 sheet to the opposite roller.

5. In a display and advertising device of the character described, a transferable flexible sheet, drums upon which it is coiled, driving-rollers, an endless belt, a supplemental band

60 adapted to coil and uncoil upon the rollers in unison with the coiling and uncoiling of the sheet, a driving-pulley over which the belt passes, a shaft through which power is transmitted to said pulley, beveled pinions mounted on said shaft, a beveled gear and a train

65 of gearing from which it is driven, said gear being adapted to mesh with either of the pin-

ions upon the transmitting-shaft, and a mechanism by which said shaft may be moved longitudinally so that one of its pinions will en-

70 gage with the driving-gear to rotate the mechanism until the sheet has been transferred from one drum to the other and then the other pinion engaged upon the opposite side so as to reverse the movement of the sheet and

75 transfer it to the first-named drum.

6. In an advertising and exhibition device of the character described, a power-transmitting shaft having bevel-pinions mounted upon it, a bevel-gear of smaller diameter than the

80 distance between said pinions, and through which power is transmitted to one or the other, a mechanism by which the shaft carrying the first-named pinions is moved longitudinally so as to engage one of the pinions and rotate

85 the shaft in one direction and then engage the other pinion to rotate the shaft in the opposite direction, a driving mechanism by which the pinions are rotated to transfer the sheet from one drum to the other, said mechanism

90 acting after the transfer to operate the device for moving the shaft, and changing the engagement of the driving-gear so as to reverse the movement of the sheet and transfer it back to the other drum, and supplemental

95 bands adapted to coil and uncoil in unison with the coiling and uncoiling of the sheet, to compensate for the varying diameters of the drums upon which the sheet is alternately wound.

100

7. In an advertising device of the character described, a flexible sheet transferable from one drum to another alternately, a belt and belt-pulleys by which said transfer is effected, supplemental bands adapted to coil and un-

105 coil upon the rollers in unison with the coiling and uncoiling of the sheet, a longitudinally-slidable shaft through which power is transmitted to the belt-pulleys, said shaft having bevel-pinions mounted upon it and

110 adapted to alternately engage the opposite sides of a driving gear or pinion whereby the movement of the transmitting-shaft may be reversed, flanges fixed upon said shaft and an eccentric or cam mounted upon a shaft

115 projecting between said flanges whereby its rotation will act upon the flanges to slide the transmitting-shaft endwise to disengage one pinion and engage the other, and reverse the rotation of the shaft.

120

8. In an advertising device of the character described, an endless flexible sheet with drums and mechanism by which it is alternately transferred from one roller to the other, supplemental bands adapted to coil and uncoil

125 upon the rollers in unison with the coiling and uncoiling of the sheet, a driving or power mechanism consisting of a train of gearing and intermittent or mutilated gears through which power is transmitted to move the sheet

130 from one roller to the other and allow it to remain stationary for a given time between each advancing movement.

9. In an advertising device of the character

described, a flexible sheet, drums upon which it is alternately coiled and uncoiled to transfer from one drum to the other, a shaft through which power is transmitted to rotate the drums and advance the sheet, means operating in unison with said sheet and compensating for the varying diameters of the drums upon which the sheet is alternately wound, beveled pinions mounted upon said shaft, a gear-wheel adapted to engage alternately one or the other of said pinions upon opposite sides of its center whereby the revolution of the shaft is reversed, an eccentric rotatable between collars upon the shaft whereby the shaft is alternately moved longitudinally to engage one gear and disengage the other, a train of gearing connecting with the driving-gear shaft whereby the latter is advanced intermittently until the advertising sheet has been entirely transferred from one drum to the other, a second train of gearing connected with the shifting eccentric and actuated by the same power as the first train, said second train being so calculated as to move the eccentric and reverse the rotation of the shaft when the sheet has been entirely transferred from one drum to the other.

10. In an advertising device of the character described, a sheet adapted to coil alternately from one drum to another so as to exhibit its surface between the two, an endless belt with rollers through which power is transmitted to move the sheet, supplemental bands adapted to coil and uncoil upon the rollers in unison with the coiling and uncoiling of the sheet, a shaft through which power is transmitted to the belt-driving rollers, said shaft being movable longitudinally and having pinions fixed to it and adapted to engage opposite sides of a driving-gear so as to alternately reverse the movement of the shaft, a train of gearing by

which said shaft is rotated intermittently, a second train of gearing and an eccentric driven thereby which acts to move the transmitting-shaft longitudinally to change the engagement of its pinions and reverse its rotation when the sheet has been transferred from one drum to the other, a clockwork mechanism and escapement and springs through which power is applied to drive the mechanism, one of said springs acting continuously, and mechanism by which the other is thrown into action only when the sheet is to be advanced.

11. In an advertising device of the character described, a sheet and drums to which it is connected so as to be alternately transferred from one drum to the other, intermediate mechanism by which said transfer is effected, means operating in unison with said sheet and compensating for the varying diameters of the drums upon which the sheet is alternately wound, mechanism by which the motion of the driving-shaft is reversed after such transfer is completed so as to again return the sheet to the first drum, clockwork mechanism and escapement, and a plurality of springs one of which acts constantly to move the mechanism and the other only when power is applied to advance the sheet, and a mechanism consisting of a notched wheel and escapement-lever, and means for actuating it intermittently from the main clockwork mechanism whereby the second spring is thrown into action at the desired intervals.

In witness whereof I have hereunto set my hand.

CHARLES S. STAFFORD.

Witnesses:

S. H. NOURSE,
GEO. H. STRONG.