No. 840,465. PATENTED JAN. 8, 1907.

B. C. BATCHELLER.

PNEUMATIC TUBE SYSTEM.

APPLICATION FILED MAY 1, 1905.

4 SHEETS—SHEET 1.

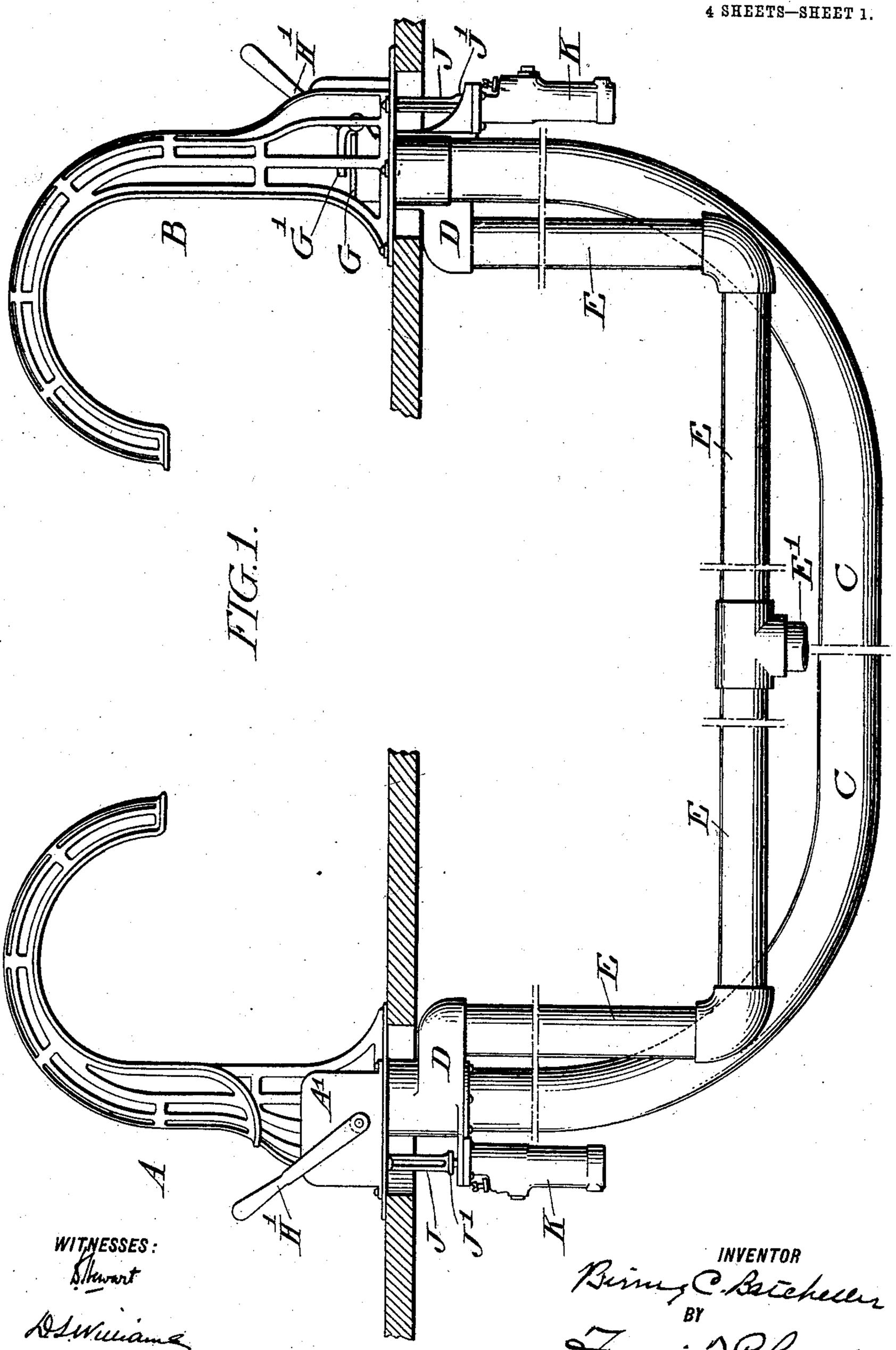

FIG. 1.

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4 SHEETS—SHEET 2.

FIG. 2.

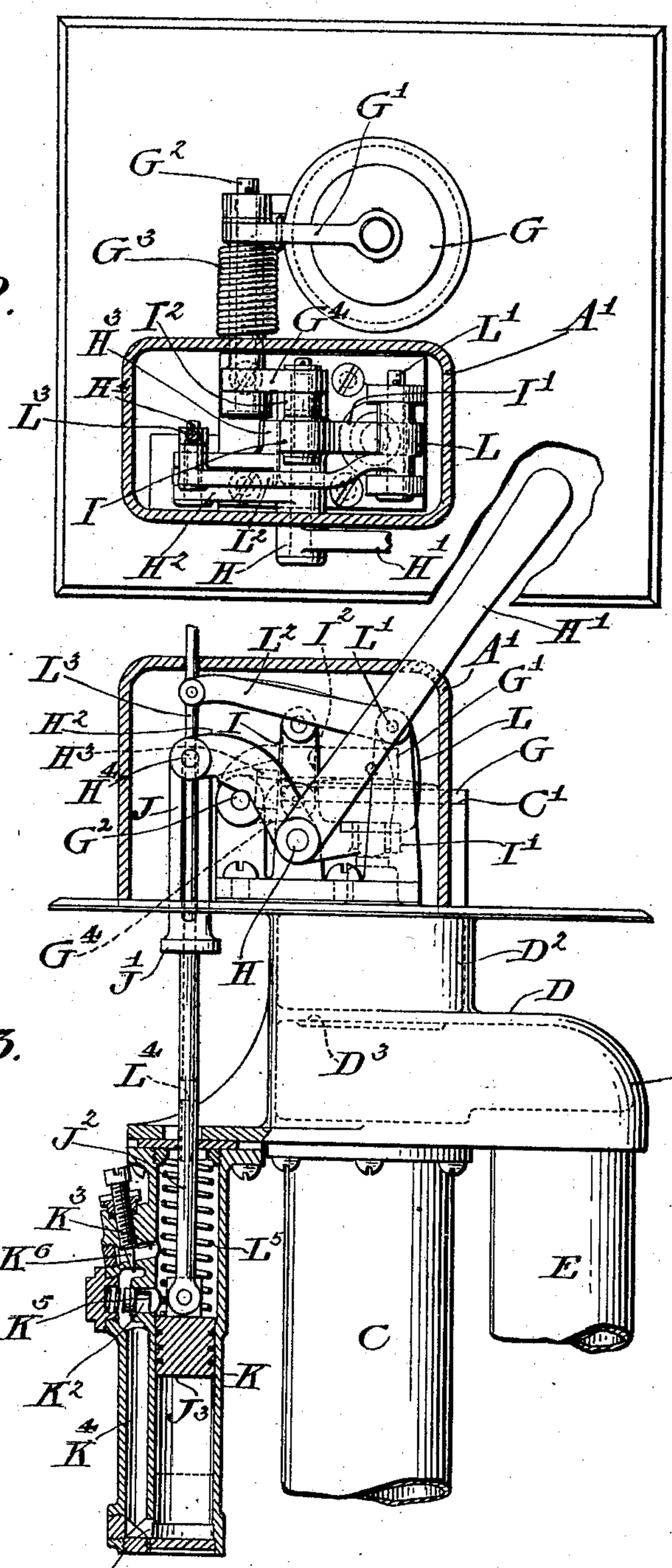

FIG. 3.

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4 SHEETS—SHEET 3.

FIG. 4.

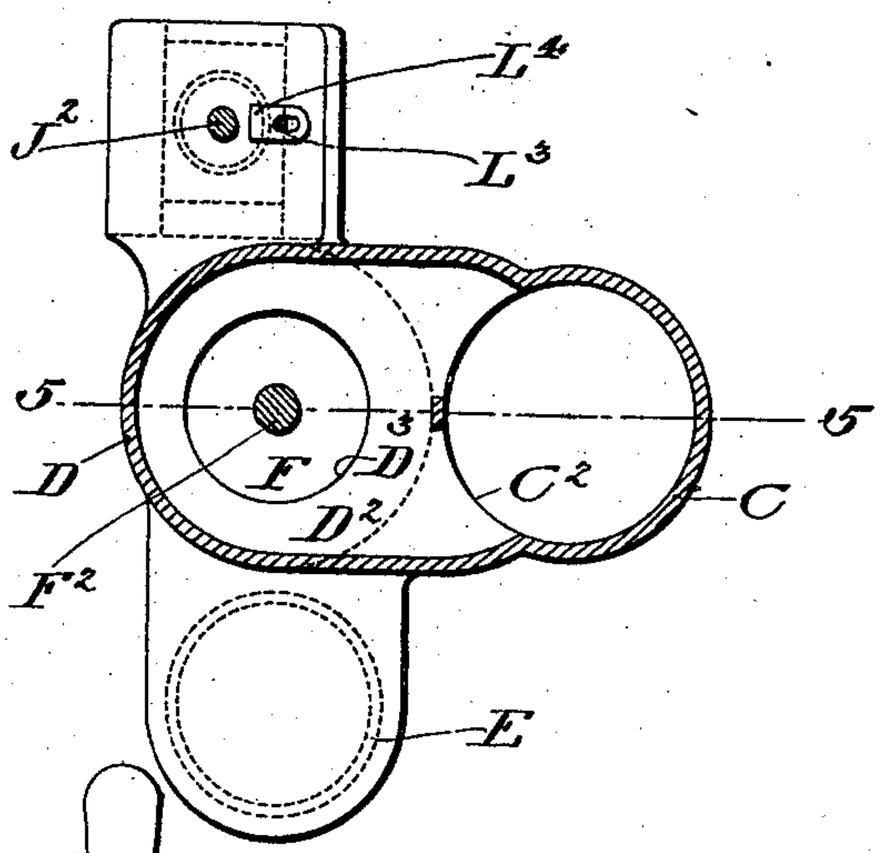
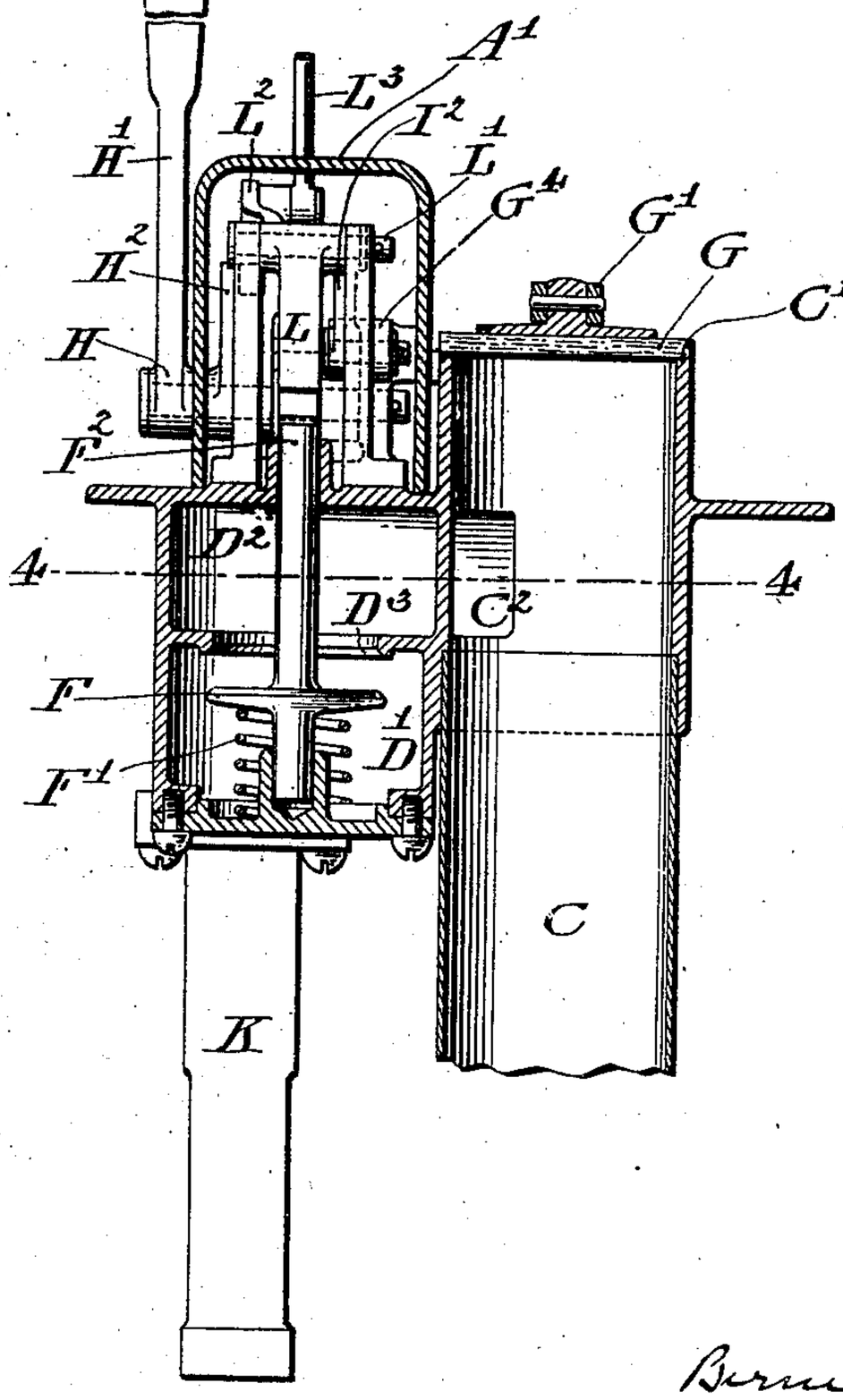


FIG. 5.



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4 SHEETS—SHEET 4.

FIG. 7.

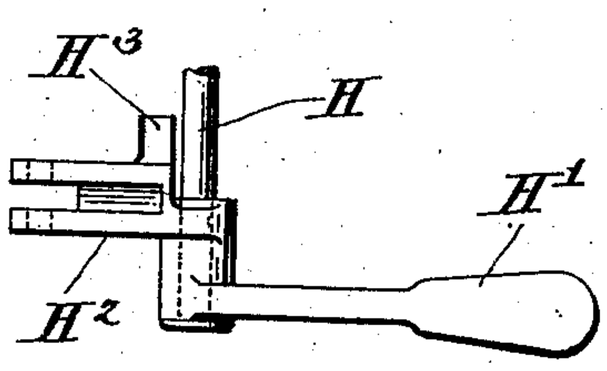


FIG. 8.

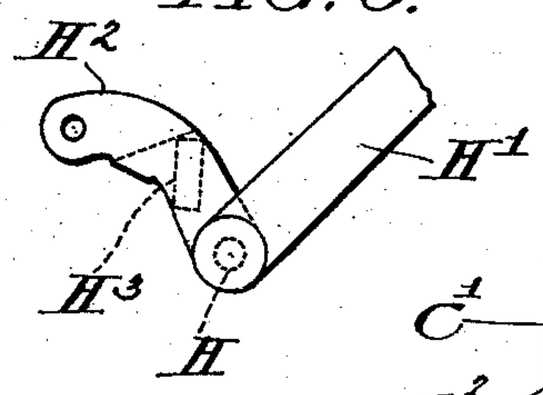


FIG. 6.

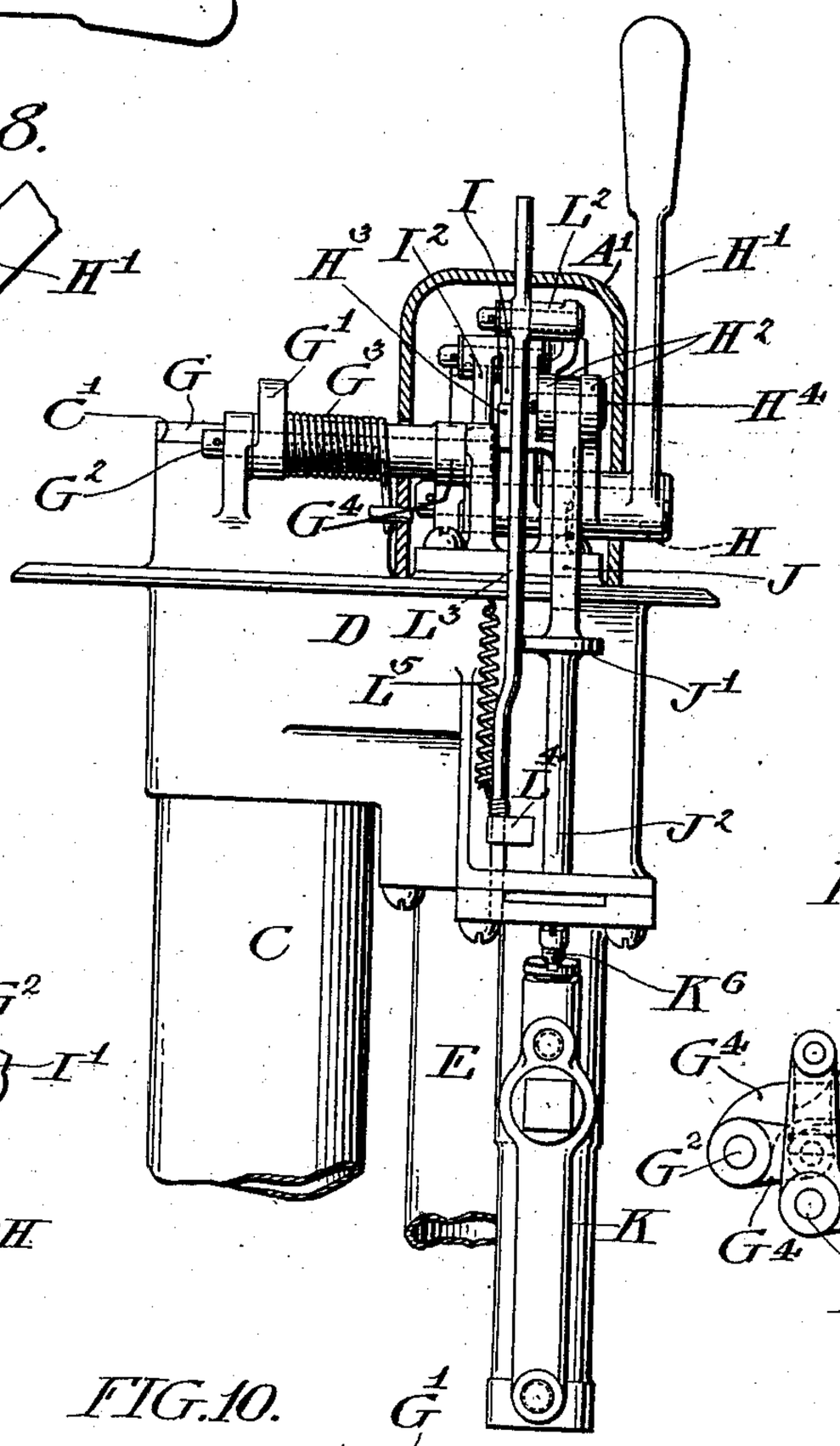


FIG. 9.

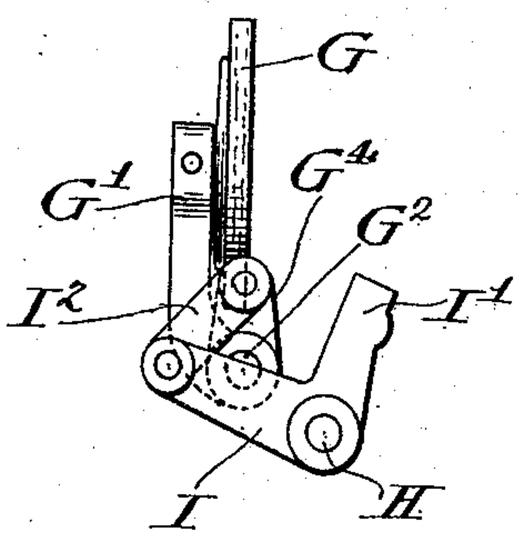


FIG. 11.

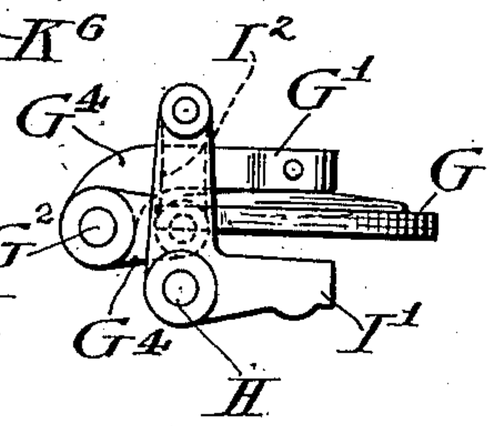
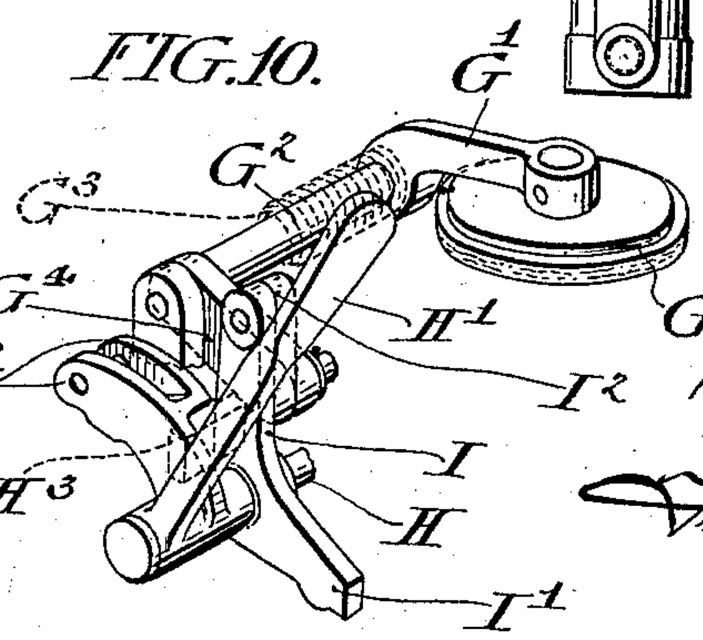


FIG. 10.



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UNITED STATES PATENT OFFICE.

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PNEUMATIC-TUBE SYSTEM.

No. 840,465. Specification of Letters Patent. Patented Jan. 8, 1907.

Application filed May 1, 1905. Serial No. 258,289.

To all whom it may concern:

Be it known that I, BIRNEY C. BATCHELLER, a citizen of the United States of America, residing in the city and county of Philadelphia, in the State of Pennsylvania, have invented a certain new and useful Improvement in Pneumatic-Tube Systems, of which the following is a true and exact description, reference being had to the accompanying drawings, which form a part thereof.

My invention relates to pneumatic-tube systems, and has for its object to provide a pressure system adapted for operation only during the passage of a carrier through the tube and in which the mechanism for controlling the flow of compressed air through the tube is directly and positively connected with a time-escapement, so that said time-escapement is set in operation by the act of setting the valves for a flow of air through the tube and operates after a determined period to restore said valves to their normal position in which they cut off the flow of air.

The nature of my improvements will be best understood as described in connection with the drawings in which they are illustrated, and in which—

Figure 1 is a side elevation of the two-station system provided with my improved devices. Fig. 2 is a plan view of the station appliances with the top of the casing A′ removed to show the internal mechanism. Fig. 3 is a side elevation of the station appliances with the front of the casing A′ removed and its time-escapement mechanism shown in central vertical section. Fig. 4 is a horizontal section on the line 4 4 of Fig. 5. Fig. 5 is a vertical section on the line 5 5 of Fig. 4 with the valve-actuating appliances shown in full. Fig. 6 is a side elevation of one of the station appliances with the casing A′ sectioned to show the contained mechanism. Figs. 7 and 8 are respectively plan and side views of the lever H′ and parts directly connected therewith. Fig. 9 is a side elevation of the tube-gate G and parts directly connected with it with the gate shown in open position. Fig. 10 is a view showing the same parts illustrated in Fig. 9 with the gate shown in closed position, and Fig. 11 is a perspective view of the parts shown in Figs. 7, 8, and 9 in their assembled relationship to each other.

A and B indicate the two stations, one at each end of the tube C.

D D are the casings containing the air-valves and through which the tube C is connected with the air-supply pipe E, which pipe connects with both stations and is connected by a supply-pipe E′ with a source of compressed air. (Not shown.) The casing D is formed with a chamber D′, which is in direct and constant communication with the air-supply pipe E, and with the chamber D^2, which is in permanent communication with the tube C through lateral openings C^2. The two chambers are connected through a valve-seated port D^3, which is normally closed by a valve F, held to its seat by a spring F′ and having a spindle F^2, which projects up from the casing and by which the valve is opened.

I have indicated at C′ the mouth of the tube C, and either mouth of the tube is provided with a gate-valve G, by which it can be closed, said gate-valve connecting through a lever-arm G′ with a rock-shaft G^2, which is acted on by a spring G^3 in a direction to open the valve, leaving the mouth of the tube unobstructed.

G^4 is a second lever-arm connected to the rock-shaft G^2.

H is a pivot or shaft on which is attached the hand-lever H′, in permanent connection with which is the forked lever-arm H^2, having a laterally-extending lug H^3, the forked lever-arm supporting a pin H^4.

I I′ represent a bell-crank lever pivoted concentrically with but independent of the arm H^2, its arm I being connected by a link I^2 with the lever-arm G^4 of the shaft G^2, while its arm I′ is arranged, when the lever is moved in the direction of the hands of a clock, to impinge upon and press down upon the valve-stem F^2, thereby opening the air-valve F. The position of the lever I I′ on the shaft H is such that it is engaged by the laterally-extending lug H^3 when the hand-lever H is moved toward the right.

J is a slotted extension of a piston-rod J^2 and is formed with a shoulder J′, the rod J^2 being connected with the piston which moves in the time-escapement cylinder K, said cyl-

inder having a bottom port K′, connecting through a lateral passage K^4 with an intermediate port K^2, normally closed by a spring-valve K^5, and an upper port K^3, having a regulable restricted opening the orifice of which is determined by the adjusting-needle K^6. The pin H^4 passes through the slotted head J, as indicated.

L is a latch pivoted on the pin L′ and having the lever-arm L^2 extending laterally and connected with a rod L^3, which rod is provided with a laterally-extending finger L^4, lying in position to be engaged by the shoulder J′, a spring L^5 being attached to the rod L^3 and acting to press the latch-lever into operative position—that is to say, in position where it will engage the end of the lever-arm I′ when it is moved to the position indicated in Fig. 3.

In normal condition both of the valves G G are open and both of the valves F are closed, the tube being thus cut off from air-supply and open at both ends to the atmosphere. When it is desired to send a carrier through the system, the carrier is inserted into the open end of the pipe C, and the operator then turns the adjacent lever H′ toward the right through the lever-arm H^2, raising the piston J^3, the fluid contents of the cylinder H flowing freely from top to bottom through the valve K^5 and the described ports. The same movement of the hand-lever through the lug H^3 turns the bell-crank lever I I′ toward the right, closing the gate G by the action indicated in Figs. 9 and 11, the connection of the lever-arms I and G^4 through the link I^2 being such that in the act of closing the gate the link I^2 moves toward parallelism with the lever-arm I, so that the gate is quickly closed and finally is securely clamped and held to its seated position by the toggle-like action of the links. As the lever-arm I′ approaches a horizontal position it impinges on the valve-spindle F^2, opening the air-valve F, and is finally engaged by the latch-lever L, after which the hand-lever H′ and its connected lever-arm H^2 can be moved backward or toward the left without affecting the position of any of the parts which have been moved by its right-hand shift of position.

The opening of the air-valve F admits compressed air to the tube C, and the inserted carrier is rapidly propelled to the connected station, and while it is in motion the piston J^3 of the time-escapement cylinder K is moving down under the action of a spring L^5, (shown in Fig. 3,) the fluid in the lower part of the cylinder escaping through the restricted port K^3 into the upper part of the cylinder. The downward motion of the piston of course draws down the shoulder J′, which finally impinges on the finger L^4, drawing down the rod L^3 and turning the latch-lever L^2 L toward the left until it releases the lever-arm I′, whereupon the spring G^3 rotates the shaft G^2 toward the left, restoring the connected parts to their normal non-operative position, as shown in Fig. 9, and of course permitting the valve F to close and cut off the air-supply.

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

1. In a pneumatic-tube system, the combination of a tube, a gate or valve for closing its end, a connected air-supply pipe, a valve for controlling the admission of air from said pipe to the tube, means for opening the air-valve and closing the tube-gate, a manually-operated device for operating said means, an automatic latch for holding said valve in open and said gate in closed position, and a time-escapement mechanism acting to release said latch and positively and directly set in operation by the manually-operated device for actuating the valve and gate as aforesaid.

2. In a pneumatic-tube system, the combination of a tube, a gate or valve for closing its end, a connected air-supply pipe, a valve for controlling the admission of air from said pipe to the tube, a manually-movable device, means actuated by said device acting to first close the tube-gate and subsequently open the air-valve, an automatic latch for holding said gate closed and said valve open, a time-escapement device for releasing the latch and means for setting said device in operation directly actuated by the manually-operated device for shifting the gate and valve as described.

3. In a pneumatic-tube system, the combination of a tube, a gate or valve for closing its end, a connected air-supply pipe, a valve for controlling the admission of air from said pipe to the tube, a manually-movable device, means actuated by said device acting to first close the tube-gate and subsequently open the air-valve, an automatic latch for holding said gate closed and said valve open, a time-escapement device for releasing the latch, and means for setting said device in operation directly actuated by the manually-operated device for shifting the gate and valve as described, said means for actuating the time-escapement being adapted to permit the manually-operative device to move backward without affecting the movement of the time-escapement.

4. In a pneumatic-tube system, the combination of a tube having a valve or gate for closing its end, a connected air-supply pipe and a valve for controlling the admission of air to the tube, with a time-escapement device, a manually-actuated lever connected to actuate the time-escapement, a bell-crank lever I, I′, actuated by the time-escapement lever when it is turned to set the time-escape-

ment in operation, one arm of said lever acting to open the air-valve, a shaft G^2, to which the gate-valve is attached said shaft having also a lever-arm G^4, a link I^2, connecting arm G^4, and I', as described, a latch for holding lever I, I', and connected parts in position to close the tube and hold the air-valve open and means for shifting said latch set in operation by the time-escapement.

5. In a pneumatic-tube system of the character described and having a gate-valve G, means for closing said valve comprising a rock-shaft G^2, having an attached lever-arm G^4, in combination with a manually-operable pivoted lever-arm I, and a connecting-link I^2, said levers and connecting-link being arranged as described and so that the lever I and link I^2, move from a position of angular divergence toward parallelism as the gate is closed.

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