

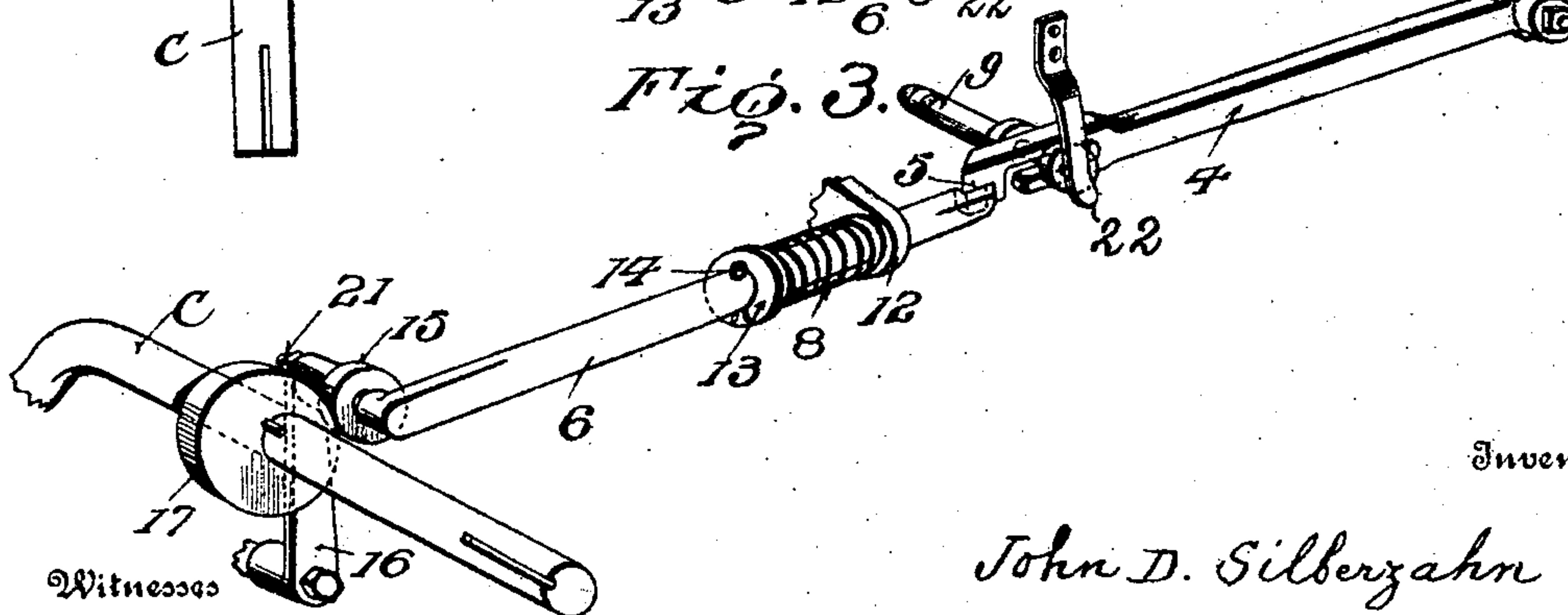
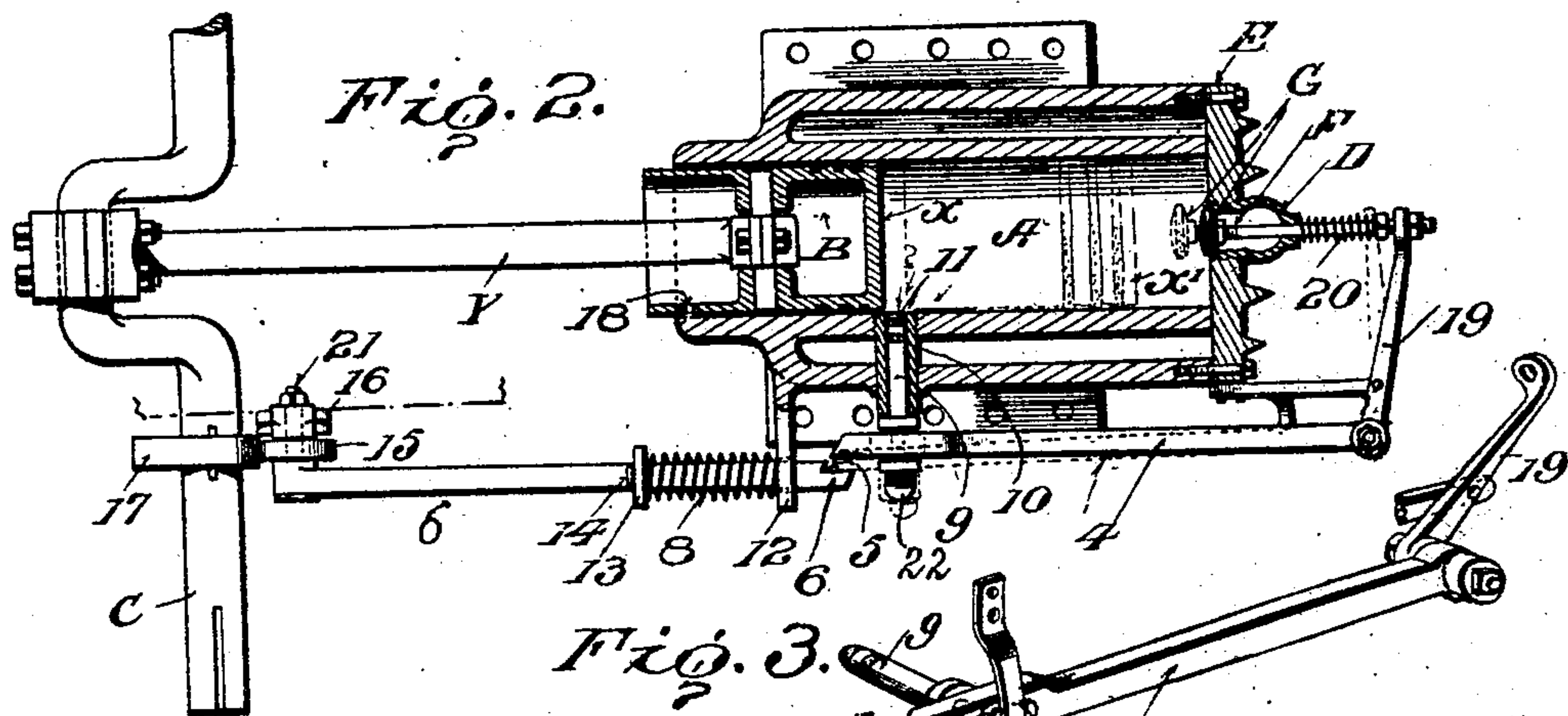
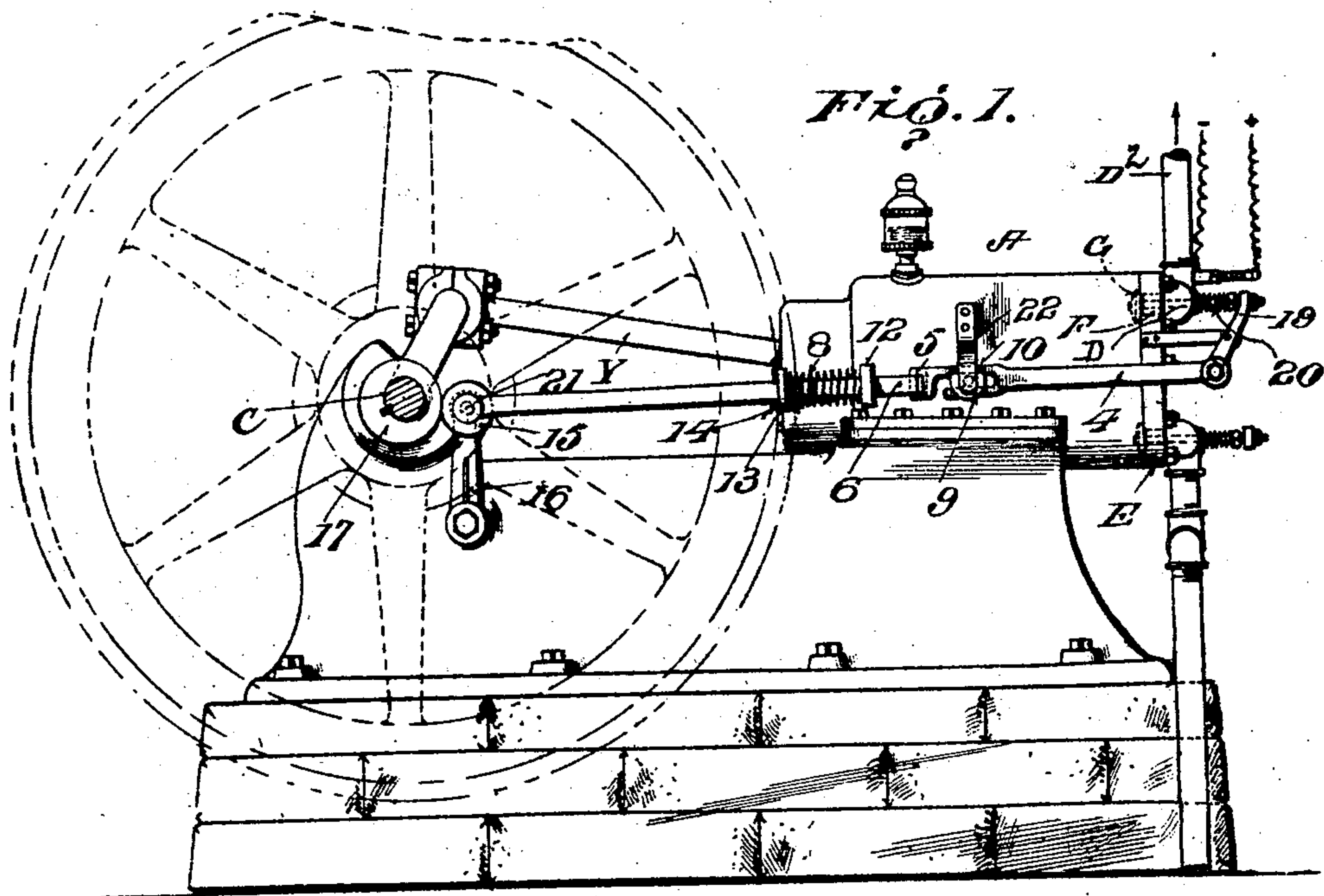
No. 859,127.

PATENTED JULY 2, 1907.

J. D. SILBERZAHN.

MECHANISM FOR AUTOMATICALLY OPERATING EXHAUST VALVES
ON EXPLOSIVE ENGINES.

APPLICATION FILED JAN. 28, 1907.



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Specification of Letters Patent.

Patented July 2, 1907.

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To all whom it may concern:

Be it known that I, JOHN D. SILBERZAHN, a citizen of the United States, residing at Marinette, in the county of Marinette and State of Wisconsin, have invented certain new and useful Improvements in Mechanism for Automatically Operating Exhaust Valves on Explosive-Engines, of which the following is a specification.

This invention relates to improvements in mechanism for automatically operating exhaust valves on explosive-engines, to allow the discharge of the pressure in the engine cylinder at the proper time, which mechanism will be simple in its construction and easy of operation.

I attain these objects by the mechanism and arrangement of parts illustrated in the accompanying drawings, in which

Figure 1, is a side view of the engine constructed in accordance with my invention, the main shaft being in section. Fig. 2, is a longitudinal section of the main parts of the engine showing the novel features on a larger scale. Fig. 3, is a perspective view of the means for actuating the main valve.

In said drawings, A, indicates the cylinder or explosive chamber of an ordinary explosion engine and B, the piston thereof which is adapted to travel in the cylinder A, approximately from x to x' .

C, represents the crank-shaft, which is revolved by the pitman Y, which is connected to the piston B, in any well-known manner.

D, is an exhaust chamber carrying the exhaust pipe D^2 , said chamber D is substantially part of the head E of the cylinder A, and is connected therewith by the passage F, which has its mouth beveled and forms a seat for the valve G therein.

Through the wall of cylinder A I provide a small opening 11 located above the position occupied by the piston B in its outer course. To said opening is secured an auxiliary cylinder 10 having a solid piston 9 therein. Said piston has a grooved head that acts as a support and guide for an exhaust valve rod 4. A hanger 12 is secured to some stationary part of the engine to guide and retain in proper position the cam rod 6. Said rod 6 has in its end a notch and shoulder 5 to enter into alinement with the end of the valve rod 4. The cam rod 6 carries at one end a bearing pin 21 for a roller 15 which bears constantly against a cam 17 on the crank shaft C, said roller bearing pin 21, being also guided by a pivoted arm 16. Upon the cam rod 6, is also placed a coiled spring 8, one end of which bears against the hanger 12, and the other end against a collar 13, mounted upon said cam rod 6, and secured thereto by a pin 14. The cam 17 and the cam rod 6, when connected by the

notch 5, as in Fig. 3, pushes the valve rod 4, ahead, and said rod 4, being connected to the stem 20 of the valve G, by the pivoted rod 19, it pushes said valve G into the cylinder A and makes an opening for exploded gases or pressure to escape through the passage F and the exhaust pipe D.

After the piston B has traveled back into the cylinder A toward the point x' ; and after uncovering the opening 11; and the opening 18, in the side of the piston B, near its outer end reaches opposite the opening 11, the pressure in the auxiliary cylinder 10, escapes through said opening 18. As there is then no force in the cylinder 10, the piston 9, is returned to place by a small spring 22, that may be attached to any part of the engine; the piston 9 being then ready for another explosion. The piston 9, in returning to place draws the valve rod 4 out of line with the notch 5 in the cam rod 6, and this permits the coil spring 20 on the rod of the valve G to return said valve G to place, so that it closes the opening F, and the cylinder A is ready for another explosion. The valve rod 4, cannot pass out beyond the point of the cam rod 6, as said point of the cam rod 6, in its travel never frees the point of the valve rod 4.

Having now fully described my invention, I claim:—

1. In an automatic mechanism for opening the exhaust valve of an explosive engine, the auxiliary cylinder 10 and the solid piston 9 therein, the outer head of said piston being circumferentially grooved, the valve rod 4 straddling the reduced portions of the head, and the spring 22 bearing against the outer end of the head, substantially as described.

2. In a device of the class described, the combination of the auxiliary cylinder 10, the solid piston 9, therein having its outer head circumferentially grooved to form a neck therein, the valve rod 4 longitudinally grooved to straddle said neck and the spring 22 bearing against the outer end of the head, substantially as described.

3. In an exhaust valve operating device, the combination of the cylinder A, the auxiliary cylinder 10, and its piston 9, the exhaust valve G in line with the end of the cylinder A, the valve stem 20, the pivoted lever 19, and the valve rod 4, having one end straddling the circumferentially grooved head of the piston 9 of the auxiliary cylinder, substantially as described.

4. In an exhaust valve operating device, the combination of the cylinder A, the auxiliary cylinder 10, its piston 9, having its head circumferentially grooved to form a neck therein, the valve rod 4, having one end straddling said neck, the cam rod 6, having a notch in one end to receive the point of the valve rod, the pivot pin 21, projecting laterally from the other end of the rod 6, and the pivoted arm 16, supporting the opposite end of the pivot pin 21, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

JOHN D. SILBERZAHN.

Witnesses:

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