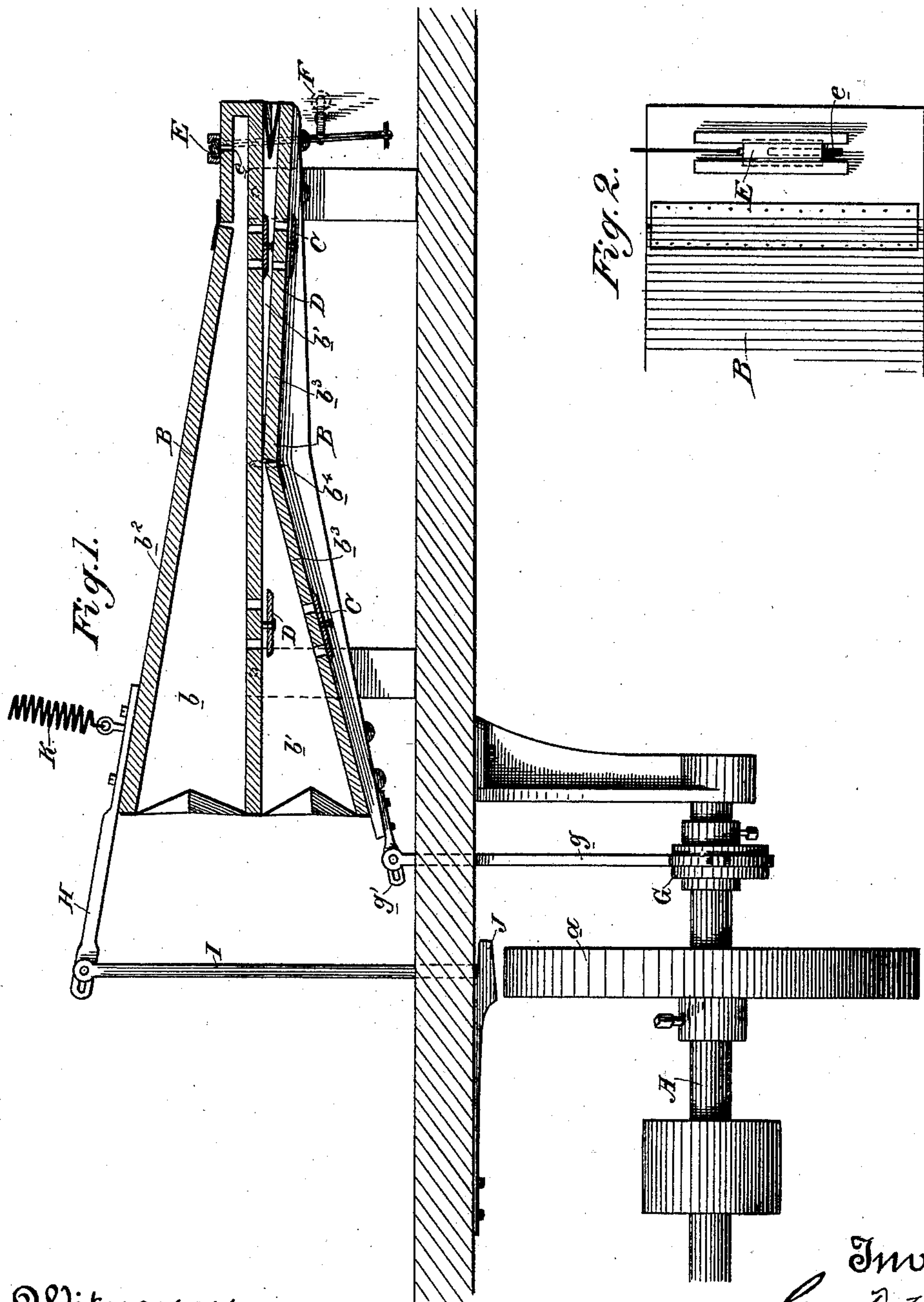


No Model.)

G. F. WELLS.
SPEED REGULATOR.

No. 387,330.

Patented Aug. 7, 1888.



Witnesses,
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UNITED STATES PATENT OFFICE.

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MANLEY C. LAWTON, OF STATEN ISLAND, CALIFORNIA.

SPEED-REGULATOR.

SPECIFICATION forming part of Letters Patent No. 387,330, dated August 7, 1888.

Application filed May 12, 1888. Serial No. 273,720. (No model.)

To all whom it may concern:

Be it known that I, GEORGE F. WELLS, of the city and county of San Francisco, State of California, have invented an Improvement in Speed-Regulators; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to the class of devices for regulating the speed of engines, and especially motors designed for running small machines; and my invention consists in a bellows-like frame operated by the engine or motor and having a regulating-valve, and a brake-connection from said frame to a portion of the engine or motor, all of which, together with details of construction, I shall hereinafter fully describe.

The object of my invention is to provide a simple speed-regulator delicate and noiseless but effective in its operation, and which is, therefore, specially adapted for use in connection with motors designed for operation in automatic musical instruments, where the speed has to be varied and controlled with so much accuracy.

Referring to the accompanying drawings for a more complete explanation of my invention, Figure 1 is a vertical longitudinal section of the frame of my speed-regulator, the remaining parts being shown in elevation. Fig. 2 is a plan of the controlling-port *e* and valve *E*.

A is a shaft of a motor of any suitable description, said shaft carrying a wheel, *a*.

I need not herein further describe or illustrate the motor, as it forms no part of the present application.

B is a bellows-like frame having an upper chamber, *b*, and two lower chambers, *b'*, the former having a hinged top wall or lid, *b²*, and the latter having inclined connected bottom walls, *b³*, hinged on a central transverse line at *b⁴*, whereby they work together and oppositely. In these bottom walls are ports controlled by downwardly-opening valves *C*, and in the central wall separating the lower chambers from the upper chamber are ports controlled by downwardly-opening valves *D*.

Upon the upper surface of the end of frame *B* is an inlet-port, *e*, communicating with the top chamber, *b*, and consisting of a very nar-

row slit or elongated opening. This port is controlled by a slide-valve, *E*, which is operated in any suitable manner, such as by the stop *F*, supposed to be on the front of the instrument with which the motor and speed-regulator are used.

Upon the shaft *A* is an eccentric, *G*, from which a rod, *g*, extends to and is connected with an arm, *g'*, extending from the end of one of the hinged bottom walls of frame *B*. Connected with the hinged top wall of the frame *B* is an arm, *H*, to the end of which is connected a rod, *I*, which bears down upon or carries a brake-shoe, *J*, adapted to impinge upon the wheel *a*. A spring, *K*, holds the hinged top wall up and keeps the brake normally out of contact.

The operation of the governor is as follows: When the port *e* on top is closed by the valve *E*, so that no air is admitted to chamber *b*, the swinging of the bottom walls, *b³*, whose motion is derived from the eccentric *G* and rod *g*, exhausts what air is in chamber *b* out through valves *C* and *D*, and this exhaustion draws the top wall, *b²*, down, thereby, through the arm *H* and rod *I*, applying the brake-shoe *J* to the wheel *A*, and this application is constant while port *e* remains closed, so that this represents the greatest check to the speed of the motor. Now, by admitting a little air through port *e*, the exhaustion from chamber *b* is not as complete as before, and therefore the top wall is not drawn down so far and the brake is somewhat relieved. Then by exposing more of port *e* the brake is further relieved, and it will be seen, therefore, that the speed of the motor can be nicely and accurately regulated by operating stop *F*.

The shape of the regulating-port *e* is advantageous in this connection, for, on account of its narrowness, extreme delicacy of movement of the stop *F* is not essential, and yet by moving it slightly the most delicate regulation of the motor may be effected. Its operation is perfectly noiseless, and its use in connection with the motors of automatic musical instruments is effective.

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

1. The combination of a bellows-like frame operated by the engine or motor and having a port with an adjustable valve for controlling the degree of its expansion or contraction, and
5 suitable connections, comprising a connecting-rod and a brake-shoe operated thereby, by which the speed of the motor is affected, substantially as herein described.

2. The bellows-like frame operated by the
10 engine or motor and having a port with an adjustable valve for controlling the degree of its expansion or contraction, in combination with a brake acting upon the motor for checking it, and a connecting-rod between the frame and
15 brake, whereby the latter is operated, substantially as herein described.

3. The combination of a bellows-like frame consisting of an expanding and contracting portion above and an expanding and contracting portion below and communicating with the
20 portion above to expand or contract the portion above, said bellows having a port with an adjustable valve for regulating and controlling the degree of expansion or contraction of the portion above, and a brake and connections connected with said portion above for
25 affecting the speed of the motor, substantially as herein described.

4. The combination of a bellows-like frame
30 consisting of the upper valved chamber having a hinged lid or top wall, a lower valved chamber communicating therewith and having a hinged bottom wall, a connection between the motor and the hinged bottom wall, whereby
35 the latter is operated to exhaust the upper chamber and draw down its top wall, said bellows having an entrance-port with an adjustable valve to the upper chamber for regulating the depression of the top wall, and a brake
40 and connections with said top wall for controlling the speed of the motor, substantially as herein described.

5. The combination of a bellows-like frame consisting of the upper chamber having a

hinged top wall, the lower chambers having
45 oppositely-working connected bottom walls, the valves D between the lower chambers and the upper chamber and the valves C in the bottom walls, a connection with the motor for operating the bottom walls to exhaust the up-
50 per chamber and depress its top wall, said bellows having an entrance-port with an adjustable valve to the upper chamber for controlling the degree of depression of said wall, a spring for holding it up, and a brake and connections
55 with said top wall for controlling the speed of the motor, substantially as herein described.

6. The combination, with the shaft A, of the motor having wheel *a* and eccentric G, the bellows like frame having communicating
60 upper and lower chambers controlled by valves, said upper chamber having a hinged top wall and the lower chambers having hinged bottom walls, the eccentric-rod *g*, by which the bottom walls are operated to exhaust the up-
65 per chamber and depress its top wall, the spring for holding said wall up, said bellows having the entrance-port with sliding valve for controlling the depression of the top wall, and the brake acting on the wheel *a* and con-
70 nected with the top wall, substantially as herein described.

7. The bellows-like frame operated by the motor, said bellows having a port for regulating the degree of its expansion or contraction,
75 said port consisting of an elongated narrow slit, and a slide-valve controlling the port, in combination with a brake acting on the motor, and connecting-rods from the brake to the bellows-like frame, substantially as herein de-
80 scribed.

In witness whereof I have hereunto set my hand.

GEORGE F. WELLS.

Witnesses:

S. H. NOURSE,
H. C. LEE.