No. 691,500. Patented Jan. 21, 1902.

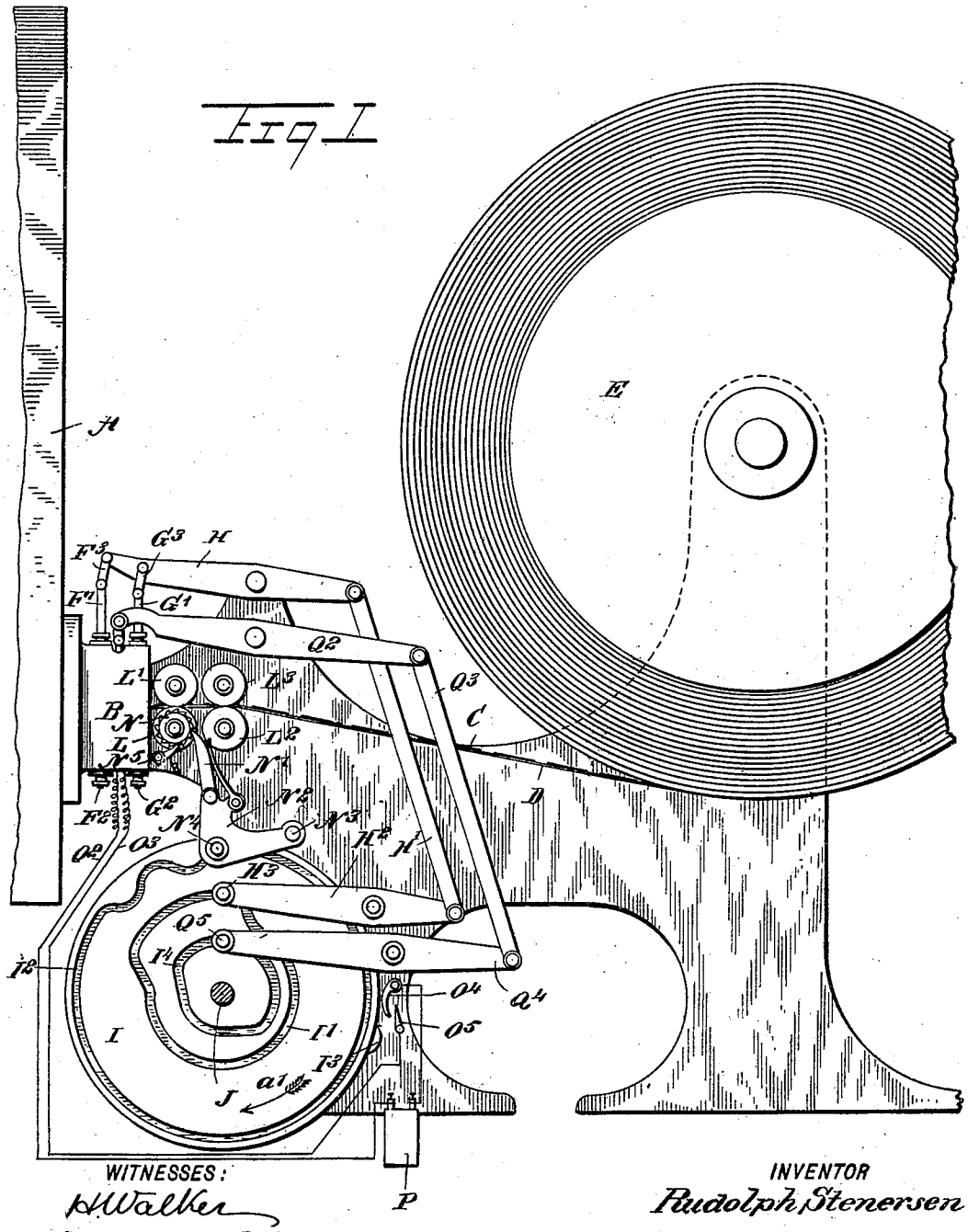
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GENERATING MOTIVE POWER.

(Application filed Mar. 15, 1901.)

(No Model.) 2 Sheets—Sheet 1.

Fig 1.



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Fig 2

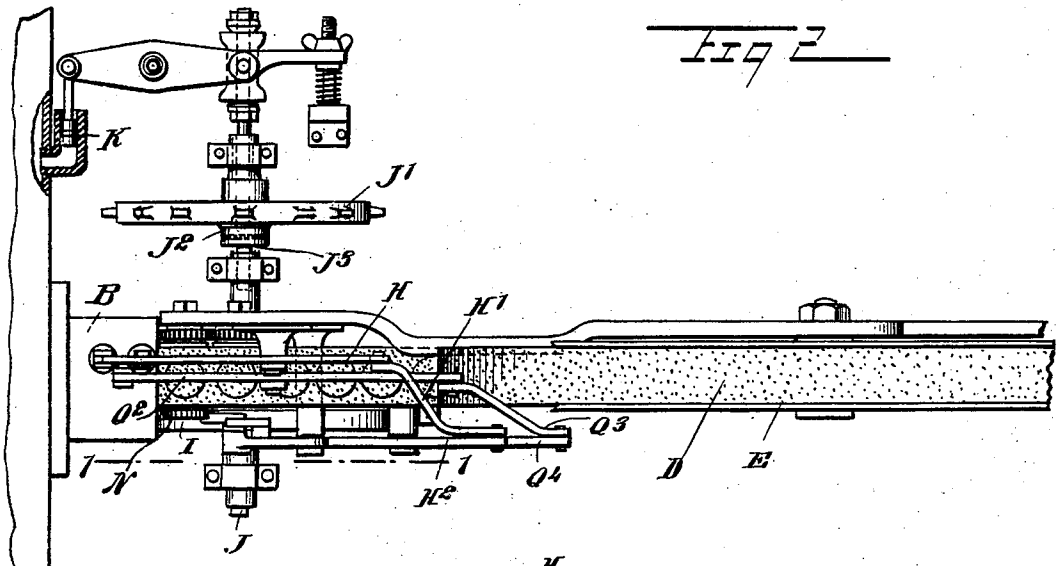


Fig 3

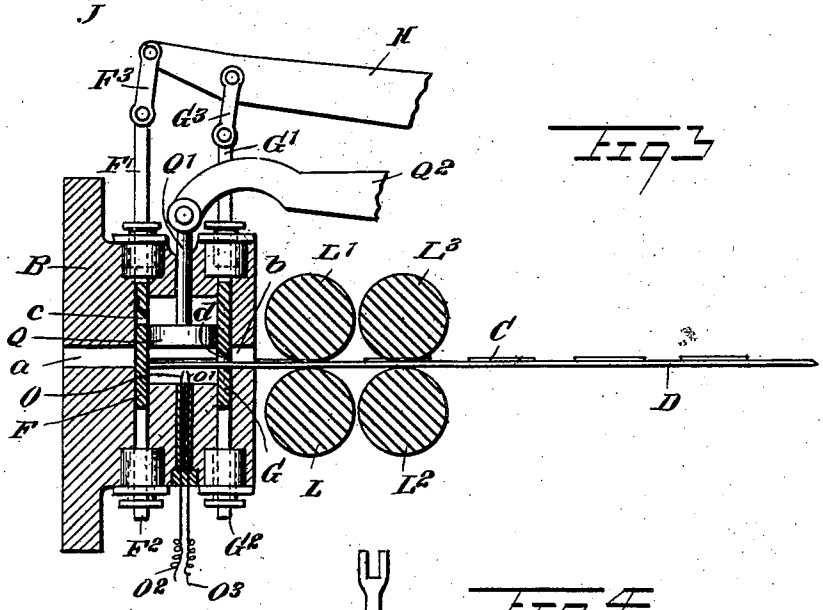
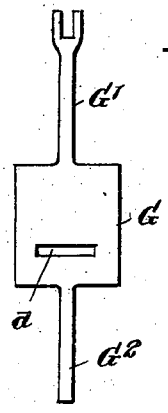


Fig 4



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UNITED STATES PATENT OFFICE.

RUDOLPH STENERSEN, OF BROOKLYN, NEW YORK, ASSIGNOR OF TWO-THIRDS TO CARL J. LUNDMAN AND CHARLES F. NORLIN, OF BROOKLYN, NEW YORK.

GENERATING MOTIVE POWER.

SPECIFICATION forming part of Letters Patent No. 691,500, dated January 21, 1902.

Application filed March 15, 1901. Serial No. 51,329. (No model.)

To all whom it may concern:

Be it known that I, RUDOLPH STENERSEN, a citizen of the United States, and a resident of the city of New York, borough of Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Generating Motive Power, of which the following is a full, clear, and exact description.

The object of the invention is to provide certain new and useful improvements in generating motive power whereby explosive charges are successively exploded in an explosion-chamber connected with a pressure-storage chamber, to store the force of the explosion in the storage-chamber, and to utilize the pressure obtained for driving machinery or for other purposes.

The invention consists of novel features and parts and combinations of the same, as will be fully described hereinafter and then pointed out in the claims.

A practical embodiment of the invention is represented in the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the views.

Figure 1 is a side elevation of the improvement, with parts in section, on the line 1 1 in Fig. 2. Fig. 2 is a plan view of the same. Fig. 3 is an enlarged sectional side elevation of part of the improvement, and Fig. 4 is a face view of the cut-off valve for the charge.

The improved motor illustrated in the drawings is provided with a pressure-storage chamber A, from which the pressure obtained is withdrawn to drive other machinery and is utilized for other purposes, and on one side of the chamber A is secured an explosion-chamber B, in which explosive charges C in the form of caps are exploded successively to produce the desired pressure in the chamber A, as hereinafter more fully described. The charges C are held on a web D of a suitable material and unwinding from a roll E, as indicated in Figs. 1 and 2. The interior of the explosion-chamber B is connected by a port *a* with the interior of the pressure-chamber A, and a similar port *b* connects the interior of the explosion-chamber with the outside, and through this port *b* passes the web D and the charges C to the interior of the explosion-chamber. The ports *a* and *b* are adapted to be alternately cut off by suitable cut-off valves F and G, having their stems F′ F² and G′ G² mounted to slide in suitable stuffing-boxes carried on the explosion-chamber B, as is plainly indicated in Fig. 3. The cut-off valves F and G are provided with ports *c* and *d*, respectively, of which the port *d* is located near the bottom of the cut-off valve G, while the port *c* is located near the top of the valve F. The valves F and G are arranged on the inside of the explosion-chamber B, and the port *c* is adapted to register with the port *a* at the time the explosion takes place in the chamber B, and the other port *d* is out of register with the port *b*. The port *c* moves out of register with the port *a*, and then the port *d* moves in register with the port *b* to allow of feeding the new charge through the registering ports *b* and *d* into the interior of the explosion-chamber B. The cut-off valve G also serves as a knife to cut the web D, carrying the charges, after it has been fed into the explosion-chamber B, as hereinafter fully described.

In order to impart the desired movement to the valves F and G, the following device is provided: The upper ends of the stems F′ G′ are connected by links F³ and G³, respectively, with a lever H, connected by a link H′ with another lever H², carrying a friction-roller H³, traveling in a cam-groove I′ of a cam-wheel I, secured on a shaft J, journaled in suitable bearings and connected by a loose sprocket-wheel J′ and a sprocket-chain with other machinery to impart a rotary motion to said sprocket-wheel J′ and by clutch members J² J³ to the shaft J and the cam-wheel I to rotate the latter in the direction of the arrow *a*′, as indicated in Fig. 1. This rotary motion of the shaft I causes a swinging of the lever H² and by the link H′ a corresponding movement of the lever H, so that the valves F G are periodically moved to the different positions above referred to. One of the clutch members J² or J³ is controlled from a safety-valve

K on the storage-chamber A, as is plainly shown in Fig. 2, so that when the pressure in said chamber runs beyond the normal pressure for which the valve is set then the friction-clutch members are thrown out of mesh to stop the rotation of the shaft J and the cam-wheel I. The latter controls the feed mechanism for the web D and the charges C thereon, and this feed mechanism consists, essentially, of pairs of drawing-rollers L L' and L^2 L^3, located in front of the explosion-chamber B, as is plainly illustrated in the drawings, the web D passing between the drawing-rollers of the sets to feed the web through the registering ports *b* and *d* at the proper time and as previously explained. On one outer end of the drawing-roller L is secured a ratchet-wheel N, engaged by a spring-pressed pawl N', fulcrumed on a lever N^2, pivoted at N^3, and provided with a friction-roller N^4, traveling in a cam-groove I^2 of the cam-wheel I, so that when the latter is rotated, as previously described, a swinging motion is given periodically to the lever N^2, so that the pawl N' rotates the ratchet-wheel N and the feed-roller L to feed the web D forward a distance and carry one charge into the interior of the explosion-chamber B. In order to prevent return movement of the drawing-roller L, a dog N^5 is employed. (See Fig. 1.)

In order to ignite a charge within the explosion-chamber, I may employ various means—such, for instance, as the electric igniting device shown in the drawings, and which consists, essentially, of electrodes O O', reaching into the explosion-chamber and connected at their outer ends with wires O^2 O^3, of which the wire O^2 contains a battery P or other source of electricity and also connects with a pivoted arm O^4, adapted to be engaged by a projection I^3 on the rim of the cam-wheel I to press said arm O^4 in contact with a contact-plate O^5, connected with the other wire O^3. Thus at each revolution of the cam-wheel I the projection I^3 by moving the arm O^4 against the contact-plate O^5 closes the circuit, and consequently a spark passes between the electrodes O O' and ignites the charge C within the explosion-chamber B at the time.

In order to discharge the products of combustion from the explosion-chamber B, I prefer to use a piston Q, mounted to reciprocate in said chamber and having its rod Q' connected with a lever Q^2, connected by a link Q^3 with a second lever Q^4, carrying a friction-roller Q^5, traveling in a cam-groove I^4 of the cam-wheel I. Thus when the cam-wheel I is rotated a periodical movement is given to the piston Q for the purpose previously mentioned, it being understood that the several cam-grooves I' I^2 I^4 and the projection I^3 are so arranged relatively to one another that the desired movements of the cut-off valves, the piston Q, and the igniting device take place in the regular order.

When the machine is in operation, a charge is fed to the explosion-chamber, and then the cut-off valves F and G are shifted, so that the cut-off valve G detaches the charge by severing the web D and at the same time closes the port *b*, while the interior of the pressure-chamber is connected by the registering ports *a* and *c* with the explosion-chamber containing the charge. At this time the igniting device is employed, so that the spark ignites the charge within the explosion-chamber, and the pressure produced passes through the registering ports *a* and *c* to the interior of the pressure-chamber A. The valves F and G then again shift to the previous position, (shown in Fig. 3,) and the above-described operation is repeated—that is, the drawing-roller L is rotated from the cam-wheel I—so that another charge is fed to the explosion-chamber and is then cut off from the web and ignited after a change of the valves F and G has taken place, as above explained. It will be understood that the portion of the web carrying the charge and which has been severed will be consumed and pass into the pressure-chamber.

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

1. A generator, comprising an explosion-chamber, a pressure-storage chamber connected with the explosion-chamber, a feed device for feeding a web carrying explosive charges into said explosion-chamber, and cut-off valves for alternately connecting the explosion-chamber with the storage-chamber and the explosion-chamber with the outside, for introducing the charges, one of the valves serving as a knife to sever the web, as set forth.

2. A generator, comprising an explosion-chamber having a port in one side, a feeding device for feeding a web carrying explosive charges into said explosion-chamber, a cut-off valve controlling the said port and serving also as a knife to sever the web, and an igniting device for igniting the charges when the explosion-chamber is closed to the outside, as set forth.

3. A generator, comprising an explosion-chamber having a port in one side, a feeding device for feeding a web carrying explosive charges into said explosion-chamber, an apertured cut-off valve controlling said port and also serving as a knife to sever the web, an igniting device for igniting the charges when the explosion-chamber is closed to the outside, and a storage-chamber connected with said explosion-chamber at the time the latter is cut off from the outside, as set forth.

4. A generator, comprising an explosion-chamber, a pressure-storage chamber connected with the explosion-chamber, a feeding device for feeding a web carrying explosive charges into said explosion-chamber, cut-off valves for alternately connecting the explosion-chamber with the storage-chamber and the explosion-chamber with the outside, one

of the valves being apertured and through which the web passes, the said valve also serving as a knife to sever the web carrying the charges, and means, substantially as described, for actuating said feed device and said cut-off valves in unison, as set forth.

5. A generator, comprising an explosion-chamber, a pressure-storage chamber connected with the explosion-chamber, a feed device for successively feeding explosive charges into said explosion-chamber, cut-off valves for alternately connecting the explosion-chamber with the storage-chamber and the explosion-chamber with the outside, the valve controlling the port communicating with the outer air being apertured and through which aperture the charges pass said valve serving as a knife to sever the web carrying the charges, an igniting device for igniting the charges in the explosion-chamber when the latter is closed to the outside and is connected with said storage-chamber, and means for actuating said cut-off valves, said feed device and said igniting device, as set forth.

6. A generator, comprising an explosion-chamber, a pressure-storage chamber connected with the explosion-chamber, a feed device for successively feeding explosive charges into said explosion-chamber, cut-off valves for alternately connecting the explosion-chamber with the storage-chamber and the explosion-chamber with the outside, for introducing the charges, the valve through which the charges are introduced also serving as a knife to sever the web carrying the charges, and means for automatically stopping said feed device and said cut-off valves when the pressure in the storage-chamber increases beyond the normal pressure, as set forth.

7. In a generator, the combination with a storage-chamber, and an explosion-chamber having a port leading to the storage-chamber and a port leading out through one side thereof, of a feeding device for feeding an explosive charge into the chamber through the port in its side, valves for alternately closing and opening the ports of the explosion-chamber, an igniting device for igniting the charge, and means for forcing the products of combustion from the explosion-chamber into the storage-chamber, as set forth.

8. In a generator, the combination with a storage-chamber, and an explosion-chamber having two ports, one leading into the storage-chamber, of valves controlling the said ports, one valve being apertured to admit the charges and also serving as a knife to sever the web carrying the charges, a pivoted lever, links connecting the valve-stems with said lever, one in rear of the other, a cam, and means for operating the lever from the cam, as set forth.

9. In a generator, the combination with a storage-chamber, and an explosion-chamber having two ports, one leading into the storage-chamber, of sliding valves controlling said ports, a driven shaft, means for operating the valves from said shaft, feed-rollers opposite one of the ports of the explosion-chamber, means for operating the rollers from the said shaft, a plunger mounted in the explosion-chamber, and means for operating the plunger from the said shaft, as set forth.

10. In a generator the combination with a storage-chamber, an explosion-chamber connected with the storage-chamber, a feed device for feeding an explosive charge into the explosion-chamber, valves for alternately connecting the explosion-chamber with the storage-chamber and with the outside, a shaft, and means for operating the valves and feed device from said shaft, of a driving-pulley on said shaft, and having a clutch connection therewith, and a safety-valve on the storage-chamber and serving to throw the clutch members out of mesh when the pressure in the chamber exceeds the normal, as set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

RUDOLPH STENERSEN.

Witnesses:
JNO. M. RITTER,
THEO. G. HOSTER.