C. A. COMPTON.

HYDRAULIC POWER PIPE SYSTEM.

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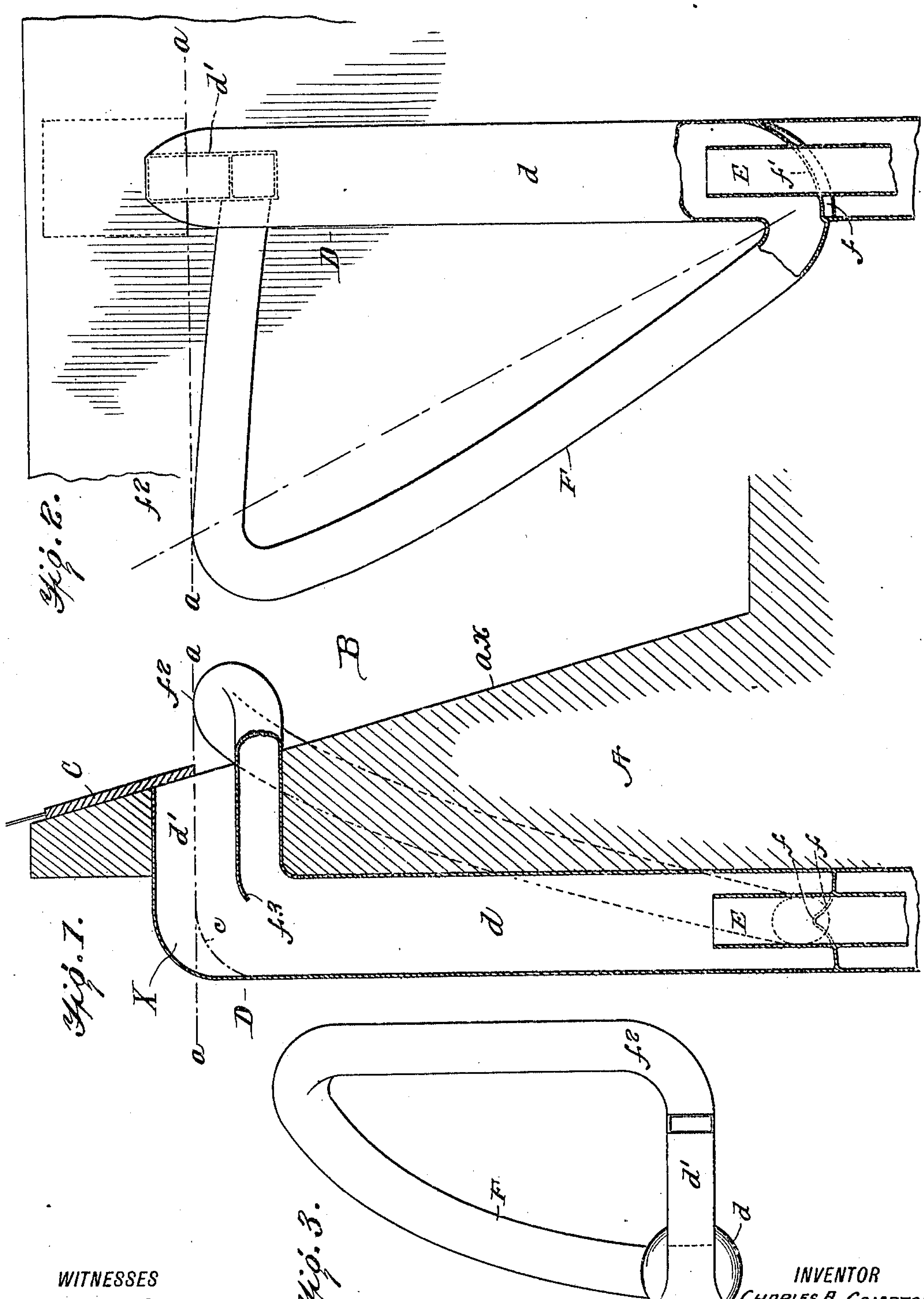
955,945.

Patented Apr. 26, 1910.



WITNESSES

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HYDRAULIC-POWER PIPE SYSTEM.

955,945. Specification of Letters Patent. **Patented Apr. 26, 1910.**

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To all whom it may concern:

Be it known that I, CHARLES ANDREW COMPTON, a citizen of the United States, residing at Washington, in the District of Columbia, have invented an Improved Hydraulic-Power Pipe System, of which the following is a specification.

My invention relates to improvements in hydraulic power systems whereby an excess of power may be derived and act in conjunction with the ordinarily obtainable and convertible volume of a stream or flow of water in a fall; the excess or additional power being the result of obtaining an additional amount of water, and holding it in store and continually using it or its equivalent quantity of water.

The main object of my invention is to provide a means by which a stream of falling water may be partially deflected in an upward direction and may be again brought into contact with the descending stream, thereby imparting to the latter increased pressure.

A further object of my invention is to provide a simple and effective means for accomplishing the above result which may be applied to any power plant having a turbine shaft and a turbine located at the bottom thereof.

Other objects and advantages will appear in the following specification and the novel features of the invention will be particularly pointed out in the appended claims.

My invention is illustrated in the accompanying drawings in which similar reference characters indicate corresponding parts in the views, and in which—

Figure 1 is a sectional view showing one embodiment of my invention. Fig. 2 is a front view thereof, a portion of the device being shown in section, and Fig. 3 is a plan view showing the relation of the auxiliary pipe to the main pipe.

Referring now to Fig. 1, I have shown therein a section of a dam A arranged to hold the water of a lake or stream B. On the inner side a^x of the dam A, I arrange a movable gate C which may be raised or lowered by any suitable means, to close or open the entrance to the main pipe which I have denoted in general by D and which extends through the dam as clearly shown in Fig. 1.

The main pipe D consists of a cylindrical portion d and has at its top an elbow connecting a laterally extending rectangular portion d'. The portion d of the main pipe D lies on the outer side of the dam, and in close proximity thereto. At the bottom of the portion d of the pipe is a lower pipe E, whose cross sectional area is approximately one-half that of the pipe d. The pipe E projects into the pipe d as shown and is designed to convey the descending stream of water to a turbine, not shown, for the operation of the latter. At the lower end of the vertical pipe d is an auxiliary pipe F, which communicates with the former. A curved deflecting plate f tends to deflect part of the water into the pipe F, while a certain portion of the water flows downwardly through the pipe E, which is disposed in an opening in the plate f in the manner clearly shown. The deflecting plate f has a ridge f', against which the descending stream of water falls, being deflected thereby in the manner of a water-shed around the central pipe E and into the mouth of the auxiliary pipe F. The latter pipe is curved upwardly and extends through the dam as shown in Fig. 1, its highest point, f^2, being preferably just below the low water level. From this point it is inclined downwardly and is bent around to enter the bottom part of the portion d' of the main pipe D. This pipe ends in a downwardly turned portion f^3, as shown in Fig. 1.

From the foregoing description of the various parts of the device the operation thereof may be readily understood. In Fig. 1 the gate C is shown lowered to the line a—a which is one-half of the distance from the top of the lateral pipe d' to the top of the auxiliary pipe F as clearly shown in the figures. The gate is now raised to the top of the pipe d'. The water flowing in from the stream or pond through the pipe d' fills both portions of the main pipe D, the bottom pipe E and the auxiliary pipe F, the highest point of the latter being just below the line a—a as heretofore explained. When all the pipes are full I close the gate down to about low water line, permitting only an opening for a sufficient amount of water to enter from the dam or pond to fill pipe d as it joins the water flowing from pipe F. The gate is always closed to low water level, approximately, when the pipes are performing their function. The outflow through the pipe E will cause the water to vacate space X which is indicated by the line c, a—a, and the outward and upward portion of pipe d'. This space X will be practically void of water when the pipes are in operation. As the water descends in the portion d of the main pipe D, the water in the upper arm of the curved pipe F will begin to descend. This will create a circulatory movement around through the auxiliary pipe F, part of the water, as has been described, being deflected into this pipe and part of it passing through the pipe E to the turbine. The gate C is in such a position as to admit only the amount of water which flows through the pipe E, but the movement of the water in the pipe F will be kept up, and will descend with and act in conjunction with the volume of water descending from the dam or pond, plying greater pressure on the discharging current in pipe E. If the pipes are flowing full, it will be observed that the water only enters pipe F at the bottom at the same rate that it leaves it at the top, where it joins the inflowing water from the dam to descend with it through pipe d. Therefore the water flows with the same velocity at all points in pipe F. Hence, in descending through pipe d and completing the circuit, it maintains the same equalized velocity at all points in pipe d that it maintains in pipe F. The whole volume of water in pipe d falls with an equalized velocity in its descent from the outlet of pipe F to the top of pipe E. So the circuit of water equalizes the velocity of water falling from the dam without decreasing its velocity. Thus the equivalent of acceleration is maintained in a water-fall supplied by any stream or dam and the volume, mass, or head of water in the fall is increased thereby increasing the force of the fall.

In Fig. 2 it will be seen that the greater half of the auxiliary circuit, which includes of course the portion d of the main pipe D, lies to one side of a line drawn from the bottom portion of the pipe F to the point f^2 which is its highest point. The additional weight of water on the side of descent facilitates a constant turning of the circuit of water, producing an effect similar to that of the heavy fill on one side of the drive-wheels of a railway engine.

While I have shown a specific arrangement of the pipes and connections, it will be understood that my invention contemplates any arrangement of pipes in which the auxiliary stream is deflected from the main stream and is brought into said main stream again at a higher point to add to the pressure of the descending water.

I claim—

1. In a hydraulic power pipe system, a main pipe, an auxiliary pipe communicating with the main pipe at its bottom, a deflecting plate arranged in the main pipe to deflect part of the water into said auxiliary pipe, said auxiliary pipe being curved upwardly and communicating with said main pipe, and means for admitting water into the main pipe and for regulating the admission thereof, substantially as described.

2. In a hydraulic power pipe system, a main pipe having a vertical circular portion and a rectangular portion extending laterally from the top of the first-named portion, an auxiliary pipe communicating with the main pipe at its bottom, a deflecting plate arranged in the main pipe to deflect part of the water into said auxiliary pipe, said auxiliary pipe being curved upwardly and then downwardly at an incline and communicating with the main pipe, and a gate for regulating the admission of water into the laterally extending portion of the main pipe.

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