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P. DAVIES

PRIMING DEVICE FOR SPILLWAY SIPHONS

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Fig. 1.

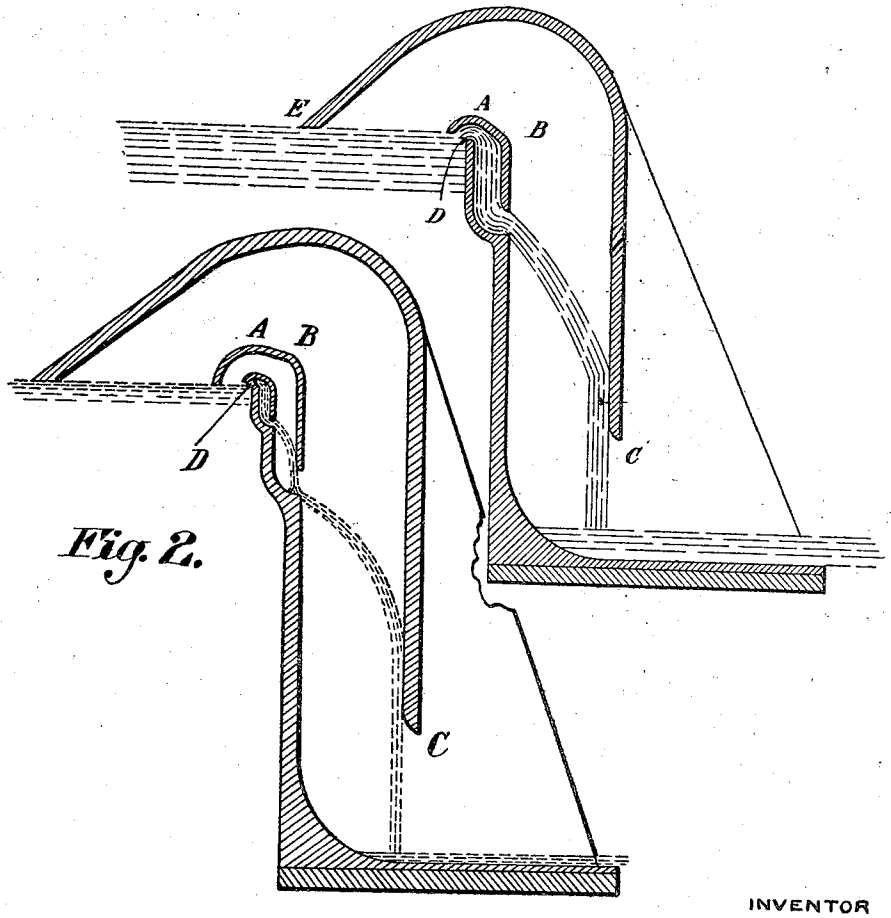


Fig. 2.

WITNESSES

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PRIMING DEVICE FOR SPILLWAY SIPHONS.

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To all whom it may concern:

Be it known that I, POWYS DAVIES, a subject of the King of England, residing at Raipur, Central Provinces, India, executive engineer and superintendent of works in the public works department of India, have invented certain new and useful Improved Priming Devices for Spillway Siphons, of which the following is a specification.

In the ordinary spillway siphon, priming is secured by a rise of water-level in the reservoir or canal which causes water to spill over the crest of the siphon; air is carried out of the siphon by the falling water and, owing to the resulting partial vacuum formed, the water rises in the siphon and the priming action is intensified until the siphon is running full within one or more minutes. The device according to this invention, enables a powerful jet of water to be projected into the main siphon by means of a relatively smaller siphon (or siphons) of similar general construction which is built or provided in the over-pour crest wall of the main siphon; this small siphon, hereinafter called the "baby" siphon to distinguish it from the main siphon, in brief, enables the main siphon to be primed with a smaller rise in water level in the reservoir or canal and thereby permits of closer regulation of water-level in the said reservoir or canal. Secondly it makes it possible to dispense with the downstream seal in the largest siphons and still secure priming with a moderate rise of water level in the said reservoir or canal and thus very materially to increase the discharging capacity of the siphons. Thirdly it makes it possible by constructing a very small siphon in the crest of the baby siphon itself to secure priming of the largest siphons both with an almost negligible rise of water level in the said reservoir or canal and with no downstream seal in the main siphon and thereby permits of both close regulation and greatly increased discharging capacity.

In order that my said invention may be clearly understood and readily carried into effect, the same will now be described more fully, by way of example, with reference to the accompanying drawings, in which:—

Figure 1 is a vertical section of a device embodying the invention, and

Figure 2 is a similar view to Figure 1 but showing a modification.

Referring first more particularly to Figure 1, the device shown enables a powerful jet of water to be projected into the main siphon by means of a relatively small or "baby" siphon constructed or provided in the over-pour crest wall, by which means a given rise in water-level in the reservoir or canal will have the same effect in priming the siphon as many times such rise in water-level when priming depends on flow over the crest alone. When the main siphon is provided with a downstream seal the baby siphon will be of very small dimensions and an almost negligible rise of water level in the reservoir will secure priming of the main siphon but when the main siphon has no downstream seal as in the construction shown in Figure 1 the baby siphon must be made of substantial size depending on the size of the main siphon which it has to prime. It will be observed that the crest of the siphon is sloped from A to B the object being to throw across the siphon this stream of water passing over the crest during the action of priming and thereby to ensure that such stream will not depress the jet from the baby siphon vertically downwards inside the siphon, which action would cause air to be admitted into the siphon from the bottom C and thereby prevent full priming.

The adoption of this device increases the discharging capacity of the main siphon very greatly, partly owing to the omission of the downstream seal and partly owing to the fact that the discharge through the baby siphon itself is added to that of the main stream.

In cases where the maximum discharging capacity combined with very close regulation of the water-level of the reservoir or canal is required the design will be as shown in Figure 1 with the exception that in this case the baby siphon itself will be provided, as shown in Figure 2 with a similar but still smaller siphon, as D, which is primed by a slight increase in the reservoir water-level and in turn primes the baby siphon which likewise in its turn primes the main siphon. For instance, when the water in the reservoir rises sufficiently to seal the upstream side of the siphons, water pours over the crest of the smallest siphon and causes it to prime. The smallest siphon discharges into the medium sized siphon and causes it to prime in turn. The latter then discharges into the main siphon and causes it to prime

in the same way. A very small rise of water level above the crest of the smallest siphon is sufficient to prime it so that by the operation of all these siphons working in turn, the largest siphon can be primed with a very small rise of water level in the reservoir.

The baby siphon will ordinarily be constructed of reinforced concrete and the very small siphon in the crest of the baby siphon will ordinarily be of suitable metal but I do not confine myself to this particular method of construction but may use any other suitable method.

What I claim is:—

1. A spillway siphon having a siphon or siphons, relatively smaller than the main siphon, provided in the over-pour crest wall substantially as and for the purpose hereinbefore described.

2. A siphon having a siphon relatively smaller than the main siphon, the smaller siphon being connected at its outlet end with the outlet leg of the main siphon and having its outlet leg and suction end arranged externally of the passage through the main siphon, the outlet end of the said smaller siphon extending the full width of the main siphon and being so adapted as to cause a stream of water or other liquid to be projected to effect the sealing of the outlet leg of the main siphon.

In testimony whereof I have hereunder signed my name.

P. DAVIES.