



Thomas G. ALLEN

Hydrautomat

In its time (1922-1925), this was considered to be one of the greatest inventions ever, but for reasons unknown got lost since then. Here it is again. Recently replicated & improved by Michael Sipos.

youtube.com

Michael Sipos' Replication
(Bluejersey112)/YouTube Videos

<http://groups.yahoo.com/neo/groups/LightTech/conversations/topics/8>

LightTech Yahoo Groups Conversation on the Hydrautomat

<https://www.youtube.com/watch?v=PzPTc9E0nM>

Overview of the Hydrautomat - This is a walking through all of the components of the Hydrautomat, as well as how it functions.

<https://www.youtube.com/watch?v=Uhm22ksfHhd8>

The Hydrautomat In Operation

http://www.youtube.com/watch?v=ggKXpf6quDo&list=PLJgtRSOIA7_W5h5-KqhXdZO28oXtRxppk&index=1

(1) Make Your Own Hydrautomat - Intro (4 MB FLV)

http://www.youtube.com/watch?v=sTdZfVd0c_A&list=PLJgtRSOIA7_W5h5-KqhXdZO28oXtRxppk&index=2

(2) Make Your Own Hydrautomat - History (10 MB FLV) -- This video provides some background information to what I used to do in constructing the Hydrautomat. And some of the changes that will be done with the new Hydrautomat

http://www.youtube.com/watch?v=15ayOfOo60g&list=PLJgtRSOIA7_W5h5-KqhXdZO28oXtRxppk&index=3

(3) Make Your Own Hydrautomat - Operation of Hydrautomat (74 MB FLV) -- In this part of the series: I describe how the Hydrautomat works in both Theory and Practice. ...

http://www.youtube.com/watch?v=c8SWML0t4Mk&list=PLJgtRSOIA7_W5h5-KqhXdZO28oXtRxppk&index=4

(4) Make Your Own Hydrautomat - Fittings (37 MB FLV) -- This video is a tale of two methods on how to screw a barb fitting into a plastic bulkhead fitting, WITHOUT damaging/destroying the threads of the plastic fitting.

http://www.youtube.com/watch?v=Xq5gFOGjeuY&list=PLJgtRSOIA7_W5h5-KqhXdZO28oXtRxppk&index=5

(5) Make Your Own Hydrautomat - Components In Brief (17 MB FLV) -- This is a brief description of what each component (tank) looks like and where the holes (for the fittings) are drilled on the components....

http://www.youtube.com/watch?v=yS9u-6pKxE&list=PLJgtRSOIA7_W5h5-KqhXdZO28oXtRxppk&index=6

(6) Make Your Own Hydrautomat - Operating Tank (11 MB FLV) -- The Operating Tank is the "workhorse" of the Hydrautomat. It's essentially a fluidic piston that pushes and pulls on the air in the Stage 1 and Stage 2 tanks.

http://www.youtube.com/watch?v=H-WdPrZggJY&list=PLJgtRSOIA7_W5h5-KqhXdZO28oXtRxppk

(7) Make Your Own Hydrautomat - Feed Tank (18 MB FLV) -- The Feed Tank is preferably a large wide container that is left open (not in a vacuum). Depending on what you're using the Hydrautomat for: An automatic water feeder or float valve can be installed to prevent the tank from overflowing....

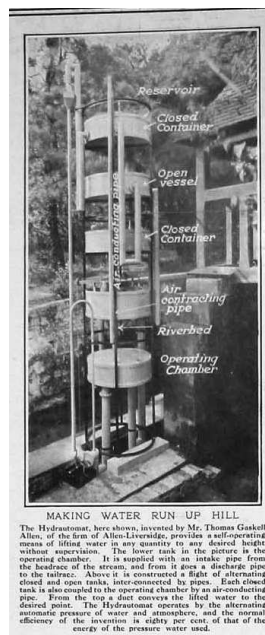
http://www.youtube.com/watch?v=gc1-IQ2cZw&list=PLJgtRSOIA7_W5h5-KqhXdZO28oXtRxppk&index=8

(8) Make Your Own Hydrautomat - Drain Tank (51 MB FLV) -- This is the most complicated component in the whole Hydrautomat setup: The Drain Tank....

http://www.youtube.com/watch?v=0s0bAwlo_DU&list=PLJgtRSOIA7_W5h5-KqhXdZO28oXtRxppk&index=9

(9) How To Make Your Own Hydrautomat - Assembly (15 MB FLV) -- Now for some final tips for putting together the Hydrautomat -...

http://www.old-print.com/mas_assets/full2/M2061922/M2061922254.jpg



MAKING WATER RUN UP HILL

The Hydrautomat, here shown, invented by Mr. Thomas Gaskell Allen, of the firm of Allen-Liversidge, provides a self-operating means of lifting water in any quantity to any desired height without supervision. The lower tank in the picture is the operating chamber. It is supplied with an intake pipe from the bedrock of the stream, and from it goes a discharge pipe to the surface. Above it is constructed a flight of alternating closed and open tanks, inter-connected by pipes. Each closed tank is also coupled to the operating chamber by an air-contraction pipe. From the top a duct conveys the lifted water to the desired point. The Hydrautomat operates by the alternating automatic pressure of water and atmosphere, and the normal efficiency of the invention is eighty per cent. of that of the energy of the pressure water used.

Popular Science (22 December 1922)

Marvelous "Water Staircase" Lifts Stream 20 Feet

Serious problems of irrigation and rural water supply may shortly be solved by an extraordinary apparatus recently perfected in England, which automatically raises 14 gallons of water from a stream to a height of 20 feet in a little less than 3 minutes, without the use of pumps or any source of power other than what nature furnishes. This device, seems at first glance something like perpetual motion applied to water, and called by its inventor, T.G. Allen, a "hydrautomat", or "water staircase", is hailed by engineers as marvelously ingenious. It is an extraordinary improvement on the hydraulic ram commonly used.

Two Energy Sources Used

In all the centuries in which men have attempted to make nature serve them through two sources of energy -- the weight of water and atmospheric pressure -- no such radical invention has been recorded.

Using these two forces, the experimental "water staircase" -- erected near London -- is said to operate with extraordinary efficiency. It consists of an alternating series of open and closed tanks, one above the other, the action of which is to use the energy of a quantity of water at a given level to raise a smaller quantity of water to a higher level.

The stream from which the power is derived, empties into an open intake tank located 7-1/2 feet above the lowest level of the device. Thus there is an available fall of 7-1/2 feet from the upper level of the stream, which may be termed the head race, to the lower level, or tail race. Half way between the upper and lower levels is an airtight operating chamber, supplied with an intake pipe from the head race, and a discharge pipe to the tail race. Above the upper water level is the alternating series of closed and open tanks. These tanks are interconnected by pipes. In addition, the closed tanks are coupled to the operating chamber by an air pipe.

Operation of the "water stairway" is confined to two strokes -- a pressure stroke followed by a suction stroke. The pressure is created by the water column flowing from the open supply basin just below the surface of the head race into the airtight operating chamber.

The effect of this water flow is to compress the air in the operating chamber and to force it upward through the air pipe into the two closed and water-filled tanks. Immediately the water in these tanks, lifted by the preceding stroke, is forced upward into the two open tanks above them.

Thus at the end of the pressure stroke, the operating chamber and the two open tanks are full of water, while the two closed tanks are full of air.

How the Water "Climbs"

In the suction stroke the contents of the operating chamber are discharged downward into the tail race, or discharge pipe, through a siphon, and at the same time the inlet from the head race into the operating chamber is automatically closed. This is accomplished by a valve actuated by the rush of water out of the discharge pipe. In the operating chamber is thus produced a vacuum that also extends to the two closed tanks, by virtue of the connecting pipe.

the result of this vacuum is that it sucks up the water "one flight" from the corresponding tank below. Thus at the end of the suction stroke, the open tanks are empty of water and the closed tanks are full. The valve in the head race inlet then opens automatically, pressured water is admitted into the operating chamber, a new stroke starts, and the cycle is repeated.

http://books.google.com/books/about/The_Allen_Hydrautomat_Water_Self_raiser.html?id=xabTigAACAAJ

The Allen 'Hydrautomat' Water Self-raiser

Author Oliver Lodge (Sir)
Publisher Morland Press, 1922
Length 31 pages

"I can only express my admiration of the simplicity and beauty of the invention, and my wonder that humanity has had to wait so long for the construction of an arrangement which must prove of the greatest service." -- Sir Oliver Lodge

<http://www.nature.com/nature/journal/v111/n2783/abs/111306b0.html>
Nature 111, 306-306 (03 March 1923) | doi:10.1038/111306b0

The Hydrautomat

THE problem of raising a small quantity of water to a considerable height by utilising the energy of a larger mass of water has been solved in a number of ways. In the seventeenth century, the City of London was supplied with water pumped from the Thames by means of a reciprocating pump, driven by a crank which was made to rotate by a water-wheel turned by the flow of the river. The "hydraulic ram" is a device that has been successfully used, and recently there has been developed a device, the hydrautomat, which utilises the pressure of the atmosphere to lift water...

[trove.nla.gov.au/ndp/del/article/16081112?](http://trove.nla.gov.au/ndp/del/article/16081112)
The Sydney Morning Herald (NSW)
17 July 1923

WATER-RAISING : THE HYDRAUTOMAT -- AN IMPORTANT INVENTION

There is installed in an office in Washington, U.S.A., a working model of what is described as one of the world's greatest engineering devices. It is called the hydrautomat and is literally a water-self-worker, which makes it possible for flowing water to raise itself from one level to another. Many engineers assert that the invention "will solve the great problems of providing a continuous water supply for arid areas, and Sir Oliver Lodge says of the hydrautomat: "I can only express my admiration of the simplicity and beauty of the invention, and my wonder that humanity has had to wait so long for the construction of an arrangement which must prove of the greatest service."

The inventor is Mr. Thomas Gaskell Allen, a well-known London hydraulic engineer. The invention attracted the attention of the United States Government Department of Weights and Measures, and it was at the request of that department that Mr. Allon set up the working model in Washington. The model is only three feet in diameter and eight feet in height, but it is capable, on actual working experiment, of raising more than 70,000 gallons of water daily. Mr. Francis Arnold Collins describes the working of the model in the "St. Nicholas" magazine (an American publication) for June. He states that by means of the hydrautomat water is raised automatically to any desired level, silently and efficiently. A stream whose head or flow is so sluggish that it cannot be used in any other way can thus be utilised. The contrivance is self-contained, and, once set up beside a stream or within reach of running water, will operate without attention. It is really an engine in which the force of the running water and the pressure of the air work alternately to develop power without the assistance of human hands.

The stream from which the power is derived empties into an open intake tank located 7.5 feet above the lowest level of the device. Thus there is an available fall of 7.5 feet from the upper level of the stream, which may be termed the head race, to the lower level, or tail race. Half-way between the upper and lower levels is an air-tight operating chamber, supplied with an intake pipe from the head race, and a discharge pipe to the tail race. Above the upper water level is the alternating series of closed and open tanks. These tanks are interconnected by pipes. In addition, the closed tanks are coupled to the operating chamber by an air pipe.

Operation of the "water stairway" is confined to two strokes -- a pressure stroke followed by a suction stroke. The pressure is created by the water column flowing from the open supply basin just below the level of the head race into the air-tight operating chamber.

The effect of this water flow is to compress the air in the operating chamber and to force it upward through the air pipe into the two closed and water filled tanks. Immediately the water in these tanks, lifted there by the preceding stroke, is forced upward into the two open tanks above them.

Thus, at the end of the pressure stroke, the operating chamber and the two open tanks are full of water, while the two closed tanks are full of air. In the suction stroke the contents of the operating chamber, are discharged downward into the tail race, or discharge pipe, through a siphon, and at the same time the inlet from the head race into the operating chamber is automatically closed. This is accomplished by a valve actuated by the rush of water out of the discharge pipe. In the operating chamber is thus produced a vacuum that also extends to the two closed tanks, by virtue of the connecting pipe.

The result of this vacuum is that it sucks up the water "one flight" from the corresponding open tank below. Thus, at the end of the suction stroke, the open tanks are empty of water and the closed tanks are full. The valve in the head race inlet then opens automatically, pressure water is admitted into the operating chamber, a new pressure stroke starts, and the cycle is repeated.

During his recent visit to America Mr. Allen explained to Mr. Collins the great service the hydrautomat promises to perform the world over. "The hydrautomat," he said, "simply harnesses a great force of nature which we have allowed in the past to go to waste. Men have been watching the movements of water on the earth for untold centuries, and accepting this great waste as a matter of course. The water is raised by the power of the sun and deposited in the form of snow or rain over the earth, and gradually flows back to the sea. The power which thus goes to waste is enormous.

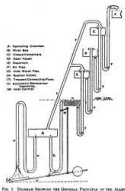
"The ancients studied this problem and speculated upon it a great deal. Archimedes hit upon a highly ingenious device for raising water above its own level, and his method is still employed, but he did not solve the problem. It is obvious, of course, that this enormous store of energy has lain idle all these centuries. Take a familiar example it is estimated that in so small a stream as the River Thames some 700,000 gallons of water pass a given point every day, even in the dry season, all going to waste. A series of hydrautomats tapping this source could pump water to any part of London. Every city which lies beside a flowing river neglects a similar opportunity.

"Throughout the world today there are millions of acres of land which only need water to become highly productive. Millions of people could find beautiful and prosperous homes on what is now waste land if only the water supply can be solved. In most instances these arid regions, even the great deserts, could be transformed if water in the general vicinity could be raised only a few feet.

"The hydrautomat must not be confused with the turbine. It merely raises water to a higher level, while the turbine catches -falling water, so to speak, and transforms its energy into electricity. The hydrautomat, however, can first raise water which, when released, will pass through turbines and develop power and electricity, which can be carried for long distances. Many engineers are confident that the hydrautomat can be used to utilise the power of the tides, thus tapping practically a limitless source of energy.

http://books.google.com/books?id=qG1fAQAAIAAJ&pg=PA601&dq=Allen+hydrautomat&source=bl&ots=ERnctUG6kpp&sig=r5lMSH0CdaarAkHNL_niKgFhXuQ&hl=en&sa=X&ei=gM3dUbyYMqPKigK674CYBA&ved=0CE8Q6AEwBQ#v=onepage&q=Allen%20hydrautomat&f=false
Mechanical engineering. Vol 44, p. 601 (1922)

Diagram Showing the General Principle of the Allen Hydrautomat



<http://books.google.com/books?id=cdoHQAAMAAJ&pg=PA166&lpg=PA166&dq=Allen+hydrautomat&source=bl&ots=H0d9k8EyF5&sig=GF7QG2KVXulz5eItrh3EJxoll&hl=en&sa=X&ei=gM3dUbyYMqPKigK674CYBA&ved=0CFEQ6AEwBg#v=onepage&q=Allen%20hydrautomat&f=false>

Popular Science Monthly - Volume 101



Inventor of "Water Staircase"
T* THOMAS GASKELL ALLEN, who,

though he makes no claim to technical knowledge of the science of hydraulics and "merely states the water seems to rise," has built in England what Sir Oliver Lodge declares to be one of the greatest inventions of all time—the hydratomat—which, by joint application of the weight of a column of water and atmospheric pressure, induces the water of streams to "lift itself by its bootstraps" to about any desired altitude, the result is an invention that Mr. Allen has been invited by the United States Bureau of Weights and Measures to demonstrate it in Washington, D. C. Engineers declare that the hydratomat, described on page 13 of this issue, will tap new and almost unlimited sources of power from English rivers at a trifling expense.

Although a British subject, Mr. Allen is American born. In 1870 he won international fame when he completed a three-year round-the-world bicycle trip—the longest on record—returning to London and entering the firm of engineers he now heads. Among his achievements, besides the hydratomat, are noted the development of the acetylene lamp as a coal, and a widely used method of applying brakes to the front wheels of motor cars.

<http://chroniclingamerica.loc.gov/lcn/sn82014689/1922-07-21/ed-1/seq-8/>
The Maui news., July 21, 1922, Page EIGHT



<http://paperspast.natlib.govt.nz/cgi-bin/paperspast?a=d&d=HNS19220905.2.56>
Hawera & Normanby Star, Volume XLII, 5 September 1922, Page 6

Writing in the Manchester Guardian last month, Sir Oliver Lodge, the well-known British scientist, referred to the utilisation of simple, natural forces such as those of wind and water as being of great antiquity, and stated that the invention of any new device in this direction may be regarded as extremely unlikely. "Nevertheless," he says, "what seems to be a new method of automatically raising water by its own gravity in combination with atmospheric pressure, wherever a small head of water is available, has been recently invented by an Anglo-American British citizen, Mr Thomas Gaskell Allen, whose name is already associated with a modified oxy-acetylene process. His water-raising apparatus (known as the hydratomat) works on a principle entirely different from that of the hydraulic ram; it is a quiet and static affair, involving no machinery, no impetus or shock, and only one necessary mechanical valve. The method has been described in several of the technical papers, and a model plant now working at Carshalton has been depicted. But it is so simple and interesting a contrivance as to deserve a more general notice, since the raising of water for irrigation and other purposes is of vital importance in many countries; and it is surprising that so convenient and practical a plan for making it quietly raise itself has not been devised before the twentieth century A.D.

"The hydrostatic arrangement attributed to Hero of Alexandria, and sometimes used for scent fountains, may be said to contain the germ of the idea; and on working out the theory of the new instrument I find that it enables water to be raised to very considerable heights without any solid moving parts except one sluice, or possibly two, without involving a great pressure in any part of the instrument, and with quite considerable efficiency.

"I know nothing about the commercial prospects of the invention, but I can imagine several useful applications for it, and think that a hydraulic system which can secure a result of this kind is bound to be of service to mankind."

books.google.com/books?id=cdoHQAAMAAJ
The Popular Science Monthly - Volume 101 - Page 192

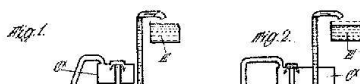
..So epochal is his invention that Mr. Allen has been invited by the United States ... to demonstrate it in Washington, D. C. Engineers declare that the hydratomat...

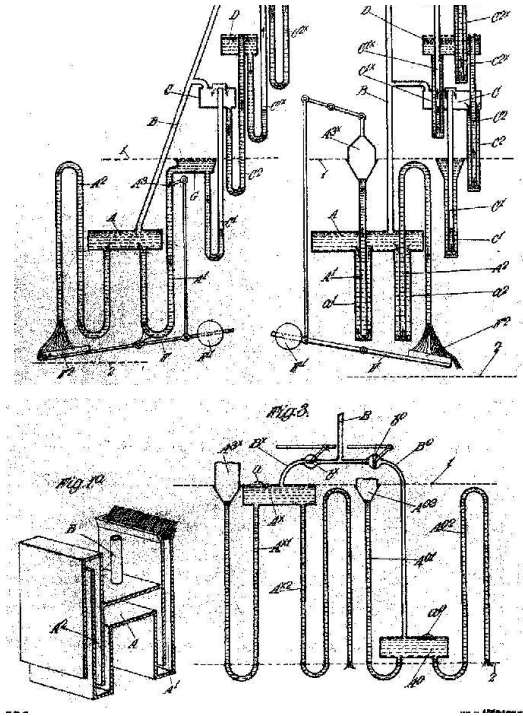
books.google.com/books?id=U1M2AQAMAAJ
Engineering Production - Volume 5 - Page 20

Inventor of "Water Staircase" THOMAS GASKELL ALLEN, who, though he ... of the greatest inventions of all time — the hydratomat — which, by joint application of ...

US Patent 1597664 SYSTEM OF RAISING LIQUID

[PDF]





<http://www.energeticforum.com/234441-post58.html>

Hi gsmsslb.

I am a long way from completing my study of this pump, it seems patience is not a possibility here on the forums, so here is version 1. This is without optimization or pressure values, to be honest it still needs to be completed as this will only give you a basic geometry of its operation. regards Arto

Hydraulomat

The Book of Knowledge
Volume Nine Page 860
Italian Edition 1926

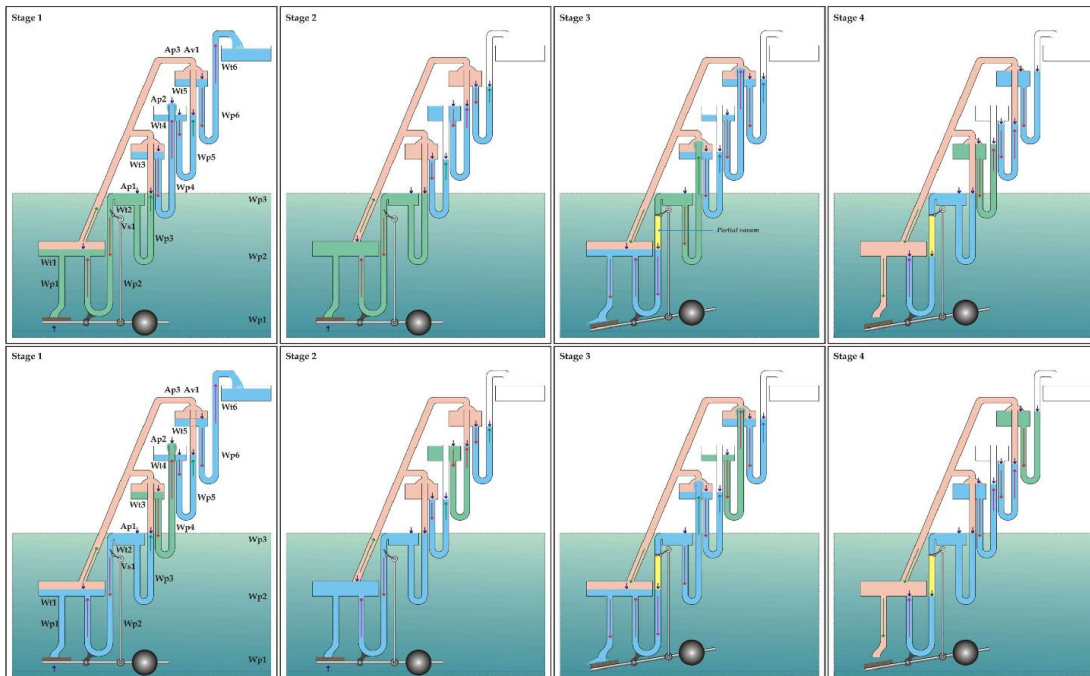
Cursive study by Arto Heino

1. These pictures show how a river is made to raise itself by the apparatus called a hydraulomat. It consists of an operating chamber at the bottom, and a series of tanks alternately opened and closed and connected with pipes. An air-pipe also links them all. Water is here shown running into the operating chamber from the river at the higher level, compressing the air and forcing it through the air-pipe to the closed overhead tanks.

2. The closed overhead tanks are full of water at the beginning of the operation, but the pressure of the air from the operating chamber forces the water out the closed tanks, and in each case it passes through a bent outlet pipe into the tank immediately above. At the close of the operation, therefore, as shown here, the operating chamber and the open tanks are full of water and the closed tanks are full of air.

3. The operating chamber now discharges its water into the river at the lower level, and in doing so automatically closes, by a simple lever mechanism, the outlet into the chamber from river. When the water has all run out at the lower level, practically a vacuum is left, which extends by the air-pipe to the various closed tanks above.

4. The vacuum in the closed tanks causes the water to be sucked up one flight from the open tanks below, and at the end of the movement the operating chamber and the open tanks are empty of water, while the closed tanks are full. The inlet from the river level of the river then automatically opens, and the operation is repeated.



Geometric Values					Volume
Water Tank	W1	W2	W3	W4	W5
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	22	20			

W1	111	182	205	285	3
W1	108.333333	106.555556	106.555556	106.555556	3
W2	182	182	182	182	3
W2	1231.48878	1214.442755	1251.448782	1251.448782	3
W3	182	182	182	182	3
W3	1275.51482	1251.555556	1251.555556	1251.555556	3
W4	182	182	182	182	3
W4	1251.48878	1214.442755	1251.448782	1251.448782	3
W5	182	182	182	182	3
W5	1251.48878	1214.442755	1251.448782	1251.448782	3
W6	182	182	182	182	3
W6	1251.48878	1214.442755	1251.448782	1251.448782	3
Cv1	108.333333	106.555556	106.555556	106.555556	3

