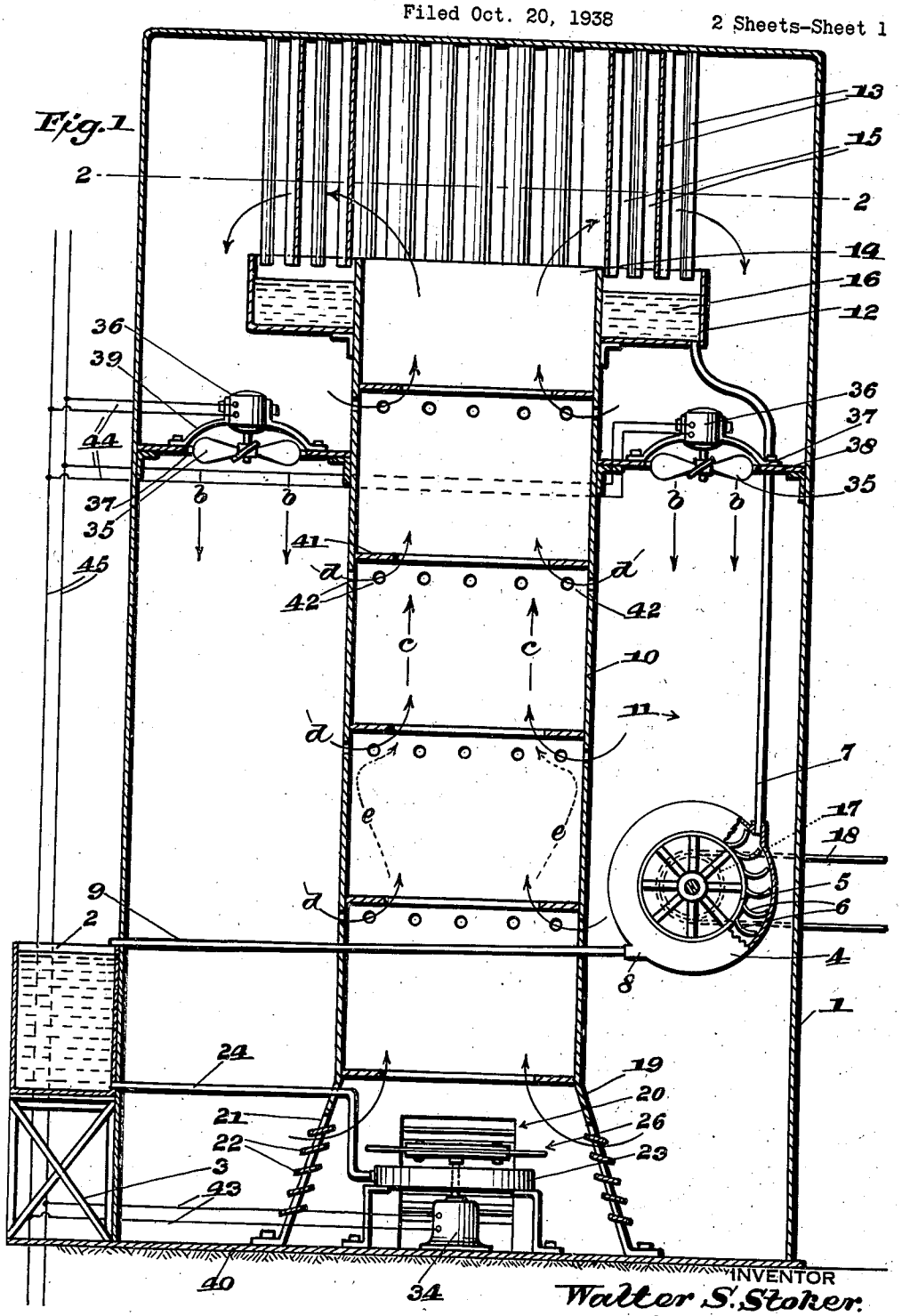
Dec. 9, 1941. W. S. STOKER 2,265,878

POWER APPARATUS

Filed Oct. 20, 1938 2 Sheets-Sheet 1

Fig. 1



INVENTOR

Walter S. Stoker.

BY

Munn, Anderson & Liddy

ATTORNEY

Dec. 9, 1941. W. S. STOKER 2,265,878

POWER APPARATUS

Filed Oct. 20, 1938 2 Sheets-Sheet 2

Fig. 2.

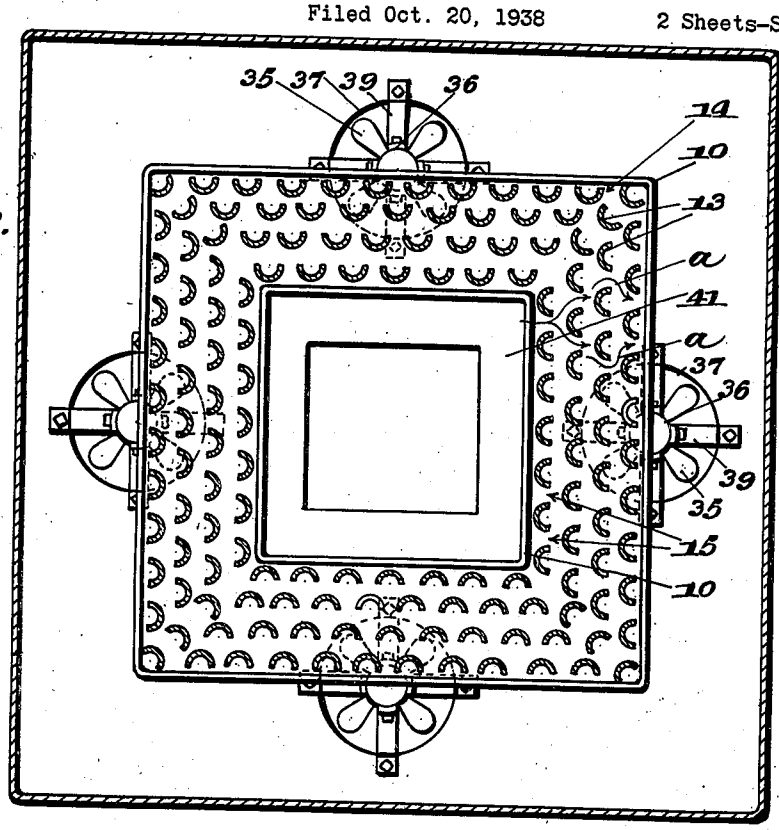
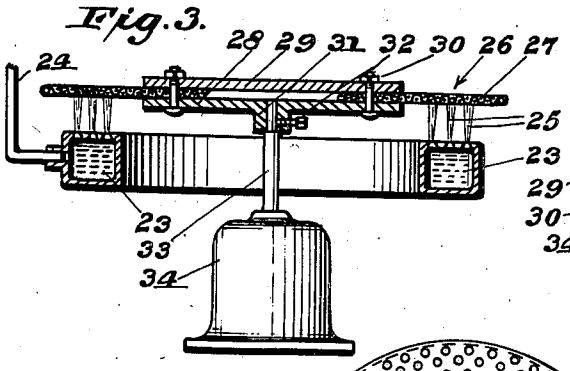


Fig. 3.



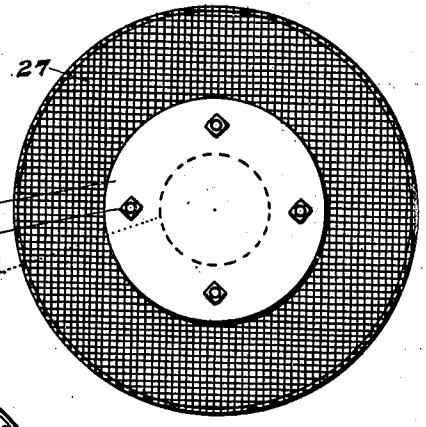
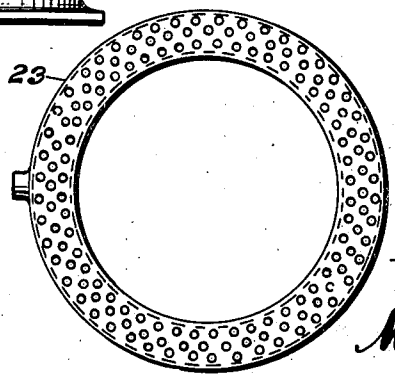


Fig. 4.

Fig. 5.



INVENTOR
Walter S. Stoker
BY
Munn, Anderson & Liddy
ATTORNEY

Patented Dec. 9, 1941

2,265,878

UNITED STATES PATENT OFFICE

2,265,878

POWER APPARATUS

Walter S. Stoker, Sequim, Wash.

Application October 20, 1938, Serial No. 236,129

3 Claims. (Cl. 103—232)

This invention relates to improvements in power apparatuses. One of the foremost purposes of the apparatus is the production of power by what is regarded as the novel use of water initially stored in a supply tank in a solid volume. The water from this source is so treated as to take on a finely divided form and thus facilitate its elevation to a prescribed altitude whence it gravitates to accomplish the production of power in the previously mentioned novel way. Thus the objects of the invention are as follow:

First, to provide an apparatus of the character described by which power is produced by the simple expedients of manufacturing a water vapor, separating the water constituent of said vapor at a considerable altitude and then using the water head thus produced for the operation of an engine.

Second, to provide in a power apparatus of the character described, an extremely effective atomizer for producing the necessary water vapor, the reduction of the latter into the finest possible particles being depended upon for the lifting thereof to the elevated separating chamber.

Other objects and advantages will appear in the following specification, reference being had to the accompanying drawings, in which:

Figure 1 is a central vertical section of the power apparatus.

Figure 2 is a cross section taken on the line 2—2 of Fig. 1, particularly illustrating the separating apparatus.

Figure 3 is a partially sectional and elevational view of the vaporizing apparatus.

Figure 4 is a plan view of the revoluble atomizer,

Figure 5 is a plan view of the water jet head.

In carrying out the invention provision is made of a housing 1 which encloses the entire apparatus excepting the water tank 2. The latter is supported upon a suitable framework 3 outside of the housing and is initially supplied with water from any convenient source. The housing 1 is shown as enclosing a turbine 4, but it is desired to state that in practice this turbine is preferably also located outside of the housing so as not to obstruct the downwardly directed air current.

While on the subject of the turbine 4, it will be seen that this device comprises an encased wheel 5, the ducts 6 of which are adapted to be impinged by a water jet, from an upright conduit 7. The lower end of this conduit is coupled to the turbine casing, the latter having a discharge outlet 8 which can be piped at 9 to any suitable receiver, for example, the water tank 2. By thus transporting the spent water it becomes possible to conserve the supply. The initial volume in the tank 2 needs to be replenished only at intervals to compensate for evaporation losses.

Situated inside of the housing 1 is a standpipe 10. This standpipe is in spaced relationship at 11 to the housing 1. The space 11 constitutes an air passage which surrounds all sides of the standpipe.

The latter is preferably square in cross section (Fig. 2) as is also the housing 1 and the chamber 12 of the condensing apparatus at the top of the standpipe. This apparatus comprises the chamber 12 already mentioned, which virtually consists of a trough or any other suitable kind of receiver, into which the water may drip as the water collects on the baffles 13.

These baffles stand upright (Fig. 1) and they completely surround outlet 14 of the standpipe 10 (Fig. 2). Each of the baffles is semi-circular in cross section. The convexities of the baffles are made to face the outlet 14. The baffles of the succeeding series are staggered in respect to each other so that the openings 15 between the baffles in one series confront the convexities of the baffles in the next series.

The result of this arrangement is the production of tortuous passages depicted by the arrows 2 (Fig. 2) for the water vapor. The latter is thus so interrupted in its passage toward the housing 1 that all of the water entrained in the vapor is forced to be collected on the baffles. Practically no moisture is intended to be reconveyed to the space 11, consequently the latter conducts only air which is virtually dry.

A volume of water 16 collects in the chamber 12 as the result of the operation of the separating apparatus. This volume of water represents the condensate, and inasmuch as the latter is collected in a confined space, it becomes useable as an available source of power. To this end the previously mentioned conduit 7 is connected to the bottom of the chamber 12. The head of water comprises a column of considerable height, and when the jet at the lower terminal of this column impinges the ducts 6 of the turbine the wheel 5 of the latter will be driven with great force. The power thus derived can be transmitted by the pulley and belt arrangement 17, 18.

Reverting to the standpipe 10, it is noted in Fig. 1 that the standpipe has a flared base 19. This not only affords stability but also provides a housing for the vaporizing apparatus generally

designated 20. The base 19 is provided with a number of large openings 21. These openings are preferably fitted with louvers 22 which are set at an upright pitch toward the axis of the standpipe 10. In practice these louvers can be made adjustable so as to vary the pitch, but in many installations it will be entirely sufficient to set the pitch of the louvers so that the downward air current will be properly directed upwardly in the standpipe 10 without being required to make too sharp a bend in the central region of the base 19.

The vaporizing apparatus consists of a head 23 (Fig. 3) which is in the form of a hollow ring (Fig. 5). Water is delivered to the interior of this head by a pipe 24 which is coupled to the bottom of the tank 2. The water thus gravitating to the head 23 issues in a plurality of jets 25 (Fig. 3). The jets are intercepted by an atomizer 26 which comprises a revoluble screen 27.

Said screen may either comprise a circular disk or a ring of woven wire (Fig. 4). The inner rim of the latter is clamped between a pair of plates 28, 29, by means of bolts 30. The plate 28 has a hub 31 which is secured at 32 to the upright shaft 33 of an electric motor 34. The screen 27 is thus made to revolve in a horizontal plane a short distance above the head 23 and at right angles to the jets 25. The woven wire-mesh provides an excellent interceptor, and inasmuch as the atomizer 26 is revolved at a high rate of speed, it follows that the result of cutting the water jets at a rapid rate is the production of a finely divided water mist or vapor.

This vapor is intended to be driven upward in the standpipe 10. The vapor obviously has some weight, but being in the nature of a cloud or fog, it becomes easy to drive it to the top of the standpipe and into the separating apparatus. This is accomplished by one or more propellers 35. Four of these are shown (Fig. 2) the idea being to equalize the down draft in the space 11.

Said propellers are carried by the shafts of electric motors 36. The propellers are revoluble in large openings 37 in a platform 38, upon which the motors are mounted by means of spiders 39. The platform 38 provides a partition across the space 11, inasmuch as it extends from the standpipe 10 to the housing 1. The space is thus closed off with the exception of the passages which the openings 37 afford. The air drawn from the space above the platform is thus discharged into the space below the platform in solid columns, but these columns soon loose their identity because of the dissemination of the air in the space 11.

At this point it must be explained that the standpipe 10 is intended to be of considerable height. In practice it will be approximately 250 feet high. This dimension, however, is not to be regarded as a restriction, because the principles of the apparatus will work out with a standpipe of less height, and also with a standpipe of greater height. The chamber 12 is thus stationed at an approximately 250 feet altitude. It is readily seen that when the turbine 4 is mounted either upon the surface of the ground or upon the bed plate 40 by which all of the apparatus is carried, the resulting head will be ample to produce considerable power at the pulley 17 and belt 18.

It is highly important to mount the propellers 35 in the manner disclosed. This mode of mounting serves to drive the air downward in the space 11 (arrows *b*). The result is a suction in the standpipe 10. The natural effect of a whirling propeller is to give the discharged air a spiral impulse. This spiralling of the air is not objectionable in the space 11, but it would be objectionable if a spiral current of air were introduced into the bottom of the standpipe 10.

It is desirable and necessary to confine the updraft in the standpipe 10 to rectilinear lines (arrows *c*, Fig. 1). The vapor which is transported by this updraft thus tends to keep away from the sides of the standpipe 10 with the result that there is little or no collection on the walls. In order to insure this effect the standpipe 10 is fitted with baffles 41 at suitable intervals. Each of these baffles merely comprises a narrow flange (Fig. 2) following the cross sectional contour of the standpipe. There is a series of holes 42 immediately under each baffle 41. Air will be drawn into the standpipe 10 through these holes from the space 11 (arrows *b*) and the shunt currents thus produced will divert the updraft *c* from the walls of the standpipe 10 should said updraft tend to flare (arrows *e*, Fig. 1).

It will be readily understood that inasmuch as the standpipe 10 is of considerable height, the baffles 41 will be spaced fairly far apart, but the spacing will be so regulated that the shunt air currents at the arrows *d* will be introduced at the approximate places where the updraft *c* would be expected to naturally flare from the intended rectilinear vertical course. In other words, if the standpipe 10 were not fitted with the diverting means which the baffles 41 and openings 42 represent, the upwardly flowing column of vapor would eventually flare into full contact with the walls of the standpipe. The repeatedly reentrant shunt air currents tend to keep the vapor column away from the walls of the standpipe and thus minimize the premature separation thereof.

The apparatus also demonstrates several important physical principles. The volume of water in the tank 2 naturally gravitates toward the ground when released. The force of gravity is utilized in conducting the water to the water jet head 23. The jets 25 will seek the level of the volume of water in the tank 2; they will not reach that level as solid jets because of being intercepted by the revoluble screen 27.

When the erstwhile solid water is divided finely enough it is easily lifted as a mist or vapor. When a moving volume of air is directed against the vapor the latter will be made to move with the air. Finally, the impingement of a separator element by the moving vapor mass will cause the separation of the moisture so that the water reappears in its original liquid form.

These principles are taken advantage of in producing an effective power apparatus. The electric motors 34, 36, are only of a fractionally combined H. P. They are connected by wires 43, 44, to any ordinary low voltage line 45. The only requirement of the motor 44 is to drive the atomizer 26 at a high rate of speed. The motors 36 are required to drive the propellers 35 at a low rate of speed. It is merely necessary to set the air in the space 11 in motion and to maintain a circulation in the housing 1 and through the standpipe 10.

It is intended to completely encase most of the apparatus, as already stated. It is not necessary to continuously supply the housing 1 with fresh air because the volume of air originally entrained thereby is entirely sufficient for operating purposes. It is generally necessary to replenish the water in the tank 2 from time to

time because vaporization losses must be compensated for.

I claim:

1. An apparatus of the character described comprising a standpipe, means at the bottom of the standpipe for issuing water jets, revoluble atomizing means cutting said jets to produce water vapor, means for drawing said vapor to the top of the standpipe, means for separating the aid and water comprising the vapor and confining the separated water, and a conduit for conducting a volumn of water from the last means.

2. In a power apparatus, a standpipe having an altitude approximating two hundred feet, water vapor separating apparatus at the top of the standpipe, means for introducing the vapor into the bottom of the standpipe, means for drawing an air current up the inside of the standpipe and through the separating apparatus thereby to propel the vapor upward, and means embodied in the standpipe tending to keep the vapor moving upward in a substantially rectilinear current.

3. In a power apparatus, a standpipe, water vapor separating apparatus at the top of the standpipe, means for introducing the vapor into the bottom of the standpipe, means for drawing an air current up the inside of the standpipe and through the separating apparatus thereby to propel the vapor upward, and baffles fitted in the standpipe, the latter having holes below the baffles to admit air streams for impingement upon the vapor current to keep it moving upward in a substantially rectilinear current.

WALTER S. STOKER.