WHAT IS CLAIMED IS:

1. A composite water-controlling screen pipe, comprising:

a base pipe;

a self-adaptive internal flow control device mounted on the base pipe and used for a circulation channel for fluids inside and outside the base pipe and controlling an opening degree of the circulation channel according to the change in viscosity of different fluids so as to automatically limit flow;

a flow control device mounted on the base pipe and adjacent to the self-adaptive internal flow control device for controlling an overflow of the base pipe; and

a screen pipe coaxially and threadedly connected to the base pipe, wherein an inner diameter of the screen pipe is the same as that of the base pipe.

2. The composite water-controlling screen pipe according to claim 1, wherein the self-adaptive internal flow control device is in a float-type, and controls an opening degree of a buoy according to the change in viscosity of different fluids so as to automatically limit flow.

3. The composite water-controlling screen pipe according to claim 2, wherein the self-adaptive internal flow control device is made of tungsten carbide hard alloy.

4. The composite water-controlling screen pipe according to claim 1, 2 or 3, wherein the flow control device comprises:

a support diversion disc opened with an overflow groove and a diversion pipe; and

a rotatable balance disc connected to the support diversion disc and provided with a throttle hole to cooperate with the overflow groove and the diversion pipe, the balance disc being rotated as needed to regulate the number of plugged holes of the throttle hole to control the overflow of the base pipe, and being locked with a lock nut.

5. The composite water-controlling screen pipe according to claim 4, wherein the throttle hole is mounted with a tungsten alloy nozzle.

6. The composite water-controlling screen pipe according to claim 1, 2, 3 or 5, wherein the screen pipe comprises:

a body; and

a filter sleeve comprising an outer protective jacket, a filter jacket and an inner protective jacket fitted sequentially, the filter jacket comprising a plurality of filter screens stacked successively, wherein hole sizes of the filter screens are set depending on requirement for oil reservoir.

7. The composite water-controlling screen pipe according to claim 6, wherein the inner protective jacket, the outer protective jacket and the filter screen are all made of acid-proof and antisepticise materials.

8. The composite water-controlling screen pipe according to claim 7, wherein both ends of the filter sleeve are respectively welded to the flow control device and a positioning step of the body, and fluid flowing through the filter screen flows into the base pipe via the self-adaptive internal flow control device after passing through the flow control device.

9. The composite water-controlling screen pipe according to claim 6, wherein the filter sleeve is fixed onto the body via a support disc.

10. A composite water-controlling and flow-limiting device, comprising a composite water-controlling screen pipe according to any one of claims 1-9.