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IMAGE CONVERTER TUBES

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Fig. 1

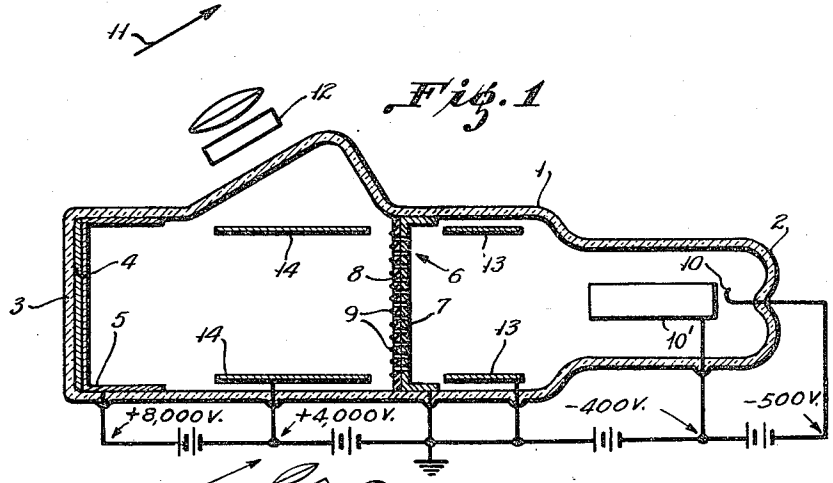
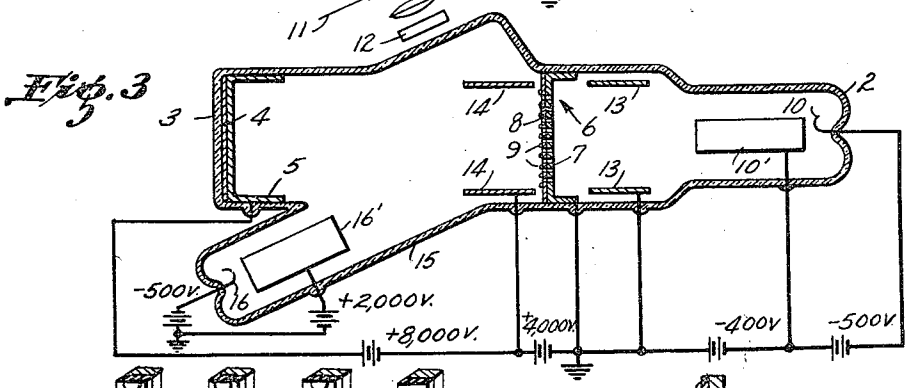


Fig. 3



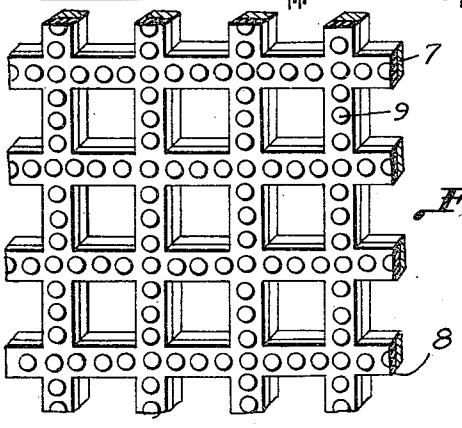


Fig. 2

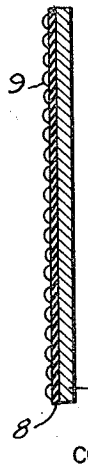


Fig. 2a

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IMAGE CONVERTER TUBES

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4 Claims. (Cl. 313—66)

This invention relates to new and useful improvements in devices for storing intelligence.

The object of the present invention is to provide means for controlling the appearance of stored intelligence on a fluorescent screen.

Figs. 1 and 3 illustrate alternative embodiments of the invention; and

Figs. 2 and 2*a* show the storage electrode of the embodiments in detail.

The storage device of Fig. 1 is enclosed within an evacuated envelope having a generally cylindrical body 1 and a hollow branch 2 projecting from one end. The opposite end of the body is closed by an end wall 3 on the inside of which a screen 4 of fluorescent material is formed. A film 5 of aluminum to which positive potential of 8000 volts may be applied covers the screen 4 and contacts the adjacent side wall of cylinder 1. The film acts as a light reflector and as a barrier to slow moving electrons and ions.

The cylindrical body is divided into two compartments by a storage electrode 6 which is parallel with the end wall 3. Figs. 2 and 2*a* illustrate the storage electrode 6 which is composed of three parts; a metal mesh 7, a layer 8 of insulating material on the mesh, and a mosaic 9 of isolated globules of photoelectric material. The mesh 7 is at ground potential and has many small holes, of the order of 160,000 per square inch, and about half in surface area is open.

An electron gun is mounted within branch 2 and comprises a cathode 10 to which negative potential of 500 volts is applied and a focusing and accelerating electrode 10' carrying negative potential of 400 volts. The gun produces a beam of electrons arranged to flood the entire surface of mesh 7.

The mosaic surface 9 may be charged by suitable radiation modulated in accordance with the intelligence to be stored. As shown, the source of radiation is an object 11 radiating, for example, infrared rays through a filter 12 and a slanting window in envelope 1 on the mosaic surface 9. Depending on the density of the infra-red rays, the individual globules of 9 will become more or less charged. These globules will emit photoelectrons, and the loss of negative photoelectrons will leave positive charges on the globules which will be retained due to the insulating layer 8. Depending on the magnitude of this positive charge, more or less electrons emitted by the gun are permitted to pass through holes of mesh 7 and thence through 8 and film 5 to impinge on fluorescent screen 4 and produce an image thereon of the signals impressed on the storage electrode from source 11. Electrode 13 at ground potential focuses and accelerates the beam from the electron gun.

The storage electrode 6 will hold the charge until the globules on 9 are discharged by a cloud of electrons from the electron gun forming on the mosaic side by lowering the potential of electrode 14 below 4000 volts indicated in the drawing and thereby preventing the passage of the electrons towards the fluorescent screen. Electrons

from a separate gun facing the mosaic as shown in the embodiment of Fig. 3 can also be used to neutralize the positive charges. The stored intelligence signals are amplified by the amount that the number of electrons passing through the holes in mesh 7 exceeds the number of photoelectrons emitted by the globules of mosaic 9 per unit time.

The output of the storage electrode 6 may be accelerated and focused by any suitable means provided between it and fluorescent screen 4. For example, electrodes 14 and 5 will perform these functions. Electromagnetic focusing can readily be added by slipping an appropriate coil over the cylindrical tube and supplying current to said coil.

Instead of flooding mesh 7 with electrons traveling at just the right low velocity to go through only those holes surrounded by positively charged globules, secondary electrons emitted by mesh 7 on bombardment by faster electrons may also be used. A transversal magnetic field would then be arranged to separate the low velocity secondary electrons from the high velocity primary electrons to avoid steady excitation of the fluorescent screen and consequent loss of contrast, by the fast electrons.

What is claimed is:

1. An electronic storage device comprising an evacuated envelope having a cylindrical body, a fluorescent screen near one end and a source of electrons near the other end of the cylinder, and a storage electrode in the cylinder, said storage electrode having a conducting mesh facing said source and a mosaic of insulated photoelectric particles facing the screen.

2. The storage device according to claim 1, and in which the storage electrode and screen are parallel to one another.

3. An electronic storage device comprising an evacuated envelope having a cylindrical body, a fluorescent screen at one end of the body, a storage electrode parallel with the screen and positioned approximately midway in the cylinder, said storage electrode having a metal mesh facing the other end of the body, a layer of insulating material on the surface of the metal mesh facing the screen, a mosaic of insulated photoelectric particles on the layer of insulating material, an electron source near the other end of the body for flooding the metal mesh with a beam of electrons, and a window in the side wall of the body exposing the mosaic to radiation from an outside source.

4. An electronic storage device comprising an evacuated envelope having a cylindrical body with a closed end and a hollow branch opening into the other end, a fluorescent screen on the inside of the closed end, an aluminum film covering the fluorescent screen and contacting with the adjacent side walls of the cylinder, a storage electrode parallel with the screen and positioned midway in the cylinder, said storage electrode comprising a perforated metal mesh facing the branch end having of the order of 160,000 holes per square inch, a layer of insulating material on the surface of the metal mesh facing the fluorescent screen, a mosaic of insulated photoelectric particles on the layer of insulating material, an electron source within the branch for flooding the metal mesh with a beam of electrons, and a window in the side wall of the envelope exposing the mosaic to radiation from an outside source.

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