

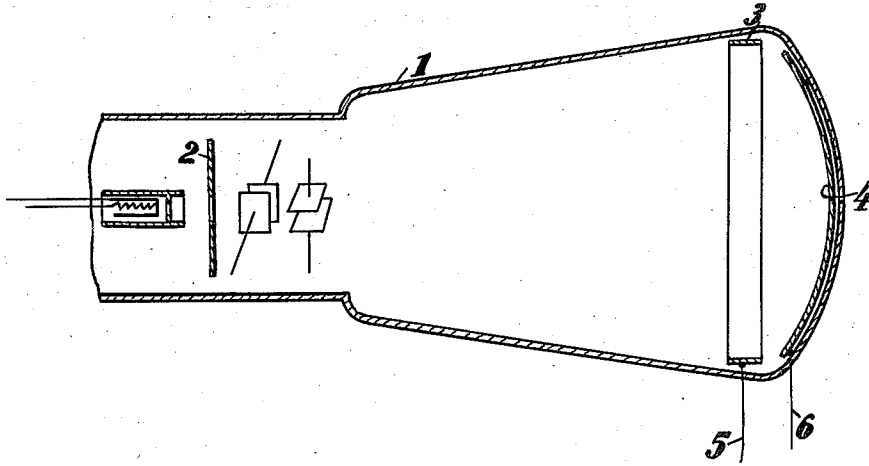
Dec. 31, 1940.

K. SCHLESINGER

2,227,003

CATHODE RAY TUBE

Original Filed Oct. 12, 1933



Inventor

Klaus Schlesinger

UNITED STATES PATENT OFFICE

2,227,003

CATHODE RAY TUBE

Kurt Schlesinger, Berlin, Germany, assignor, by
mesne assignments, to Loewe Radio, Inc., a cor-
poration of New York

Original application October 12, 1933, Serial No.
693,303. Divided and this application January
7, 1936, Serial No. 57,871. In Germany October
17, 1932

1 Claim. (Cl. 250—162)

It is already known to metallize the luminous
screen of Braun tubes, and to connect up the
same with a constant potential. On the other
hand it has already been proposed to furnish the
wall of the Braun tube with a metallic coating,
and to earth this coating or to link up the same
with the maximum potential occurring in the
tube and in this case to use it as an after-accel-
eration anode.

The applicant has found that both in the case
in which the conductive wall coating as well
as in the case in which the metallized screen
is employed as after-acceleration anode the
image points are not sharply formed. If fur-
thermore the coating—such as usual hereto-
fore—extends to within close proximity of the
first anode, the high potential thereof exerts
undesirable effects on the ray.

The widening out of the image point may in
these cases be explained by absence of the re-
turn-current electron cloud, which also exerts
a certain concentrating effect.

The applicant has found that the concentrat-
ing effect of the return-current electrons may be
wholly replaced by the effect of a conductor
raised to a suitable potential which is weakly
negative in relation to the ray. This conductor
may conveniently be constructed in the form of
a preferably narrow metallic strip (for example,
silvered strip) arranged on the wall of the tube.
The width of the conductor is so chosen that
the field thereof exerts no noticeable effect on
the ray in the vicinity of the anode. In the case
of a tube of 30 cm. in length, 6 cm. diameter of
the neck and 18 cm. diameter of the bottom the
width of the strip in accordance with the inven-
tion can be selected at 5 cm., i. e., at approxi-
mately $\frac{1}{6}$ of the length of the tube.

If now this conductor is raised to a suitable
potential, which is weakly negative in relation to
the ray, the image screen may be tapped without
an increase taking place in the width of the
image point.

According to the invention, the metallized
image screen is now employed as after-accel-
eration anode (second anode) by the application
of a suitable high positive potential.

The following potentials in operation have
been found suitable in connection with a tube
of the dimensions set forth above:

1st anode=1000 volts, metallized auxiliary con-
ductor=900 volts,
2nd anode=3000 volts.

Naturally the tubes according to the inven-

tion may also be operated with other potentials;
these potentials, however, must always be se-
lected in such fashion that the auxiliary con-
ductor always possesses a negative potential in
relation to the ray.

It is to be observed that the auxiliary conduc-
tor should not be made too weakly negative in
relation to the after-acceleration anode, as
otherwise the ray will be bent off in the vicinity
of the auxiliary conductor, which in the case
of television tubes takes effect in the form of a
rounding of the image.

The tube according to the invention is of par-
ticular importance for use with so-called resid-
ual gas filling, i. e., a gas pressure of not more
than 10^{-4} mm.

A form of embodiment of the tube according
to the invention is illustrated by way of example
in the drawing. In the latter 1 is the body of
the tube, 2 the first anode, and 3 an auxiliary
conductor according to the invention, which
may be arranged in the vicinity of the image
screen, possesses a weakly negative potential in
relation to the ray, and is made so narrow that
it is unable to exert any disturbing effect on the
ray in the vicinity of the first anode. 4 is the
metallized image screen, which in accordance
with the invention is employed as after-accel-
eration anode. 5 and 6 are the leads passing to
the auxiliary conductor and the image screen.

The most favourable potentials vary in re-
spect of different forms and sizes of tubes, and
may be adjusted without difficulty in each single
case.

The combination of a tube according to the
present invention with suitable potential sup-
plying means has been claimed in the co-pend-
ing parent application to the present one, Ser.
No. 693,303, filed October 12, 1933.

I claim:

A cathode ray tube device comprising an elon-
gated envelope having an end wall and a side
wall portion, the said end wall being substan-
tially normal to the longitudinal axis of the
elongated envelope and having a transverse di-
mension of the order of three-fifths of the
length of the envelope, a conducting coating
adapted to luminesce under electron impact
covering substantially the end wall only of the
said envelope, an electron gun supported within
the envelope substantially on the longitudinal
axis and at substantially the end of the enve-
lope remote from the conducting end wall for
developing an electron beam to impact said con-
ducting coating, beam deflecting means for

moving the electron beam across the said conducting end wall, said deflecting means being located intermediate the electron gun and the end of the envelope having the conducting coating, and one and only one tubular auxiliary electrode positioned within the envelope intermediate the conducting end wall and the beam deflecting means and substantially parallel to the

tube wall, said auxiliary electrode having open ends and electrically separated from the said conducting end wall and having a longitudinal length less than one-sixth of the length of the tube envelope, said auxiliary electrode being adapted to be maintained slightly negative relative the electron gun anode. 5

KURT SCHLESINGER.