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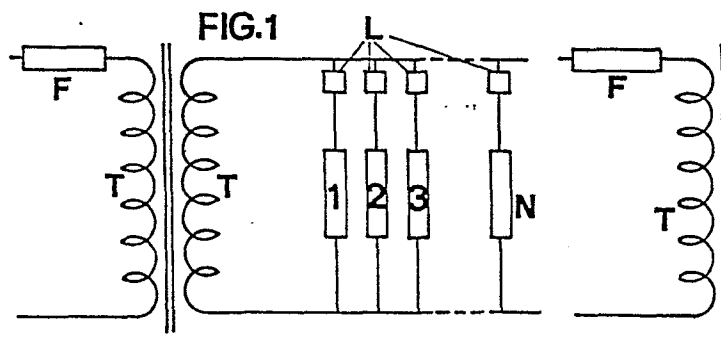
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54 A parallel system for the lighting of neon lamps, fluorescent lamps, and similar.

57 A system for the lighting of neon lamps, fluorescent lamps and similar, consisting in tubes 1, 2, 3 ... N arranged in parallel and with one electrode connected to one end of the high-tension of a transformer T and the other electrode connected to the other end by means of interposition of a

current limiter, consisting in a wire resistance R. A conductor tongue M is placed outside of each lamp (tube), applied to the glass, for facilitating the lighting prime making the inner gas sensitive to the over tensions carried by the glass.



"A parallel system for the lighting of neon lamps, fluorescent lamps and similar"

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The present invention concerns a system for the lighting of neon lamps, fluorescent lamps and further applications, characterized in the parallel arrangement of the components.

It is already well known that actually neon lamps for signboards are lighted by means of transformers current elevators, showing on the secondary tensions between 1000 and 10.000 Volt, with different current intensity relating to the diameter of said tubes.

More precisaly, intensities of 25 m A for lamps (tubes) of 12 and 15 mm are used, 50 m A for lamps (tubes) of 15 and 20 mm, and 100 m A for diameters of 20 and 22 mm.

Said transformers are planned according to the length of the lamp (tube) in reason of 500 Volt for each linear meter of length of said lamp (tube), with tension jumps of 500 Volt, from 1000 to 10.000 Volt, so as to request the realisation of 57 different transformers, corresponding to 11 different tensions multiplied by three used intensities.

Said request implies a large number of different transformers and this causes a situation of difficult finding and choice

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of the most adequate component.

For example, the lighting of 18-19 meters of a 25 mm lamp (tube), implies the use of a 9000 V transformer for 100 m A  
5 on the secondary and consequently a high danger condition for the installer and for normal use.

Furthermore, the transformers of said last kind are little protected by security systems actually known like fuses, au-  
10 tomatic switches and similar, in consideration of the fact that they must also bear short circuits.

A further disadvantage of said transformers is that they heat up very much, due to the fact that they always work at  
15 nominal current and it may happen that they burn, even if the realization criteria are good and improved.

Usually, lamps up to three meters length are used; therefore, if one transformer shall light an 18 m lamp (tube), six  
20 lamps (tubes) in series will be used and, as it is known, if one element out of the whole series brakes, the whole system stops working and this means that a technician urgently must be called.

25 Furthermore, the art shows parallel systems for the lighting of neon lamps (tubes), characterized in impedances consisting in high inductance windings which are very expensive in their realization and rather encumbering. further, very  
oftenly said systems are not able to determine the prime of  
30 all parallel lamps (tubes) due to conducting difficulties of the contained gases.

All this shows the need of medium and big installations for an alternative system, which is the aim of the present invention, characterized in a low production cost, a minimum encumbering, a considerable installation simplicity and perfect functioning.

The system according to the present invention consists in a transformer for elevating the net tension up to 1200 Volt, with a current intensity corresponding to the absorption requests, wherein the lamps (tubes) to be lit are connected in parallel with one electrode directly to one end of the high-tension, while between the other electrode of each lamp (tube) and the other end an element is placed having the function of limiting the current's intensity to the value requested for the lighting of each lamp (tube) leaving the remaining intensity at disposal.

Said limiter element consists in a wire resistance of minimum cost, perfectly functioning in the presence of alternate current frequencies of 50 Hz.

In a possible variant that may be applied to systems with very high frequencies current generators - 5000 ÷ 40.000 Hz - said limiter element consists, according to the present invention, in condensers C, the capacitive reactance  $\frac{1}{\omega C}$  thereof proving to be appropriate for determining the lighting of neon lamps (tubes), according to the aim set forth.

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A main feature of the present invention consists - in the variant with resistance limiters - in a small metal tongue placed outside each lamp (tube), applied to the glass thereof, which tongue allows to solve the problem of the prime as it is able to make the inner gas sensitive to the over-  
5 tensions carried by the glass.

The present invention will be explained more in detail hereinbelow relating to the enclosed drawings in which some  
10 embodiments are shown.

Figure 1 shows the scheme of a parallel system for the lighting of neon lamps (tubes), fluorescent lamps and similar.  
15

Figure 2 shows the scheme of a variant for currents at frequencies of 50 Hz, provided with limiters consisting in wire resistances R.

20 Figure 3 shows a perspective view of a lamp (tube) provided with tongue M for making the inner gas sensitive to the over- tensions carried by glass V.

Figure 4 shows the scheme of a high frequency variant  
25 provided with limiters consisting in condensers C.

Relating to the details of the drawings, the system comprises lamps (tubes) 1, 2, 3, ..., N arranged in parallel, each provided with the own limiter L at the ends of  
30 transformer T and a protection fuse F fed by the net. Tongue M is liable with the electrode of resistance R.

The advantages of the system according to the present invention are many:

- a single transformer T is provided for the whole system, with a protection fuse F against short circuit and over-  
5 load;
- a relatively low working tension;
- easy installation;
- turning out of teh only out of order lamp (tube) wherein the technician may easily find it and the whole system  
10 continues its working.

In a variant according to the present invention, exchanges for light-games may light the neon lamps (tubes) directly without any external transformer.

CLAIMS

1. A device for the lighting of neon lamps (tubes), fluorescent lamps and similar, characterized in lamps (tubes) (1, 2, 3, ..., N), arranged in parallel, with an electrode directly  
5 connected to one end of a high tension transformer (T), at a frequency of 50 Hz, and the other electrode connected to the other end by means of interposition of a current limiter consisting in a wire resistance (R) and characterized in a small metal tongue (M) liable to the electrode outside each tube for making  
10 the inner gas sensitive to the over tensions carried by the glass and facilitating the lighting's prime.
2. A device for the lighting of neon lamps (tubes), fluorescent lamps and similar, according to claim 1, characterized in  
15 that said current limiters, for frequencies from 5000 ÷ 40.000 Hz, consist in condensers (C).
3. A device for the lighting of neon lamps (tubes), fluorescent lamps and similar, according to claim 1, characterized in  
20 the presence of a transformer (T) for elevating the net tension up to 1200 V.
4. A device for the lighting of neon lamps (tubes), fluorescent lamps and similar, according to the precedent claims, characterized in that each limiter (L) regulates the current intensity to the value necessary for the lighting of each lamp  
25 (tube) leaving the remaining intensity at disposal.

FIG.1

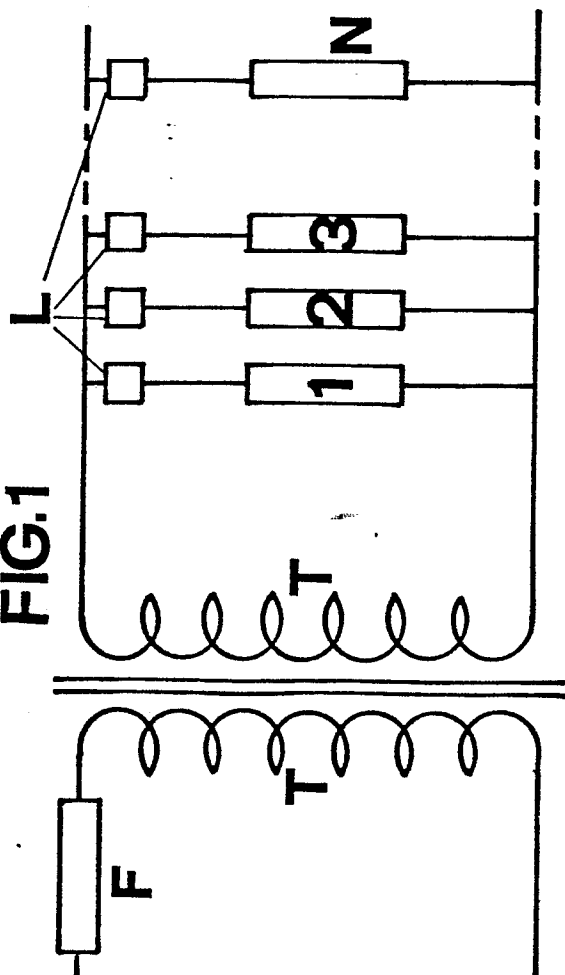


FIG.2

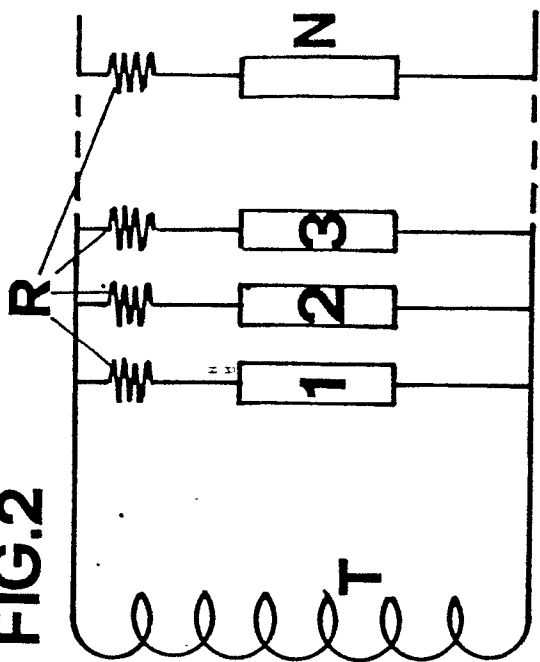


FIG.4

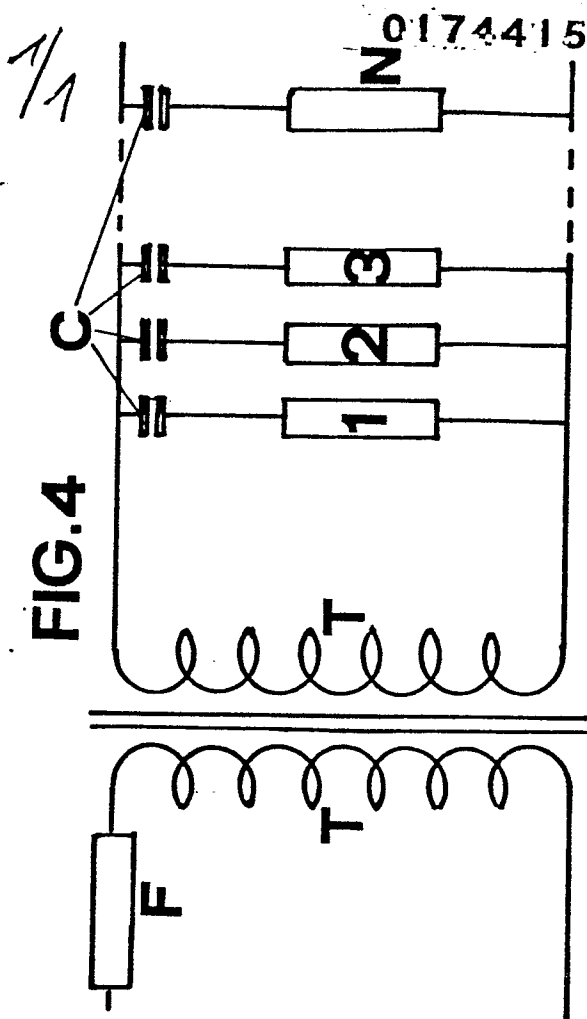
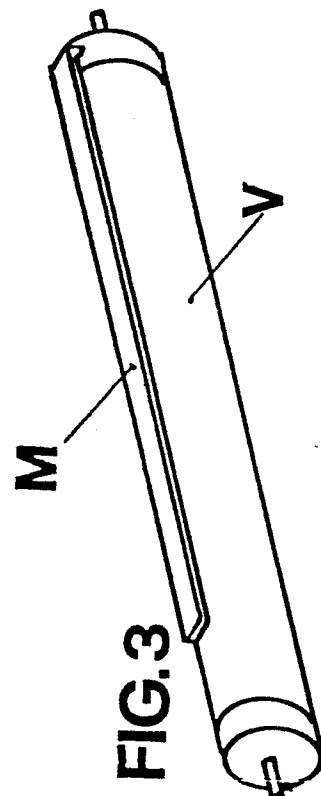


FIG.3



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| DOCUMENTS CONSIDERED TO BE RELEVANT                                                                                                                                                                                     |                                                                                              |                                                                                                                                                                                                                                                                              |                                                |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|
| Category                                                                                                                                                                                                                | Citation of document with indication, where appropriate, of relevant passages                | Relevant to claim                                                                                                                                                                                                                                                            | CLASSIFICATION OF THE APPLICATION (Int. Cl. 4) |
| X                                                                                                                                                                                                                       | DE-A-1 147 694<br>(SIEMENS-SCHUCKERT)<br>* Column 3, line 39 - column 4, line 12; figure 1 * | 1-4                                                                                                                                                                                                                                                                          | H 05 B 41/29                                   |
| X                                                                                                                                                                                                                       | GB-A- 936 285 (SOCIETE TRIFLUX)<br>* Page 1, line 80 - page 2, line 50; figure 1 *           | 1,2                                                                                                                                                                                                                                                                          |                                                |
| X                                                                                                                                                                                                                       | US-A-2 086 668 (FODOR)<br>* Page 3, lines 41-55; figure 11 *                                 | 1,3,4                                                                                                                                                                                                                                                                        |                                                |
| A                                                                                                                                                                                                                       | DE-A- 629 684 (OSRAM)<br>* Page 2, lines 16-37; figures *                                    | 1                                                                                                                                                                                                                                                                            |                                                |
|                                                                                                                                                                                                                         |                                                                                              |                                                                                                                                                                                                                                                                              | TECHNICAL FIELDS SEARCHED (Int. Cl. 4)         |
|                                                                                                                                                                                                                         |                                                                                              |                                                                                                                                                                                                                                                                              | H 05 B 41/00                                   |
| The present search report has been drawn up for all claims                                                                                                                                                              |                                                                                              |                                                                                                                                                                                                                                                                              |                                                |
| Place of search<br>THE HAGUE                                                                                                                                                                                            |                                                                                              | Date of completion of the search<br>13-04-1985                                                                                                                                                                                                                               | Examiner<br>DUCHEYNE R.C.L.                    |
| CATEGORY OF CITED DOCUMENTS                                                                                                                                                                                             |                                                                                              |                                                                                                                                                                                                                                                                              |                                                |
| X : particularly relevant if taken alone<br>Y : particularly relevant if combined with another document of the same category<br>A : technological background<br>O : non-written disclosure<br>P : intermediate document |                                                                                              | T : theory or principle underlying the invention<br>E : earlier patent document, but published on, or after the filing date<br>D : document cited in the application<br>L : document cited for other reasons<br>& : member of the same patent family, corresponding document |                                                |