transport

transport lighting

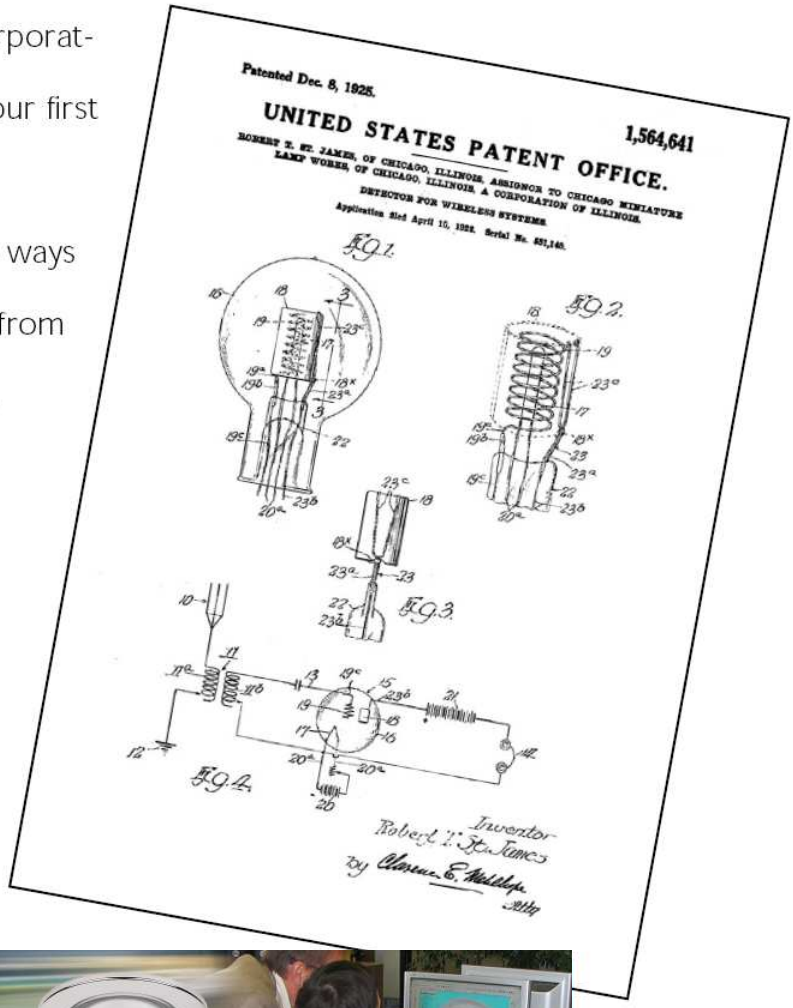
NEW 2008

CML
INNOVATIVE TECHNOLOGIES
WHERE INNOVATION COMES TO LIGHT

transport lighting

An introduction

From 1910 when we were incorporated...thru 1922 when CML filed our first patent to the present day, our engineers have found innovative ways to develop new product ideas... from incandescent lamps to the most sophisticated LED solutions... across the globe, our light designers, test engineers, and manufacturing teams from the Americas, Europe & China are available to ensure that you project receives all the attention that it deserves.



Patented Dec. 8, 1925.

UNITED STATES PATENT OFFICE.

1,564,641

ROBERT S. ST. JAMES, OF CHICAGO, ILLINOIS, ASSIGNOR TO CHICAGO MINIATURE LAMP WORKS, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

DETECTOR FOR WIRELESS SYSTEMS.

Application filed April 10, 1922. Serial No. 551,140.

Fig. 1.

Fig. 2.

Fig. 3.

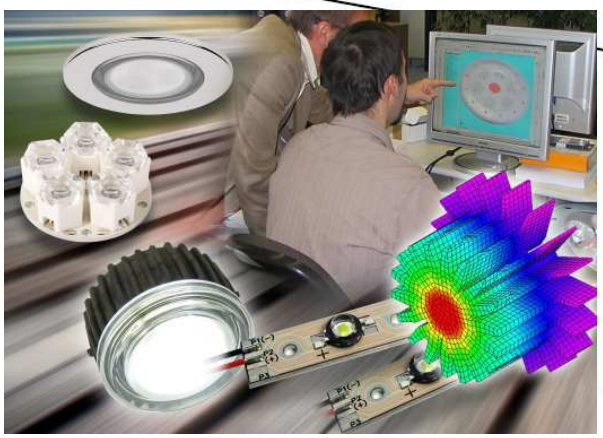
Fig. 4.

Inventor

Robert S. St. James

by Clarence E. Middleton

Atty



As a transport vehicle designer and builder what can CML do for you..?

One of the largest growth areas in electronics at this time is LED Illumination, CML has made it our business to ensure that we can offer our customers easy to use LED modules…"*LEDules*"

Together we are developing and manufacturing some of the most innovative *LEDules* available today.

For too long LEDs have been viewed as problematic – our goal is to change that.

Working towards the aim of making LEDs easy, we offer a range of *LEDules* from 3 to 14 watts in a variety of colours, cool & warm white blue, cyan, green, amber, red & rgb.

LEDules are available in a number of specification levels…with optics, with or without custom designed drivers…& with or without heat management

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Today.. the **technological advances** in the field of the **LED Lighting** make it possible to design systems **specifically for the Transport Market**. These new solutions allow the replacement of traditional Incandescent lighting with LED systems offering **increased performance**, **increased life** of approximately 50000h against 1000h for traditional incandescent, **reduced maintenance** and up to **80% reduction in energy consumption**

ENERGY SAVER

CML

ENVIRONMENTAL

CML who have been producing lighting for the **transport industry** for **almost 100 years**, and are now working to bring you an **easy to use LED solution...**

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making LEDs easy

RoHS CoMpLiant

transport lighting

The **solid state** nature of **LED** lighting, offers the **perfect solution** for use in **transport,** railway, air, trucks, bus, cars or motorcycles and solves the limitations of traditional systems: LED lighting modules have **small** overall **dimensions** and a variety of shapes, **cope easily** with extreme **temperatures** (cold start without risk), are highly suited to **impact resistance** and **vibrations**, and of course the light output can be **controlled** by a simple device to vary intensity and in the case of RGB devices can offer **subtle colour & mood changing**.

The results achieved by the **innovative use of LED** bring transport illumination into a **new era**, and when total life costs are considered, at **comparable cost** to traditional **Incandescent**

In order to **achieve the optimum** from a new **LED lighting** system talk to the **experts**…. Through a combination of **experience** and technical flair **CML-IT** will bring your lighting **dreams to reality**…

making LEDs easy

transport lighting

LEDules… power LEDs ready to use

3 watt

- 1 high power light emitting diaode (3 watt LED)
- Similar output as 10 watt incandescent bulb
- Colors: Cool white, Warm white, Red and Cyan
- 1.74" round compact source
- High efficiency optics: 5 or 25 degree beam
- Less than 4 watt power consumption
- Input voltage 10-30V dc

application example

Application: reading light

application example

4 watt

- 3 high power light emitting diaodes (LEDs - 1 watt each)
- Similar output as 20 watt incandescent bulb
- Colors: Cool white, Warm white, Red and Cyan
- 10 - 30 Vac / Vdc
- Fully integrated with driver electronics and heat sink
- Rugged and sealed
- 2.25" round
- High efficiency optics: 40 degree beam

making LEDs easy

Application: spot light

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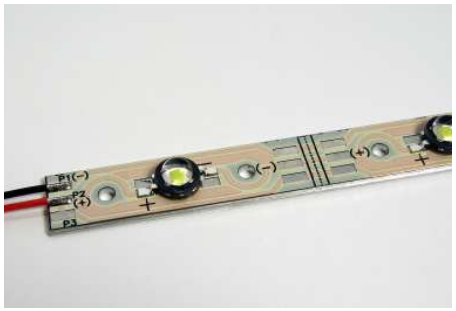
LEDules for transport lighting

8 watt

- 6 High Power Light Emitting Diodes (1 Watt LEDs)
- Colors: Cool White, Warm White, Blue, Cyan, Green, Amber and Red
- Consistent unit-to-unit color temperature
- 11.9" (302mm) x 0.5" (13mm) strip
- Operating life 50,000 hours
- Metal Clad PCB Substrate
- 8" power leads
- Compatible with range of standard and custom drivers
- For Decorative Edge Lighting, Cove Lighting,



9 watt

- 3 High Power Light Emitting Diodes (3 Watt LEDs)
- Colors: Cool White, Warm White, Blue, Cyan, Green, Amber and Red
- Consistent unit-to-unit color temperature
- 1..5" (38.1mm) round compact source
- May be driven up to 1000mA
- Operating life 50,000 hours
- High efficiency optics: 6 or 25 degrees
- Metal Clad PCB Substrate
- 8" power leads
- Compatible with range of standard and custom drivers
- For Spot Lighting, Reading Lighting

14 watt

- 5 High Power Light Emitting Diodes (3 Watt LEDs)
- Colors: Cool & Warm White, Blue, Cyan, Green, Amber & Red
- Consistent unit-to-unit color temperature
- 1.74" (44.2mm) round compact source
- May be driven up to 1000mA
- Operating life 50,000 hours
- High efficiency optics: 6 or 25 degrees
- Metal Clad PCB Substrate
- 8" power leads
- Compatible with range of standard and custom drivers
- Spot Lighting, Emergency Lighting,

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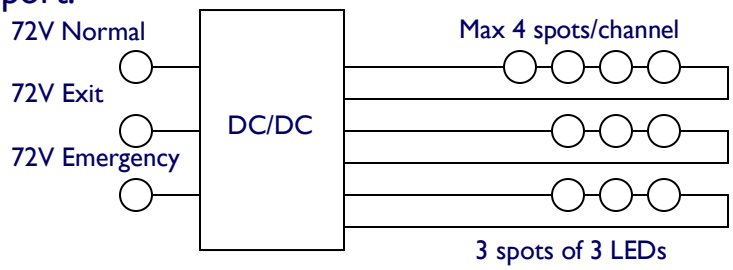
A winning combination in transport lighting

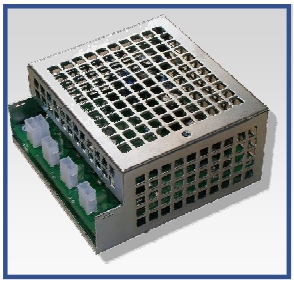
CML offer a combination of **Experience** & **Technology**…**CML** have been supplying lighting for almost **100 years…**more recently to **AIRBUS, BOEING, AUDI, BMW & HARLEY DAVIDSON**…& our light engineers are developing new products for Spanish & French Railways.. **CML** are also working with Europe's leading power supply manufacturers to produce complete lighting systems as detailed below

Typical LED lighting arrangement

The equipment comprises from 1 to 10 spots integrated in the ceiling light of the train, including the power supply. This LED system makes it possible to precisely illuminate the interior of the passenger carriages. The luminous power of the spots is measurable in order to respect the safety requirements related to the passenger transport.



The power supply is a DC/DC converter Input voltage 72 Vdc (network battery of the train, adaptable on request) Voltage range 50 to90Vdc Output: either 3 spots per way: 2 ways of 3 spots maximum + 1 way of 4 spots maximum Power max: 40W nominal Current output: 350mA Overload surcharge and the short-circuits at exit Overpotential protection at exit Environment: Operating temperature: -25°C with +70°C Cooling: natural convection Conforms to EN50155, EN50121-3-2



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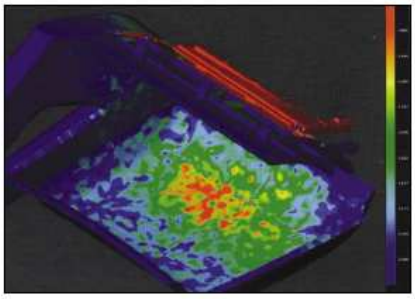
Our capabilities include

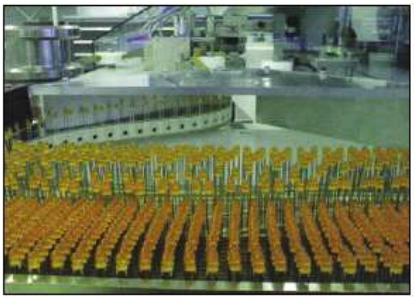
Custom Product Development

From concept to detailed design, CML will assist you in analyzing your product requirements and performing technlogy trade-offs to arrive at an optimal system design. We will tthen prototype and evaluate to confirm design approach. The detailed design is then generated, producing design documentation to support production.



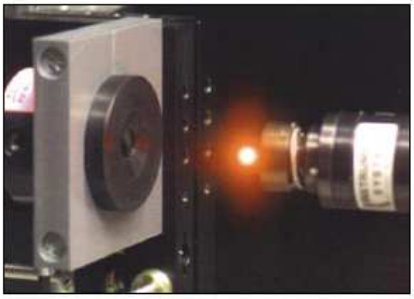
Light/Optical Design

CML will work with you to define your specific lighting objectives and provide alternatives for the best LED light sources and efficient optical approach. This may include lighting simulations to support detailed optical design and valuation.



Electrical Design

Based on input power type and LED load, CML will design an optimised current driver based on your specific needs for size, efficiency, features set and cost.



Mechanical Design

Whether you need an all new fixture or integrating a new LED system in an existing fixture, CML will provide a mechanical design that addresses the target lighting fixture and optimised thermal management to ensure long LED life.

Rapid Prototyping

Whether using existing CML SSL Engines or new customised designs, CML will rapidly fabricate a prototype

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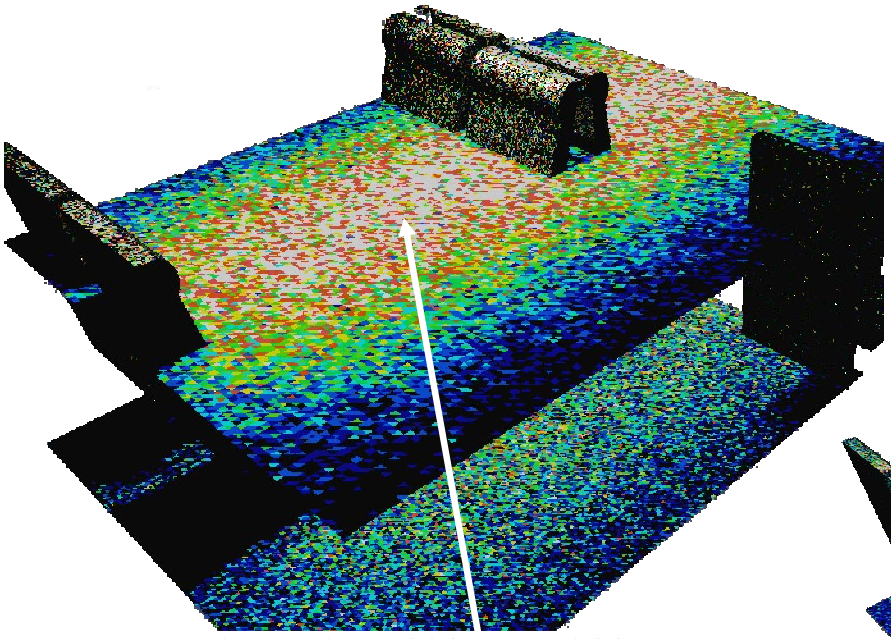
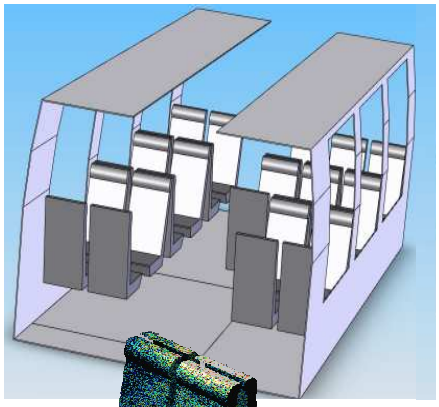
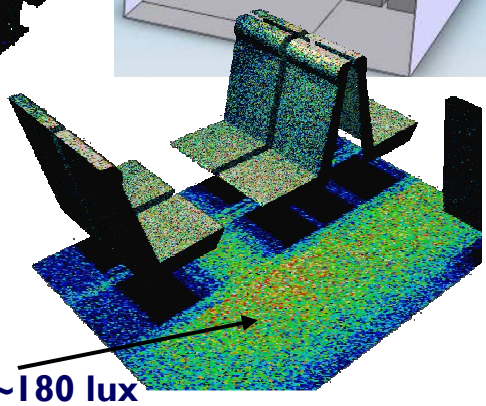
CML's Secret Weapon……. Simulation…



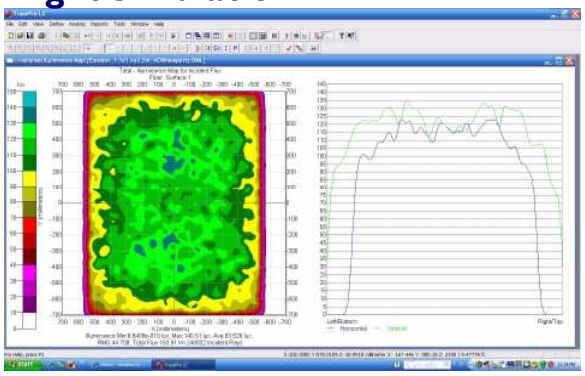
Reading height 800mm ~300 lux



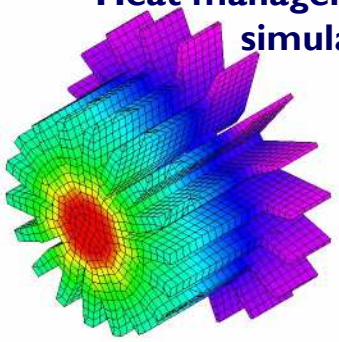


Floor level ~180 lux

Light simulation



Heat management simulation



Our engineers in Bamberg Germany, when given the dimensions of your rail-car, bus,truck or elevator will calculate using our own software the lighting units needed to satisfy your specification, as shown in the example above. We can guarantee the light output right off your own CAD files.

transport lighting

……In addition to our custom range of products, check out CML's range of standard Panel mount indicators….

CML IT offers panel mount indicators manufactured with LED, Neon or Incandescent light sources. These indicators are available in a number of different lens and termination styles, with voltages of 2V ~ 250V available off-the-shelf.

CML's wide range of both indicators and based LEDs offer low energy use, low maintenance replacement cost for a whole series of power on indicators, alarm status signalling etc. and are ideally suited for the design of all manner of control panels, from lighting, door & heating control to the drivers control panel.

….CML's products are environmentally friendly….

CML products are generally built locally in the market they serve minimizing transport and reducing carbon footprint...

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What else can CML-IT offer…?

CML's R&D is located worldwide. Our R&D centres in America, Asia & Europe offer world class technology. Engineers from China, Germany, UK, France, America collaborate to bring world class solutions to the market

making LEDs easy

Our corporate headquarters in Hackensack NJ is an FAA accredited Aerospace facility providing lighting systems to Airlines and Aircraft builders in USA & across the globe.

Our own low cost manufacturing centres in Costa Rica , China & Czech provide "local" manufacturing to meet supply chain needs.

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