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A.D. 1824 . . . . . N° 4899.

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**Diorama, or Method of Exhibiting Pictures.**

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**ARROWSMITH'S SPECIFICATION.**

TO ALL TO WHOM THESE PRESENTS SHALL COME, I, JOHN ARROWSMITH, of Air Street, Piccadilly, in the County of Middlesex, Esquire, send greeting.

WHEREAS His most Excellent Majesty King George the Fourth did, by His  
5 Letters Patent under the Great Seal of that part of the United Kingdom  
of Great Britain and Ireland called England, bearing date at Westminster, the  
Tenth day of February, One thousand eight hundred and twenty-four, in the fifth  
year of His reign, give and grant unto me, the said John Arrowsmith, my  
eñors, adñors, and assigns, His especial licence, full power, sole privilege and  
10 authority, that I, the said John Arrowsmith, my eñors, adñors, and assigns,  
during the term of years therein mentioned, should and lawfully might make,  
use, exercise, and vend, within England, Wales, and the Town of Berwick-upon-  
Tweed, the Invention, partly communicated to me by a certain Foreigner residing  
abroad, and partly discovered by myself, of "AN IMPROVED MODE OF PUBLICLY  
15 EXHIBITING PICTURES OR PAINTED SCENERY OF EVERY DESCRIPTION, AND OF  
DISTRIBUTING OR DIRECTING THE DAYLIGHT UPON OR THROUGH THEM, SO AS TO  
PRODUCE MANY BEAUTIFUL EFFECTS OF LIGHT AND SHADE, WHICH I DENOMINATE A  
'DIORAMA';" in which said Letters Patent there is contained a proviso that if  
I, the said John Arrowsmith, shall not particularly describe and ascertain the  
20 nature of the said Invention, and in what manner the same is to be  
performed, by an instrument in writing under my hand and seal, and cause  
the same to be inrolled in His Majesty's High Court of Chancery within  
six calendar months next and immediately after the date of the said Letters



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Patent, that then the said Letters Patent, and all liberties and advantages whatsoever thereby granted, shall utterly cease, determine, and become void, as in and by the same, reference being thereunto had, will more fully and at large appear.

**NOW KNOW YE**, that in compliance with the said proviso, I, the said 5 John Arrowsmith, do hereby declare that the nature of the said Invention, and the manner in which the same is to be performed, are particularly described and ascertained in manner following, that is to say:—

The Invention consists in placing the pictures or painted scenery (which are intended to form the exhibition) within a building so constructed that 10 the saloon or amphitheatre containing the spectators may be caused to revolve at intervals, as may be desired, for the purpose of bringing in succession two or more distinct scenes or pictures into the field of view, and without the necessity of the spectators removing from their seats. From this arrangement of the revolving saloon the scenery or pictures themselves may remain 15 stationary, and they will therefore admit of the application of the said improved method of distributing or directing the daylight upon or through them, so as to produce the effects of varying the light and shade in a more pleasing manner than has been hitherto accomplished, the said variable effects of light and shade being performed according to the said improved method, by means 20 of a number of coloured transparent and moveable blinds or curtains, some of which said blinds are placed behind the picture or scenery, for the purpose of intercepting and changing the colour and shade of the rays of light, which are permitted to shine or pass through certain semi-transparent parts of the said picture or scenery, and thereby effect many curious changes in the 25 appearance of the colours in proportion as the said coloured blinds are moved up and down, which motion is performed in a particular order by the aid of certain lines or cords connected with suitable machinery, as will be herein-after more particularly described; others of the said coloured transparent blinds or curtains are situated above and in front of the said pictures or scenery, so as 30 to be moveable by the aid of cords or lines as aforesaid, and by that means to distribute or direct the rays of light which are permitted to fall upon the face of the picture, at the same time the rays of light in passing through the said coloured blinds effect many surprising changes in the appearance of the colours of the painting or scenery, and thereby form the pleasing exhibition herein- 35 before denominated a diorama; but in order to explain clearly the manner of carrying the said Invention into effect, and to enable persons conversant with works of a similar nature to put it in practice, I have hereunto annexed two Sheets of Drawings or Plans marked Fig. 1 and Fig. 2.

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The Drawing Fig. 1 represents an horizontal plan of a building adapted to exhibit two distinct scenes or pictures, according to the said improved mode, one of the pictures being supposed to be furnished with the moveable transparent coloured blinds or curtains and apparatus as aforesaid, and the other picture being supposed to be viewed in its natural state without any such blinds or curtains. A, A, shows the plan of the revolving saloon, which is fitted up with boxes and seats for the accommodation of the spectators. B, B, shews the situation of one of the pictures; and C, C, the situation of the other. The saloon is in the form of a cylindrical building, having a proper and spacious opening S, S, in one side thereof, for viewing the pictures through; and doors s, s, at the back or opposite side for the admission of company. The space or distance between the opening of the saloon and the pictures is enclosed above and on each side by light screens, forming a kind of vista, as seen at a, a, b, b, so as effectually to conceal the margins or boundary of the pictures, and thereby produce in a certain degree the effect of panoramic pictures. The manner in which the revolving saloon is constructed is explained clearly by the Fig. 2, and the same characters or letters of reference are used to denote corresponding parts upon both the Figures.

Fig. 2 represents a transverse section of the entire building, supposed to be taken at about the dotted line marked z, z, in the Fig. 1. A, A, shews the saloon; B, B, one of the pictures which is suspended from above, and is kept in a proper degree of tension by small weights hung on at bottom and also at the sides, at which place the lines for the weights pass over small pulleys fixed to a stationary rail, but which are not visible in the Drawings. D, D, shews a large window fitted with ground or some transparent glass, to admit a portion of light behind the picture. Before this window the aforesaid coloured transparent blinds are suspended by small lines, so as to be capable of moving up and down, in order to pass by and overlay each other.

I have only represented five of these blinds in the Drawings where they are marked 3, 4, 5, 6, and 7, but there may be a considerably greater number used, which must depend entirely upon the nature of the painting or scenery to be exhibited, and must, as well as the arrangement of their movements and also of the colour of the cloth or fabric of which they are composed, be determined by the judgment of the painter or artist. E, E, shews a large window or skylight situated in the roof of the building, for the purpose of admitting light upon the face of the picture. This window is also fitted with ground glass, and is furnished with transparent coloured blinds, as seen at F, F. These as well as the before-mentioned blinds I usually make of coloured calico or other light texture, and they are adapted to move upon hinges or joints

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at their uppermost ends, so as to be capable of moving into the dotted position *f, f*, and thereby permitting the rays of light to fall unobstructed upon the face of the picture; but when they are raised up, as shewn in the Figure, they intercept part of the rays of light, and when brought fully up they may be made to close up the window entirely, and thereby cause all the rays of light to pass upon the picture through the said coloured shades or blinds, so as to produce variations in the shades and tints upon the picture. The various transparent coloured blinds are moved in the following manner:—

The cords or lines which proceed from them are passed over small pulleys near the top of the building, and then descend and are attached to a long lever or balance *G, H*, which moves upon a centre or fulcrum at *h*, and is situated against a partition of the building, as seen at *G, H*, in the Plan, Figure 1. The cords or lines marked *K* proceed over small pulleys *K*, and over leading pulleys situated at the end of the roof of the building, after which they are attached to the extremities of the blinds *F, F*, as shewn in the Figure, in order to move them upon their centres, and close or open them. There are five pairs of these blinds in the length of the building, each furnished with a separate cord attached to the lever *G, H*, but I have only exhibited one of the pairs in the Drawings. The cords marked *L* and *M* proceed over small pulleys at *l* and *m*, and are attached to the hanging blinds 3, 4, 5, 6, 7, it will appear from inspection of Fig. 2 that the cords *L* and *M* are attached to the lever *G, H*, on opposite sides of the center thereof, consequently when the lever is moved on its center, some of the said blinds would ascend and others descend, so as to pass over each other, and produce different tints of light, but no precise or even general rules can be laid down for these motions, as they will depend upon the nature of the picture or scenery as herein-before stated, and must therefore be determined by the artist who paints the same. The lever *G, H*, when at rest, stands in the position shewn by the dotted lines *g, g*, Fig. 2, in which situation the blinds *F, F*, are also in the dotted position *f, f*, or quite open. But when it is desired to produce the effect of change in the lights and shades of the picture, a workman draws the end *H* of the lever *G, H*, slowly downwards, by turning the handle or winch *P*, shewn in Fig. 1, and also by dotted lines at *P* in Fig. 2, where two ends of a rope *o, p*, may be seen, which proceed over pulleys *q, r*, and are attached to the opposite ends of the lever *G, H*. This rope winds round a barrel, which is turned by a pinion and cog wheel from the winch *P*, and the ends *o, p*, of the rope pass off on opposite sides of the said barrel, so that by turning the winch *P* round slowly in contrary directions the changes may be produced as aforesaid. *t* represents a balance weight attached to one end.

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- of the lever G, H, for the purpose of balancing the weight of the blinds. The degree or extent of motion which the various coloured blinds may require to have communicated to them can be obtained by attaching their lines or cords to the lever G, H, nearer to or farther from its center of motion *h*. The
5. floor of the revolving saloon is supported upon a very strong timber framing, which consists of a central shaft or axis Q, having twelve timbers or arms similar to those seen at R and T, arranged round it at equal distances, in the manner of radii. The extremities of these timbers are connected together by upright pieces V, V, and the whole framing is farther strengthened by
10. diagonal braces *v, v*, and cross timbers *w, w*, which proceed from one arm to the next, and are firmly bolted to each arm, so as to form a pentagonal framing. The cross timbers *w, w*, serve to carry the bearings of twelve strong iron shafts or axes similar to those seen at *x, x*, which have cast-iron wheels or rollers X, X, fixed upon them, being adapted to roll round
15. upon the surface of a metal kirk or ring *e, e*, which is bolted down firmly to a course or coping of masonry situated upon the top edge of the circular wall Y, Y. This wall, if seen in plan, would appear like a large well, and its foundation proceeds some feet below the surface of the ground, in order to obtain a solid foundation for the support of the revolving saloon.
20. The framing of the saloon above described is steadied in its revolving motion by the central shaft Q, which is furnished with a pivot or gudgeon at its lower extremity, working into a brass stop-piece N, being fitted with adjusting screws, as shown in Fig. 2, and bolted securely upon the surface of a pier of masonry *y, y*. The cylindrical part of the saloon above the floor is composed
25. of light wood framing, which is ornamented internally by drapery, and the ceiling is composed of a transparent painting, stretched beneath a system of light iron frames *i, i*, forming a kind of roof, which is furnished with a pivot or gudgeon in the centre, adapted to turn round in a bearing affixed to one of the principles of the main roof, as seen at I. J, J, shews a skylight for admitting light through the transparent ceiling of the saloon. The extent of revolving motion which would require to be given to the saloon for exhibiting the two pictures, as represented in the Plan, Fig. 1, would be an arc of about 73 degrees, and during the time that the saloon is in the act of revolving no company is permitted to go in or out; but when the opening S, S, is
30. brought into the proper situation opposite either of the pictures, then one of the two doors *s, s*, of the saloon will be found to correspond exactly with one at the doorways shewn in the circular brick wall surrounding the saloon, and will thus open a direct entrance to the saloon. On the outside of this circular wall a suitable anteroom is provided for the company to wait in if they happen

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to arrive while the saloon is in motion. The said revolving motion of the saloon is effected by means of a sector or portion of a wheel, having cogs formed upon its edge. This sector is securely fixed to the central shaft Q, as seen at 8, in Fig. 2, so that its cogs may be engaged with the cogs of a pinion 9, which is fixed upon a vertical shaft, having a bevelled wheel 11 upon its lower extremity. The wheel 11 is engaged with the teeth of a bevelled pinion 12, upon the axis of which a cog wheel 13 is fixed, engaging with the teeth of a pinion 14, upon the axis of the fly wheel and winch 15. By this train of wheelwork a man standing upon the platform 16 may by turning the winch 15 cause the whole saloon to revolve slowly, and by proper stops being fixed to some part of the framing below it, is caused to ring a bell, and thus indicate when the saloon has been turned into a proper situation for the pictures to be viewed through the opening S, S. c & d, Fig. 2, represents slight partitions or opaque blinds, which are erected in order to conceal the lower margin of the picture from the view of the spectators. 15

I have now fully described the manner of carrying the said Invention into effect, and I hereby declare that I consider the claim of Invention to consist in the employment of colours, transparent moveable blinds or curtains, as herein-before described, which are adapted to distribute or direct the daylight upon or through pictures or painted scenery of every description, for the purpose of publicly exhibiting the same, and by which means many beautiful effects of light and shade may be produced, such exhibition being denominated a Diorama. At the same time I wish it to be observed that the claim of Invention is not considered to extend to the use of the revolving saloon as herein-before described generally, but only when the same is used in combination with the aforesaid improved method of distributing or directing the light upon or through pictures or painted scenery. The particular arrangement or construction of the wheelwork for turning the saloon, as well as the means of communicating the requisite motions to the aforesaid transparent coloured blinds, may be varied in many ways, according to the discretion of the workman employed in constructing the same. The size and proportions of the different parts may also be varied, according to the circumstances of the case, without departing from the object of the Invention, as herein-before described and set forth. 20 25 30

In witness whereof, I, the said John Arrowsmith, have hereunto set my hand and seal, this Eighteenth day of February, in the year of our Lord One thousand eight hundred and twenty-four. 35

JOHN (L.S.) ARROWSMITH.

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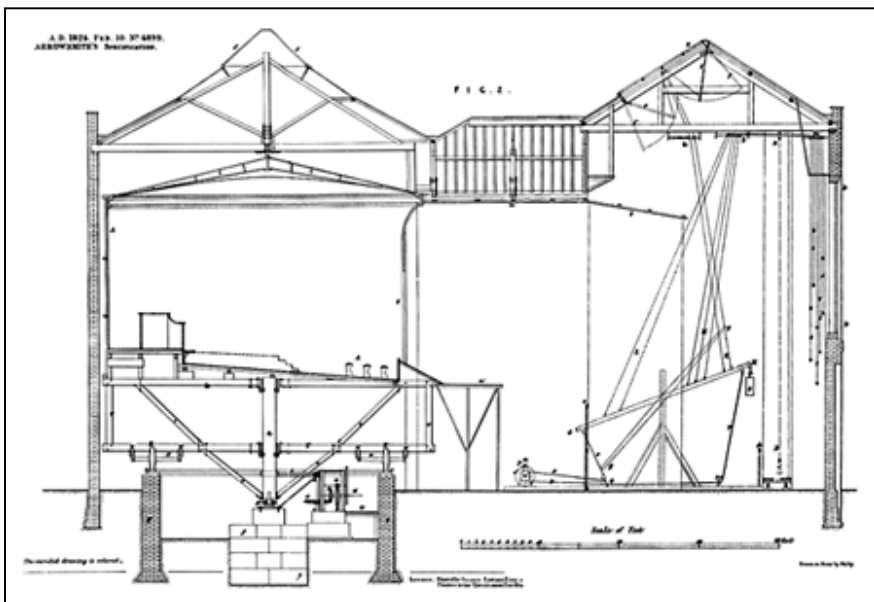
**AND BE IT REMEMBERED**, that on the Eighteenth day of February, in the year of our Lord 1824, the aforesaid John Arrowsmith came before our said Lord the King in His Chancery, and acknowledged the Specification aforesaid, and all and every thing therein contained and specified, in form 5 above written. And also the Specification aforesaid was stamped according to the tenor of the Statute made for that purpose.

Inrolled the Sixth day of March, in the year of our Lord One thousand eight hundred and twenty-four.

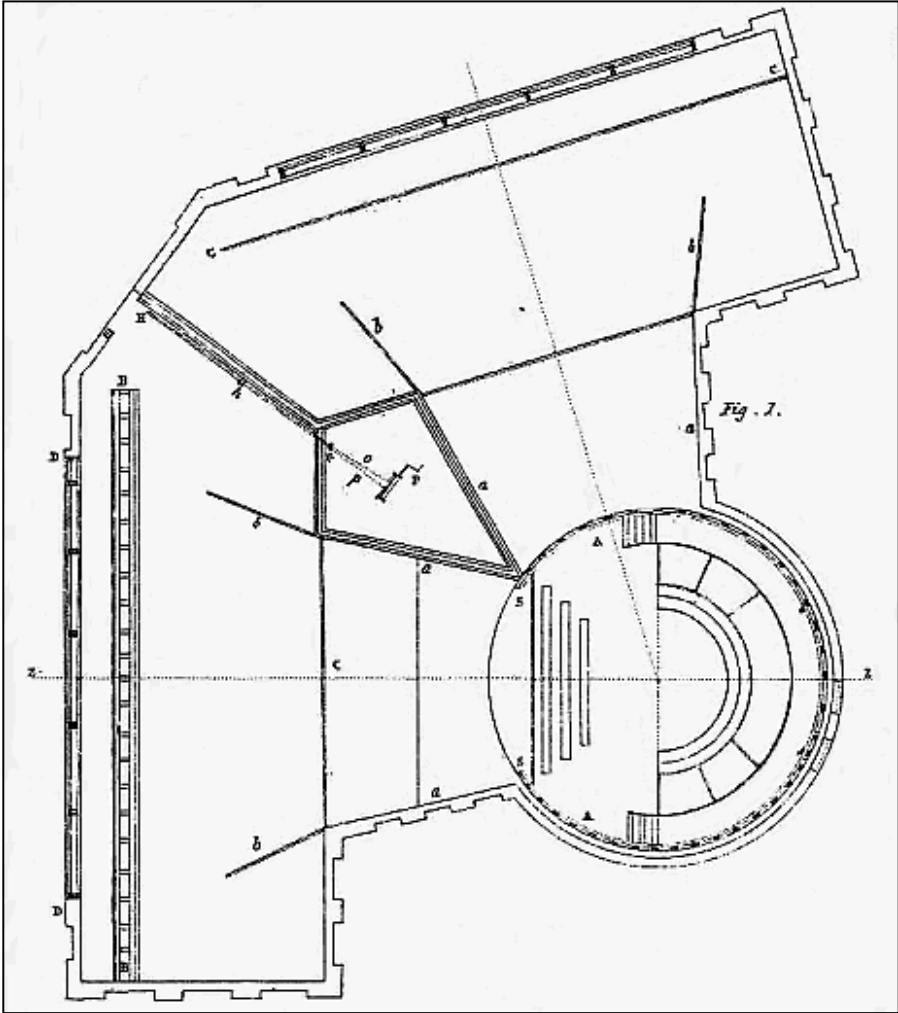
LONDON :

Printed by GEORGE EDWARD EYRE and WILLIAM SPOTTISWOODE,  
Printers to the Queen's most Excellent Majesty. 1857.

TROWER.



**Figure 2 (Transverse section)** from large fold-out plate 2  
(drawn on stone by Malby & Sons) in the first official printing in 1857  
of British Patent No. 4899



**Figure 1 (Plan)**

The plan on the very large fold-out plate 1 of the official specification measures 52 x 42 cms. It is a lithographic reproduction in black and white drawn from the original coloured drawing as part of the enrolled manuscript now at the Public Record Office. Because of the large dimensions of that fold-out plate it is not suitable for reproduction here and instead the figure above is taken from the first publication of the patent in *The Repertory of Arts, Manufactures and Agriculture, consisting of original communications, specifications of Patent Inventions*, April 1825, Vol. XLVI, No. 275 (second series), plate X (between pp. 260-1). It should be noted that this smaller 1825 publication of the plan differs from the official specification in being both laterally reversed and printed sideways, with the labelling appropriately adjusted.

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