The Edison Electric Light.

The Legal and Commercial Status.

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EXECUTIVE OFFICES

THE EDISON ELECTRIC LIGHT CO.

16 AND 18 BROAD STREET,

NEW YORK, OCTOBER 7TH, 1886.

TO WHOM IT MAY CONCERN:

Your attention is respectfully solicited to the following facts. They are submitted not in a spirit of menace or as a threat, but simply as a matter of abstract justice both to shareholders, whom we represent, and to yourselves, as parties to whom our true position has been persistently misrepresented.

The fact that Mr. Thomas A. Edison invented the incandescent lamp in the form in which it is now presented by all electric light companies was so widely proclaimed by the publication thereof in every class of literature at the time of the invention, that it would now seem very like an insult to the intelligence of the community to recall it. Indeed, a retrospective view of the history of the great invention is rendered unnecessary by the fact that even the infringing companies themselves do not dwell upon their claim to the ownership of original patents, but fortify their position by the assertion that Edison's patents are invalid and open to the public, and offer in corroboration of their statement the apparent apathy of the Edison Company in the matter of defending them. That they, or doubtless many of them, are honest in their belief, and therefore in their representations,

may be conceded without prejudice to the facts. In this way alone can be explained the business policy pursued by them of risking large private fortunes as well as the property of the shareholders of their respective companies in the form of guarantees against any damages the Edison Company may ultimately obtain from them or their customers for infringement of its patents.

It may very properly be asked does not the lapse of several years without the Edison suits appearing in the open Courts confirm the charge of apathy and prove the claim of invalidity? The Edison Company answers NO. They had reasons which restrained them from active patent litigation at the start, but that activity was ordered over a year ago, and in consequence of it more than 100 suits are now pending. Many of these, necessarily the most important thereof, will, in the natural order of legal procedure, reach trial within the coming year. Quiet preparation, together with important work done abroad, will ensure the rapid progress of these suits through the Courts the coming winter, and, to the end that no false steps shall be taken, additional counsel of the highest ability have lately been retained by the Edison Company.

Understanding that you are using, or are contemplating using, incandescent electric light based upon Mr. Edison's inventions, and in conformity with the spirit and essence of the above, your attention is called to the following statement showing what are the patents owned by the Edison Company.

We present also in the enclosed folder statistics showing the extent of the business done by the Edison Company

under these patents. In contrast with the detailed statement therein submitted, we need only state that carefully compiled statistics show that the fifteen infringing companies, aspiring to secure business, by the illegal use of our patents, had up to the 1st day of October, 1886, placed in central stations and isolated plants throughout the U. S., a total of only 84,600 lamps. This includes a great number of lights now discontinued, and also several thousand lights yet to be supplied from central stations which were at that date in process of construction.

We are legally advised that we may look to you for damages in case we maintain any one of the broad patents enumerated herein. The measure of damages for infringement of patented goods has been fixed by the Courts at about three times the loss sustained by the owners thereof. The extent of the damage to the Edison Company may, in a degree, be approximated by a retrospective glance at the number and formidable character of the companies now embarked in the business of electric lighting, and therefore directly detracting from profits legally the right of the Edison Company.

For the purpose of enabling you to estimate your liability in the event of the Edison patents being sustained, we may state that a conservative calculation apportions a damage of $25 for each lamp in an original installation, and $2.50 for each renewal lamp, independent of the fact that such decision would necessarily render your plant inoperative.

As to the probability of such decision, you are reminded of the well established fact of the origin of the incandescent lamp, of the furore created at the time by the announcement of its discovery, and of the pilgrimage of thousands to Menlo Park to witness the exhibition made by Mr. Edison. You are further reminded of the fact that the Edison patents have been fully sustained in Germany and in England, in both of which countries a most exhaustive search utterly failed to develop either a lack of novelty or a structural weakness in the patent itself,—the two great rocks upon which most inventors' ships are stranded. You are further reminded of the fact that the delay in reaching a decision does not impair its force when attained, a notable example of which is the Goodyear Rubber Co., whose suits were not finally settled until after the expiration of the patents, when large amounts of money were collected in damages.

In respect to the value of the guarantees so freely given you by the companies themselves and by private individuals interested therein, we would respectfully inquire whether in your judgment either the corporations themselves or the individuals interested therein would be able to protect you from the avalanche of damages that the very multiplication of their business transactions during a long continued period of immunity would bring about them? In point of fact, does it not go without saying that the greater the extent to which they may exploit their business, the more disastrous will be the weakness of their guarantees when the day of settlement comes

In respect to the Patent suits brought against the Edison Co., attention is called to the imperative necessity the opposing companies were under to do something to break the moral force of the fact of the Edison suits—to the minor and even trifling details involved and generally to the fact that whilst the Edison Patents cover broadly the fundamental principles of incandescent lighting, the Edison Company does not pretend that the experience of others will not suggest to them more or less of improvement in detail. You are simply reminded in this respect that the Edison Co. being the first in the field and their work being upon such an extensive scale, they have necessarily had the larger experience and consequently their detail must possess the dual quality of originality and superior fitness. But, be this as it may, no detail patent has the force to either mulct a user in damages or stop his plant.

Trusting that our presentation of this purely business matter in a business way and in a spirit the reverse of hostile, may fully accord with your sense of justice and fair dealing, we beg to remain,

Very respectfully,

THE EDISON ELECTRIC LIGHT COMPANY,

E. H. JOHNSON,

President.

Description of the Edison Lamp.

The Edison Incandescent Electric Lamp consists of a chamber or receiver made entirely of glass, from which the air has been exhausted as completely as possible. This chamber is composed of two parts, a bulb or globe and an inner stem or tube; these parts are united by the fusing together of the glass. Through the inner stem pass two wires, and to the ends of these wires within the globe are attached the ends of the incandescent conductor. This is a filament of carbon of high electrical resistance. The ends of the filament are connected to the wires by electro-plating the joints with copper. The portion of each wire which passes through the end of the stem is of platinum, and at this part the glass is melted around the wires and the stem is pressed down upon them so as to form a flat seal. The lamp globe has at its lower end a base composed of plaster-of-paris upon which are secured two contact-plates, one of which is a screw-threaded ring encircling the base, and the other a tip or button at the extremity of the base. Each of the two wires leading from the carbon filament is connected to one of these contacts.

The lower end of the globe is irregular in shape, that is, it has projections extending from it into the plaster. This prevents the lamp from turning in its base.

In making the lamp the globe is first blown from the molten or pot glass; the wires are laid in the stem or tube, the end of the stem is pressed down upon them and the carbon filament is attached to them. This filament is made from a thin strip of bamboo fibre which is bent into the form of an arch or loop and then carbonized. The globe is then secured

by fusion to the stem which has an enlargement or shoulder for this purpose. The lamp is then exhausted of air from the top of the globe, and sealed by fusing the glass together at that point.

While the lamp is being exhausted a current of electricity is passed through the filament, which heats it, and thus drives out the air and other gases which are contained in the pores of the carbon. After the lamp is sealed the base and contact-plates are placed upon it.

For each lamp is provided a socket or holder, so arranged that the lamp can be readily placed in or removed from it; it has within it two contact-plates placed so as to correspond with the contact-plates on the base of the lamp. The socket is adapted to be placed upon a fixture or any other suitable support, and the wires which are to convey current to the lamp enter the socket, and are connected with the contact-plates within it, so that when the lamp is placed in the socket the electrical circuit is completed to and from the carbon filament. The socket is provided with a key or circuit-controller, by turning which one side of the circuit is broken or closed, whereby the lamp is extinguished or lighted.

The following is a statement of certain of the patents owned by The Edison Electric Light Company, the features included in which are employed in the manufacture of the Edison lamp as described above and as shown in the cut, Figure 1, and also in lamps made by other manufacturers of incandescent electric lamps as shown in the other cuts:

1. Patent Number 223,898, dated January 27th, 1880, is for

"1. An electric lamp for giving light by incandescence, consisting of a filament of carbon of high resistance secured to metallic wires.

"2. The combination of carbon filaments with a receiver made entirely of glass, and conductors passing through the glass, and from which receiver the air is exhausted."

2. Patent Number 227,229, dated May 4, 1880, is for

"In an electric lamp, the combination with a hermetically sealed vacuum chamber made entirely of glass, of metallic conductors passing through the

glass and around which the glass is melted, and an incandescent conductor placed in the electric circuit."

3. Patent Number 230,255, dated July 20th, 1880, is for

"The method of forming electric lamps, consisting in separately forming the inclosing globe and the supporting bulb for the incandescent conductor, attaching the wires and incandescent conductor thereto, and then hermetically uniting the parts prior to the formation of the vacuum."

4. Patent Number 251,540, dated December 27, 1881, is for

"An incandescing carbon conductor for electric lights, made from cane bamboo or similar fibre."

5. Patent Number 251,554, dated December 27, 1881, is for

"1. The combination with an incandescent electric lamp and its socket detachable from each other, and adapted to be used in a complete or round wire circuit, of controllable means for positively holding them in position together, and means for automatically completing the circuit connections between them through both limbs or members of the circuit upon placing them together in position.

"2. An incandescent electric lamp having contact-plates or rings upon its neck or base arranged one above the other on the base of the lamp forming the terminals of both limbs or members of a complete or round wire circuit.

"3. The combination with a separate removal incandescent electric lamp and its socket of means for holding them positively in position relatively to each other."

6. Patent Number 264,698, dated September 19, 1882, is for

"1. In an incandescent electric lamp the central tube of support formed with a solid, flat portion at its upper extremity, through which the leading-in conductors pass and in which they are sealed.

"2. The method of sealing the leading-in conductors into the central tubular carbon support of an incandescing electric lamp, consisting in squeezing the open upper end of the tube upon such conductors and at the same time closing air-tight such end of the tube."

7. Patent Number 264,737, dated September 19, 1882, is for

"1. An incandescing electric lamp having an irregularly shaped neck in combination with a collar attached to said neck, and metallic terminals secured to said collar and connected with the leading-in wires of the lamp."

8. Patent Number 265,311, dated October 3, 1882, is for

"1. A separate electric lamp, consisting essentially of an enclosing globe made entirely of glass, and incandescing material secured therein, conductors leading thereto and sealed in the glass where they pass therethrough, and a base of insulating material in which the neck of the globe is secured, said base being provided with metallic contact-plates to which the conductors leading into the globes are secured at their outer ends.

"2. A socket for an electric lamp adapted to be placed upon a gas-pipe or other suitable support, and provided with contact-plates forming the terminals of an electric circuit.

"3. The combination with a bracket or chandelier arm, or other gas or hollow pipe, containing the wires of an electric circuit, of a socket or holder for an electric lamp adapted to be secured therein, and to receive and support the lamp, and provided with contact-plates forming the terminal of the wires of the electric circuit.

"4. A socket for an electric lamp adapted to be placed upon a gas-pipe or other suitable support, and provided with contact-plates forming the terminals of an electric circuit, and also provided with a circuit controller inserted in one branch of the circuit for controlling the circuit."

9. Patent Number 265,777, dated October 20, 1882, is for

"The method of treating the carbon filament of an incandescing electric lamp, consisting in raising such carbon filament to incandescence during the latter part of the process of exhausting the lamp globe, whereby the air and gas are driven from the carbon filament and the flexibility of the filament is increased."

10. Patent Number 266,447, dated October 24, 1882, is for

"The method of manufacturing incandescent electric lamps, consisting in forming the inclosing globe or bulb directly from molten or pot glass, forming separately the supporting tube or neck for the incandescent conductor, sealing therein the leading-in wires, attaching the carbon thereto and then hermetically uniting the parts by welding together prior to the exhaustion of the lamp."

11. Patent Number 317,631, dated May 12, 1885, is for

"In an incandescing electric lamp, the combination with the glass inclosing globe and the neck thereof, of contact-plates joined together and held upon the neck of the lamp by plastic material."

12. Patent No. 251,596, dated December 27th, 1881, is for

"In a socket for electric lamps, the combination, with interior insulating portions provided with circuit-connections, of exterior metal portions, forming a covering therefor."

The following named patents are some of those owned by The Edison Electric Light Company, the devices covered by which are not used by that company but are employed in lamps made by other electric lamp manufacturers:

1. Patent Number 239,153, dated March 22, 1881, is for

"The combination with the glass inclosing globe and incandescing conductor of an electric lamp, of a support hermetically sealed to the globe and supporting the carbons at a distance above the point of sealing."

2. Patent Number 307,029, dated October 21, 1884, is for

"The process of forming flexible incandescing filaments for electric lamps, consisting in first forming a straight filament of carbonizable substance, then carbonizing the same and finally bending the flexible filament thus formed into the desired shape."

In addition to the patents above enumerated, which relate only to the lamp itself, the Edison Co. is the owner of other patents covering other details of lamp construction, and of various devices, such as dynamo-electric machines, meters, motors, regulators, etc., which are or may be required to form a complete and perfect system of electric lighting or distribution.

The following is a complete list of the Edison Company's patents:

No.	Date.	Title of Patent.
181,613	August 29, 1876.	Electric Lighting.
214,636	April 22, 1879.	Improvement in Electric Lights.
214,637	" 22, "	" " Thermal Regulators.
218,166	August 5, "	" " Magneto-electric Machines.
218,167	" 5, "	" " Apparatus for Electric Lights.
218,866	" 26, "	" " Electric Lighting Apparatus.
219,393	Sept. 9, "	" " Dynamo-electric Machines.
219,628	" 16, "	" " Electric Lights.
222,881	Dec. 23, "	" " Magneto-electric Machines.
223,112	" 30, "	Method for Measuring Electricity.
223,898	Jan. 27, 1880.	Electric Lamp.
224,329	Feb. 10, "	Electric Lighting Apparatus.
227,226	May 4, "	Safety-conductor for Electric Lights.
227,227	" 4 "	Electric Light.
227,228	" 4, "	" "
227,229	" 4, "	" "
228,617	June 8, "	Brake for Electro-magnetic Motors.
230,255	July 20, "	Method of Manufacturing Electric Lamps.
237,732	Feb. 15, 1881.	Electric Light.
238,868	March 15, "	Manufacture of Carbons, Incandescent Lamps.
239,147	" 22, "	System of Electric Lighting.
239,148	" 22, "	Treating Carbons for Electric Lamps.
239,149	" 22, "	Incandescing Electric Lamp.
239,150	" 22, "	Electric Lamp.
239,151	" 22, "	Method of Forming Enlarged Ends on Carbon Filaments.
239,152	" 22, "	System of Electric Lighting.
239,153	" 22, "	Electric Lamp.
239,372	" 29, "	Testing Electric Light Carbons.
239,373	" 29, "	Electric Lamp.
239,374	" 29, "	Regulating the Generation of Electric Currents.
239,745	April 5, "	Electric Lamp.
240,678	" 26, "	Webermeter.
242,896	June 14, "	Incandescent Electric Lamp.
242,897	" 14, "	" " "

No.	Date.			Title of Patent.
242,898	June	14,	1881.	Magneto or Dynamo-electric Machine.
242,899	"	14,	"	Electric Lighting.
242,900	"	14,	"	Manufacturing Carbons for Electric Lamps.
242,901	"	14,	"	Electric Meter.
248,416	Oct.	18,	"	Manufacture of Carbons for Electric Lamps.
248,417	"	18,	"	Manufacturing " " " "
248,418	"	18,	"	Electric Lamp.
248,419	"	18,	"	Electric Lamp.
248,420	"	18,	"	Fixture and Attachment for Electric Lamp.
248,421	"	18,	"	Current Regulator for Dynamo-electric Machines.
248,422	"	18,	"	System of Electric Lighting.
248,423	"	18,	"	Carbonizer.
248,424	"	18,	"	Fitting and Fixture for Electric Lamps.
248,425	"	18,	"	Apparatus for Producing High Vacuums.
248,426	"	18,	"	Apparatus for Treating Carbons.
248,427	"	18,	"	Apparatus for Treating Carbons.
248,428	"	18,	"	Manufacture of Incandescent Electric Lamps.
248,429	"	18,	"	Electric Motor.
248,430	"	18,	"	Electro-magnetic Brake.
248,433	"	18,	"	Vacuum Apparatus.
248,434	"	18,	"	Governor for Electric Engines.
248,435	"	18,	"	Utilizing Electricity as a Motive Power.
248,436	"	18,	"	Depositing Cell for Plating the Connections of Electric Lamps.
248,437	"	18,	"	Apparatus for Treating Carbons.
248,565	"	18,	"	Meter.
251,536	Dec.	27,	"	Vacuum Pump.
251,537	"	27,	"	Dynamo-electric Machine.
251,538	"	27,	"	Electric Light.
251,539	"	27,	"	Electric Lamp.
251,540	"	27,	"	Carbon for Electric Lamps.
251,541	"	27,	"	Electro-magnetic Motor.
251,542	"	27,	"	System of Electric Lighting.
251,543	"	27,	"	Electric Lamp.
251,544	"	27,	"	Manufacture of Electric Lamps.
251,545	"	27,	"	Electric Meter.
251,546	"	27,	"	Electric Lamps.
251,547	"	27,	"	Electric Governor.
251,548	"	27,	"	Incandescent Electric Lamp.
251,549	"	27,	"	Electric Lamp and the Manufacture thereof.
251,550	"	27,	"	Magneto or Dynamo-electric Machine.
251,551	"	27,	"	System of Electric Lighting.
251,552	"	27,	"	Underground Conductor.
251,553	"	27,	"	Electric Chandelier.
251,554	"	27,	"	Electric Lamp and Socket.
251,555	"	27,	"	Regulator for Dynamo-electric Machine.
251,556	"	27,	"	Regulator for Dynamo-electric Machine.
251,557	"	27,	"	Webermeter.
251,558	"	27,	"	"
251,559	"	27,	"	Electrical Drop-light.
251,596	"	27,	"	Socket for Electric Lamps.
257,276	May	2,	1882.	Switch for Electric Light Circuits.
257,277	"	2,	"	Socket for Electric Lamps.
260,562	July	24,	"	Switch and Indicator for Electric Lamps.
12,631	"	27,	"	Design for an Incandescent Electric Lamp.
263,133	August	22,	"	Dynamo or Magneto-electric Machine.
263,134	"	22,	"	Regulator for Dynamo or Magneto-electric Machines.
263,135	"	22,	"	Electric Lamp.

No.	Date.	Title of Patent.
263,136	August 22, 1882.	Regulator for Dynamo or Magneto-electric Machines.
263,137	" 22, "	Electric Chandelier.
263,138	" 22, "	Electric Arc Light.
263,139	" 22, "	Manufacture of Carbons for Electric Lamps.
263,140	" 22, "	Dynamo-electric Machine.
263,141	" 22, "	Straightening Carbons of Electric Incandescent Lamps.
263,142	" 22, "	Electrical Distribution System.
263,143	" 22, "	Magneto or Dynamo-electric Machine.
263,144	" 22, "	Mold for Carbonizing Incandescents.
263,145	" 22, "	Making Incandescents.
263,146	" 22, "	Dynamo or Magneto-electric Machines.
263,147	" 22, "	Vacuum Apparatus.
263,148	" 22, "	Dynamo or Magneto-electric Machine.
263,149	" 22, "	Commutator for Dynamo or Magneto-electric Machines.
263,150	" 22, "	Magneto or Dynamo-electric Machine.
263,878	Sept. 5, "	Electric Lamps.
264,298	" 12, "	Coupling Device for Electrical Conductors.
264,299	" 12, "	Connection for Electric Circuits.
264,642	" 19, "	Electric Distribution and Translation System.
264,643	" 19, "	Magneto-electric Machine.
264,645	" 19, "	System of Conductors for the Distribution of Electricity.
264,646	" 19, "	Dynamo or Magneto-electric Machine.
264,647	" 19, "	Dynamo or Magneto-electric Machine.
264,648	" 19, "	Dynamo or Magneto-electric Machine.
264,649	" 19, "	Dynamo or Magneto-electric Machine.
264,650	" 19, "	Manufacture of Incandescing Electric Lamps.
264,651	" 19, "	Incandescent Electric Lamp.
264,652	" 19, "	Incandescent Electric Lamp.
264,653	" 19, "	Incandescent Electric Lamp.
264,654	" 19, "	Incandescent Electric Lamp.
264,655	" 19, "	Incandescent Electric Lamp.
264,656	" 19, "	Incandescent Electric Lamp.
264,657	" 19, "	Incandescent Electric Lamp.
264,658	" 19, "	Regulator for Dynamo-electric Machines.
264,659	" 19, "	Regulator for Dynamo-electric Machines.
264,660	" 19, "	Regulator for Dynamo-electric Machines.
264,661	" 19, "	Regulator for Dynamo-electric Machines.
264,662	" 19, "	Regulator for Dynamo-electric Machines.
264,663	" 19, "	Regulator for Dynamo-electric Machines.
264,664	" 19, "	Regulator for Dynamo-electric Machines.
264,665	" 19, "	Regulator for Dynamo-electric Machines.
264,666	" 19, "	Regulator for Dynamo-electric Machines.
264,667	" 19, "	Regulator for Dynamo-electric Machines.
264,668	" 19, "	Regulator for Dynamo-electric Machines.
264,669	" 19, "	Regulator for Dynamo-electric Machines.
264,670	" 19, "	Regulator for Dynamo-electric Machines.
264,671	" 19, "	Regulator for Dynamo-electric Machines.
264,672	" 19, "	Regulator for Dynamo-electric Machines.
264,673	" 19, "	Regulator for Dynamo-electric Machines.
264,698	" 19, "	Electric Lamp.
264,737	" 19, "	Incandescing Electric Lamp.
265,311	Oct. 3, "	Electric Lamps and Holders for Same.
265,774	" 10, "	Maintaining Temperature in Webermeters.
265,775	" 10, "	Electric Arc Light.
265,776	" 10, "	Electric Lighting System.
265,777	" 10, "	Treating Carbons for Electric Lamps.

No.	Date.			Title of Patent.
265,779	Oct.	10,	1882.	Regulator for Dynamo-electric Machines.
265,780	"	10,	"	Regulator for Dynamo-electric Machines.
265.781	"	10,	"	Regulator for Dynamo-electric Machines.
265,782	"	10,	"	Regulator for Dynamo-electric Machines.
265,783	"	10,	"	Regulator for Dynamo-electric Machines.
265,784	"	10,	"	Regulator for Dynamo-electric Machines.
265,785	"	10,	"	Dynamo-electric Machine.
265,786	"	10,	"	Apparatus for the Electrical Transmission of Power.
265,858	"	10,	"	Regulator for Dynamo-electric Machines.
265,859	"	10,	"	Regulator for Dynamo-electric Machines.
266,447	"	24,	"	Electric Incandescent Lamps.
266,588	"	24,	"	Vacuum Apparatus.
266,793	"	31,	"	Electrical Distribution Systems.
266,808	"	31,	"	Safety-catch.
268,205	Nov.	28,	"	Dynamo or Magneto-electric Machines.
268,206	"	28,	"	Incandescing Electric Lamps.
271,613	Feb.	6,	1883.	Manufacture of Incandescing Electric Lamps.
271,614	"	6,	"	Shafting.
271,615	"	6,	"	Governors for Dynamo-electric Machines.
271,616	"	6,	"	Regulators for Dynamo-electric Machines.
271,628	"	6,	"	Secondary Batteries.
271,654	"	6,	"	Regulators for Dynamo-electric Machines.
273,485	March	6,	"	Incandescing Electric Lamps.
273,486	"	6,	"	Incandescing Electric Lamps.
273,487	"	6,	"	Regulators for Dynamo-electric Machines.
273,488	"	6,	"	Regulators for Dynamo-electric Machines.
273,491	"	6,	"	Regulators for Driving Engines of Electrical Generators.
273,492	"	6,	"	Secondary Batteries.
273,493	"	6,	"	Valve-gear for Electrical Generator-engines.
273,828	"	13,	"	System of Underground Conductors for Electrical Distribution.
274,290	"	20,	"	Systems of Electrical Distribution.
274,291	"	20,	"	Molds for Carbonizing.
274,292	March	20,	1883.	Secondary Batteries.
274,293	"	20,	"	Electric Lamps.
274,294	"	20,	"	Incandescing Electric Lamps.
274,295	"	20,	"	Incandescing Electric Lamps.
274,296	"	20,	"	The Manufacture of Incandescents.
275,612	April	10,	"	Manufacture of Ipcandescing Electric Lamps.
275,613	"	10,	"	Incandescing Electric Lamps.
275,749	"	10,	"	Connection for Electric Light Fixtures.
276,232	"	24,	"	Means for Operating and Regulating Electrical Generators.
276,233	"	24,	"	Electrical Generators and Motors.
13,940	May	29,	"	Design for Incandescing Electric Lamps.
278,413	"	29,	"	Regulator for Dynamo-electric Machine.
278,414	"	29,	"	Regulator for Dynamo-electric Machine.
278,415	"	29,	"	Manufacturing of Incandescing Electric Lamps.
278,416	"	29,	"	Manufacturing of Incandescing Electric Lamps.
278,417	"	29,	"	Manufacturing of Incandescing Electric Lamps.
278,418	"	29,	"	Apparatus for Translating Electric Currents from High to Low Tension.
278,419	"	29,	"	Dynamo-electric Machine.
278,535	"	29,	"	System of Electrical Distribution.
280,563	July	3,	"	Electrical Measuring Apparatus.
280,727	"	3,	"	System of Electrical Distribution.
281,349	"	17,	"	Regulator for Dynamo-electric Machines.
281,350	"	17,	"	Regulator for Dynamo-electric Machines.

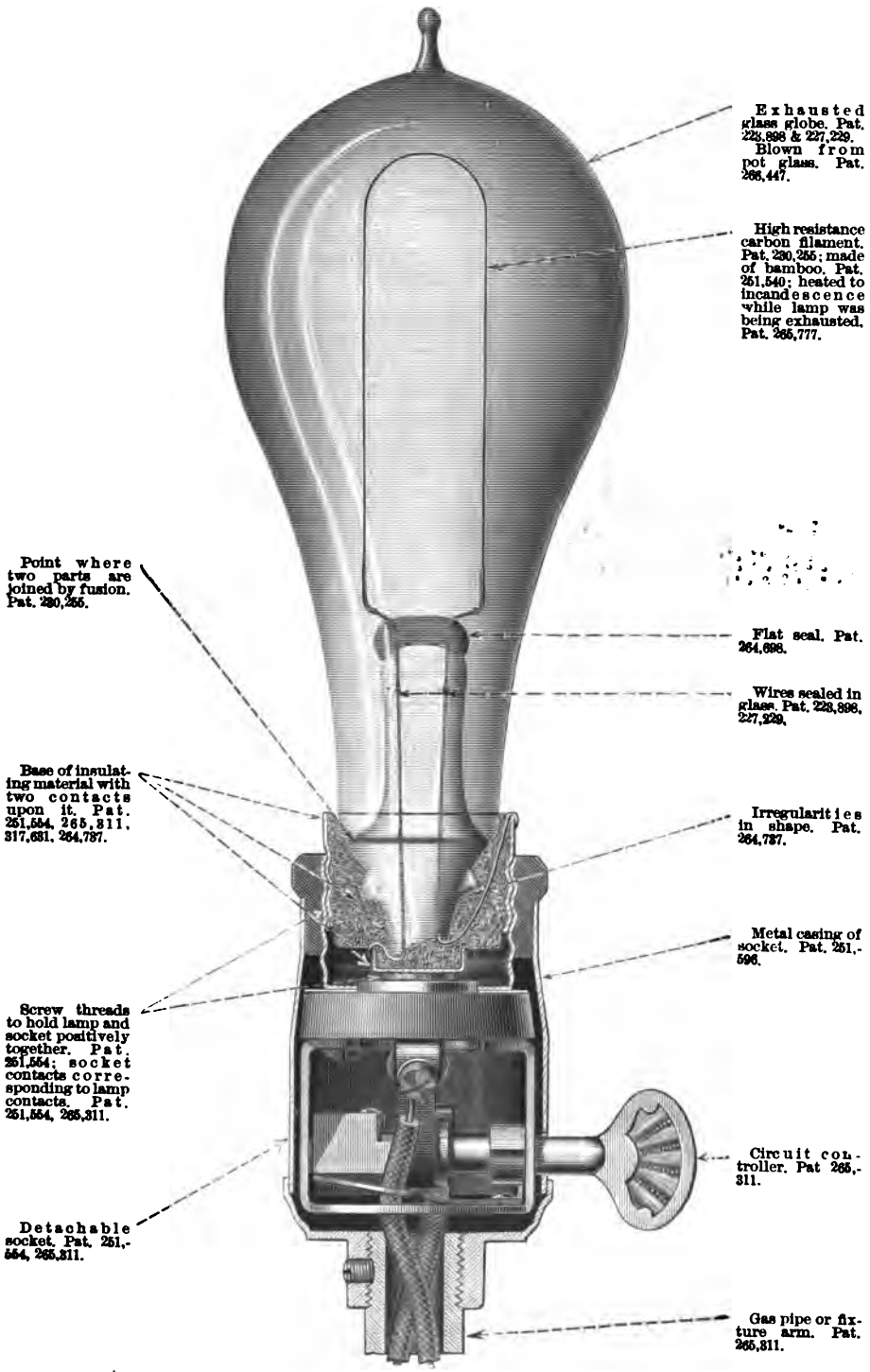
No.	Date.			Title of Patent.
281,351	July	17,	1883.	Electrical Generator.
281,352	"	17,	"	Webermeter.
281,353	"	17,	"	Dynamo-electric Machine.
281,576	"	17,	"	Safety-catch for Electric Light Circuits.
283,270	August	14,	"	Incandescing Electric Lamp.
283,983	"	28,	"	System of Electrical Distribution.
283,984	"	28,	"	System of Electrical Distribution.
283,985	"	28,	"	System of Electrical Distribution.
283,986	"	28,	"	System of Electrical Distribution.
287,501	Oct.	30,	"	Electrical Testing.
287,511	"	30,	"	Electric Regulator.
287,512	"	30,	"	Dynamo-electric Machine.
287,513	"	30,	"	Dynamo-electric Machine.
287,514	"	30,	"	Dynamo-electric Machine.
287,515	"	30,	"	System of Electrical Distribution.
287,516	"	30,	"	System of Electrical Distribution.
287,517	"	30,	"	System of Electrical Distribution.
287,518	"	30,	"	Manufacturing Incandescing Electric Lamps.
287,519	"	30,	"	Incandescing Electric Lamp.
287,520	"	30,	"	Incandescing Conductor for Electric Lamps.
287,521	"	30,	"	Dynamo-electric Machine.
287,522	"	30,	"	Mold for Carbonizing.
287,523	"	30,	"	Dynamo-electric Machine.
287,524	"	30,	"	Regulator for Dynamo-electric Machine.
287,525	"	30,	"	Regulator for Systems of Electric Distribution.
287,532	"	30,	"	Junction for Electrical Conductors.
287,533	"	30,	"	Safety-catch for Electric Circuits.
288,318	Nov.	13,	"	Regulator for Dynamo-electric Machine.
293,432	Feb.	12,	1884.	Electrical Generator or Motor.
293,434	"	12,	"	Incandescent Electric Lamp.
293,435	"	12,	"	Electrical Meter.
297,580	April	29,	"	Electric Arc Lights.
297,581	"	29,	"	Incandescent Electric Lamp.
297,582	"	29,	"	Dynamo-electric Machine.
297,583	"	29,	"	Dynamo-electric Machine.
297,584	"	29,	"	Dynamo-electric Machine.
297,585	"	29,	"	Incandescing Conductor for Electric Lamps.
297,586	"	29,	"	Electrical Conductor.
297,587	"	29,	"	Dynamo-electric Machine.
298,658	May	13,	"	Socket for Incandescent Electric Lamps.
298,679	"	13,	"	Treating Carbons for Electric Lights.
298,954	"	20,	"	Dynamo-electric Machine.
298,955	"	20,	"	Dynamo-electric Machine.
298,956	"	20,	"	Operating Dynamo-electric Machines.
304,082	August	26,	"	Electrical Meter.
304,083	"	26,	"	Dynamo-electric Machine.
304,084	"	26,	"	Device for Protecting Electric Light Systems from Lightning.
304,085	"	26,	"	System of Electrical Distribution.
304,086	"	26,	"	Incandescent Electric Lamp.
304,087	"	26,	"	Electrical Conductor.
307,029	Oct.	21,	"	Filament for Incandescent Lamps.
307,030	"	21,	"	Electrical Meter.
307,031	"	21.	"	Electrical Indicator.
314,582	March	21,	1885.	Safety-catch for Electric Circuits.
317,632	May	12,	"	Incandescent Electric Lamp.
317,633	"	12,	"	Incandescent Electric Lamp.
328,572	ct.	20,	"	Commutator for Dynamo Electric Machine.
328,573	"	20,	"	System of Electric Lighting.
328,574	"	20,	"	System of Electric Lighting.

No.	Date.	Title of Patent.
328,575	Oct. 20, 1885.	System of Electric Lighting.
334,853	Jan. 26, 1886.	Mold for Carbonizing.
339,279	April 6, "	System of Electric Distribution.
341,644	May 11, "	Incandescent Electric Lamp.
341,839	" 11, "	Incandescent Electric Lamp.

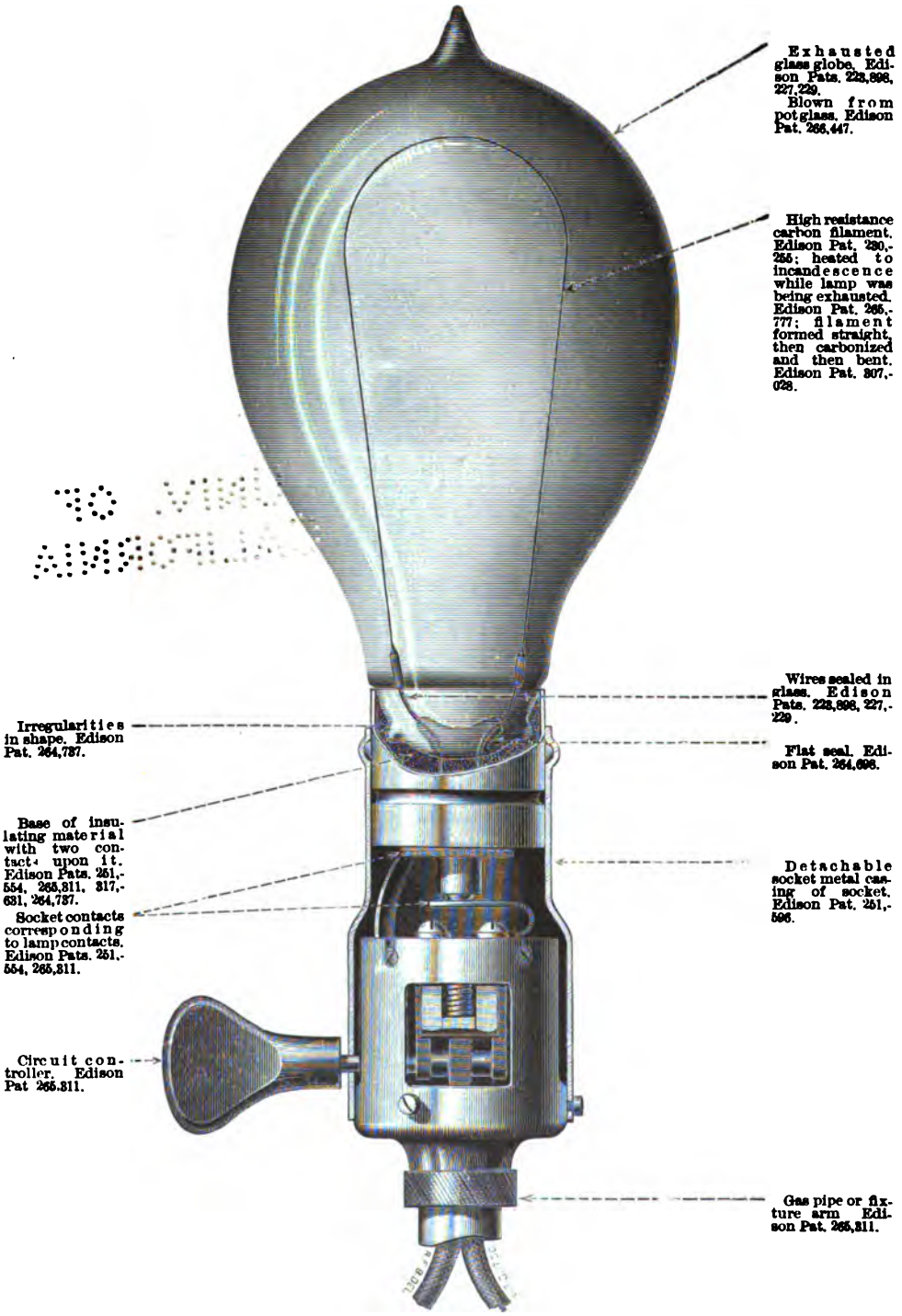
The following cuts are designed to illustrate the infringement of the Edison patents by the lamps of other makers. They are taken directly from the lamps and sockets themselves.

It will be apparent that in each of the infringing lamps, where it is attempted to avoid any one of the Edison patents, this is done by the omission of some useful part or device, or by the substitution of inferior ones to those employed by the Edison Company.

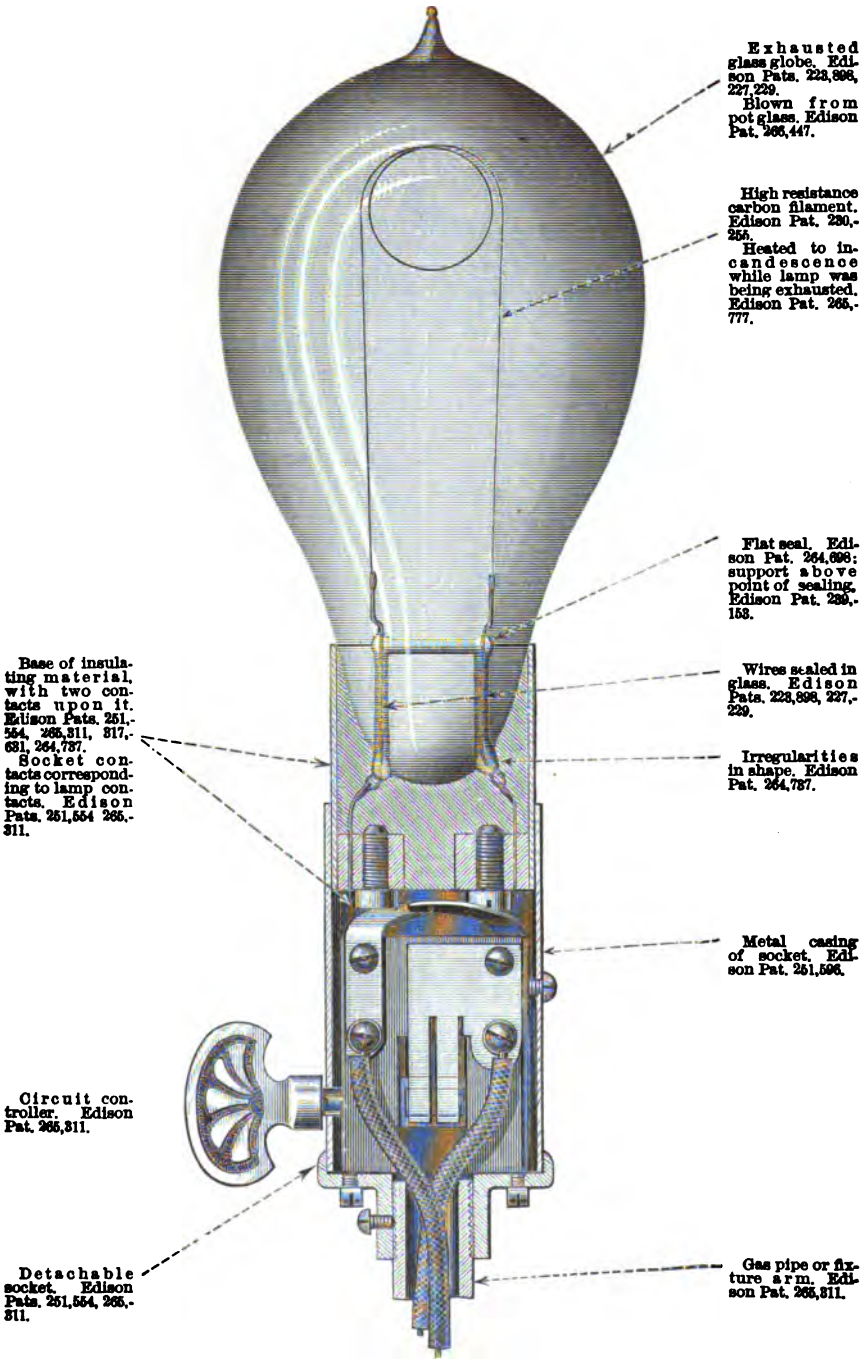
All lamps now on the market, it will be seen, infringe a greater or less number of the Edison patents, and it is impossible to construct a commercially practical incandescent electric lamp without using many of the devices covered by the patents owned by The Edison Electric Light Company.



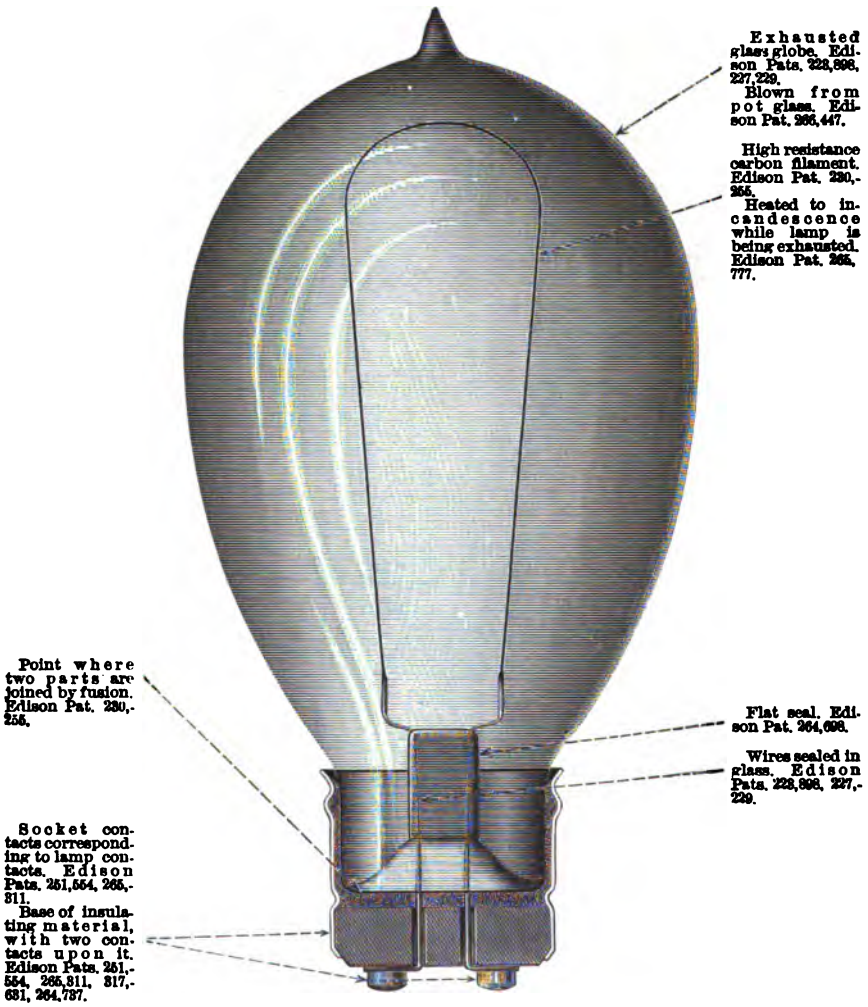
THE EDISON LAMP.



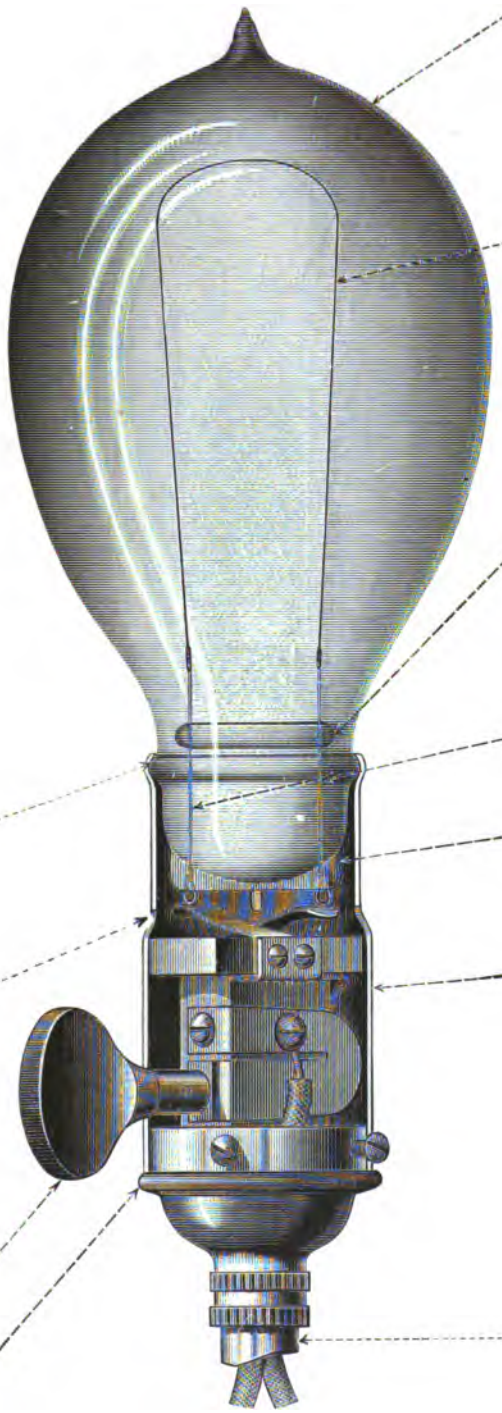
The United States Co. (Weston Lamp) Infringing the Edison Patents.



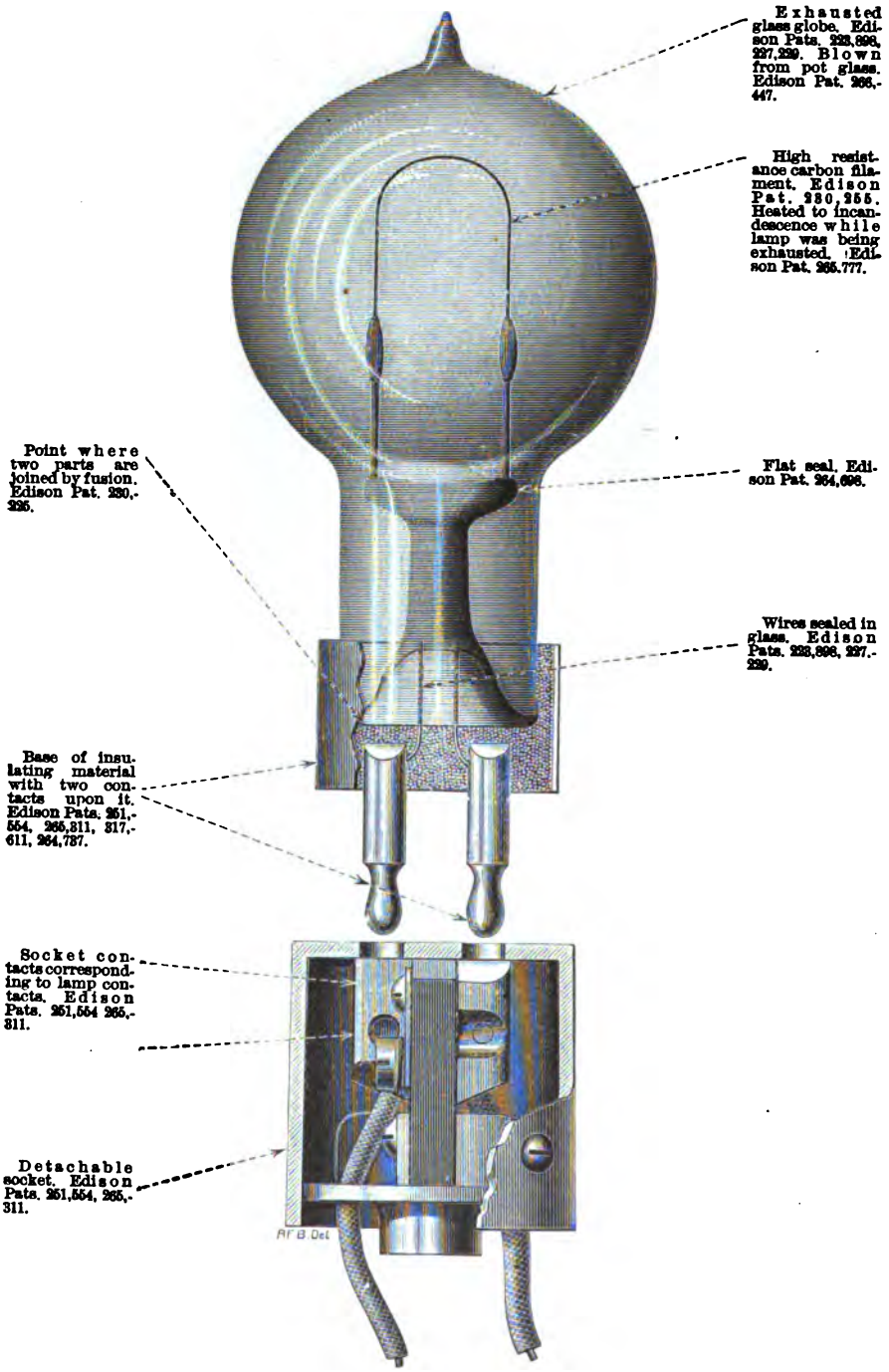
Brush-Swan Infringements of the Edison Patents.



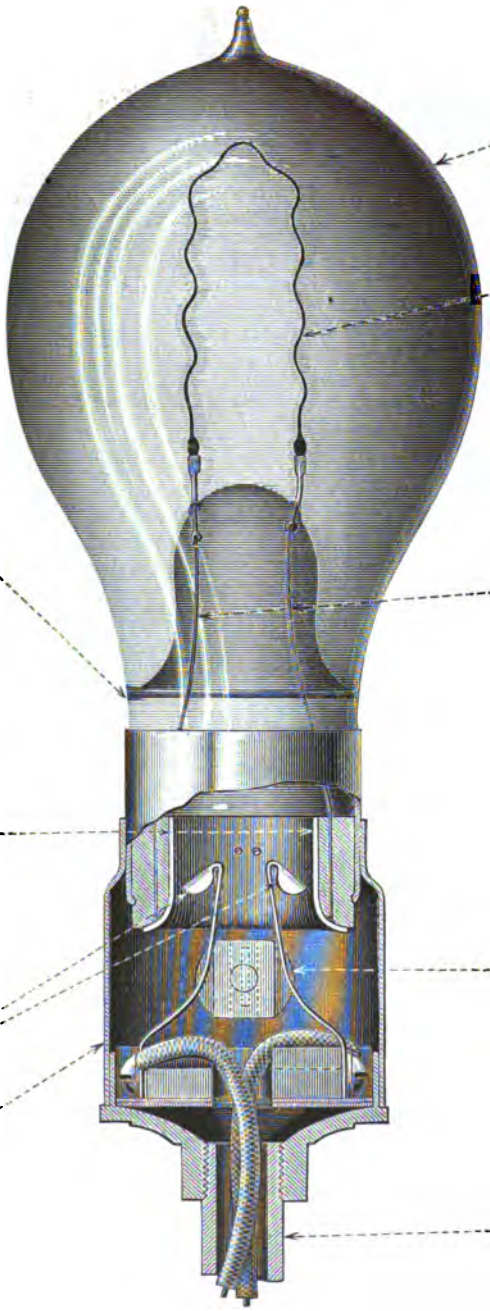
Westinghouse Co. Infringements of the Edison Patents (No. 1).



Westinghouse Co. Infringements on the Edison Patents (No. 2).



Bernstein Infringements of the Edison Patents.



Mather Co. Infringements on the Edison Patents.

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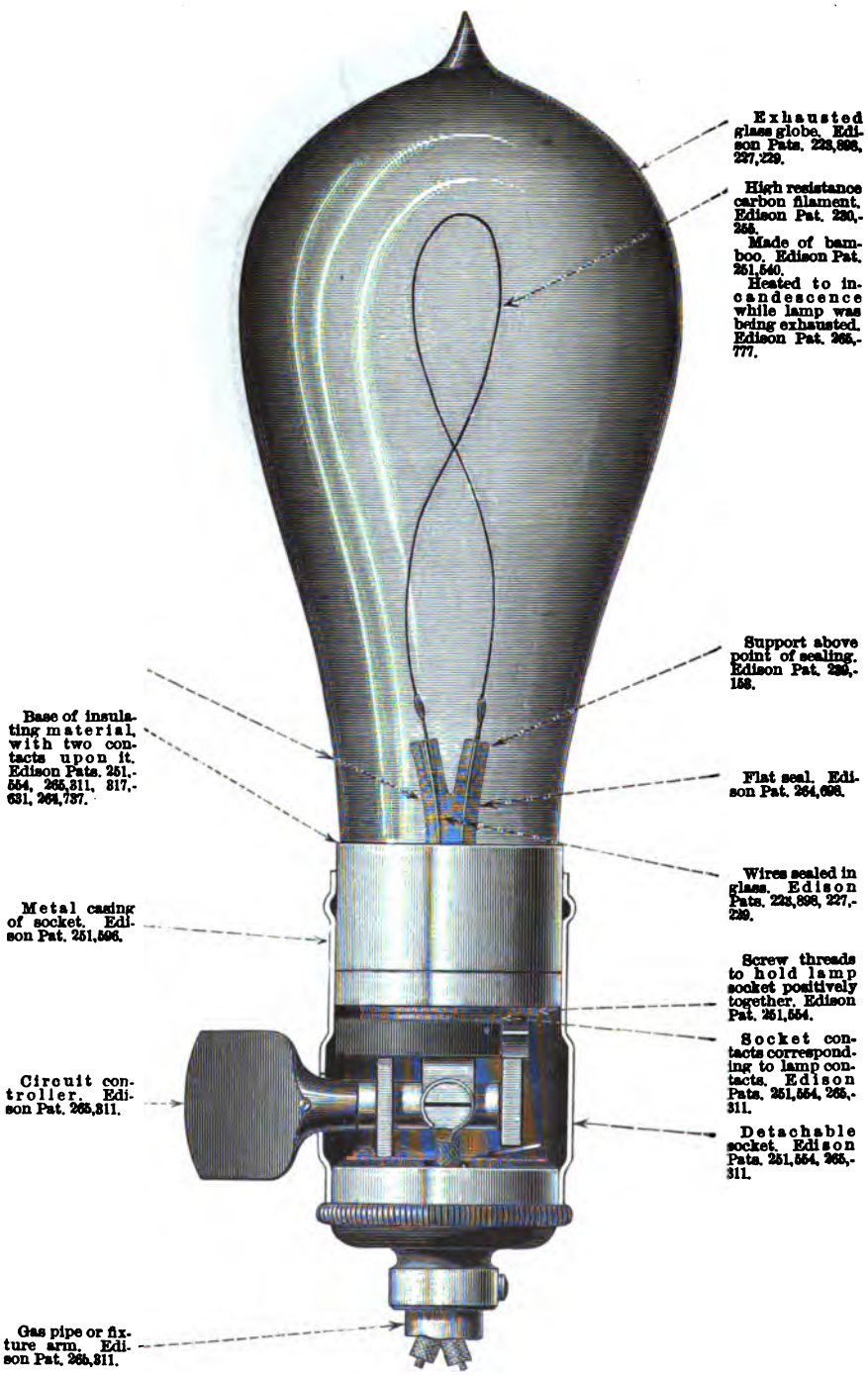
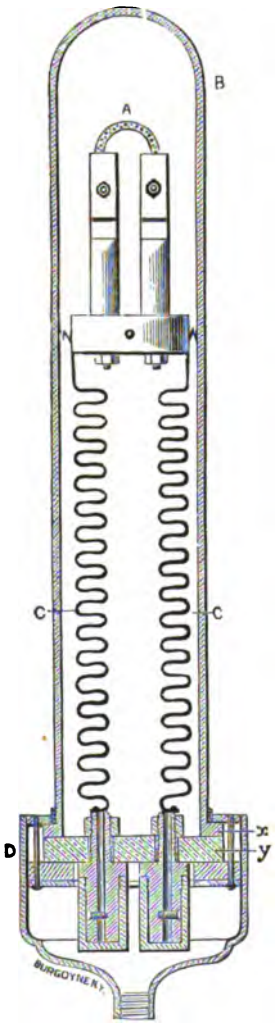


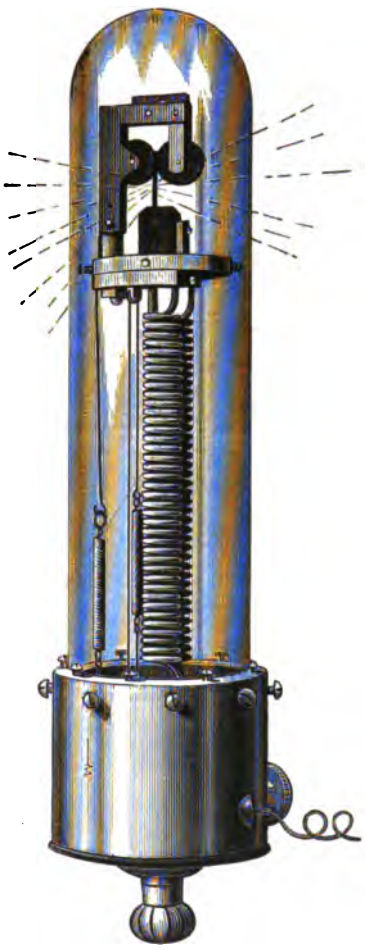
Consolidated Co. (Sawyer-Man) Infringements of the Edison Patents.



Sawyer-Man Lamp.

The Sawyer and Man Lamp, as patented by them May 12, 1885, the application for the patent having been filed January 9, 1880.

Referring to the letters on the illustration, A is a piece of carbon $\frac{1}{10}$ of an ohm in resistance; the globe B is filled with nitrogen gas, and has its base flange *x* clamped by rings and bolts to the plate *y*; the cup D is filled with wax; the conductors C C are known as "radiators," and serve to radiate the heat generated by waste of energy in the lamp.



Sawyer Lamp.

After the failure of Sawyer and Man, Sawyer alone produced what he called his "feeder" lamp, shown by this cut.

This lamp has the burner of the old Werdermann Lamp placed in a Sawyer and Man structure. Like the Sawyer and Man Lamp it was a failure.