NEW GILBERT CHEMISTRY SETS

Newly designed in Gilbert’s chemical laboratory in collaboration with one of America’s outstanding chemical research laboratories under the direction of Treat B. Johnson, Yale University, Ph.D., a recognized authority on chemistry.

NEW BASEWOOD LABORATORY TYPE CABINETS

At left—No. 1 CHEMISTRY

The Handy Beginner’s Set

At right—No. 2 JUNIOR CHEMISTRY

Laboratory

Here is the set that will interest the beginner and assure him to perform many simple and amusing experiments. Above the desk, at eye level, a row of eight vital experiments that can be done by any one. Both sets include 25 sheets of chemicals and apparatus and 300 all-metal desks and test-tube racks. Packed in Basewood laboratory cabinet.

NEW EXPERIMENTER’S DESK TYPE LABORATORY

At left—No. 3 INTERMEDIATE CHEMISTRY LABORATORY

With this great outfit for the younger chemist you can clean glassware, make experiments, clean, and all sorts of things, etc. These 600 experiments and 200 accessories make this the most complete set. Illustrated and described below—NEW—up-to-date—COMPLETE DESK TYPE LABORATORY OUTFITS

Above—No. 14 INVENTOR’S DESK TYPE CHEMISTRY LABORATORY

Here are men of chemicals at your fingertips. With this laboratory you can dive into the wizardry of chemical magic. 111 chemicals and pieces of apparatus with three big books describing over 400 experiments in chemistry, glass blowing and chemical magic. Laboratory is mounted on a table with oak trim. Easy to keep clean. Finished in Basewood with hardwood corners and top. 17 ft. of test-tube racks and shelf space. Stand 47½” high, 39” wide, table-top 14½” deep.

At right—No. 25 MASTER SCIENTISTS’ DESK TYPE CHEMISTRY LABORATORY

This unrivaled desk type laboratory is the finest of its kind for the student or young scientist. Over 300 pieces of chemicals, apparatus and equipment including five big books on Chemistry, Chemical Magic, Hydraulics and Pneumatics, and Glass Blowing. Also a book, a scale, a steel or glass vial, a graduated cylinder, a thermometer, and various other tools. Includes a complete set of apparatus and all other equipment necessary to do over a thousand experiments. Many new experiments never before attempted in experimental chemistry. Over 140 experiments, artificial refrigeration, steel glass, liquid air, radioactivity, soap and water, tailing of bees, electricity, electrifying, electroplating, etching, electrolysis, physics, geological, biological, and chemical experiments in the 24 Vivid Books of Experiments. Stand 57½” high, 39” wide, table-top 14½” deep.

One after another amazing and unbelievable secrets are revealed.

You’re a real Chemist when you have a GILBERT CHEMISTRY OUTFIT

Exciting discoveries lie beneath the cover of every Gilbert Chemistry Outfit. One of the after another amazing and unbelievable secrets are revealed.

You can change water into wine in a flash! Change the wine into milk. Make fire from sugar. Make invisible ink. These are just a few of the hundreds of uncanny feats of science you can perform.

All the popular Gilbert Outfits, both cabinets and desk type laboratories, are shown on this page. Examine them closely. See them at your nearest local toy store.

$100.00 ANNUAL AWARD and 10 awards of $10.00 each

“To the boy doing what, in my opinion is, the most important chemical research work in 1937, I will make a cash award of $100.00. To the ten boys doing the next most important chemical research work I will award $10.00 each. Applicants for these awards must not be over 17 years of age, and must send a full description of their experiments by June 1, 1937.”

A. C. Gilbert

PRICES

No. 1 Chemistry . $ 1.00
No. 2 Chemistry . 1.50
No. 3 Chemistry . 3.00
No. 6 Chemistry . 5.00
No. 8 Chemistry . 7.00
No. 14 Chemistry . 15.50
No. 25 Chemistry . 22.50
No. X1555A Scales . 50
Wonderful Advance, Improvement and Added Educational Value in Toys from Beginning of Century

I am assuming that hardly any of you boys have ever given much thought to the wonderful advancement in construction and added educational value of the toys of today over those of only a few short years ago.

You have probably heard Mother and Dad say many times "We never had such wonderful toys when we were kids," and let it go at that, but nevertheless, it's true, and a great change has taken place since their time.

Times, conditions, the world's rapid advancement, and man's ability to master, through his skill, obstacles that once seemed to be unsurmountable barriers, all have a part in this great forward movement.

Youth of today lives in an atmosphere of speed, invention, and push, and he sees performed right before his very eyes, achievements that are actually miracles, and he revels in the opportunities that give him, through the modern toy, a chance to create, experiment, and advance for himself. All of this is reflected in the toys of today—of course, little tots still have their dolls, rubber rattles, pull toys, bells, whistles, alphabet blocks, animals, tin trumpets, drums, Noah's Arks, etc., but for the boy of advanced age, his play hours are devoted to toys that are decidedly different. His outlook on life is in keeping with all that he sees around him, and he wants to be a part of it. He desires toys that will bring realism into miniature construction, that will permit him to delve into the mysteries of chemistry, that will reveal exciting discoveries in electrical experiments, that will permit him to explore for hidden mysteries of nature through the searching eye of the microscope, and to enjoy hundreds of thrills with other scientific toys. All this appeals to his intellect, for they are toys with which he can "do things" and get just the kind of fun he wants.

In presenting the different Gilbert Toys that are illustrated on the colored pages, you'll find a variety of scientific outfits that have all been invented by Mr. Gilbert for the express purpose of giving you fun, thrills, and excitement, and to be of greatest educational value.

Mr. Gilbert believes that every boy is interested in things that will make him think for himself, and that boys want to know about all the wonders and principles of mechanics, engineering, electricity, chemistry, etc., and every Gilbert Toy is built to fill this need.

You'll soon be taking your regular jaunts along the gaily decorated thoroughfares, where shop windows will be jam full of toys and other Christmas gifts, but your visit to Toyland we know will hold you spellbound, for there in all its brilliancy and vivid colorings, will be a veritable fairyland with toys of every description and kind.

You'll find the complete Gilbert line for your personal inspection—big action models of Erector, with motors humming, turning giant fly wheels on power plants, operating elevators, ferris wheels, walking beam engines, etc. You'll see the most complete Chemistry laboratories ever made for a boy—electrically operated Kaster Kit molding outfits will be on display and demonstrated, Opto Kits, Electrical Sets, Tool Chests, Glass Blowing and Mineralogy outfits, also Magic and Puzzle Sets. Just look for the big sign that reads "Gilbert Hall of Science." We are sure you'll be thrilled by these startling exhibits and that in these groupings you'll find just the Gilbert Toy you want to take home with you.
20th Century Marvels of Transportation
Crossing the Atlantic with Speed and Luxury

In the entire history of ocean transport the North Atlantic has been the marine speedway of the world. Nations have been in constant rivalry in their never ending race for supremacy and even before the advent of steam, newspapers were advocating the merits of the American Black Ball Line, whose fast sailing clippers damped distant rivalry in their never ending race for supremacy and even been the marine speedway of the world. Nations have been in competition by sailing ships.

August 4th she completed a record crossing in four days, 7 hours and 59 minutes, exceeding the previous record time by 1 1/2 days and set a new record for the fastest crossing ever recorded for a steamer between Europe and New York and on August 30th she completed a record crossing in four days, 7 hours and 42 minutes to win the Blue Ribbon to become the fastest vessel on the high seas.

The Queen Mary's gross tonnage is 80,773--her length overall 949 feet and her breadth 128 feet. She is the second vessel ever built to exceed 900 feet in length and these figures will give one a relative idea of her huge bulk. Her height from keel to top superstructure is 35 feet, from keel to crown of forward funnel 280 feet and from keel to mainmast 334 feet. She is equipped with four sets of Parsons turbines with an output of 200,000 h.p. and each of the 375,000 blades for the complete set of turbines were fitted and tested by hand. Steam is supplied to the propelling turbines from 24 Yarrow Water Tube boilers and these have a working pressure of 425 lbs. per square inch and a steam temperature of 700 degrees F. At full pressure the 24 boilers are about 4,000,000 gallons of fresh water a day.

So high is the speed at which the turbine revolves that if it were possible to use a propeller large enough to utilize the fall effect of all the power developed. Power--Speed--Safety--Convenience--Comfort--all combine to justify the claim that these palaces of sea and air are brilliant engineering and construction triumphs.

We wonder in amazement at man's ability to create such mammoth structures, we marvel at the complexity of it all, yet facts are truths and engineering skill has done itself proud in this era of modern accomplishments. Falling on her maiden voyage to wrest the speed record from the giant French liner Normandie, the Queen Mary did, however, on July 27th, make the fastest crossing ever recorded for a steamer between Europe and New York and on August 4th she completed a record crossing in four days, 7 hours and 42 minutes to win the Blue Ribbon to become the fastest vessel on the high seas.

The five propeller shafts are of hollow steel, two feet in diameter and fitted to thrust blocks or bearings at the gear cases. Each was cast from 20 tons of manganese bronze and when machined and finished weighed 35 tons. The propellers themselves are the largest ever constructed.

Like all modern liners of great speed the Queen Mary burns oil fuel only. This fuel is contained in bunkers at each side of the boiler rooms, their total capacity being 6,500 tons and so carefully has the air and overflow pipe system been planned, that no oil vapor with its distinctive and unpleasant odor escape. It requires eight hours for refilling these bunkers. She is driven by four giant propellers--two on each side. Each was cast from 20 tons of manganese bronze and when machined and finished weighed 35 tons. The propellers themselves are the largest ever constructed.

This marked the beginning of keenest rivalry and nearly a century of record making has elapsed since that time, during which England, America, Germany, Italy and France have held supremacy at varying intervals. Singularly enough, the world witnessed in 1936 initial trans-Atlantic crossings of two of its greatest, speediest and most luxurious ships--the Queen Mary--Britain's masterpiece and the Zepplin Hindenburg--Germany's latest marvel of the air. Never, with the exception of the great French liner Normandie, have such sumptuous passenger transports been placed at the disposal of the ocean traveler and these three wonder vessels stand supreme in their spheres.

Power--Speed--Safety--Convenience--Comfort—all combine to justify the claim that these palaces of sea and air are brilliant engineering and construction triumphs.
original gyro adjustment remains unaltered. Strong currents, heavy waves, or a beam sea all tend to cause deviation or "yawing" and the human helmsman must be particularly skilled at his job if he is able to keep a moderately straight course under any of these conditions.

On the other hand, the gyro-pilot does it automatically and infallibly. Should the ship head avenging to starboard, the gyro compass in the "Iron Mike" instantly transmits the movement to a motor controlling the steering wheel, so that this wheel moves the rudder in the direction required to bring the ship back to her original direction. Then the moment she begins to straighten out, the same influence brings the rudder back to amidship position.

However, the ship may "yaw" to port or starboard, the gyro pilot invariably corrects these unwary movements and steers her on her proper course. Although the "Iron Mike" is of comparatively recent origin, it is already firmly established as one of the most valuable aids to navigation.

Besides the many water-tight bulkheads there are fireproof partitions and screens throughout the ship. The object of course is to localize any outbreak and confine it to a very limited space. An elaborate system of fire mains, hoons and self acting extinguishers renders any widespread outbreak all but impossible.

Every possible safety device has been used in her construction and should the gear mechanism of one wheel break down, the other can be brought into play with scarcely a moment's pause. In addition to the gyro-pilot the ordinary type of steering gear is provided, but in the Queen Mary duplicate wheels are used. These actuate the hydraulic rams which control the 140 ton rudder, a honeycomb of water-tight compartments. Altogether the ship contains and stage lighting system.

The Queen Mary is the first liner in the world to carry only motor driven lifeboats. These craft, 24 in all, are of massive steel construction and each can comfortably seat 245. This is in excess of 240 over the combined accommodations required for passengers and crew of 422. Every life boat can be released and lowered to the water by one man in the space of seconds. They are all propelled by Diesel engines and have exceptional maneuvering powers, which would enable them, when fully loaded, to leave the ship's side and get out of danger without delay. Furthermore, each boat has standard equipment including water, milk and biscuits for passengers, also flares, lamp, oil and matches in waterproof boxes. Truly the Queen Mary deserves to be known as the "safety first ship." To see this massive giant steam into New York Harbor and slide into her dock as smoothly and easily as a yacht, is truly a sight worth witnessing. Other smaller harbor crafts are dwarfed into mere dots so to speak in comparison to her huge bulk and you marvel at the control of this monster ship.

In addition to the gyro-pilot the ordinary type of steering gear is used. These actuate the hydraulics rams which control the 140 ton rudder, and should the gear mechanism of one wheel break down, the other can be brought into play with scarcely a moment's pause. Structurally the Queen Mary is as powerful as a battleship and it may be asserted without fear of contradiction, that no vessel in the world is as well equipped to face and withstand the hazards of the sea.

Every possible safety device has been used in her construction and not until a model had been evolved which proved capable of remaining afloat after whole sections of the hull had been torn away was the watertight sub-division of the real ship finally approved. Her colossal strength is masked by the symmetry of the completed ship and those who voyage in her see little evidence of the massive beams, girders and steel plates which constitute the hull proper.

From the keel up to a point far above the waterline she is double-hulled, literally "a ship within a ship" and between the inner and outer bottom is an intervening space of nearly six feet, divided into a great number of water tight compartments. Then on the other side of this double bottom, rise the twin steel walls of the hull to a height of nearly 40 feet. Here too, the intervening space is a honeycomb of water tight compartments. Altogether the ship has 258 of these and the bulkhead of this elaborate system of subdivision is formed by 18, water tight bulkheads of phenomenal strength.

Now let us take an imaginary tour of the ship, which would if actually done, mean tramping many miles and climbing countless companion ways and staircases, and if every compartment were visited the inspection would occupy several days. Everywhere we go, through the entire 12 decks conveniences in the last word in modernism and to the traveler on this great ship there must be an impression conveyed that no effort to minimize comfort has been spared. Space will not permit a detailed description of all public rooms so we will confine our notice to outstanding and typical examples.

At the extreme forward end of the promenade deck is the observation lounge and through the great windows in this spacious room a grand view of the sea can be obtained. The main lounge, also situated on the promenade deck, is the last word in modernism and to the traveler on this great ship there must be an impression conveyed that no effort to make comfort has been spared. Space will not permit a detailed description of all public rooms so we will confine our notice to outstanding and typical examples.

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Next we will note a large recess on both port and starboard bow, into which is snugly fitted her 16-ton anchors. To each anchor is attached 85 fathoms or 990 feet of chain cable, each single link 2 feet in length and under test a three link section withstood a strain of nearly 700 tons.
The main restaurant is situated on Deck C and extends the full width of the vessel—118 feet amidships—and is 160 feet in length and rises through three decks to a height of 30 feet. No compartment of this magnitude has ever before been built in a ship and while many people could gather here without discomfort, it is arranged to seat only 815 at one time which completely eliminates overcrowding. Sitting at a table in this immense restaurant the passenger will find it difficult to remember he is at sea and it is doubtful except perhaps in the stormiest of weather that the slightest motion of the ship will be perceptible. Here, too, there is a continuous flow of purified air regulated to the proper temperature, which a concealed ventilating system keeps this vast apartment absolutely free from the odors of cooking. The sale of one's nautical surroundings is a demarcated map on one of the walls and across this map moves an illuminated model of the Queen Mary showing at a glance the exact position of the ship at any given moment.

The main hall, popularly known as "Regent Street" and situated at the top of the main staircase on the promenade deck, is 111 feet long and in places 70 feet wide. It is literally the shopping center with 23 large show windows displaying a great variety of goods and is complete with a cigar stand and book shop. In this hall are also two telephone kiosks, where passengers may call up their friends in London or New York.

Next is the "playground on the high seas," the most wonderful children's paradise are a tiny cinema, which the children themselves provided for would-be soldiers, cowboys and Indians and there is also two telephone kiosks, where passengers may call up their friends in London or New York.

The cabin swimming pool—60 feet long with its warm sea water of emerald hue—is ideal for an invigorating plunge and with its graduated depth is calculated to attract the inexperienced as well as the experienced swimmer. Then again for those who are athletically graduated depth is calculated to attract the inexperienced as well as the experienced swimmer. The ship's cellars have to be stocked with 10,000 bottles of wine, 3,000 bottles of spirits, 40,000 bottles of beer, 6,000 gallons of draught beer and 60,000 bottles of minerals, while the tobacco supply includes 5,000 cigars and 20,000 packets of cigarettes.

The ship is virtually a world-wide wireless station with the most elaborate and complete radio equipment ever installed on a vessel. Radio technique. She has four large wireless transmitters, each capable of maintaining continuous communication with Europe and America throughout the voyage, and ship's own broadcast program is relayed by twenty-six wave lengths used by the two wireless stations on board, eleven for radio-telephony, seven for long wave and five for medium. Passengers can speak to friends anywhere in the world through one of the 500 state-room telephones and in addition to the ship's own broadcast program, world programs are picked up and relayed by twenty-eight short wave transmitters.

Blissness—luxury—convenience and comfort are apparent every where on this ocean ship and numbers of pleasant memories might be written about this marvel of the sea but to this brief description we will add that the ship's daily newspaper the "Ocean Times" is compiled in a completely equipped printing room and through wireless
portation and through most wonderful developments in aircraft

--the LZ-126 or ZR-3, since known as the Los Angeles, and the

LZ-128, immediate predecessor of the Hindenburg, but the two

the LZ design and the ZR-8 completed by German "luftschiff," fort

first dirigible over historic Friedrichshafen, is the ragth craft of

built in the 36 years since Count Ferdinand von Zeppelin flew his

markable time of a days and 18 minutes.

A feat) its payload capacity (~5 tons) will permit the greatest cora-

range at cruising speed

ship, a passenger carrying craft that flew on her maiden voyage

days, 20 hours and 36 minutes and on her return made the re-

from the old world to the new in the ~lmust unbelievable time of

a wide range of passengers, freight and mail ever lifted off the ground

of length (803.8 feet) and lifting gas volume (7,063,000 cubic

was the Graf Zeppelin in honus of the man after

planned to be a primary stress member, serves for gas cell inspection

in an aircraft, and its flying

by three ladders

permitted mechanics to work on the

engine while the airship is in flight. Electric power for the ship is

work and engine gondola

ship has 36 sides, that is, it has 36 longitudinal members. Main rings are of

side and two on the starboard. The four bladed wooden

propellers are approximately 9 feet, 9 inches in diameti:

One of the four power cars each containing a 1200 H.P. 16 cylinder

is supplied the Zeppelin under

is not marketed commerically and is supplied the Zeppelin under

of 250,000 cubic feet of lifting gas (hydrogen) and 15,000

gallons of diesel oil, both these products coming from the Bay-

"dope."

the ship's body is a cotto-

the outer skin of the ship's body is a cotton-

heavy under favorable wind

most successful airships in history —the LZ-126 or ZR-3, since known as the Los Angeles, and the

the LZ-128, immediate predecessor of the Hindenburg, but the two

before that have been among the most successful airships in history

in almost every airship aspect. It is the largest zeppelin ever built in point

lifting gas volume (5,066,000 cubic

feet); its propellet capacity (13 tons) will permit the greatest com-

ration between its

be divided into 26 bays, in each of which is a separate gas cell made of a

the ship being divided into 26 bays, in each of which is a separate gas cell made of a

intermediate rings, lower and central cor-

intermediate rings, lower and central cor-

lower and central cor-

of the Hindenburg follows to a large extent recent LZ
types, the ship being basically similar to the Graf

Zeppelin, although of course, incorporating many

improvements and refinements in design.

the system of main rings, intermediate
ing direction of rotation of the propellers is accomplished by re-

rings, lower and central cor-

lower and central cor-

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and through a system of cables the command is indicated on a
similar drum in each power car. The ship is directed from the
control car which is located just forward of the passenger quarters.
The rudder stand, elevator stand, instruments, central telephone

Control car or "Eye" of the Zeppelin—contains only navigational
facilities. Note the big tire used as a buffer wheel on landing
station connecting the fourteen most important parts of the ship,
and navigating equipment are all located here. Horizontal and
vertical control of the ship is normally by hand through a system
of gears and cables running from the control car to the control
surfaces. It is possible to clutch in an electric motor and drive,
which takes the place of man power on the wheel. The elevator or
rudder man then controls the ship by switching the motor in or
out in the desired direction of rotation. Hand control of the ship
can be instantly regained by detaching the electric drive. This
system of control has been successfully worked out on the Graf and
is the result of thousands of miles of successful operation.

In the center section in a fore and aft direction, through which the
central corridor runs. The cells are equipped with maneuvering
valves, which may be operated from the control car, and automatic
valves which operate only when the cell is 100 per cent inflated.
The maneuvering valves can all be operated simultaneously by
means of a hand wheel or individually by means of toggles. The
valves are located just above the central corridor in the bulkheads
between cells, with gas ducts to carry the valved gas up to the top
of the ship, where hooded openings in the ship's cover are pro-
vided for its escape.

Quarters are provided
along the lower corridor
for a ship's complement
of 46 men. These quar-
ters are divided into
three groups, the of-
dier's quarters with ac-
commodations for 12
officers, being located
above the control car
forward of the passenger
quarters; the deck force
quarters with accommo-
dations for 33 are just
aft of the passenger
quarters; while the ma-
chinist's quarters of 9
bunks are placed aft
near the power plants.

Above the control car in
the radio room, fully
equipped for communica-
tion by long and short
wave, radio telephone
and radio direction find-
ing. The short wave unit has been used for messages between Ger-
many and Chatham, Mass., a distance of 4,000 miles, and the ship
can easily maintain contact with any properly equipped station in
Europe or the Eastern United States or any surface vessel on the
North Atlantic.

The passenger quarters on the Hindenburg are laid out to accom-
modate fifty persons, but on a short trip of one day or less 200 per-
sons could be carried due to the lesser load of fuel, provisions, etc.
which would be required. The quarters are confined to one bay,
being entirely within the ship's hull and constructed on two levels.
Included are 25 staterooms, each containing two berths; four
public rooms including dining room, lounge, writing room and
smoking room; promenades, kitchen, office and crew mess rooms,
bar, bath and lavatories.

The passenger lounge and sun deck promenade
on the giant air liner

The arrangement of the quarters is exceedingly compact, with little
or no waste space. Although located completely within the
ship's hull, ample visibility is provided by windows located along
the promenades which extend both sides of the quarters. These
windows are built in at such an angle as to provide the widest pos-
sible range of vision, both up and down. Windows are available
on both upper and lower decks, and obviate the need for artificial
lighting in the public rooms during the daytime. The quarters are
supplied with heating and air cooling systems, and the walls as
well as the ceiling plate are insulated with aluminum foil (Alfoil).
Exhaust gases of the motors are utilized to preheat fresh air carried
into the passenger rooms.

Passenger cabin or Flying Sleeper

The interior decorations have been carried out according to de-
signs by Professor Fritz August Bergbau of Berlin. The walls of
the smoking room are covered with a veneer of pear wood which,
like asbestos, does not burn. All other rooms are covered with
balloon cloth.

In the construction of the furniture duralumin has been chiefly
used; wood has been almost completely eliminated. In order to
Continued on page 16