

AMERICA MAKES BIG DISKS NOW

Lens Manufacturers Solve Difficult Problem With the Aid of Scientists.

CATCHING UP WITH GERMANY

All Mechanical Difficulties in Making of Large Telescopic Disks Have Been Overcome—Process is "Delicate" One.

New York.—Large telescope disks are being made in the United States. All mechanical difficulties have been overcome, according to an announcement made by Dr. George W. Morey, a member of the American Chemical Society.

This remarkable achievement is due to preparation and handling of the ingredients required for pure and flawless glass and is the result of experiments begun at the outbreak of the world war, under the auspices of the geophysical laboratory of the Carnegie Institution in Washington.

Catching Up With Germany.
Before 1914 practically all the optical glass in the United States was imported from Germany. When the United States entered the war the field glasses, range finders, telescopes and other instruments of precision

One of the First Submarines



One of the first submarines ever built by John P. Holland, their inventor, of whom it is said that he conceived the idea of submarines as a means of destroying the British navy. Holland was an ardent Fenian and associate of many Irish patriots who have gone down into history. Leaders of the Revolutionary party in Ireland became interested in Holland's idea and commissioned him to build a trial submarine. He built it well enough, but on its trial spin on Long Island Sound it was struck by a coal barge and quickly sunk. The discouraged Irish leaders gave up this idea. Later Holland built his first successful submarine, "The Holland," which was accepted by the United States government in 1897. "The Holland" is here shown on her trial spin.

used by her army and navy were equipped with lenses fashioned beyond the Rhine. Private citizens even loaned or contributed opera glasses and binoculars to the fighting forces.

Optical glass of fine quality, however, is now to be had on this side of

the water. The climax of this achievement of industrial chemistry has been reached by American makers in the manufacture of lenses for telescopes. At first disks which strengthened our view were made three or four inches in diameter. Recently a special four and three-quarter inch lens was ground for Lowell observatory at Flagstaff, Ariz.

The first nine and one-half inch disk was turned out last December. Six others have since been made and delivered. As their diameters increase disks are made with greater difficulty. Finally on February 15, 1920, the first perfect 12-inch disk was furnished, and a large optical glass corporation now lists this size for short-time delivery.

Making Larger Disks.
The next size attempted was a 20-inch disk, in the manufacture of which the problem was still more complex. Several flawless ones were produced, but they cracked in the annealing process. American ingenuity was brought into play to devise a means of slowly cooling these immense plates of glass, so that they might be free from the strain so likely to destroy them. Experiments by scientists of the geophysical laboratory showed exactly how slowly their temperatures must be lowered, and the cooling schedule outlined was closely followed. Owing, however, to the extreme cold weather of last March and the shortage of gas, this schedule could not be followed. One splendid disk strained and broke just when nearly ready to be taken from the oven.

Equipment hitherto used was then scrapped and an electric furnace was specially designed to meet the needs of the problem by experts of an electric company. This device is thoroughly insulated and provided with an automatic appliance which will hold the temperature absolutely constant to a fraction of a degree while the glass is being treated to remove strain. The temperature can be dropped a few degrees a week.

With the aid of this furnace now in process of construction it is believed that the last difficulty in the way of the American manufacture of the largest disks will be overcome. Orders have already been accepted for the production of several large guaranteed disks, including one pair of the 18-inch size for refracting telescopes, and a 36-inch disk for a reflecting telescope. The furnace will receive the 40-inch size. When that goal has been reached, the company will continue the development, so that eventually the largest and finest disks in the world will be American made.

Marks New Era In U. S. Flying

All Metal Plane Will Revolutionize Aircraft Design and Construction

BIG ADVANCE IN SCIENCE

Frail Spruce and Linen Ship That Did Its Bit in War and Has Been Used in Commerce Will Be Displaced by All Metal Type.

New York.—The presence in America of John M. Larsen's JL-6 all metal monoplane will completely revolutionize aircraft design and construction, according to statements made here by leading airplane manufacturers.

The frail spruce and linen ship that did its bit in the war and that has been used successfully, though precariously, in commerce will soon be displaced by the sturdy all metal type brought out after the war by the Germans, almost every aeronautical expert who has witnessed the performance of the JL-6 agrees. One American manufacturing company has already announced its intention of discontinuing operations.

The War Plane Passes.
There is little comparison between the JL-6 and the old type plane.

The only type of airplane that was successful prior to the JL-6's appearance was the wood and linen biplane. The wing beams, the long fuselage, the engine bearers, the struts, the under-carriage were made of either spruce or ash and the wings were covered with Irish linen. The fuselage between the wings gave support to the panels. It was a strong ship; only a cyclone or a crash could warp the wings around the fuselage.

But it appears as fragile and delicate as a china vase beside the JL-6. There is an all metal fuselage. One metal wing spreads from each side of

the body, a wing that measures eight or ten inches in thickness at the leading edge, and has a trailing edge as thick as the blade of your knife. There are no interwing struts to offer wind resistance, no control horns on the ailerons, no flying or landing wires, no control wires free to the wind. It has been said that the flying, landing and control wires of the old type ship cut down its speed by as much as twenty-five miles an hour.

Wings Survive Side Slip.
The wings of the JL-6 are so rigid that only a head on crash will injure them. One plane that side slipped to the earth was immediately righted and flown away after a new propeller had been put on. Not even the fuselage to which the metal panels are attached was injured. Eighty-five men have stood upon the forty-seven foot spread without causing any ill effects.

The body of the plane contains a luxuriously furnished compartment that will seat in upholstered chairs six people. Two pilots may be seated in the control compartment. The motive power is furnished by a 160 horsepower Mercedes engine. It requires five gallons of gasoline to fly 100 miles. Present aeronautical motors require from ten to fifteen gallons for that distance. The motor is almost silent, compared to the deafening roar of the Liberty. A conversation can be carried on in the cabin with the motor wide open.

According to Mr. Larsen, the JL-6 represents the greatest step forward in flying in all time. He has purchased all American rights, from the Junker company of Germany, which first perfected the all metal plane. It was from an all metal battle plane that the boche shot down Maj. Raoul Lufberry in the most heroic air battle of the war. Dr. Hugo Junker, German engineer, is the original designer of the all metal ship.

Chic Gowns for the Warm Days

The first warm days often find us quite unprepared in the matter of clothes. This is especially true after a cold, late spring such as the one just passed, which offered little incentive to buying thin frocks. So, if we have delayed in our shopping, writes a prominent fashion correspondent, it means that we confront a real problem—that of getting a suitable warm weather wardrobe together quickly.

We are realizing more and more the need of the practical combined with beauty in our clothes. The sensible woman, however, never sacrifices beauty to the purely practical. In the dark georgette crepe frocks we have been able to supplant the good, substantial navy blue georgette crepe for wear on hot days, offering as it does the advantages of coolness and lightness.

There are those who, in their desire to help reduce the high cost of living, talk of the economy of gingham, but a gingham dress is never an economy—rather it is a luxury to be enjoyed in the country. In the first place, ghinghams are anything but inexpensive, and, furthermore, frocks made from them require frequent and careful laundering, which under existing conditions means constant additional expense. Even with the best of care they never look quite the same after a visit to the laundry.

Real Organdie Flowers.
Although we have seen a great deal of taffeta during the last year, its glory has not yet been dimmed. We have had it combined with organdie in an infinite number of ways, but no lovelier union of these two has appeared than is seen in the models made entirely of silk and decked with huge white organdie flowers applied with long, loose stitches of dark thread. The flowers are not cut from flat pieces of the muslin, but are twisted deftly and shaped so that they are big and puffy. The pieces simulating leaves are veined with the dark thread. In a dress of this sort the white appears also in the bodice in the form of a front which extends over the skirt and is bound with the dark blue taffeta. A white organdie bow at the back of the neck also is bound with blue. The short sleeves have a tiny turned-back cuff of organdie worked with blue in a loose long and short stitch.

To wear in the late afternoon or as an informal summer evening dress nothing could be more suitable than the embroidered batiste robes which have again come into fashion. We have on these both solid and eyelet embroidery. The frocks themselves are just little straightline affairs which tend to show off the beauty of the needlework. A great deal of care is exercised in the selection of meshes for such dresses. Wonderful ribbons are chosen.

The embroidered batiste robe is given further elaboration by the introduction of a lovely square mesh lace. A remarkable ribbon is used for the girdle. It is about an inch wide and of three shades of blue, one running into the other, giving the appearance of three separate ribbons stitched together.

Another method of introducing a bright-colored ribbon into an embroidered batiste robe is seen in a frock having cherry red satin ribbon with a rough surface starting at the neckline in the form of panels, slipping through medallions at the waistline and continuing down either side of the front until they are caught under the hem.

Another frock shows ribbon again featuring as the distinctive note. This is interesting as a simple adaptation of the Egyptian style, which many

people have been inclined to think of as representing elaboration only. Here a beautiful brocaded ribbon—dull red and silver—is used to give an Egyptian effect to the simplest and most practical sort of chiffon frock.

Lace With Batiste or Organdie.
It is interesting to observe another way in which lace and batiste are combined. Brown lace is used for a chemise top cut just like a long smock



Embroidered Batiste and Lace Robe to Wear in the Late Afternoon or as an Informal Summer Evening Dress.

reaching to a low hipline. A double piece of ecru batiste is attached to the bottom of the smock to make a straight skirt. Where the two are joined a garland of batiste flowers veined with brown is applied. A snash of narrow brown ribbon girdles the waistline.

The same idea might be carried out in lace and organdie. Brown lace with organdie of the same color, but slightly lighter in shade is effective, or lace may be dyed any color and used with white organdie. With the wonderful choice of ribbons that we have now a very distinctive effect may be given by the snash.

Still another pleasing use of brown is seen in an evening frock. This is one of the dancing frocks, made with a somewhat high neck and cap sleeves, which are beginning to take the place of the extreme décolletage—another instance of the turning away from extravagance toward simpler things. The bodice and tunic of the skirt are composed of brown taffeta and the trimming is tiny bows of the silk. The taffeta petals have an inch-wide edging of lighter brown tulle. Beneath the tunic are three tulle skirts, also cut in the form of petals. The first is of a very dark shade of brown overlaid with dull orange. There is a narrow foundation skirt of silk, making in all four skirts, one above the other.

Black Taffeta and Black Tulle Used

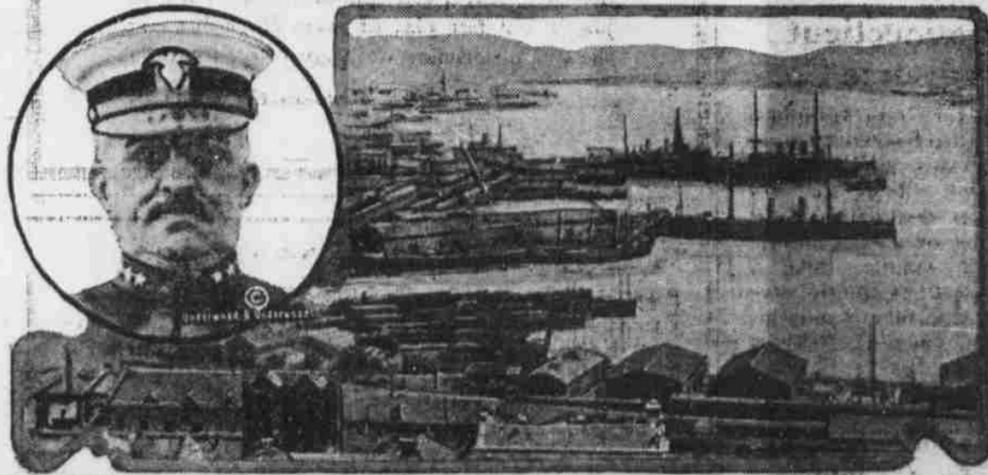
Black taffeta and black tulle are used in a similar way, the only real difference being in the skirt, which consists of four tiers of black tulle petals, so that the idea of the four skirts is carried out, but entirely in the net. The bodice is plain almost to the point of severity. It is cut to fit the figure, rather snugly and crumple at the waistline. As in the black lace dresses brought out earlier in the season and which still enjoy considerable prestige, a bit of bright color is introduced by veiling scarlet flowers with net. The bodice boasts of no trimming other than a quaint little corsage bouquet, also bright red.

Only the slender woman may aspire to the Cheruit evening frock, with its billowing skirts composed of irregular loops of pink taffeta. These loop draperies, brought out by Cheruit earlier in the season, were looked upon by many as being exceedingly impractical. This, however, has not proved true. They have been eminently successful in evening things. Wraps as well as dresses, carry long loops of

chiffon or silk. Like many new fashions they have been slow in gaining popular favor, and it is, after all, a credit to women's judgment that they do not accept a new feature until they have given it due consideration. These loop dresses, which, like the Egyptian things, were slow of acceptance, are likely to prove long-time favorites—that is, they will be seen among the autumn fashions, so that the woman who in the spring bought clothes featuring such draperies finds them quite as fashionable now as they were earlier in the season.

The Cheruit frock is developed in a wonderful shade of plain pink taffeta. Here we see the Egyptian influence as well as the loop drapery. The very long bodice is girdled with a sash made by twisting two vividly contrasting shades of pink tulle and knotting them in a huge bow at the back, the ends being allowed to trail off to several inches below the hem of the skirt. A wispy bit of pink tulle edges the frill at the neck and a garland of flowers over one shoulder.

With the U. S. Navy at Vladivostok



The picture shows a view of Vladivostok harbor showing the United States battleship New Orleans in the foreground, a Japanese battleship next, and a Chinese battleship in the rear. The insert shows Admiral A. S. Gleaves, commanding the American naval force.