MECHANIX ILLUSTRATED©

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New hot rod has belly-tank body, wingtip-tank fenders, aircraft engine, does 110 mph—Page 84

Tom McCahill Tests '52 Buick Roadmaster

Build Model PT Boat Controlled by Radio

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MI MAY 1952

SPECIAL FEATURES

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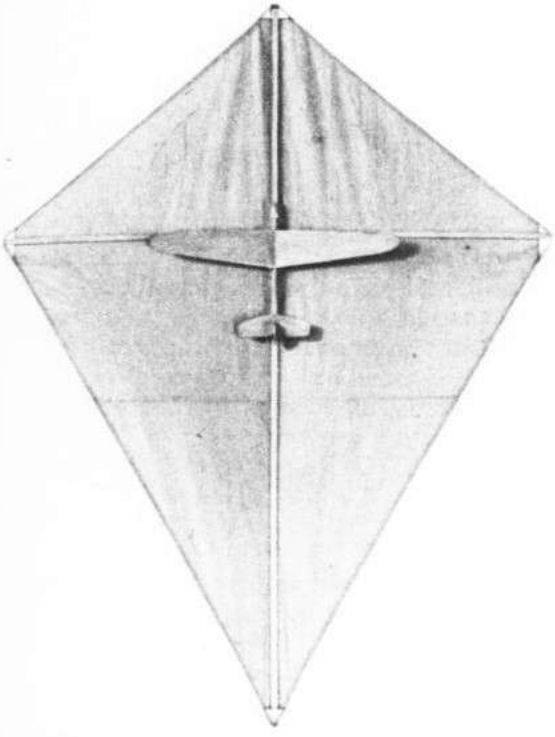
CRAFTS AND HOBBIES

continued from page 2

GO FLY A KITE

Another interesting new kite is shown below. Developed by the G. D. McKays of Montreal, it has three parts—a carrier kite, a glider set under elastic tension on top, and a small kite, not shown. When the rig is flying, the small kite is hooked to the string of the carrier kite and loosed. It climbs the string and trips a trigger on the big kite. This releases the glider, which zooms off in a showy manner.

Francis M. Rogallo, who is shown above operating one of his flexible kites, is an engineer on the staff of the Langley Laboratory of the National Advisory Committee for Aeronautics.



MOST sports are contests between persons or groups of persons. Kite-flying, too, can be that kind of sport, but to me it has always seemed a contest between man and the elements.

When I was a youngster, I fussed around with the conventional two-stick and box kites, examples of which appear in the accompanying drawings. Nearly every boy in America can make one of these kites without worrying about dimensions. If he doesn't feel like going to the bother of constructing one from scratch, he can buy one in knocked-down form for less than a dollar. With such a kite, the object is either to attain great altitude or to achieve a long duration of flight.

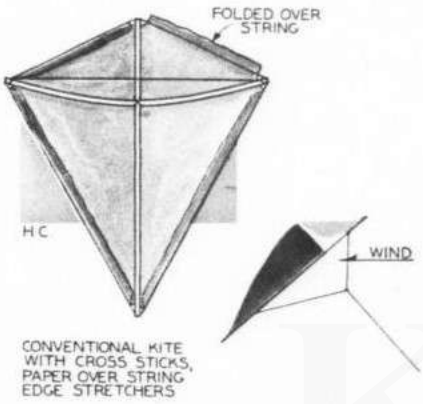
When he grows tired of the ordinary kite, a boy can try making small ones with frameworks of dried bamboo-like grass and coverings of tissue paper. These can be flown on sewing thread in very light winds. Or he can create a stir in the neighborhood by making the largest kites he can and flying

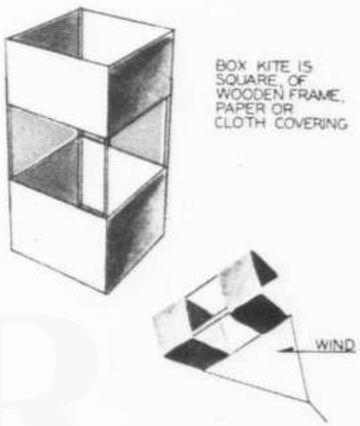
them on small-diameter Manila rope.

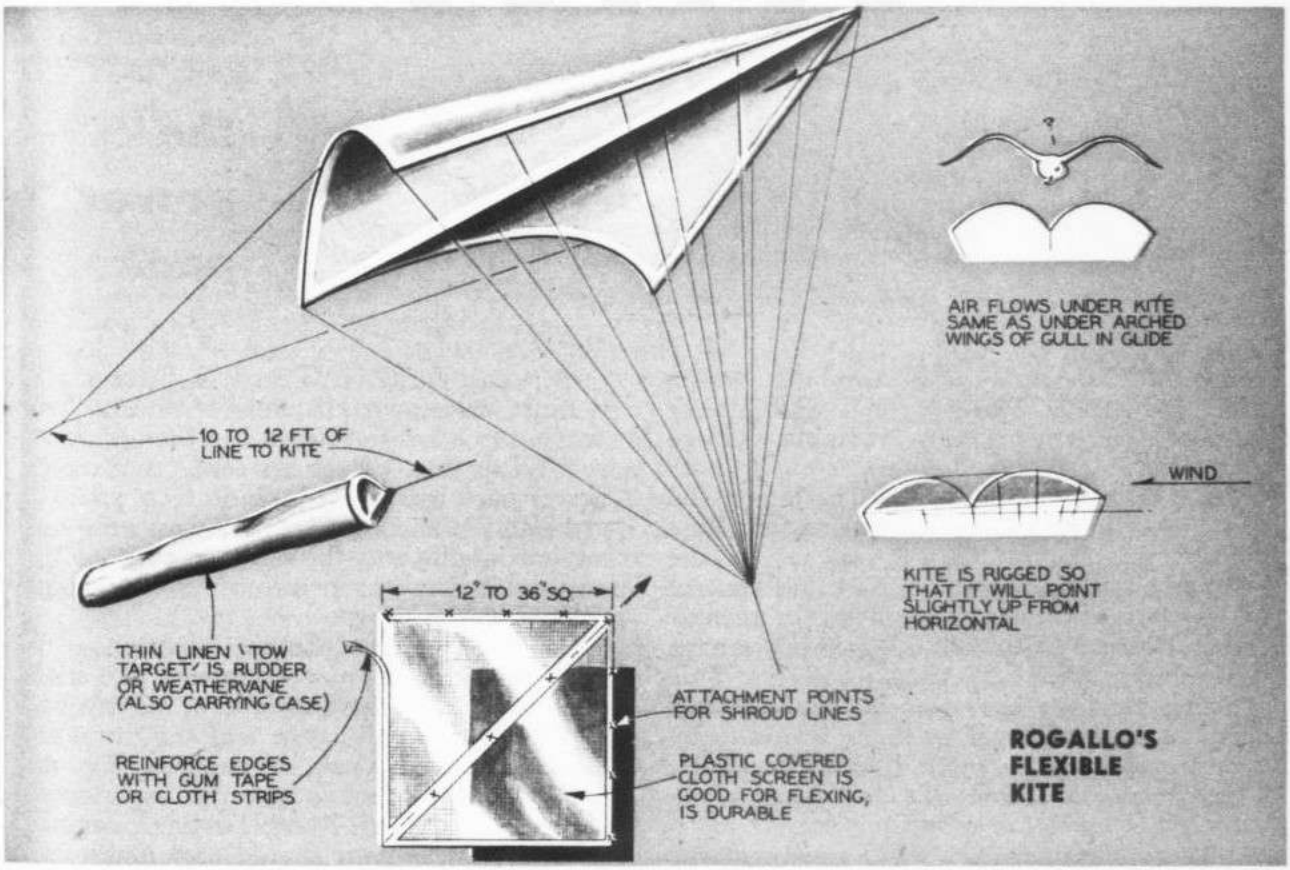
I went through all these phases of kite-flying and then laid aside my kites and studied to become an aeronautical engineer. I now work at the Langley Laboratory of the National Advisory Committee for Aeronautics. It is the function of this laboratory to study problems pertaining to aircraft of all types from parachutes and helicopters to supersonic airplanes.

When I again took up kite making after many years of aeronautical research, I was not satisfied with the conventional kites that I had made as a boy. Some improvement must surely be possible, it seemed, in both the aerodynamics and the structure of kites. The conventional kite has a low lift-to-drag ratio, largely because the flow breaks away at the leading edge of the thin, uncambered surface. Its structure is extremely fragile because it must combine a high degree of rigidity with extreme lightness.

We have learned in the study of supersonic airplane wings that it is possible to maintain smooth flow over the upper surface of a thin, sharp-edged airfoil if the surface is given the proper camber, particularly near the leading edge. We have also learned that [*Continued on page* 156]







Go Fly A Kite

[*Continued from page* 131]

a light structure can be strong and practically unbreakable if it is, like a parachute, flexible. Compare if you will the weight and ruggedness of a parachute with that of a conventional glider capable of supporting the same weight in the air.

If we could combine the shape of the supersonic airplane with the unbreakable structure of the parachute, we would have a fine kite. But for such a kite to fly, it must possess stability of both shape and position. If we could provide these, the rest would be easy.

We started by making small paper kites and dropping them as gliders. Then we attached threads to them at various points and towed them about the living room. Whenever we found a promising configuration, we would build a larger model of cloth and take it to an open field for a trial. If it didn't fly, home we went to make modifications and then back for another trial. Our efforts were not in vain, for after many attempts we succeeded in making thoroughly satisfactory models.

A simple one has but four shroud lines, two on each side, and the tail is attached either at a single point on the centerline or at the juncture of a pair of lines attached to the trailing edge about midway between the centerline and the tips. A 12x12-in. sheet of paper or plastic with one of the diagonals for the centerline is very satisfactory.

Starting with this simple design, one can add area and shroud lines almost without limit. In addition to the shroud lines attached to the leading edges, we have also attached them along the centerline diagonal, thus forming the surface into a double lobe or bucket shape as shown in the accompanying drawings. At an early stage in the development, we designed a miniature tow target to serve as both a tail in the air and a carrying case on the ground.

One of these days, we're going to make one of our kites large enough to lift a man. We'll supply him with some controls and, to test the rig in safety, we'll tow it from a boat so a crash will not injure the pilot. A further development would allow the kite to be flown as a glider. Imagine the thrill of carrying such a glider in your knapsack to the top of a mountain and then unfurling it and gliding down into the valley.

But the most intriguing possibility is the use of this wing as the lifting component of an auto-airplane. When the airplane alighted, the wing would be folded and put in the baggage compartment. The auto would then drive away unencumbered.

—*Francis M. Rogallo* •

Portable Sanders

[*Continued from page* 104]

pad permits rubbing or polishing furniture and woodwork.

Our final group of motor-driven sanders is known by such names as reciprocal, orbital, or oscillating. The abrasive surface is rapidly moved back and forth, in an oval pattern, or in a combination of both of these movements (see sketch). A clamping device is used to hold the paper or cloth tightly over the head that is operated either through a direct or a belt drive from the motor. It may then be used for sanding, polishing, or rubbing on metal, wood, plastic, or even tough composition materials.

These machines make walls smooth and joints invisible. Repainted fenders and doors of automobiles are feather-edged to perfection. Boat decks and bulkheads are maintained with a minimum of effort.

They can also be used to clean glued joints and to smooth knots and checks. They will rapidly rub down undercoats or fillers before the final finish is applied.

The orbital and oscillating types are noted for their use with, across, or against the grain. They can also smooth butt joints where the grain meets at right angles.

The reciprocating type produces a satin-like finish. It is just about perfect for lapping and finishing.

It might be well to know something about the abrasives that are to be used on these power sanders. Flint is the least expensive and the most common. It is brittle, breaks down easily, and is therefore most suitable for use on softer materials.

Garnet is more durable than flint. The stones tend to break while in use and in doing so leave new jagged surfaces. These prolong its utility.

Emery has a slower cutting action than either flint or garnet because the grains of equal size are not as sharp. It is generally used as a polisher and is used most often on metals.

Silicon carbide is man-made. Sand and coke are fused at extremely high temperatures and the hard clinkers formed are crushed into small grains. This abrasive is very brittle and is used for cutting very hard metals or wood.

Aluminum oxide is made from bauxite and small proportions of iron filings and coke. It is not as hard as silicon carbide but is much tougher.

There are several things to remember when selecting an abrasive. Soft work that might clog the paper calls for a grain that is widely spaced. Finish sanding should be done with progressively finer abrasives, but more than one grit specification should never be skipped for best results. •