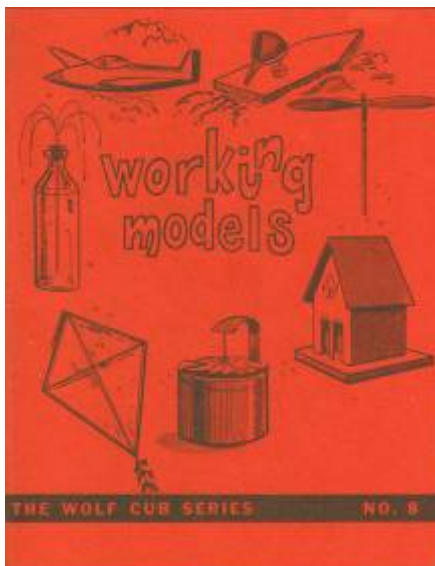


Working Models



The Wolf Cub Series No. 8

(1964)

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Boy Scouts of Canada
Ottawa**

Catalogue No. 20-238

Working Models

Downloaded from:
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Editor's Note:

The reader is reminded that these texts have been written a long time ago. Consequently, they may use some terms or express sentiments which were current at the time, regardless of what we may think of them at the beginning of the 21st century. For reasons of historical accuracy they have been preserved in their original form.

If you find them offensive, we ask you to please delete this file from your system.

This and other traditional Scouting texts may be downloaded from The Dump.

Working Models

Hi Wolf Cub,

This book of working models is for all those Cubs who like to make things and also for the many other Cubs who like to know why and how things go.

Some of these ideas are not quite as complete as they could be because we want you to add your own ideas on how things work and, if you like, change these models to suit your ideas.

Working Models

You will require help from your dad with those models which require cutting and soldering. We hope that you will enjoy making and playing with the models.

BOY SCOUTS OF CANADA

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Toy JET boat

SHOWN BELOW IS A VERY SIMPLE
JET PROPELLED BOAT. THE BOATS
SHOWN OPPOSITE ARE A FEW
EASILY BUILT WOOD BOATS. ALL
YOU NEED IS SCRAP LUMBER
FOR THE HULLS.

THE JET-PROPELLED BOAT:
USE AN EMPTY POWDER CAN FOR
THE BOILER. DRILL A HOLE IN THE
BOTTOM FOR A STEAM VENT. SET
THE BOILER UP ON PIPE CLEANER
LEGS WITH STEAM VENT UPPER-
MOST. NOW, HALF FILL THE BOILER
WITH WARM WATER & PUT IN
PLACE IN THE SARDINE CAN
HULL OVER THE LIGHTED CANDLE.
STEAM FORMING INSIDE THE
BOILER & RUSHING OUT STEAM
VENT PROPELS THE BOAT. KEEP
THE BOILER TO THE STERN SO
THE BOAT WILL PLANE.

WHAT YOU NEED



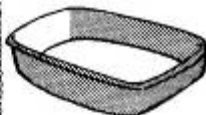
EMPTY POWDER TIN



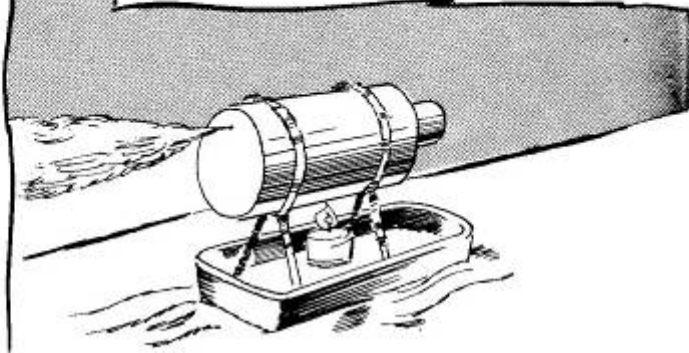
PIPE CLEANERS



A STUB OF CANDLE



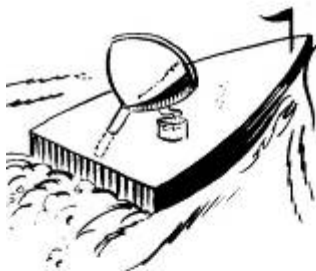
A SOAP DISH OR
AN EMPTY SARDINE CAN



and other boats

1

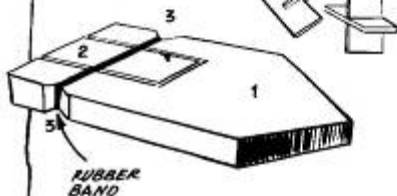
DRILL A HOLE ON AN ANGLE THROUGH THE BASE, MAKE IT WIDE ENOUGH TO ADMIT THE TOP INCH OF A FUNNEL TYPE OIL CAN SPOUT. HALF FILL CAN WITH WATER, INSERT IN HULL WITH A CANDLE BESIDE IT TO HEAT WATER



2

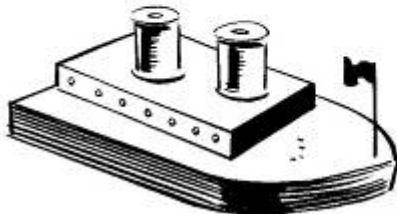
BASIC PATTERN 2 - PADDLE CUT FROM BASIC PATTERN 3 - NOTCHES CUT IN SIDES OF BASIC PATTERN TO HOLD RUBBER BAND USED TO WIND PADDLE

FOR 4 BLADE PADDLE NOTCH 2 PADDLES TO FIT TOGETHER



3

USE THE BASIC PATTERN FOR BODY OF BOAT & ADD A CABIN OF Balsa WOOD. TOP IT WITH FUNNELS MADE OF SPOOLS.

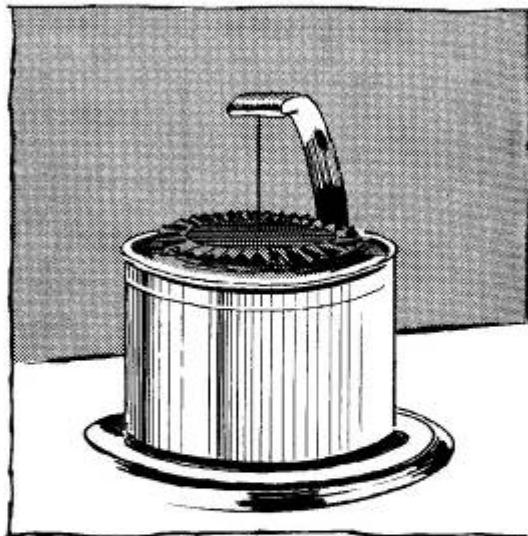


STOVE TOP

Steam Turbine

THE GREAT STEAM TURBINES IN MODERN OCEAN LINERS WORK ON THE SAME PRINCIPLE AS THIS STOVE TOP MODEL. AS THE WATER BOILS, THE STEAM RUSHING OUT OF THE VENTS STRIKE THE BLADES OF THE FAN, TURNING IT AT A GOOD SPEED.

YOU WILL NEED A COFFEE CAN, THE END FROM A 3 1/2" CAN, A PIECE OF TIN 6 1/2" X 1" & A THUMB TACK. KEEP STOVE ELEMENT ON MODERATE HEAT



4 USING THE WHEEL PATTERN ON PAGE 5, CUT THE WHEEL BLADES WITH TIN SNIPS. GIVE EACH BLADE A SLIGHT SIDEWAYS BEND



PUNCH A SMALL HOLE IN THE CENTRE OF THE FAN & DRIVE A DARNING NEEDLE THROUGH FOR A DISTANCE OF ABOUT 1/2 INCH.

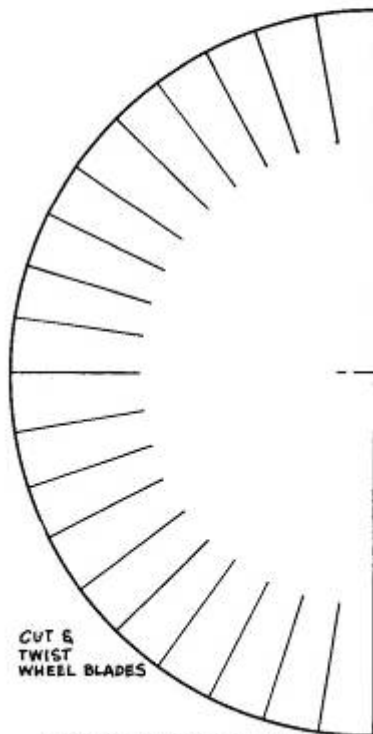
Working Models



PUNCH FOUR STEAM VENTS
IN COFFEE CAN LID.
FASTEN BRACKET WITH TACK
CLINCHED INSIDE



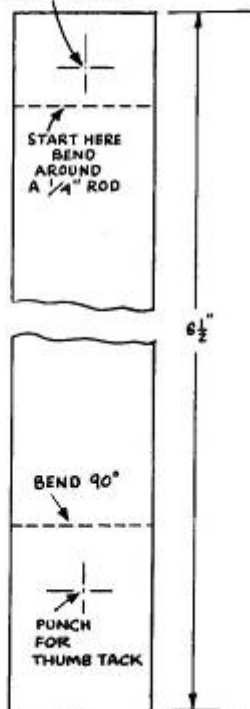
THE DIMPLES IN THE CAN LID
AND BRACKET ARE BEARINGS
FOR THE NEEDLE SHAFT



CUT &
TWIST
WHEEL BLADES

FULL SIZE PATTERN FOR WHEEL, CAN TOP, BRACKET

PUNCH SLIGHT DIMPLE



PUNCH
SLIGHT
DIMPLE
IN CAN
TOP FOR
SHAFT
BEARING

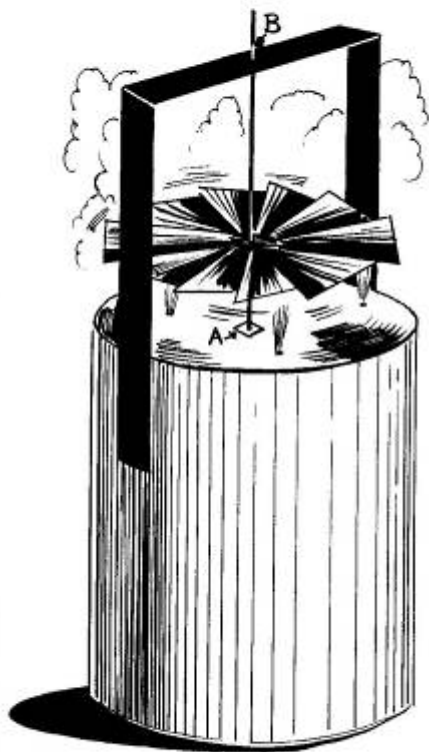
BEND 90°

PUNCH
FOR
THUMB
TACK

6 1/2"

5

2 simple turbines



HERE ARE 2 MORE STEAM TURBINES FOR YOU TO MAKE. THE SHAPE OF THE TIN CAN IMMEDIATELY SUGGESTS A MINIATURE BOILER. IN EACH MODEL THE MOVING PART IS A FAN MADE WITH THIN METAL.

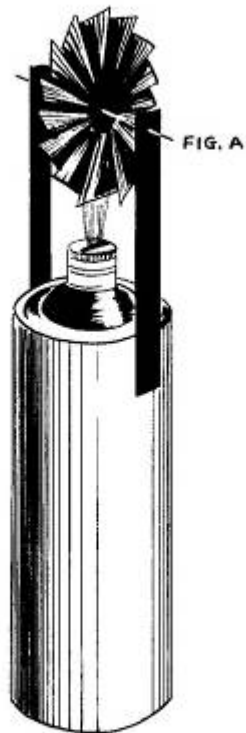
USE A CONDENSED MILK TIN FOR THE BOILER. SOLDER A SMALL SQUARE OF TIN IN THE CENTRE OF BOILER (A), & PUNCH FOUR STEAM VENTS AROUND IT. MAKE THE FAN WITH ABOUT TWELVE RADIAL CUTS. INSERT THE DARNING NEEDLE SHAFT & SOLDER IT SECURELY TO THE FAN. MAKE A BRIDGE OUT OF TIN WITH A HOLE FOR THE AXLE (B). SOLDER BRIDGE TO TIN.

Working Models

USE A BRASSO TYPE CAN FOR THIS BOILER. CUT A SLIT IN THE TOP OF THE CAN, FILL WITH WATER & HEAT.

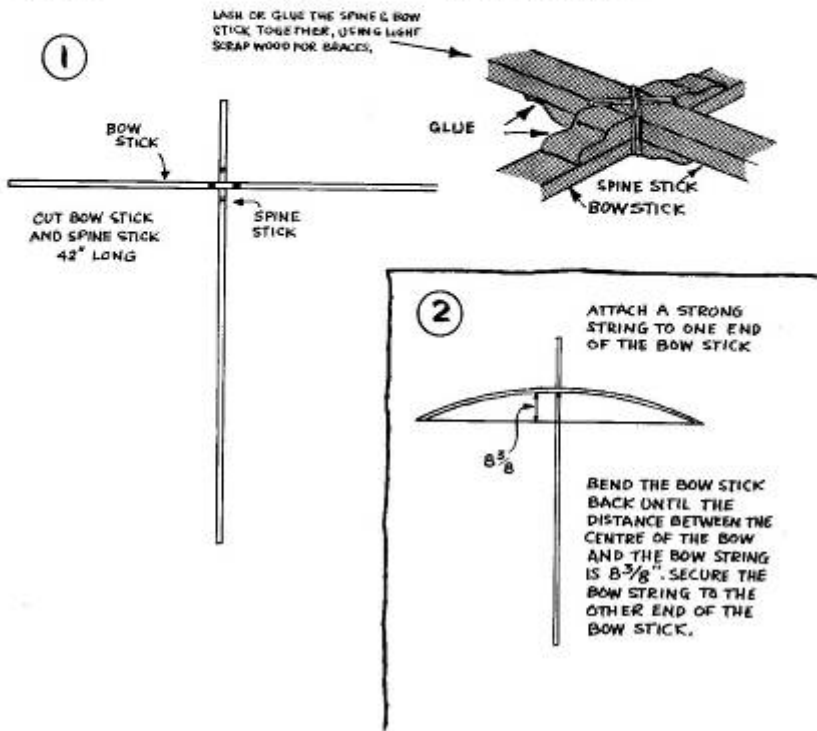
WE HAVE SHOWN THE FAN A BIT HIGHER HERE THAN YOU SHOULD MAKE IT, IN ORDER TO CLEARLY ILLUSTRATE THE NEEDLE PIVOT (FIG. A.)

THESE TURBINES ARE VERY SMOOTH RUNNING AND THE FANS REVOLVE AT A TERRIFIC SPEED.

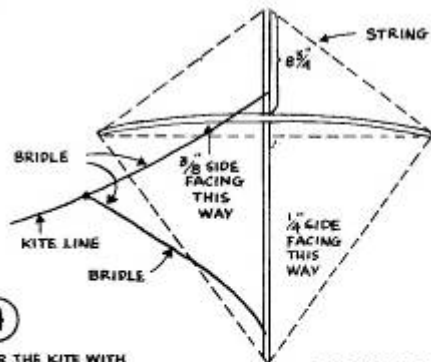
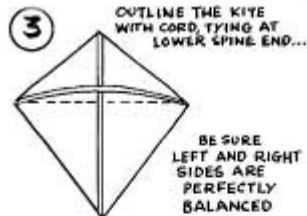




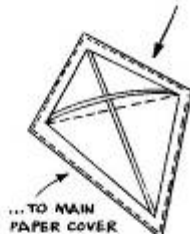
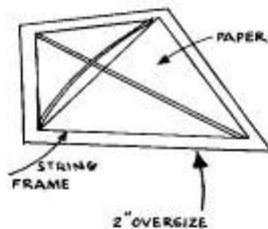
THE EDDY BOW KITE, SO CALLED BECAUSE OF THE EASY WAY IT SAILS IN EDDIES OF WIND, IS A 2-STICK KITE THAT DOES NOT NEED A TAIL TO BALANCE IT. YOU WILL NEED 2 STICKS $\frac{1}{4}$ " x $\frac{3}{8}$ " x 42" LONG, STRING, LIGHT WRAPPING OR TISSUE PAPER, GLUE, & A LARGE BALL OF 6 OR 7 PLY TWINE FOR THE BRIDLE & KITE LINE.



Working Models

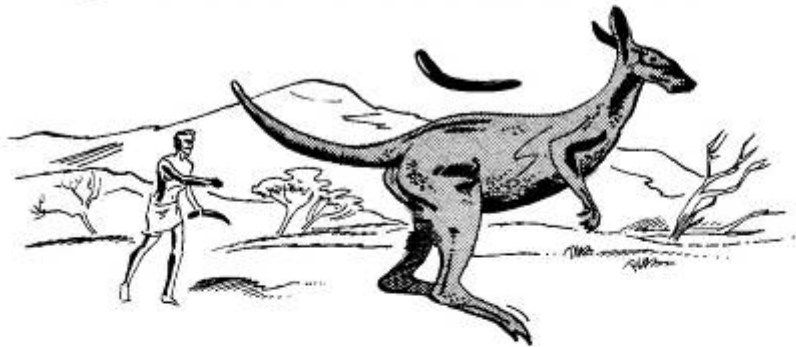


FOLD EDGES OF PAPER LOOSELY OVER STRING FRAME & GLUE...



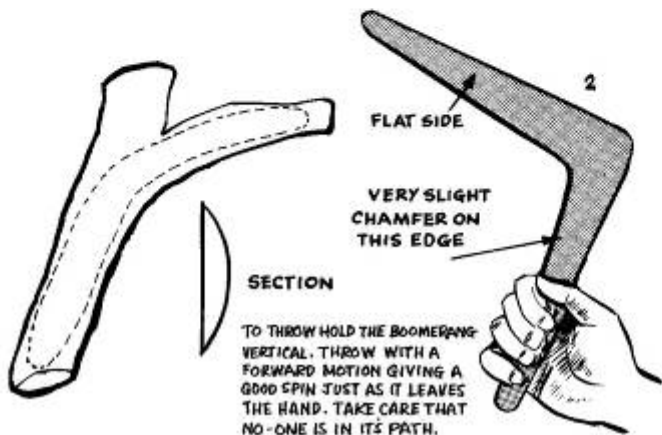
MOVE BRIDLE KNOT DOWN IF KITE RIDES TOO HIGH & TENDS TO FLOP & DIP... MOVE UP IF KITE DOES NOT RISE TO AN ANGLE OF AT LEAST 60 DEGREES

BOOMERANGS

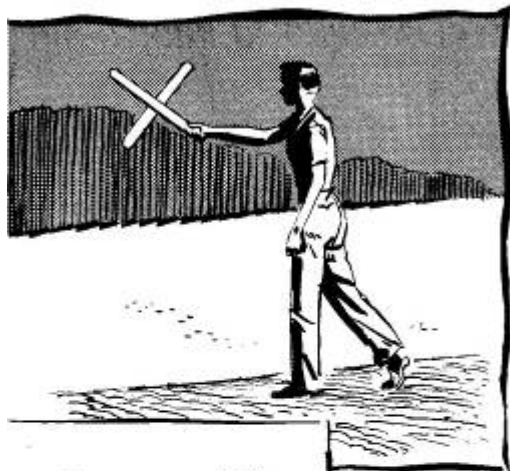


ALMOST ANY KIND OF WOOD WILL DO FOR A BOOMERANG SO LONG AS IT HAS AN EVEN LONG GRAIN. CUT A SUITABLE ELBOW FROM A TREE AS SHOWN. SAW IT LENGTHWISE DOWN THE MIDDLE SO AS TO

GET 2 BOOMERANGS FROM IT. THEN SHAPE EACH PIECE AS SHOWN IN FIG. 2. ONE SIDE IS FLAT THE OTHER CURVED. SHAPE AND FINISH WITH SANDPAPER.



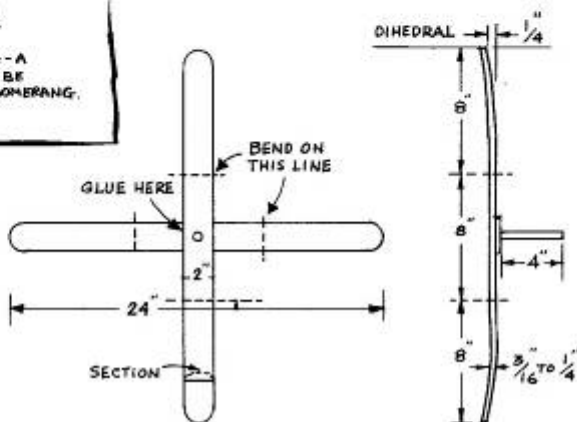
the cross-stick TYPE



THE CROSS-STICK BOOMERANG IS EASIER TO MAKE. YOU NEED 2 STRIPS OF WOOD 2 X 1/4 X 24 LONG. GLUE TOGETHER AT THE CENTRE IN THE FORM OF A CROSS. ROUND OFF THE TOP OF EACH STRIP, WHITTLING IT THIN ALONG THE EDGES & LEAVING THE MIDDLE FLAT. ROUND OFF THE ENDS. TO MAKE THE DIHEDRAL ANGLE BEND THE ENDS UP FOR A DISTANCE OF 3/8".



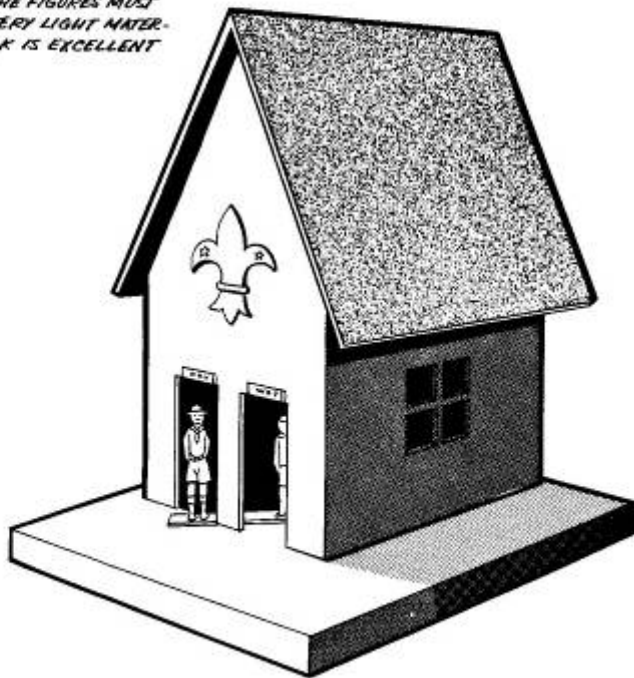
HALF-INCH DOWELLING - A PIECE 4 1/2" LONG - MAY BE USED TO CATCH THE BOOMERANG.



a Scout WEATHER

HERE IS A WEATHER DEN FOR YOUR OWN HOME OR PERHAPS FOR YOUR CUB CORNER. THE DEN IS CONSTRUCTED FROM STRONG CARDBOARD WITH 1 OR 2 PIECES OF WOOD. IN DRY WEATHER THE SCOUT COMES OUT OF THE DEN, & THE CUB APPEARS WHEN IT IS TO RAIN. YOU NEED A BASE OF WOOD ABOUT $\frac{1}{2}$ " THICK & 8x5". WALLS & ROOF OF CARDBOARD. THE FIGURES MUST BE MADE OF VERY LIGHT MATERIAL. THIN CORK IS EXCELLENT

TO FIX THE FIGURES A CROSSBAR OF WOOD IS USED. GLUE THE FIGURES AT EACH END (FIG 4). NOW DRILL 2 SMALL HOLES IN THE CROSSPIECE, EACH $\frac{1}{2}$ " FROM THE CENTRE & PASS A CATGUT OR THREAD THROUGH THE HOLES

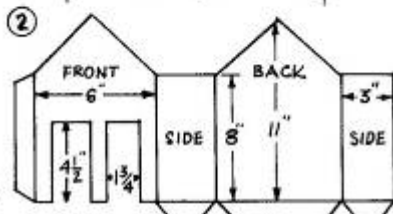
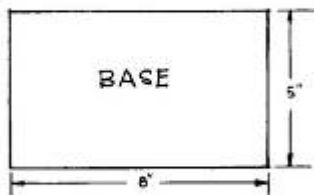


DEN

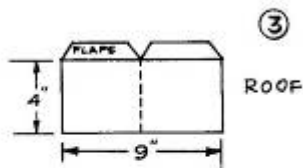
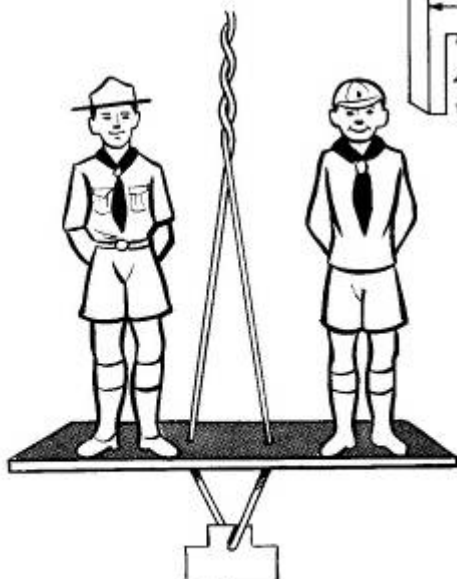
HOW DOES THIS WEATHER DEN WORK? THINK OF THE LAST TIME YOU WENT CAMPING. WHEN THE DEW WET THE TENT ROPE, YOU HAD TO SLACKEN THEM OFF; WHEN THEY DRIED YOU HAD TO TIGHTEN THEM. THE DEN WORKS ON THE SAME PRINCIPLE

①

THE LOOP MUST PASS THROUGH A WOODEN ANCHOR WHICH IS THEN FIXED TO THE BASE $\frac{1}{2}$ " FROM THE FRONT OF THE DEN. TWIST THE CORD AND FIX IT OVER THE CROSSBAR BENEATH THE ROOF RIDGE.



④

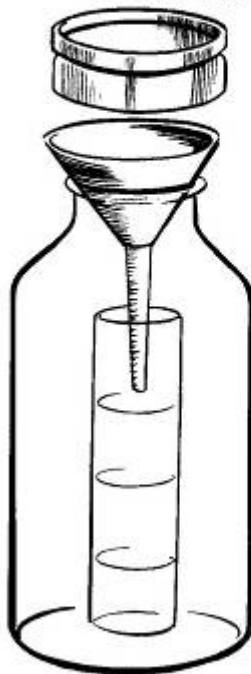


make your own
**RAIN
GAUGE**

THIS RAIN GAUGE WORKS ON THE SAME PRINCIPLE AS THE METEOROLOGIST'S BUT IS FAR SIMPLER. YOU JUST NEED A FEW ITEMS

*A 2 OZ. TOBACCO TIN, 1" DEEP
3 1/2" DIAMETER*

TAKE A SHALLOW TIN THE SIZE OF THE TOP OF THE FUNNEL & FILL IT EXACTLY 1" DEEP WITH WATER. MEASURE THIS AMOUNT IN A KITCHEN MEASURE, SAY THAT THERE ARE 10 OZ. OF WATER, THEN EVERY OUNCE = $\frac{1}{10}$ OF AN INCH OF RAIN. SO THE SMALL JAR MUST BE MARKED AT EVERY OUNCE FOR AS MANY AS IT WILL HOLD. YOU CAN MARK THE GLASS WITH A FILE OR A HACKSAW BLADE. TAKE DAILY READINGS & KEEP A RECORD. IF YOU KEEP THIS FOR A YEAR IT'S INTERESTING TO COMPARE THE AMOUNT OF RAIN FALLING IN VARIOUS YEARS & NOTICE A PATTERN.



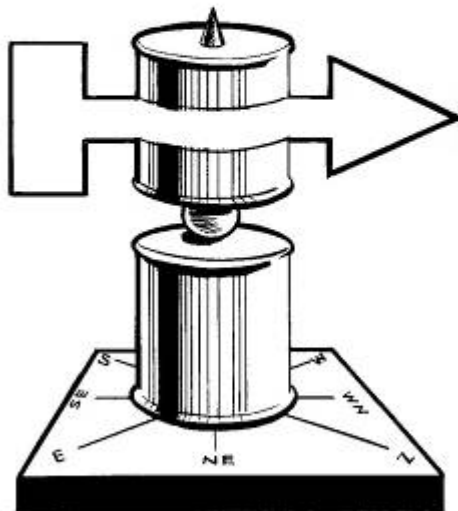
RUBBER BAND ROUND FUNNEL WHERE IT RESTS ON JAR SO RAIN WONT RUN DOWN OUTSIDE OF FUNNEL.

THERE IS A MODEL YOU CAN MAKE FOR YOUR SECOND STAR. IF YOU SET IT IN THE OPEN IT WILL TELL WHICH WAY THE WIND IS BLOWING FROM.

MODEL WINDVANE

YOU NEED A SQUARE PIECE OF WOOD ON WHICH YOU DRAW THE POINTS OF THE COMPASS. DRIVE A 3" NAIL THROUGH THE BOARD & SET THE NAIL HEAD FLUSH. NEXT PUT A SPOOL, A ROUND BEAD & ANOTHER SPOOL ON THE NAIL.

CUT OUT 2 YANES, PLUS 2 EXTRA POINTS FROM CARDBOARD. GLUE THE YANES TOGETHER & AROUND THE SPOOL. GLUE THE EXTRA POINTS ON TO HELP BALANCE THE HEAVIER TAIL.

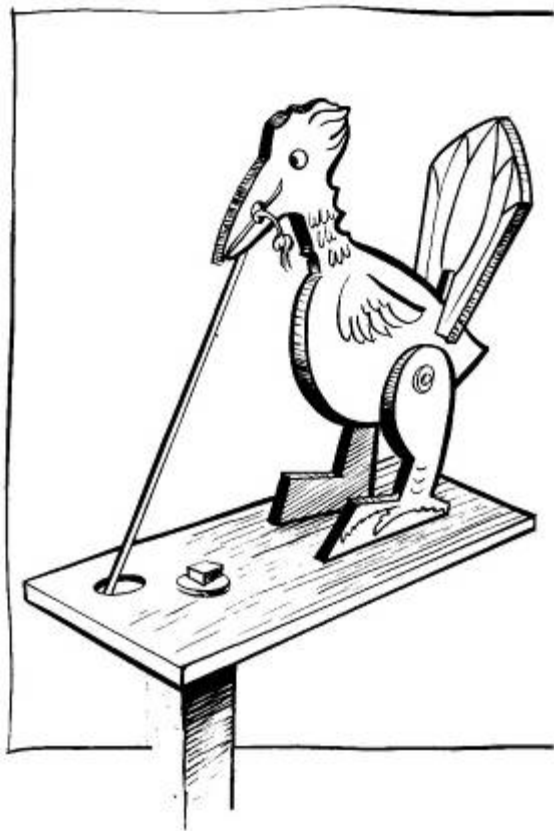


EARLY BIRD

THIS WEATHER VANE IS ALSO A ROCKING WIND TOY, THE BIRD WHICH IS BRIGHTLY PAINTED IS CUT OUT OF THIN WOOD, BODY TAIL & 2 LEGS

DRAW YOUR PARTS FIRST ON YOUR WOOD & CUT OUT WITH A COPING SAW. SET THE TAIL AT RIGHT ANGLES FOR IT IS THIS WHICH CATCHES THE WIND & CAUSES THE BIRD TO ROCK BACK & FORWARD ON ITS 2 LEGS WHICH ARE BOLTED TO ITS BODY.

THE WORM IS A PIECE OF RUBBER FASTENED TO THE BILL AT ONE END & THE PLATFORM AT THE OTHER. USE A $\frac{1}{4}$ " STOVE BOLT TO JOIN THE LEGS & BODY & A $\frac{1}{2}$ " BOLT WITH WASHER TO FASTEN PLATFORM TO POLE.



HERE IS AN EASY MODEL THAT
THE YOUNGEST CUB CAN MAKE
& IT'S FUN TO WATCH IT WORK.
YOU NEED A BOTTLE, A CORK,
A DRINKING STRAW & A PAN

WATER fountain



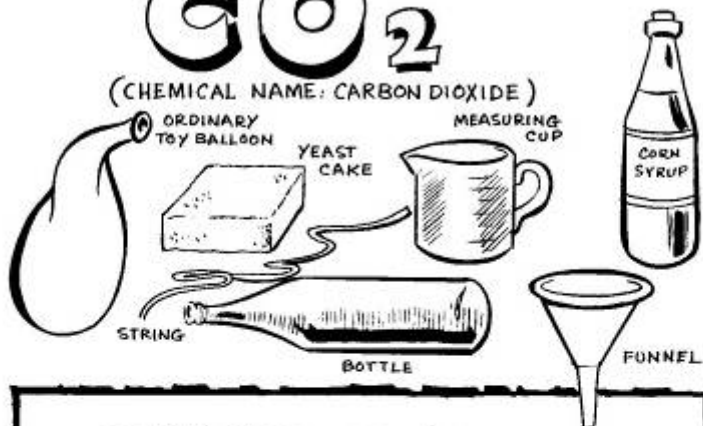
ALL YOU DO IS FILL A BOTTLE
HALF FULL WITH WATER, BORE
A HOLE THROUGH THE CORK
& PUSH A DRINKING STRAW
THROUGH, THEN PUT IN THE
CORK, MAKING SURE THAT
THE STRAW GOES WELL
DOWN INTO THE WATER.

BLOW AS HARD AS YOU CAN
INTO THE STRAW, & TAKE
YOUR FACE AWAY. WATER WILL
SPOUT OUT IMMEDIATELY IF
YOU PRESS THE TOP OF THE
STRAW TOGETHER THE
WATER WILL GO HIGHER.

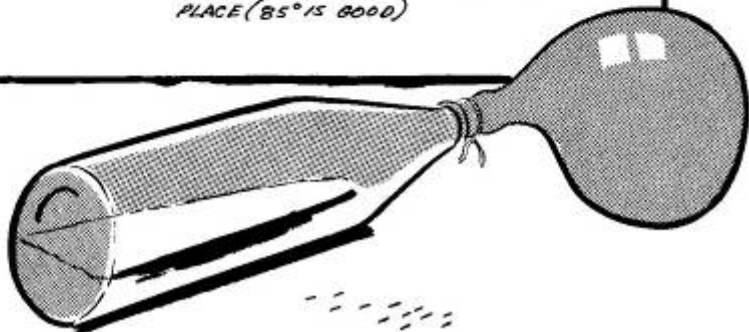
MAKE YOUR OWN

CO₂

(CHEMICAL NAME: CARBON DIOXIDE)



DISSOLVE $\frac{1}{2}$ CAKE OF YEAST IN $\frac{1}{2}$ CUP OF WARM WATER. POUR INTO A LARGE, CLEAN POP BOTTLE. ADD $\frac{1}{2}$ CUP OF CORN SYRUP (USE FUNNEL - DON'T MESS UP THE KITCHEN). SLIP THE BALLOON OVER THE MOUTH OF THE POP BOTTLE & TIE IT ON TIGHTLY WITH STRING. SET THE BOTTLE ON ITS SIDE IN A WARM PLACE (85° IS GOOD)



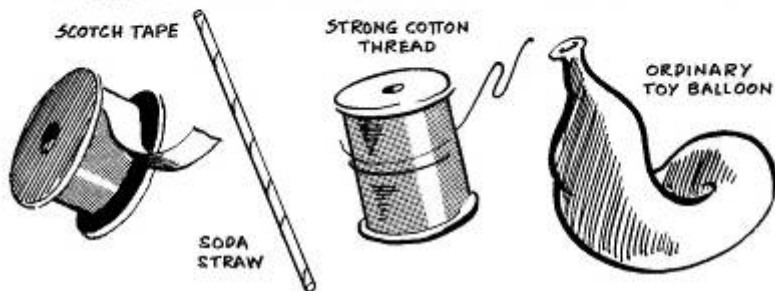
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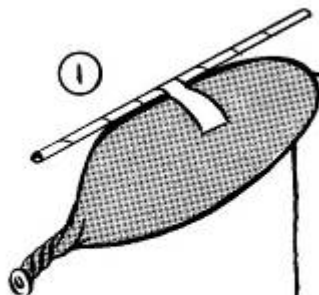
MAKE YOUR OWN



*HERE'S THE EQUIPMENT YOU NEED TO DEMONSTRATE THE PRINCIPLE
"TO EVERY ACTION THERE IS AN EQUAL & OPPOSITE REACTION" - NEWTON*

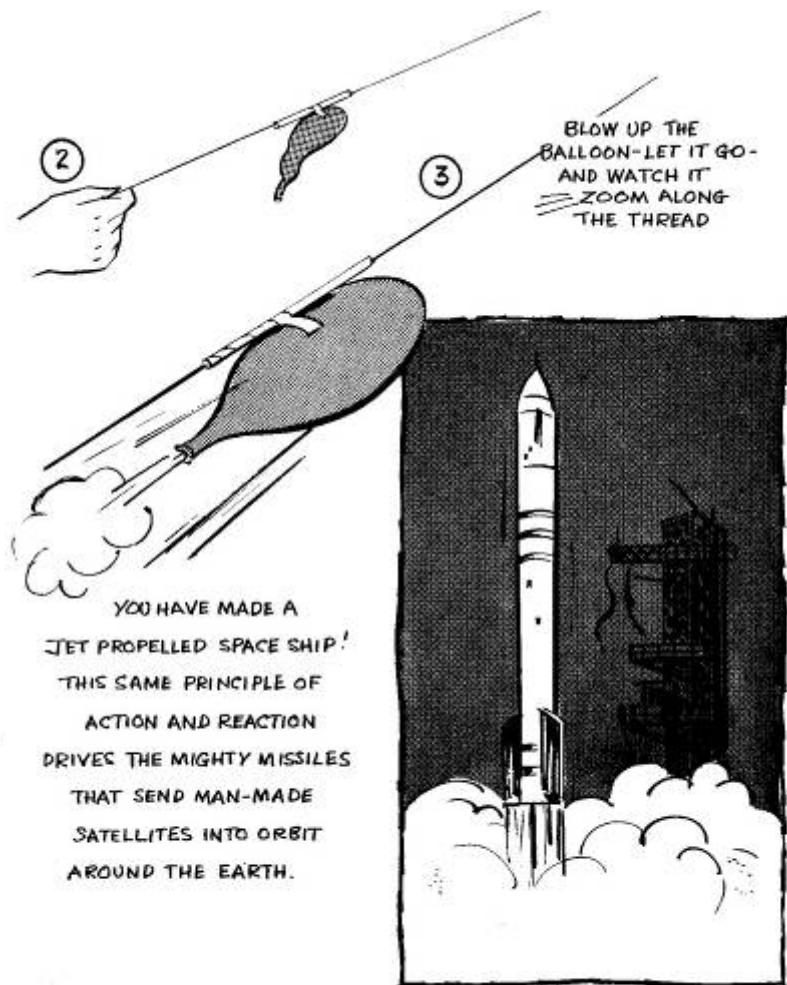


BLOW THE BALLOON UP PART WAY - PINCH THE END TO HOLD IN THE AIR.



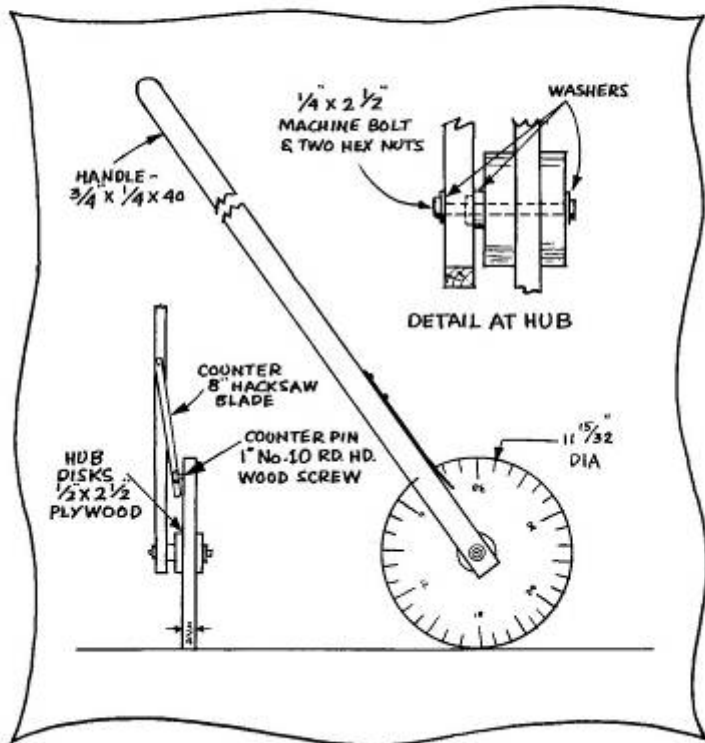
WITH A PIECE OF THE SCOTCH TAPE
FASTEN $\frac{1}{2}$ OF THE SODA STRAW TO
THE BALLOON. LET THE AIR OUT OF
THE BALLOON. TIE ONE END OF A
LONG PIECE OF THREAD TO A
TACK, HIGH ON THE DOOR... RUN
THE THREAD THROUGH THE STRAW
HOLD THE OTHER END IN YOUR
HAND.

Working Models



M^A Measuring WHEEL

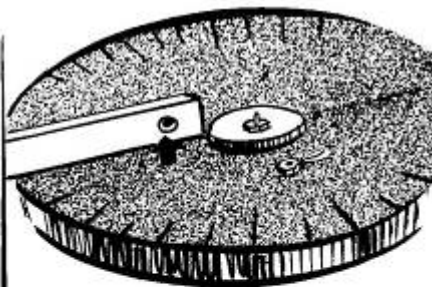
WITH THIS MEASURING WHEEL YOU CAN MEASURE OR LAY OUT ANY DISTANCE IN YARDS, FEET & INCHES WHETHER UP HILL OR DOWN. THE ACCURACY LIES IN THE CORRECT DIAMETER OF THE WHEEL, SO CUT IT OUT CAREFULLY. EVERY TIME THE WHEEL MAKES 1 REVOLUTION, THE COUNTING PIN HITS THE HACKSAW BLADE MAKING AN AUDIBLE SOUND. COUNT THE SOUNDS & YOU HAVE THE DISTANCE



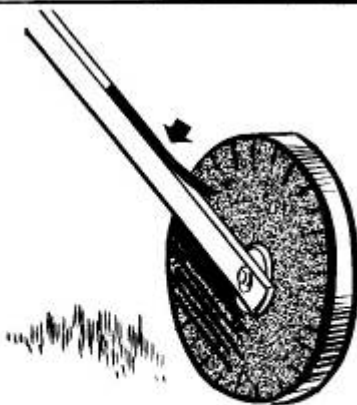
Working Models



AFTER YOU HAVE MADE THE WHEEL DISK, DIVIDE CIRCUMFERENCE INTO 36 PARTS & MARK DIVISIONS WITH A FELT PEN.



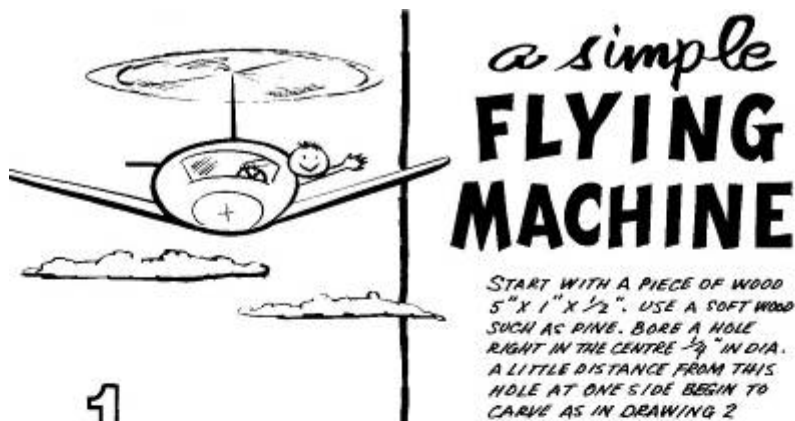
COUNTERSINK HANDLE TO FIT ONE HEX NUT ON SHAFT SO OUTER NUT CAN BE DRAWN UP TIGHT TO PREVENT TURNING.



ALIGN THE HACKSAW BLADE SO IT JUST TOUCHES SCREW HEAD & WILL SPRING BACK TO SLAP HANDLE EACH REVOLUTION.



A VEE-ROD COUNTER RIGGED UP ON A HANDLE BRACKET WILL RECORD EACH REVOLUTION OF THE WHEEL ACCURATELY.



FOLLOW DRAWINGS AS CLOSELY
AS POSSIBLE USING A SHARP
KNIFE. STILL FOLLOWING ST2
BEGIN AT THE OPPOSITE CORNER
AT THE SAME END OF THE WOOD
AND CUT AWAY UNTIL YOU

HAVE A SLANTING BLADE, BUT
VERY THIN. MAKE THE CORNERS
OF THIS END ROUND INSTEAD
OF LEAVING THEM SQUARE. DO
THE SAME THING TO THE OTHER
END OF THE WOOD. FOLLOW STEP ST3

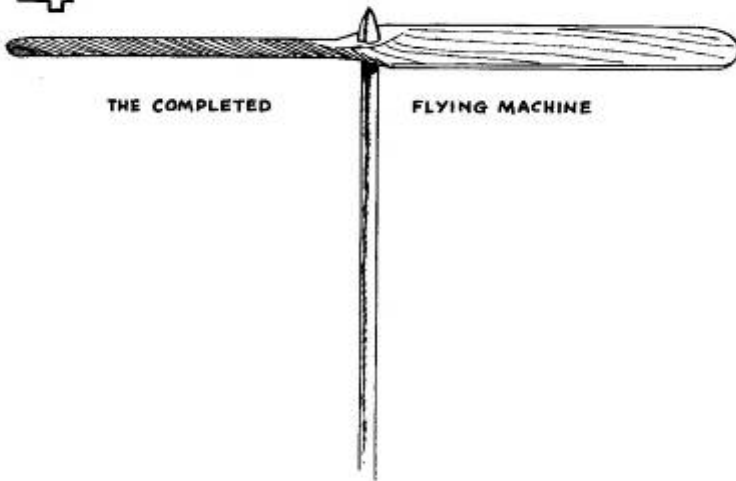
Working Models

3



THE WINGS AFTER CUTTING

4



THE COMPLETED

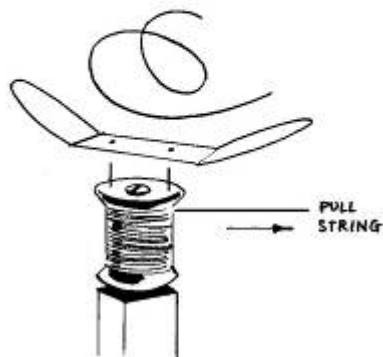
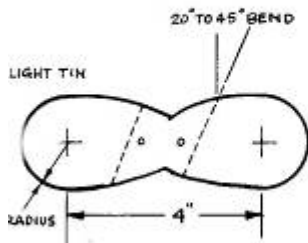
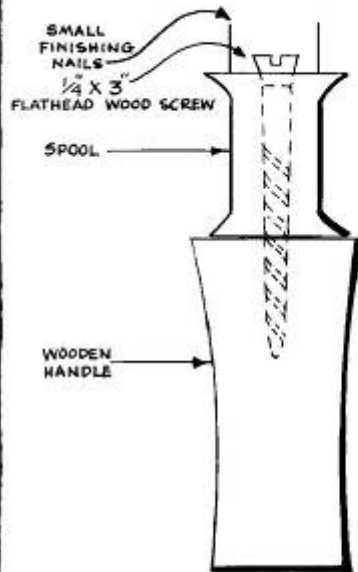
FLYING MACHINE

*AFTER BOTH ENDS OF THE WOOD
HAVE BEEN SHAPED SANDPAPER
THE WHOLE PIECE SMOOTH. GET A
BUTCHERS SKEWER & INSERT INTO
THE CENTRE HOLE. NOW ALL YOU*

*MUST DO IS HOLD THE STEM BETWEEN
THE PALMS OF THE HANDS & RUB
THE HANDS TOGETHER QUICKLY &
RELEASE THE MACHINE AS WE MAKE
IT SPIN. PRACTICE MAKES PERFECT*

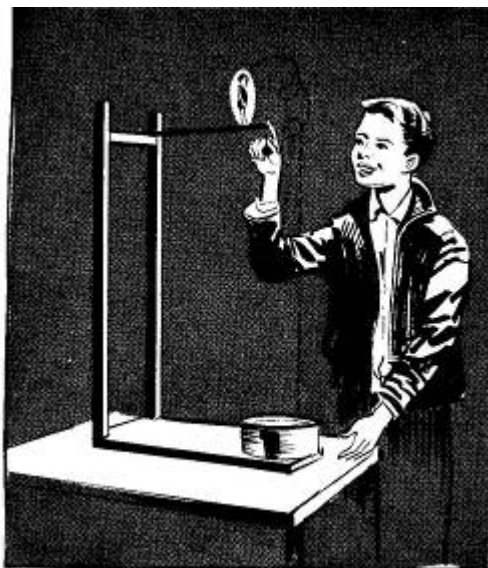
FLYING WINGS

HERE IS A LITTLE PROJECT FOR YOU. JUST GET AN EMPTY SPOOL, A WOOD SCREW, A SMALL BLOCK OF WOOD, 2 FINISHING NAILS AND A PIECE OF TIN PLATE, & FOLLOW THE DIRECTIONS. WHEN YOU HAVE COMPLETED THE WINGS, BEND THEM UP AS SHOWN. TIE SOME STRING AROUND THE SPOOL & WIND. MAKE SURE THE SPOOL TURNS FREELY. PLACE THE WINGS OVER THE TWO NAILS, HOLD IT ABOVE YOUR HEAD & PULL.



HIGH DIVER

HERE'S A GAME THAT REQUIRES PRACTICE TO GET THE DIVER INTO THE "POOL". HE IS MADE FROM $\frac{1}{2}$ " THICK WOOD AND PAINTED. THE DIVING BOARD IS MADE FROM $\frac{3}{8}$ " THICK STOCK. IF NOT SPRINGY ENOUGH SAND IT THINNER UNTIL IT IS. THE BASE & UPRIGHT MAY BE MADE AS SHOWN. ITS ONLY PURPOSE IS TO GIVE HEIGHT TO THE DIVING BOARD. SET A DISH FILLED WITH WATER ON THE BASE & "AWAY YOU GO!"



THE FREE SWINGING ARMS ARE MADE FROM TIN PLATE OR LIGHT STEEL AS THEY MUST HAVE ENOUGH WEIGHT TO CONTROL THE DIRECTION OF FIGURE

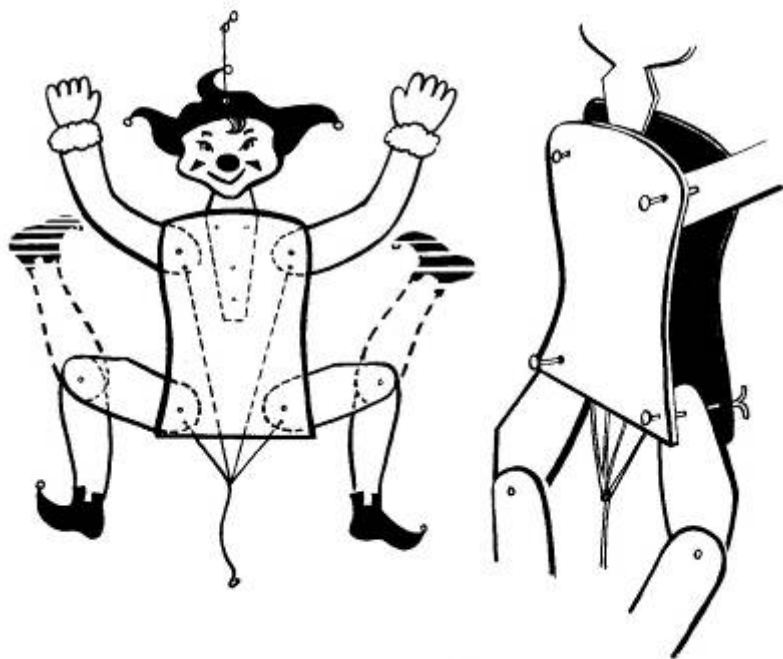


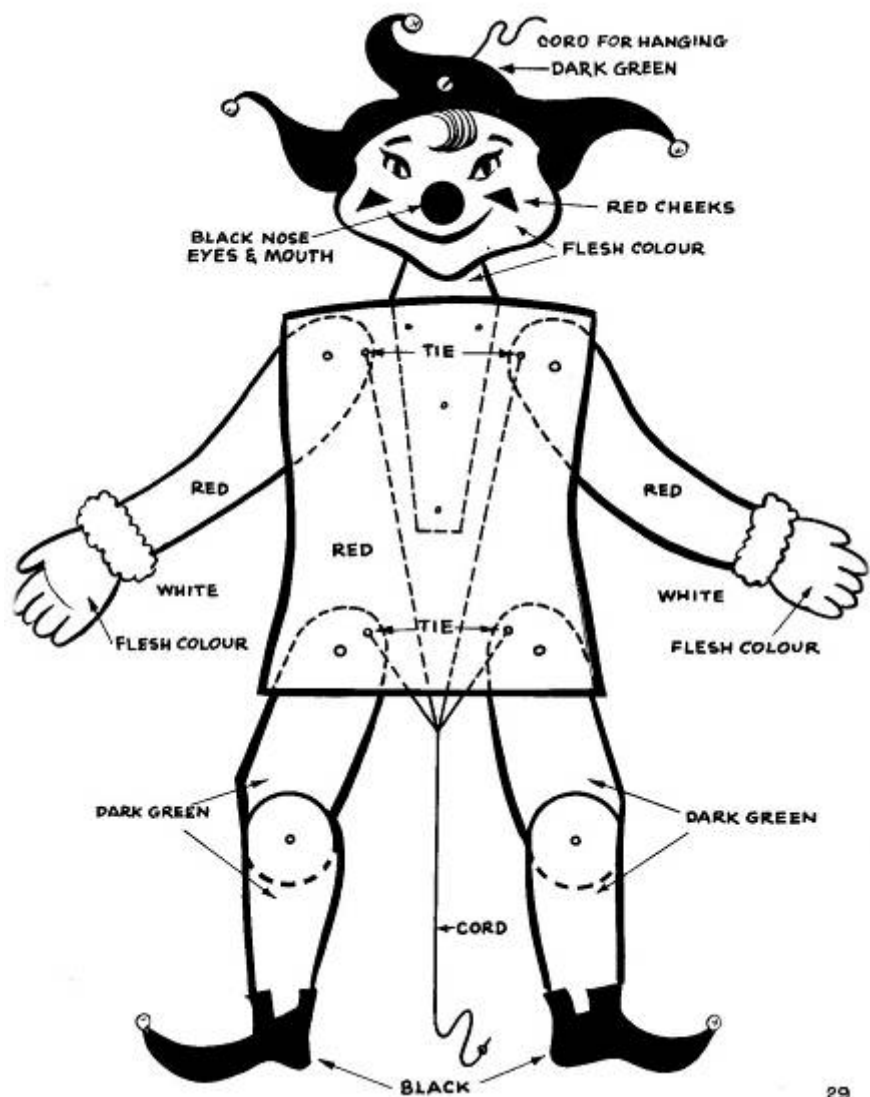
CLOSE TO THE END OF DIVING BOARD FASTEN A SHORT PIECE OF DOWEL WITH WATERPROOF CEMENT. THIS FITS LOOSELY IN HOLE DRILLED IN THE FEET OF THE DIVER.

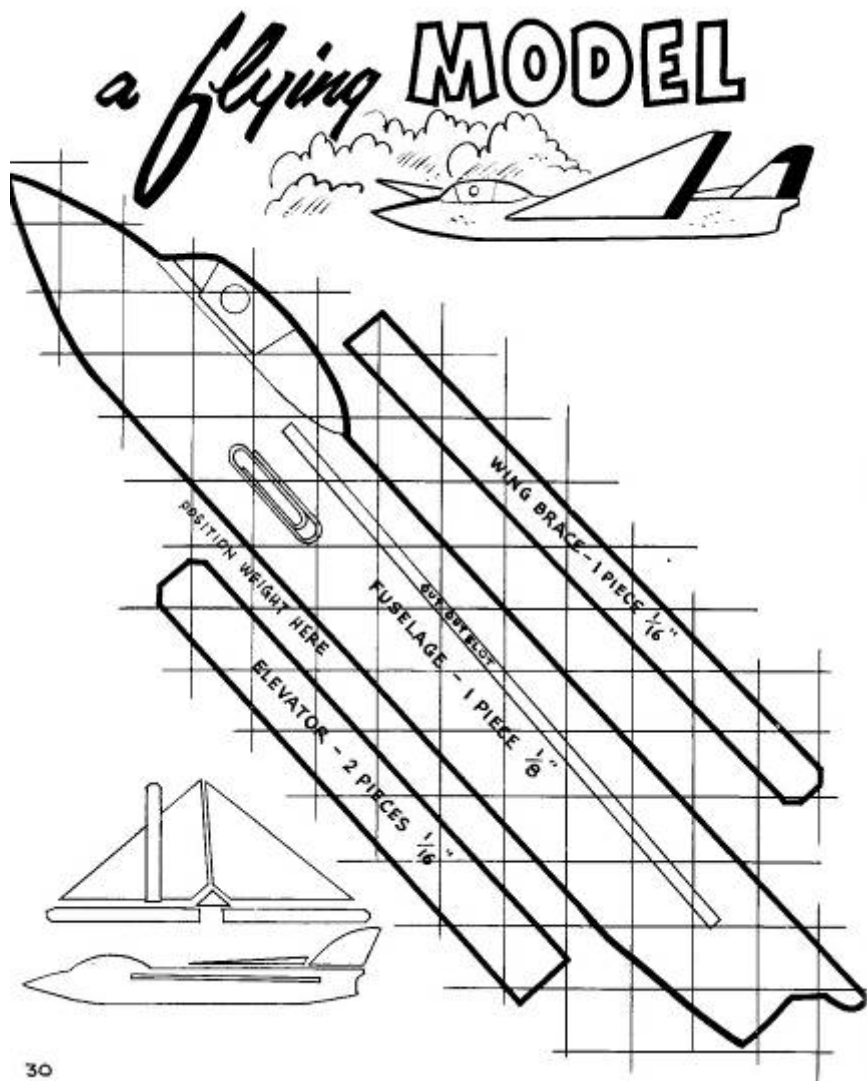
Jumping Jack

THIS WORKING MODEL IS MADE OF HEAVY CARDBOARD. USE A THICKER PIECE FOR THE HEAD PIECE IN ORDER TO SEPARATE THE TWO BODY PIECES ENOUGH TO ALLOW FREE SWING TO ARMS & LEGS.

THE DRAWING OPPOSITE IS FULL SIZE. USE REINFORCEMENTS WHERE CORD TIES TO ARMS & LEGS. USE PAPER BRADS TO HOLD PIECES TOGETHER. PAINT AS SHOWN WITH POSTER COLOURS.



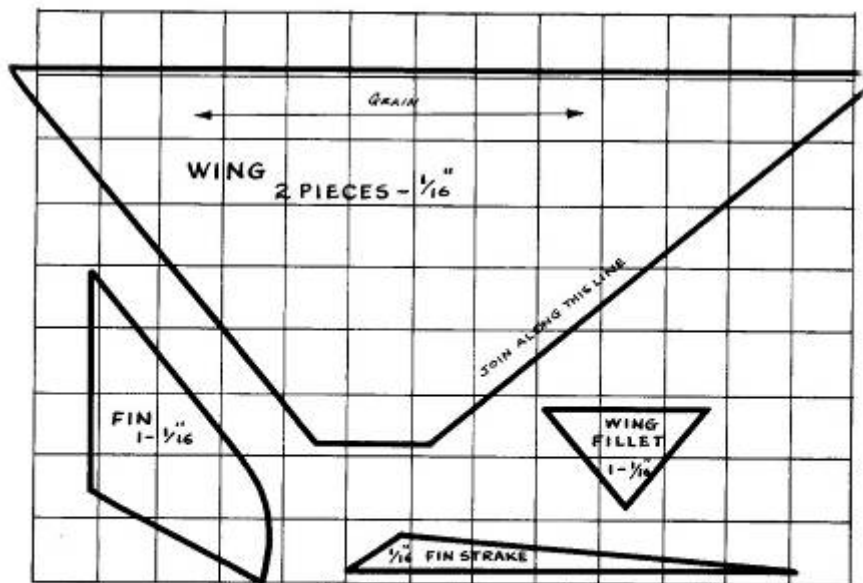




Working Models

WHAT WITH ALL THE NEW-FANGLED PLASTIC MODELS NOBODY SEEMS TO BOTHER WITH A HOMEMADE Balsa GLIDER ANYMORE. BUT HERE IS ONE YOU CAN HAVE HOURS OF FUN WITH.

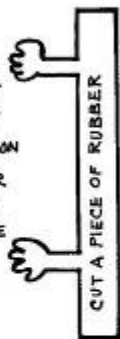
YOU MAY HAVE TO USE DIFFERENT WEIGHTS SUCH AS HAIR PINS, PAPER CLIPS ETC. TO GET PROPER BALANCE. SCOTCH TAPE THE WEIGHT UNTIL YOU GET RIGHT ONE. THEN GLUE TO BODY IN POSITION SHOWN.



a diver

HERE'S A NEW ONE TO FASCINATE YOUR PALS, IT ONLY TAKES MINUTES TO MAKE

YOU'LL NEED AN OLD FLASH LIGHT BULB, A PIECE OF RUBBER, A SECTION OF SMALL RUBBER TUBE, A CORK & A LARGE BOTTLE



MAKE SURE JOINT IS QUITE AIR-TIGHT. STICK WITH SOME KIND OF ADHESIVE



DIVER WILL REMAIN AT THE TOP OF THE BOTTLE



SHAKE THE BOTTLE GENTLY TO ALLOW SOME OF THE AIR TO ESCAPE



UNTIL DIVER IS SUSPENDED ABOUT HALF-WAY



BY PRESSING OR RELEASING CORK THE DIVER WILL RISE OR DESCEND