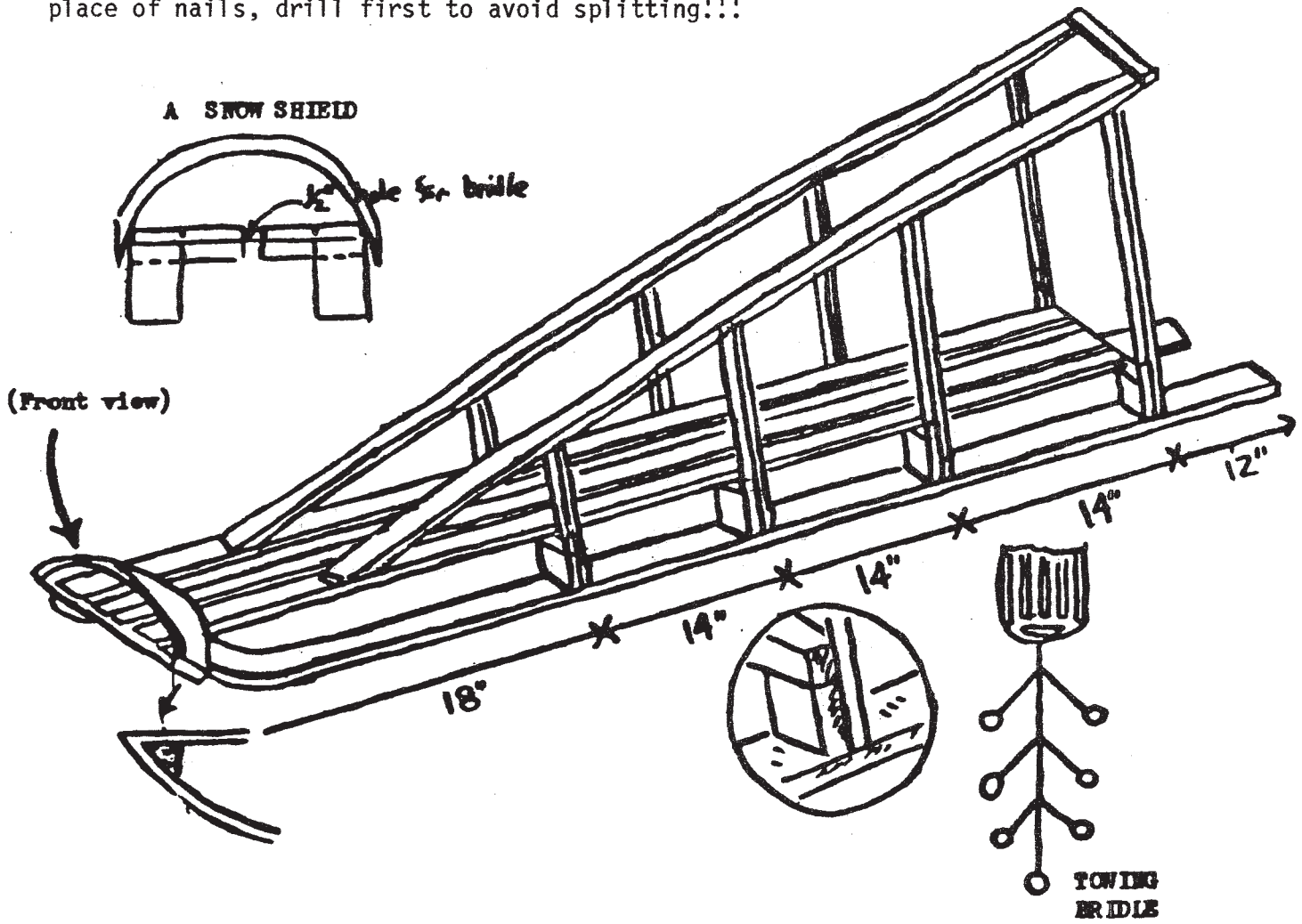
KLONDIKE SLEDGE PLAN

This year all entries in the Best Sledge Contest will be judged for approved length of 6 feet long and 18 inches wide. The drawing should be self explanatory. Your own design will be accepted. Use your imagination!! However, after researches in our Public Libraries, the accompanying sketch is authentic and we ought to be the "real McCoy." Paint your sledge bright colors -- varnish the bottom of the runners -- then wax before use. The Eskimos iced their runners. Accessories may be added -- a canvas snow curtain as a snow guard front and sides will keep equipment dry. Use screws in place of nails, drill first to avoid splitting!!!

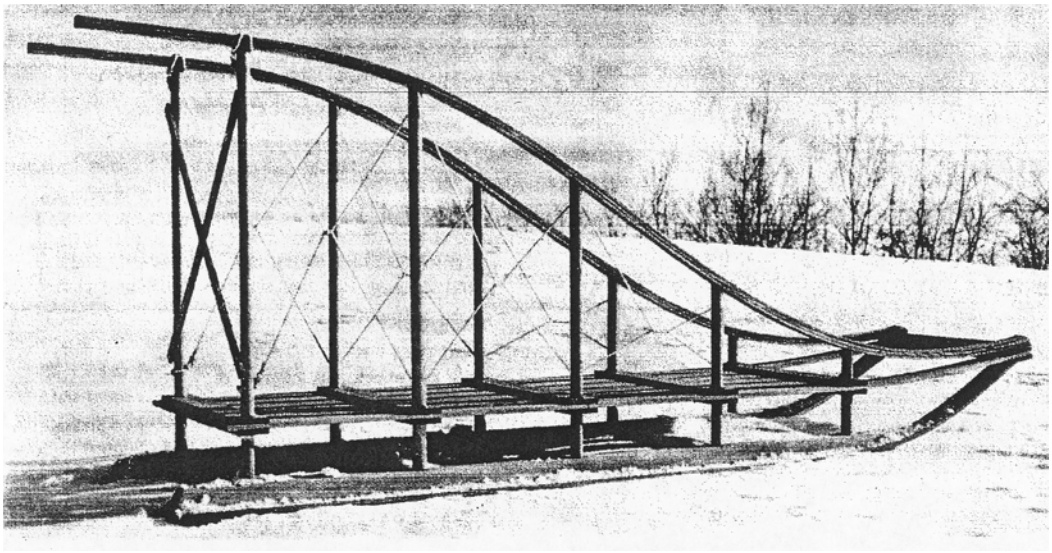


BILL OF RIGHTS
2 pcs. 4" x 1/2" x 6'6" - Runner
6 pcs. 1" x 1" x 18" - Cross Support
4 pcs. 1/2" x 4" x 5" - Floor Cover
8 pcs. 1" x 2" x 6" - Upright Support
2 pcs. 1" x 2" x 40" - Rear Upright
2 pcs. 1" x 2" x 36" - 2nd Rear Upright
2 pcs. 1" x 2" x 26" - 2nd Front Upright
2 pcs. 1" x 2" x 12" - Front Support
2 pcs. 1/2" x 2" x 6' - Hand Rail
1 pc. 1/2" x 2" x 30" - Front Curved Guard
1 pc. 2" x 2" x 18" - Tow Bar

BOY SCOUT

A KLONDIKE DERBY SLED

By GLENN WAGNER

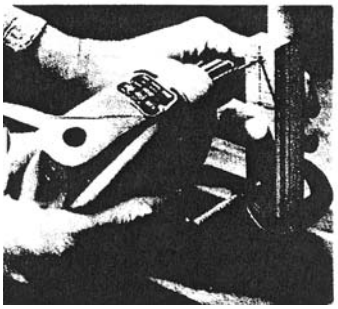


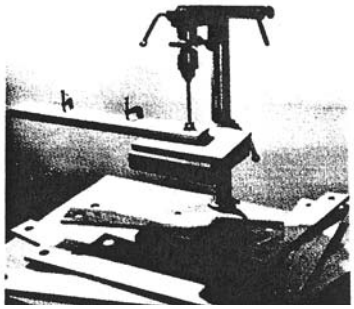
Get set for those exciting Klondike Derby days with this sleek-looking Eskimo-type sled. Measuring seven feet long, 20 inches wide and 34½ inches high, it is large enough to carry a good-size load, yet small enough to be transported in a station wagon or car trunk. Making and racing one will be a fine troop project. And when the races are over, the sled can be used to transport overnight camping gear, for rescue work, or lugging skis and equipment to the slopes either by pulling it by hand, or towing it behind a snowmobile.

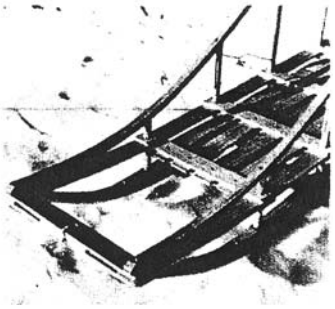
The sled is designed so it can be built without the necessity of steaming the wood. The unique design and construction of the double cross rails keep weight at a minimum, yet give strength and rigidity to the framework. Since the construction is based on a series of holes that must be aligned, the use of a drill press equipped with a 1″ diameter spur bit is recommended, to assure correct alignment and squareness of the bore. Drilling small pilot holes to locate hole centers is a technique that can be used for hand boring or machine boring of the larger holes. Follow the suggestions for construction and assembly procedure and you will have a sled that will be the hit of your Klondike Derby.

Assembly Procedure:

1. Glue the 10 posts in the runner blocks; use waterproof glue.
2. After the glue is dry, make and use a wood-block drilling jig to locate and drill the top and bottom pinholes in the posts. The top hole in the drilling jig should be located after clamping two cross rails and one side rail together to check the thickness of the stock. A 7/64″ drill will bore a drive-fit hole for the pins.
3. Cut off the heads of the finishing nails and drive one nail in each bottom posthole. Center the exposed ends. Now slip five cross rails over the posts into position on top of the pins. (Note: Since wood dowels may vary slightly in diameter, check to see that each cross and side rail will slip over the dowels without binding to prevent splitting of wood during installation. Sand or file holes—or sand dowels as required for a snug fit.) Next, slide the side rails into position on the posts, then add the five remaining cross rails to the assembly and drive the other 10 nails in the posts to hold the parts together tightly. A little waterproof glue applied at each joint during assembly will strengthen the framework. Check frame for squareness before glue sets.
4. Insert the four floorboards between the cross rails; clamp to hold. Then drill and countersink holes for the 3/16″ x 1½″ flathead stove bolts; install bolts.
5. Make and install the front cross rail assembly.
6. Now, center the runners on the bottom of the runner blocks. The rear edges should be aligned flush. Drill and countersink holes for 1″ No. 8 flathead brass wood screws spaced on 8″ centers, starting 2″ from the rear ends. Use two 3/16″ x 1½″ flathead stove bolts to fasten the runners to the runner blocks 4″ from the forward end of the blocks.
7. Raise the front rail unit sufficiently so the front ends of the runners when bent can be snapped into position behind the lower front rail; clamp if necessary. Make two wedge-shaped filler blocks to fit between each side rail and runner, then drill and countersink holes for one stove bolt on each side. Install bolts.
8. The railings are made in a unique way. The pieces are fitted and assembled without glue first, then each railing is disassembled and finally reassembled with waterproof glue. First, assemble three pieces, clamp together near one end, then locate and drill the ¼″ hole for the 3″ bolt. Insert bolt and tighten the nut loosely. Next, insert the bolt in the front rail and use another nut to hold the assembly in position temporarily. Then, carefully bend and raise the three pieces over the tops of the posts; clamp or use heavy twine to hold pieces together during this operation. Determine the angles at which the tops of the posts should be cut, then use a fine-tooth saw to cut post tops. After railings are arranged into a smooth curve, locate and drill holes for the 2″ No. 10 flathead wood screws and install screws temporarily. Drill body holes in railings and lead holes in the posts to prevent splitting. Note the angle and position of the screws as indicated on the side view of the assembly drawing. When everything is satisfactory, disassemble the units and reassemble with waterproof glue. Use clamps or twine wrapped around the pieces to hold strips until glue is dry. Clean up edges afterward and cut ends of handles square. Round off all edges slightly.
9. Make and install the braces on rear posts.
10. Saw off any extra lengths of bolts protruding beyond nuts and clean up flush with a file.
11. Sand completely and give finished sled several coats of waterproof varnish or use a vinyl finish. If sled is to be painted, apply a coat of a good grade outdoor paint primer first.
12. Locate and drill 3/16″ holes in posts for the rope lacing. Lace rope in one piece as indicated on the drawing. Wrap the handle with an X-type loop to add strength to the joint.



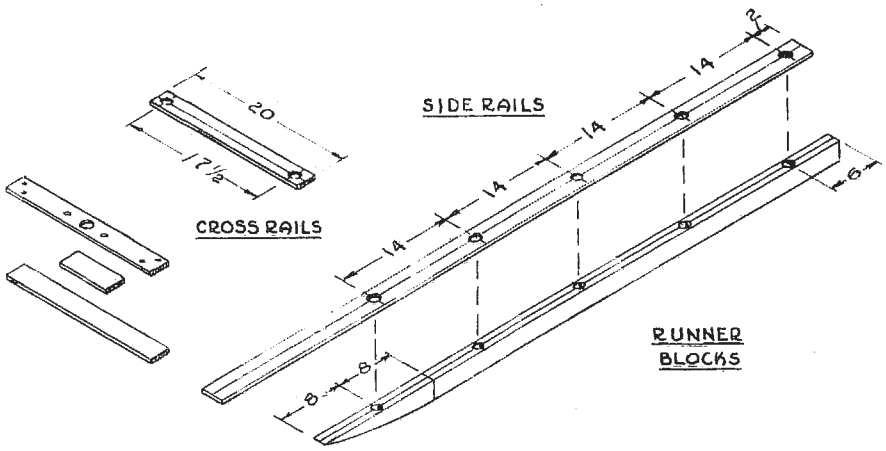




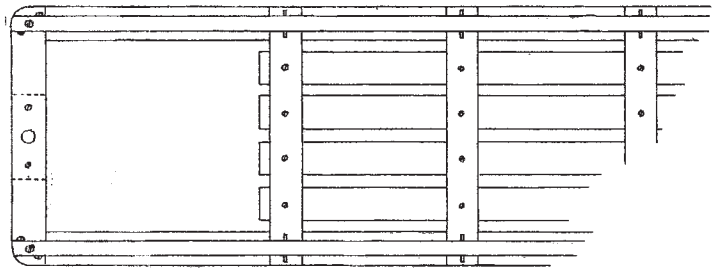
Make simple wood jig. Clamp in place to drill 7/64" holes in posts, for nail-pin drive fit.

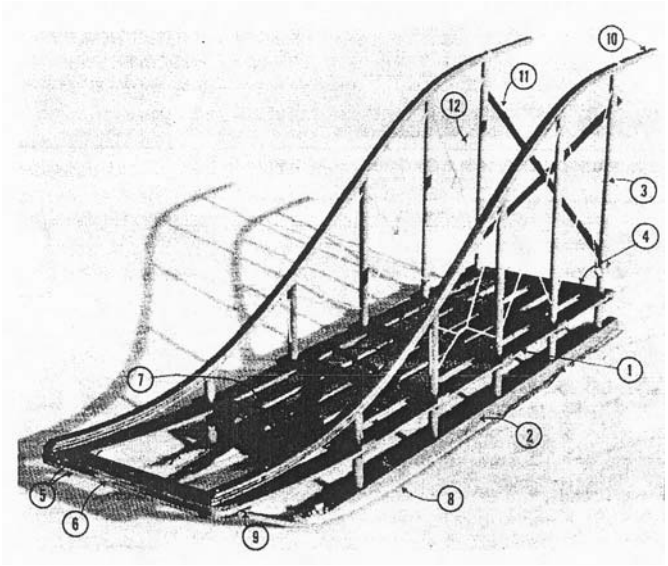
Clamp cross rails and side rails in pairs to bore 1" postholes. See text. Mark slashes on sides of pairs so you can align them.

Closeup of construction details of front end of sled. Note bolts, filler blocks, top post pins, rope lacing and railing screws.

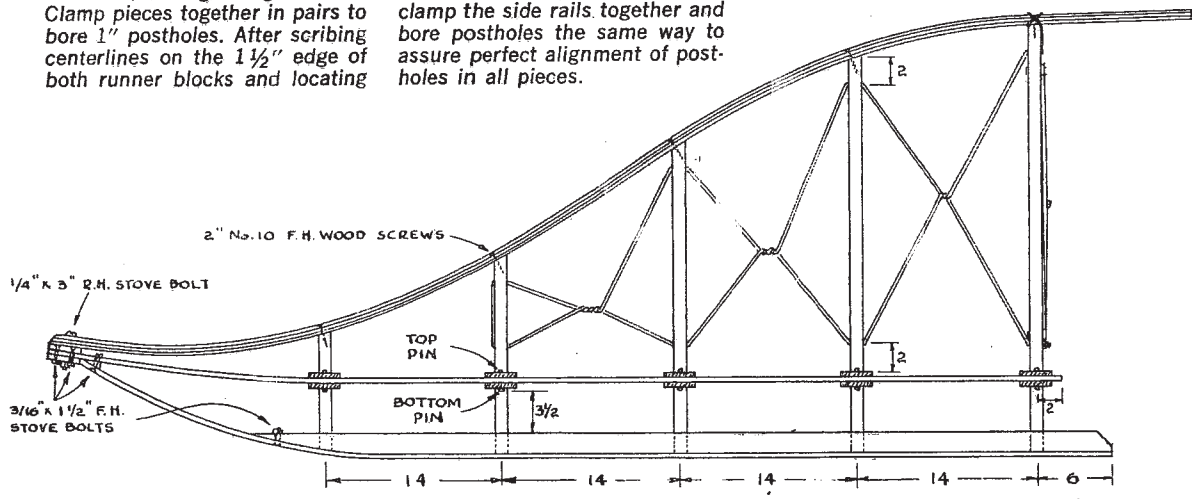


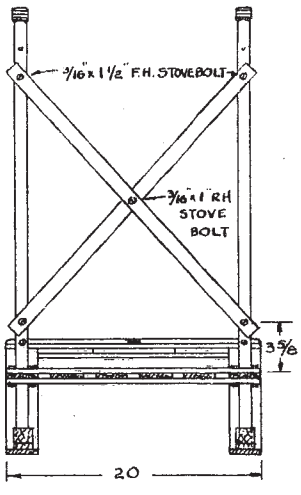
FRONT RAIL UNIT





Cut all stock to finished dimensions. Scribe centerlines on ONE side rail and ONE cross rail. Following sketches, lay out posthole centers. Drill ⅛" pilot holes in both pieces at these points. With this cross rail as a pattern, drill four more. Align edges flush. Clamp pieces together in pairs to bore 1" postholes. After scribing centerlines on the 1½" edge of both runner blocks and locating the last hole in each block as a reference point, clamp the side rail you used as a pattern in position on top of the 1½" edge and drill pilot holes in each runner block. Use the pilot holes in each runner block to center the bit while boring postholes. Now clamp the side rails together and bore postholes the same way to assure perfect alignment of postholes in all pieces.



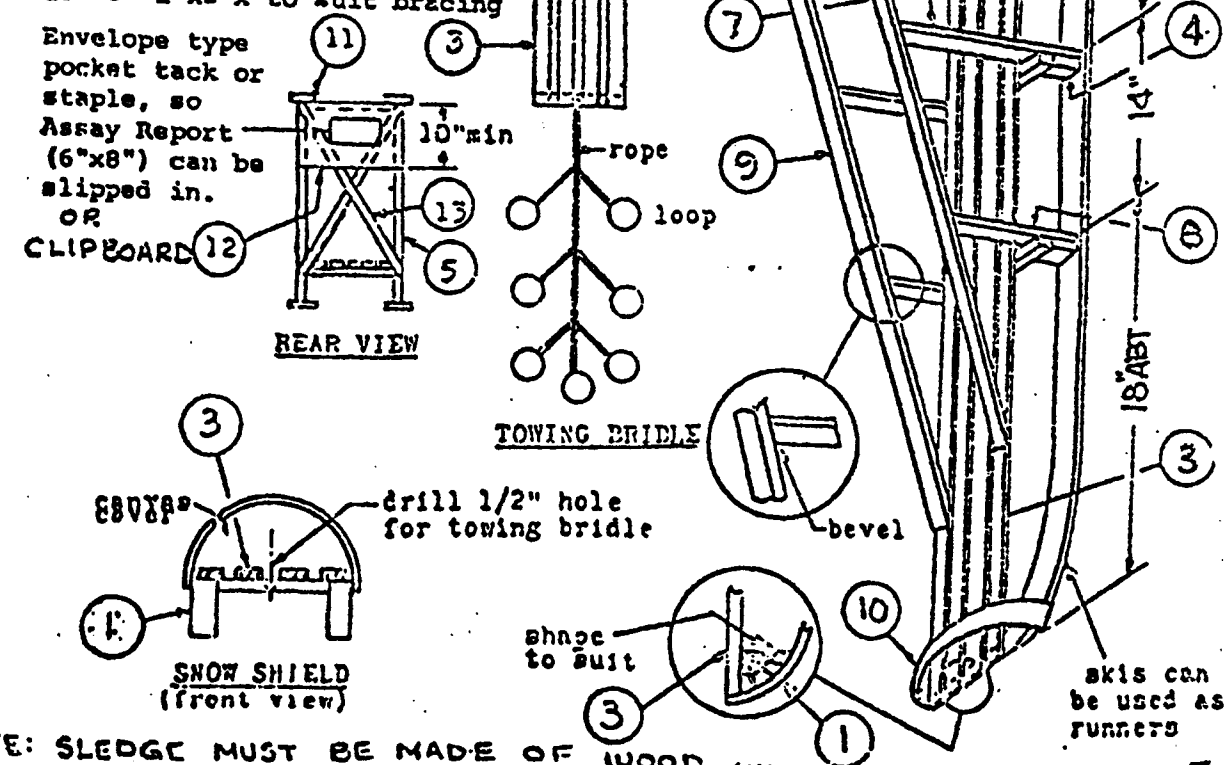


KLONDIKE SLEDGE

While your own design will be accepted, this diagram shows an authentic sledge. You may paint them bright colors but varnish or wax the bottom of the runners. Accessories may be added, canvas snow guard for front and sides. Use bolts or screws instead of nails - drill first to avoid splitting. Make towing bridle of rope, about 20 feet.

Bill of Material

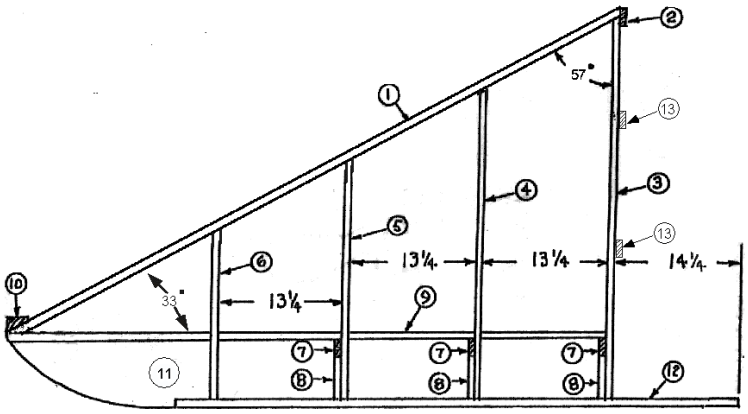
Pt.	Qty.	
1	2	-4"x½"x6'6" - runner
2	6	-1"x1"x18" - cross support
3	4	-½"x4"x5' - floor cover
4	8	-1"x2"x6" - upright support
5	2	-1"x2"x40" - rear upright
6	2	-1"x2"x30½" - 2nd rear upright
7	2	-1"x2"x21½" - 2nd front upright
8	2	-1"x2"x12" - front support
9	2	-½"x2"x6'0" - hand rail
10	1	-½"x2"x30" - front curved guard
11	1	-2"x2"x18" - rear hand rail
12	1	-¼"x10"x18" - Pocket holder
13	2	-1"x2"x to suit bracing



NOTE: SLEDGE MUST BE MADE OF WOOD WITH THE EXCEPTION OF SKIS AS RUNNERS.

SLEDGE MUST BE CONSTRUCTED BY THE BOYS WITH ADULT SUPERVISION

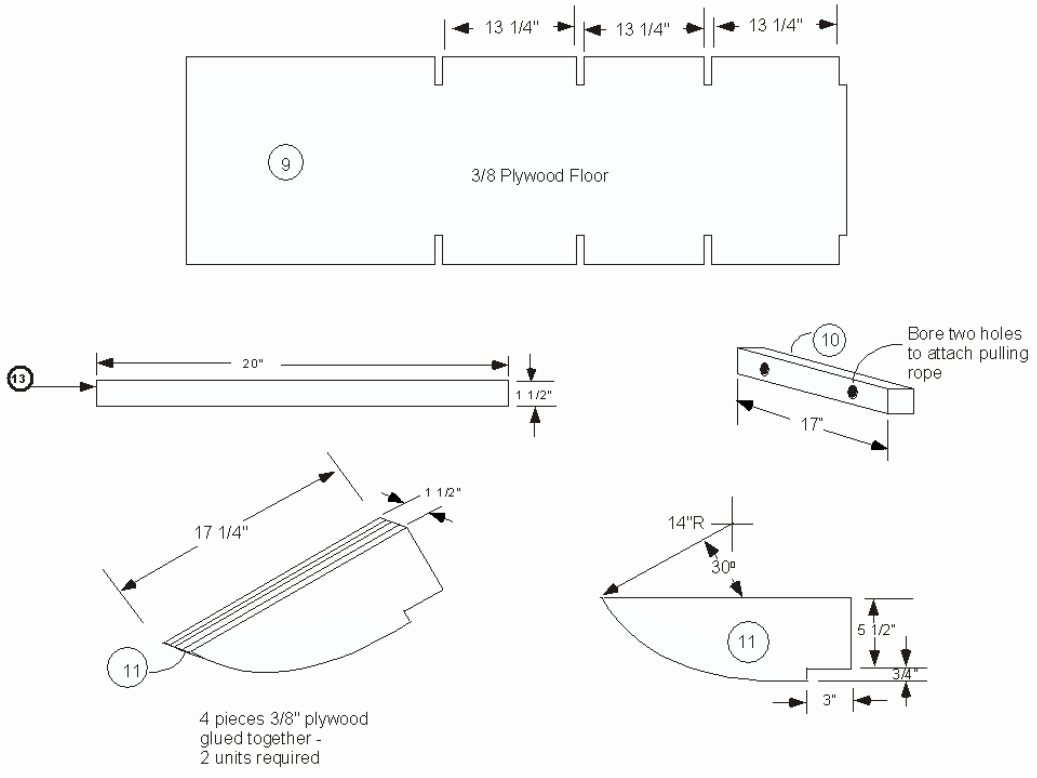
Klondike Derby Sled Plan



SIDE VIEW

Klondike Derby Sled Parts List
#1 1" x 2" x 70 1/4" Top Rail 2 req.
#2 1" x 2" x 20" Hand Rail 1 req.
#3 1" x 2" x 40 3/8" Rear Upright 2 req.
#4 1" x 2" x 32" 2nd Upright 2 req.
#5 1" x 2" x 23 7/8" 3rd Upright 2 req.
#6 1" x 2" x 16" Front Upright 2 req.
#7 1" x 2" x 20" Floor Support 3 req.
#8 1" x 2" x 4" Floor Spacer 6 req.
#9 3/8" x 20" x 60 3/4" Plywood Floor 1 req.
#10 2" x 2" x 17" Front Support 1 req.
#11 1 1/2" thick Laminated Plywood Front Runner 2 req.
#12 1" x 2" x 60" Hardwood Runners 2 req.
#13 1" x 2" x 20" Stiffener 2 req.
#6 x 1 1/4" Flat head Wood Screws 100 req.
Wood Glue
Rope for Pulling Sled
Screen, net, or plastic sheet (to form walls for sled)
Old skis may be screwed to bottom of runners if desired
Important: Glue and Screw all joints.

Parts Detail

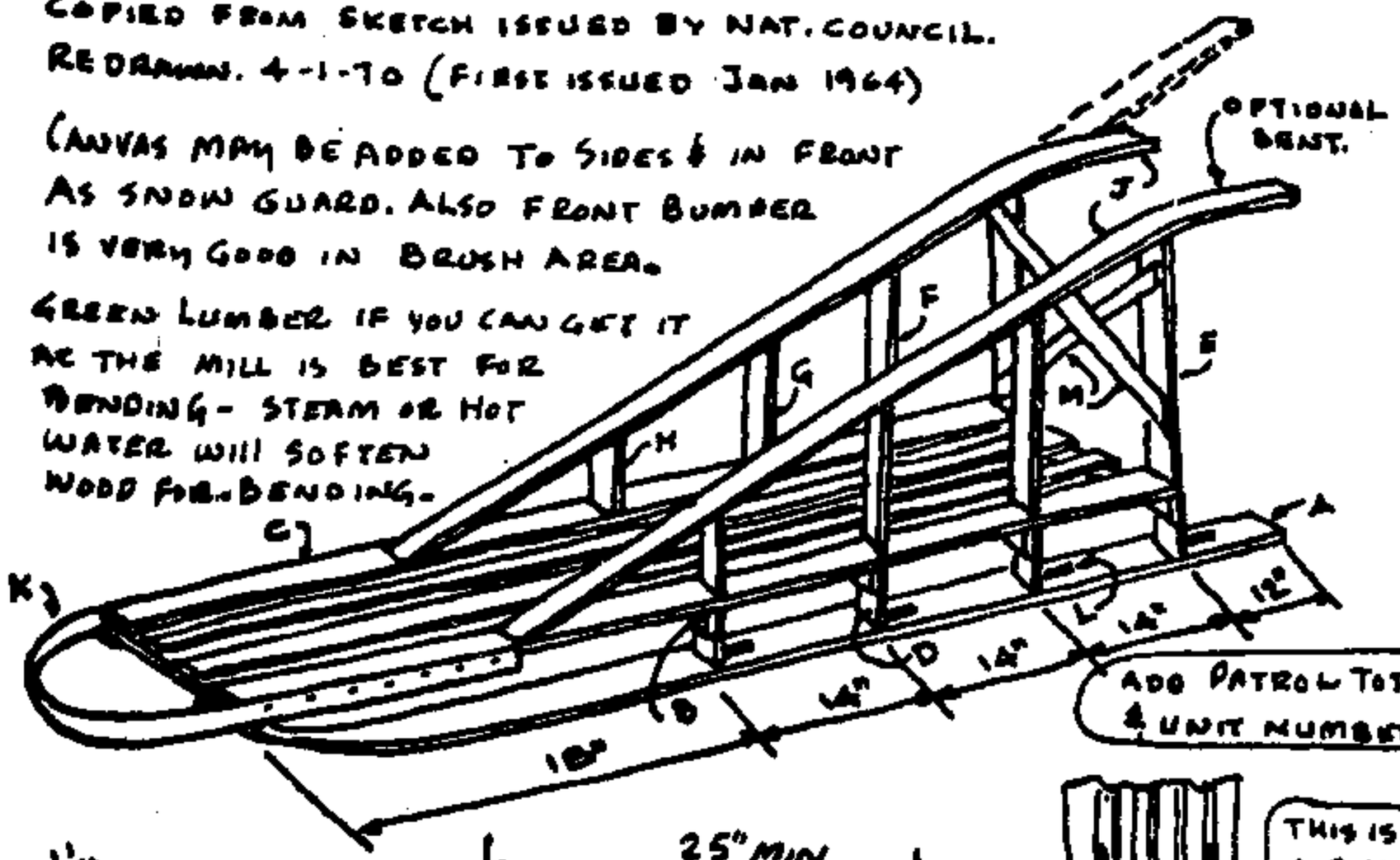


KLONDIKE SLEDGE PLAN

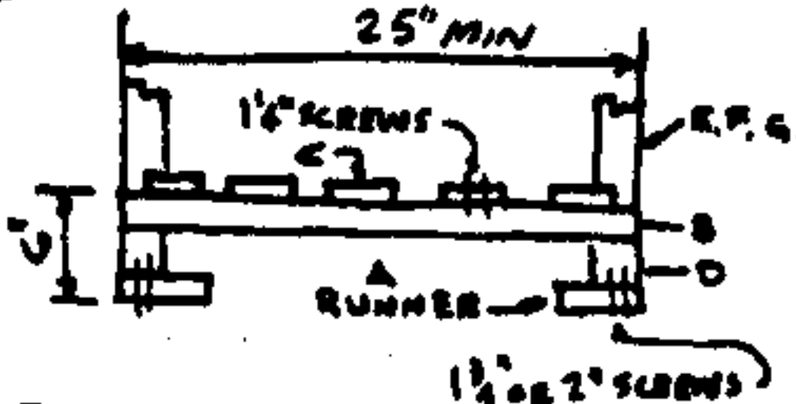
COPIED FROM SKETCH ISSUED BY NAT. COUNCIL.
REDRAWN. 4-1-70 (FIRST ISSUED JAN 1964)

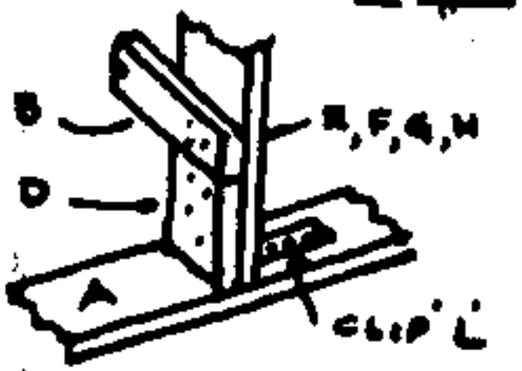
CANVAS MAY BE ADDED TO SIDES & IN FRONT AS SNOW GUARD. ALSO FRONT BUMPER IS VERY GOOD IN BRUSH AREA.

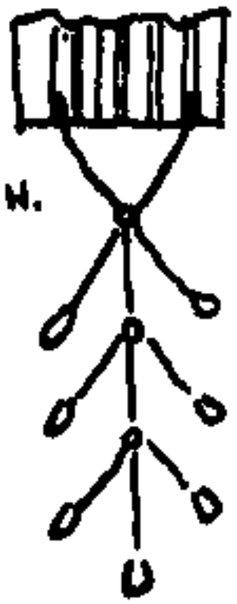
GREEN LUMBER IF YOU CAN GET IT AT THE MILL IS BEST FOR BENDING - STEAM OR HOT WATER WILL SOFTEN WOOD FOR BENDING.



ADD PATROL TOTEM & UNIT NUMBER







TOWING BRIDLE

THIS IS ONLY A SUGGESTION USE YOUR OWN IMAGINATION FOR A DESIGN.

DECORATE PAINT BRITE COLORS, ADD YOUR IDENTITY

VARNISH TO ADD PROTECTION

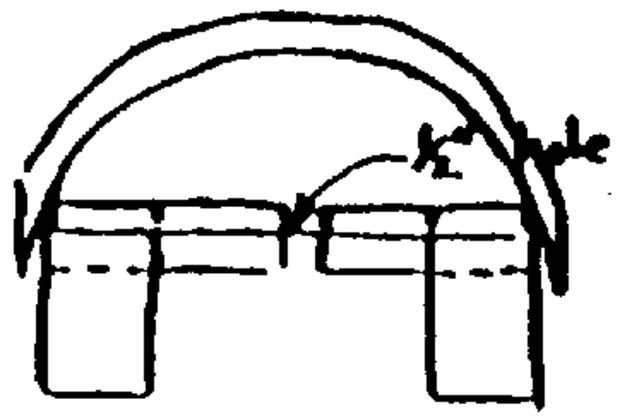
BILL of MATERIALS

RUNNER (OLD SKIS) OR 2 PCS. 4"x ⅜" x C-C" LG.	(A
CROSS SUPPORTS 5 PCS. ¾"x 1½"x 25"	(B
DECK 5 PCS, ⅜"x 4"x 3-0" LG.	(C
UPRIGHT SUPPORTS 8 PCS, ¾"x 1⅝"x 6"	(D
REAR UPRIGHTS 2 PCS. ¾"x 1⅝"x 40" MIN.	(E
2ND. REAR UPRIGHT 2 PCS. ¾"x 1⅝"x 38" MIN.	(F
2ND FRONT UPRIGHT 2 PCS. ¾"x 1⅝"x 26" MIN.	(G
FRONT UPRIGHTS 2 PCS. ¾"x 1⅝"x 12" MIN.	(H
HANDRAIL 2 PCS ¼" OR ⅜"x 1⅝"x 6'-0" MIN	(J
FRONT BUMPER (BENT) 1 PC. ½"x 2"x 5-0"	(K
ANGLE CLIPS 8 1½"x 1½" METAL	(L
CROSS BRACING 2 PCS. ¼"x 2" x 50" EACH	(M
SCREWS FOR BRACES & CLIPS	
24 - #5 x ⅝" LG. FOR RUNNERS	
22 - #10 x 1¾" LG. ALL OTHER PLACES	
132 - #8 x 1¼" LG.	
TOW BRIDAL (ROPE) LEATHER IS BEST, ALSO NYLON ROPE WILL DO	

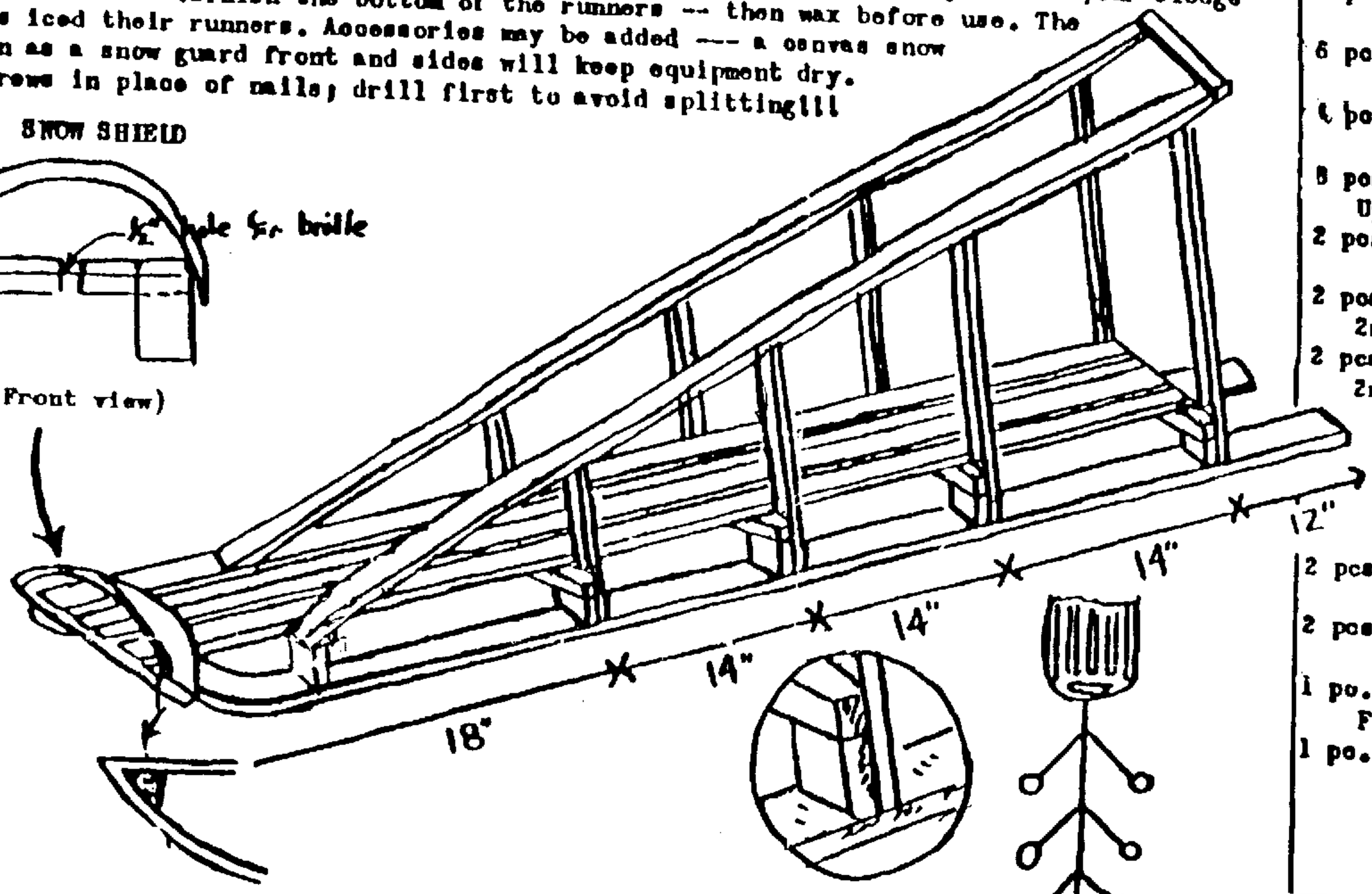
Kiddie Sled Run

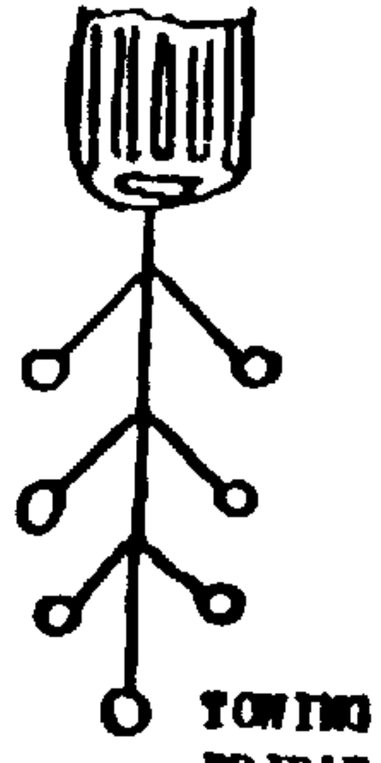
Use your imagination!! However, after researches in our Public Libraries, the accompanying sketch is authentic and we ought to be the "real McCoy". Paint your sledge bright colors --- varnish the bottom of the runners -- then wax before use. The Eskimos iced their runners. Accessories may be added --- a canvas snow curtain as a snow guard front and sides will keep equipment dry.
Use screws in place of nails; drill first to avoid splitting!!!

A SNOW SHIELD



(Front view)





TOWING BRIDLE

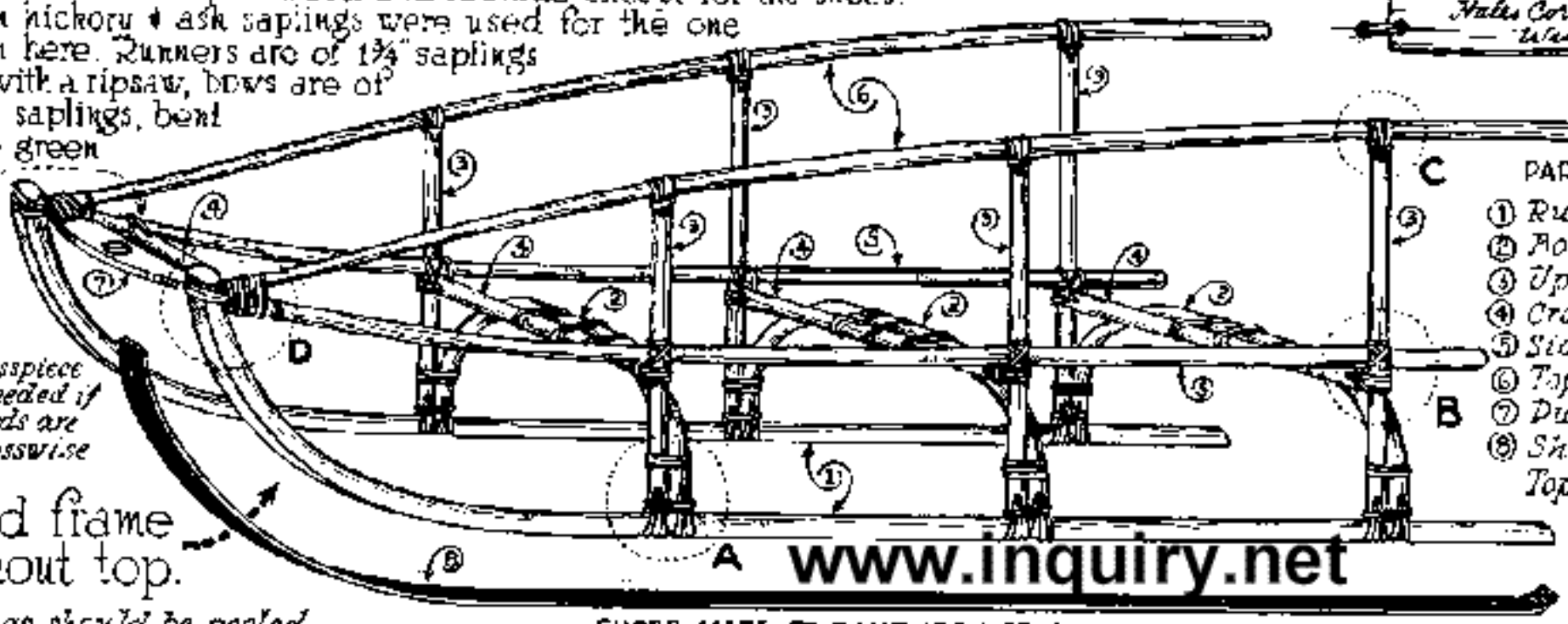
BILL OF MATERIAL

2 pcs. 4" x ½" x 6'6" - Runner
6 pcs. 1" x 1" x 19" - Cross Support
1 pcs. ½" x 4" x 5' - Floor Cover
8 pcs. 1" x 4" x 4" - Upright Support
2 pcs. 1" x 2" x 40" - Rear Upright
2 pcs. 1" x 2" x 38" - 2nd Rear Upright
2 pcs. 1" x 2" x 26" - 2nd Front Upright
2 pcs. 1" x 2" x 12" - Front Upright
2 pcs. ⅛" x 2" x 6' - Hand Rail
1 pc. ⅛" x 2" x 30" - Front Curved Guard
1 pc. 2" x 2" x 18" - Tow Bar

ARCTIC HAND SLED

These sleds are used for hauling when no dogs are available or when a man pulls with one or two dogs. If a longer sled is wanted, simply add one or more sections It is made entirely of wood and rawhide except for the shoes. Green hickory & ash saplings were used for the one shown here. Runners are of 1¾" saplings split with a ripsaw, bows are of ¾-inch saplings, bent while green

Plate by W. Ben Hunt, Wales Corners, Wis.



PARTS of SLED

①	Runners	2
②	Bows	5
③	Uprights	6
④	Crosspieces	4
⑤	Side rails	2
⑥	Top rails	2
⑦	Pull bar	1
⑧	Shoes	2

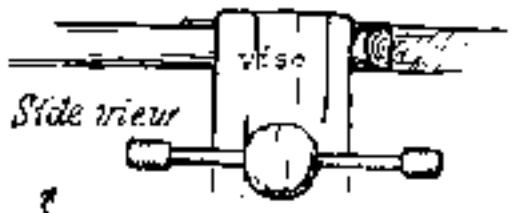
Top boards (not shown)

SHOES MADE OF BAND IRON OR SHEET IRON.

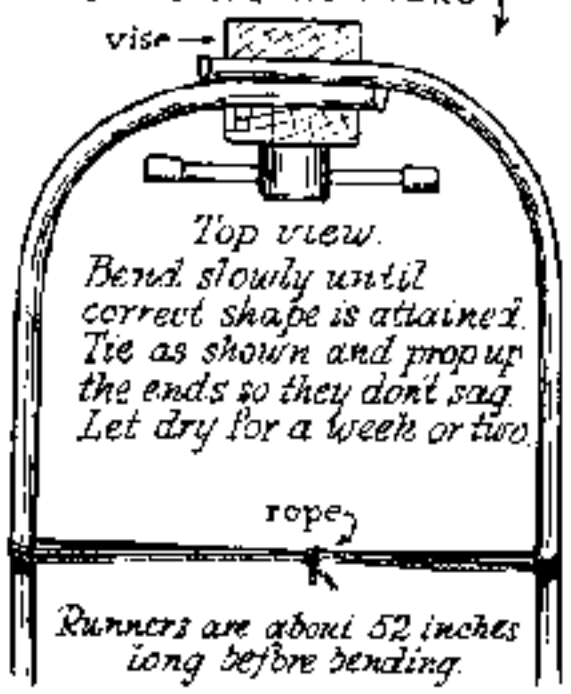
Eskimo sleds are usually built of odds and ends washed up by the sea or obtained from whalers. The different parts are tied together with walrus-hide thongs. If nails or screws were used, the wood would split when the sled received rough usage, but by using walrus-hide or rawhide fastenings, the sled becomes quite flexible and therefore is less likely to be broken. It is also easier to repair while on the trail as thongs of hide are always carried along

The sled shown above is 43 inches long, 16 inches wide and about 6 inches high. The top rails at the rear of the sled are about 15 inches from the bottom of the runners. Note the slight upturn of the side rails at the front end of sled.

Rawhide should be soaked in water for about 12 hours before using and should be pulled as tight as possible when used.



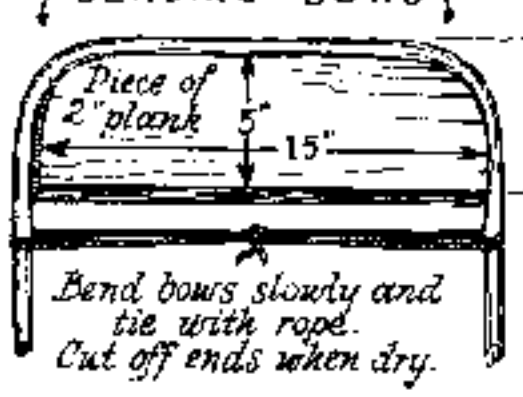
BENDING RUNNERS



Top view. Bend slowly until correct shape is attained. Tie as shown and prop up the ends so they don't sag. Let dry for a week or two.

Runners are about 52 inches long before bending.

BENDING BOWS



Bend bows slowly and tie with rope. Cut off ends when dry.

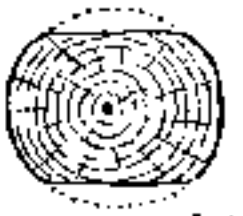
After rawhide wrappings have dried thoroughly give entire sled a coat or two of boiled linseed oil.

SECTIONAL VIEW OF RUNNERS

The only metal used is the strap-iron shoes and the screws to fasten them. Screws should be countersunk.

The Eskimos use iron or even tin when they can get it, but otherwise their sleds are shod with whalebone or thick rawhide. Sometimes shoes are made of wood fastened to the runners with walrus-hide thongs

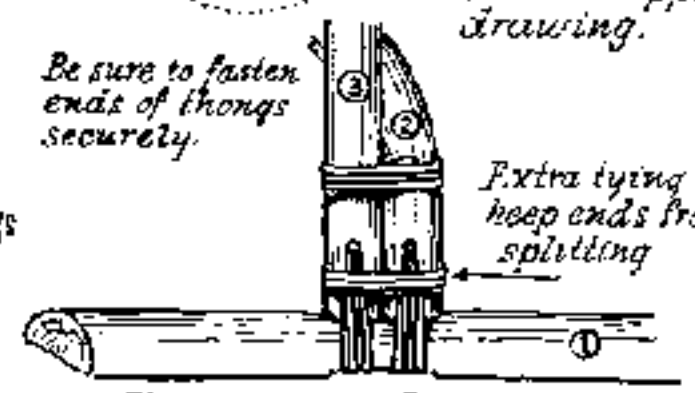
PULL BAR
made of one-inch board to fit between side rails.



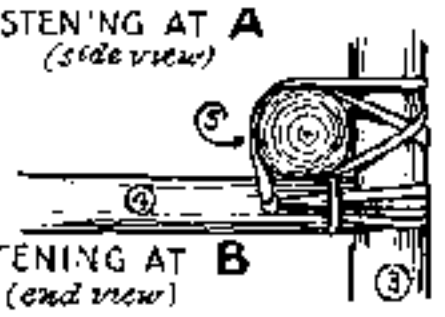
SECTION OF BOWS
Wrap bows to crosspieces as shown in upper drawing.

Be sure to fasten ends of thongs securely.

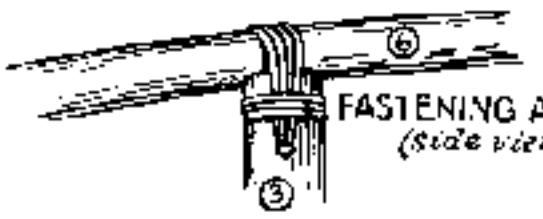
Extra tying to keep ends from splitting



FASTENING AT **A**
(side view)

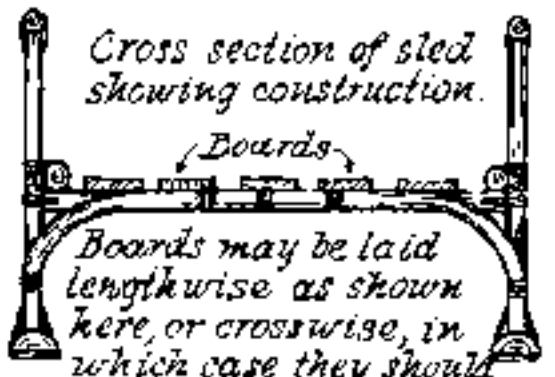


FASTENING AT **B**
(end view)



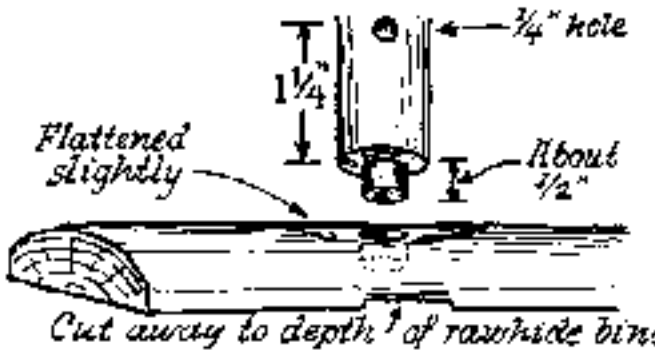
FASTENING AT **C**
(side view)

Cross section of sled showing construction.

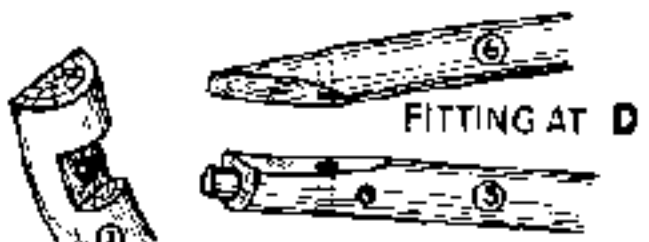


Boards may be laid lengthwise as shown here, or crosswise, in which case they should rest on the side rails.

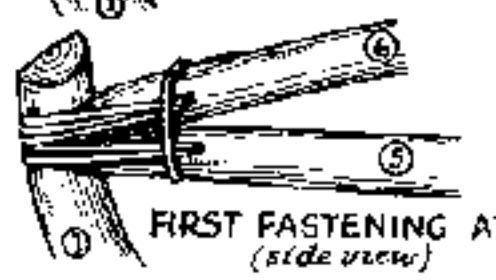
Below is shown how parts are set together with short mortise & tenons before tying with rawhide.



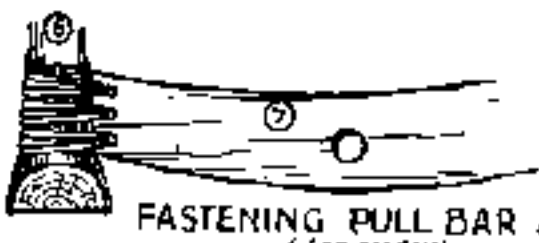
Cut away to depth of rawhide binding.



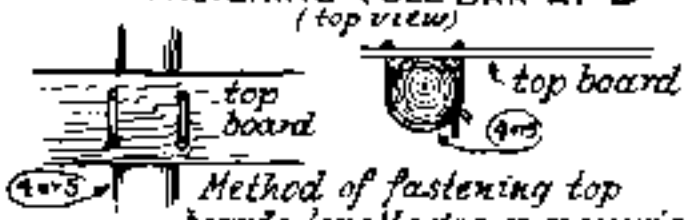
FITTING AT **D**



FIRST FASTENING AT **D**
(side view)



FASTENING PULL BAR AT **D**
(top view)



Method of fastening top boards, lengthwise or crosswise.

ESKIMO KOMATIK

By BEN HUNT

FINISHED KOMATIK

This is the type of sled used by the Eastern Arctic Eskimos of Canada. Runners are usually made of spruce, split out of logs or of planks bought from a local trading post. This is a rugged sled, easy to build and well suited for the Klondike Derby. Cross pieces are lashed to runners with ⅛" cotton cord. Eskimos prefer cord to rawhide because their dogs will not chew it. Runners are shod with 2" strips of 14" gauge sheet iron or ⅛" aluminum, fastened with screws.

I gave my sled a couple of coats of wood preservative after it was completed.

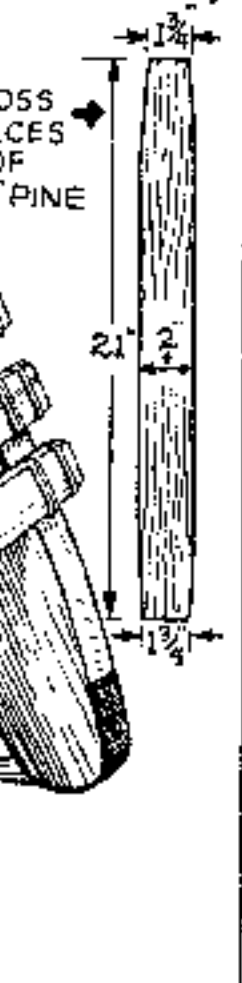
PLANK LAID OUT

No two komatiks were built exactly alike, but all of them followed this general idea. Some were made as long as 20 feet. They were of course drawn by dogs.

The sawing is best done on a large bandsaw when one is available. Otherwise a sharp keyhole saw is used to saw the curved ends.

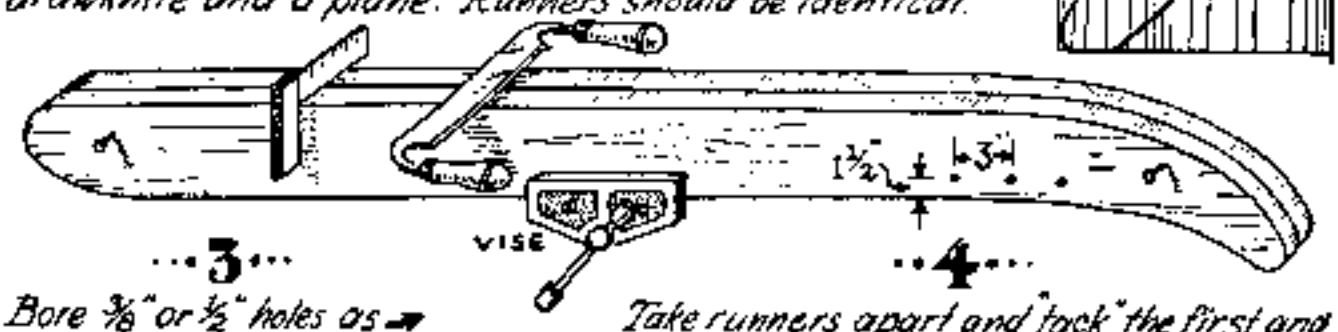
...1...

Get a 6' or 8' pine plank 2" thick by 10" or 12" wide, and lay it out like this. Notice the slight curve of the runners to allow for easier turning.



...2...

"Tack" sides together and trim edges uniform with a drawknife and a plane. Runners should be identical.

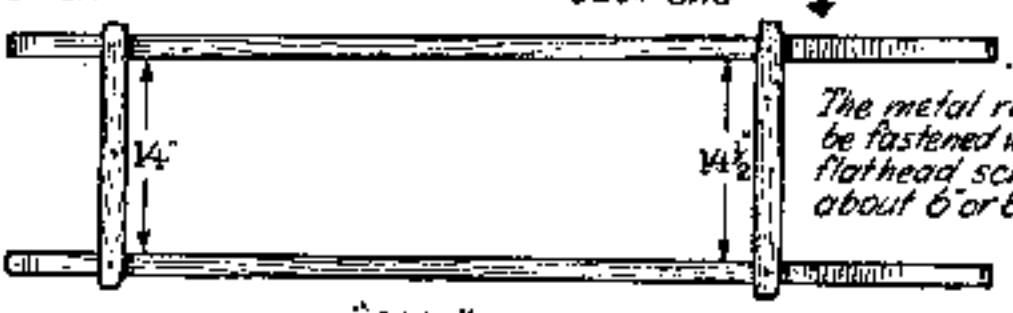


...3...

Bore ⅜" or ½" holes as shown, while the side pieces are still tacked together.

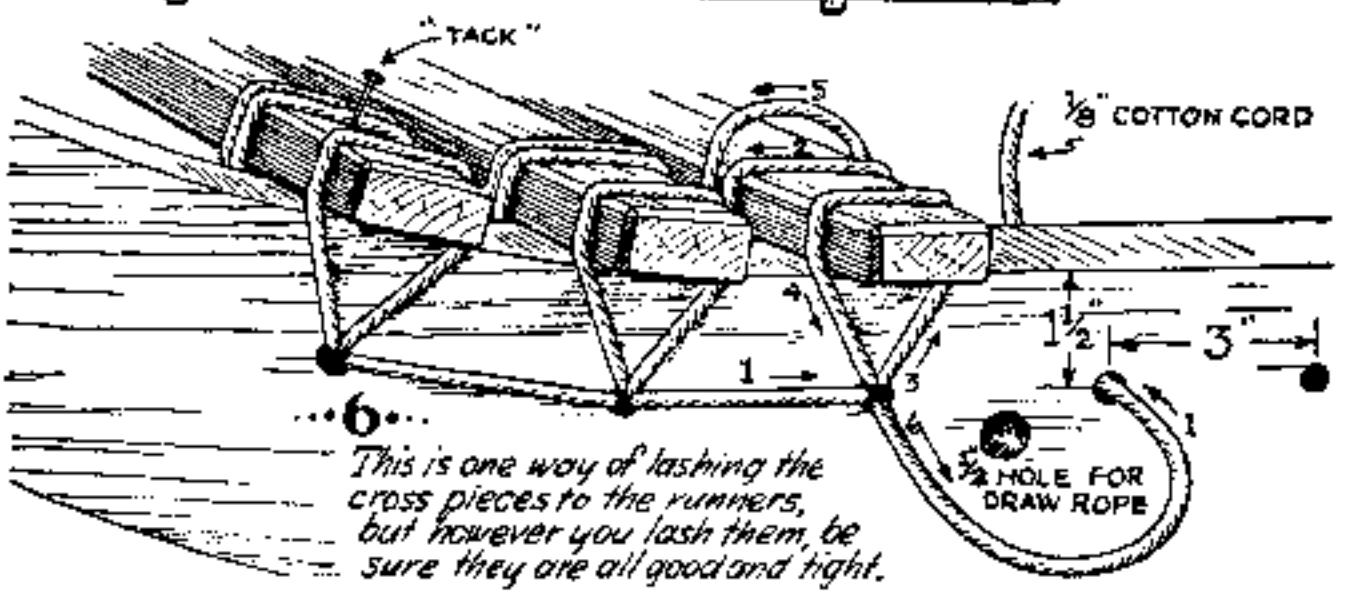
...4...

Take runners apart and "tack" the first and the last cross pieces in position. Front end of sled should be slightly wider than the back end.



...5...

The metal runners should be fastened with countersunk flathead screws, placed about 6" or 8" apart.



...6...

This is one way of lashing the cross pieces to the runners, but however you lash them, be sure they are all good and tight.

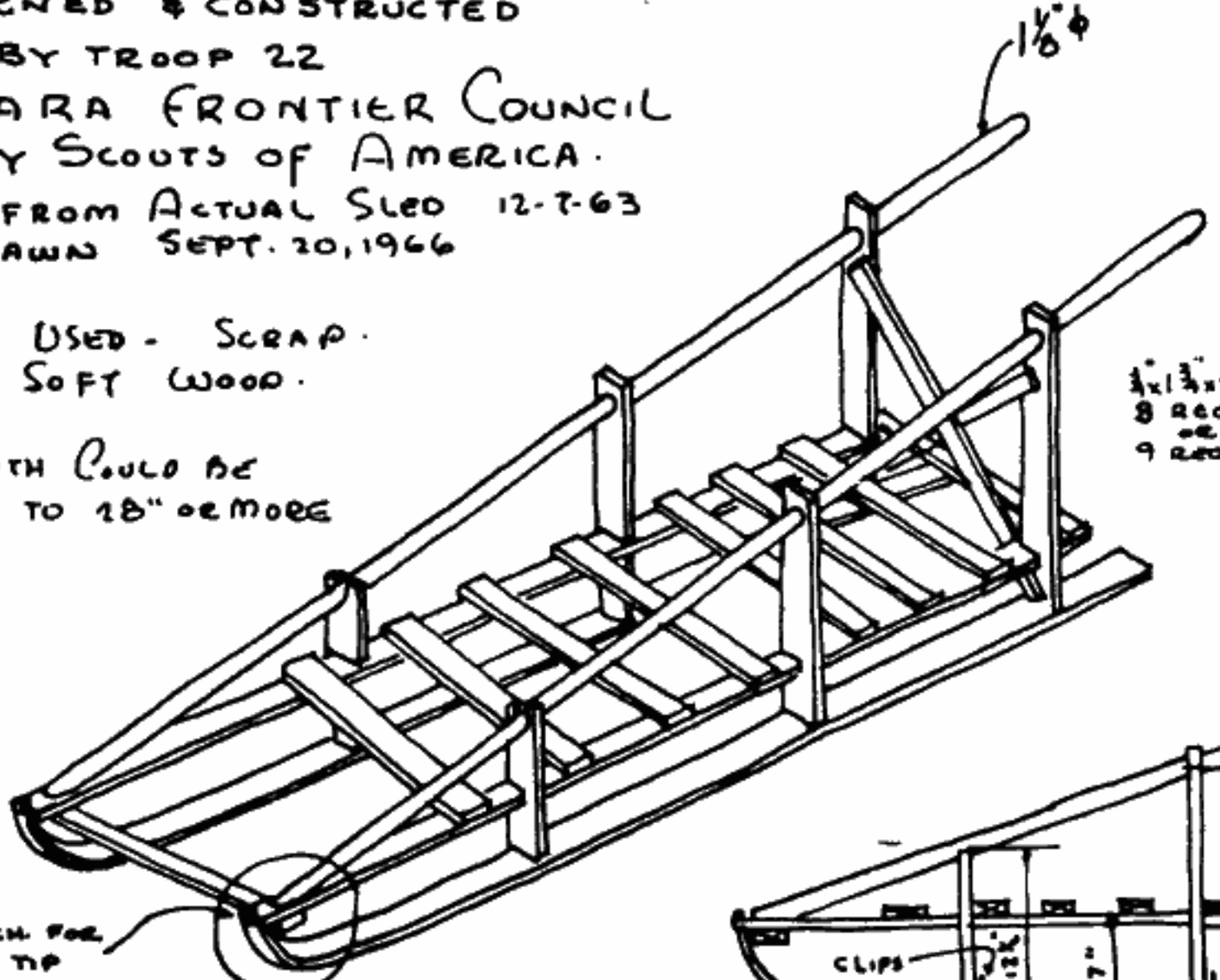
KLONDIKE SLED "SLEDGE"

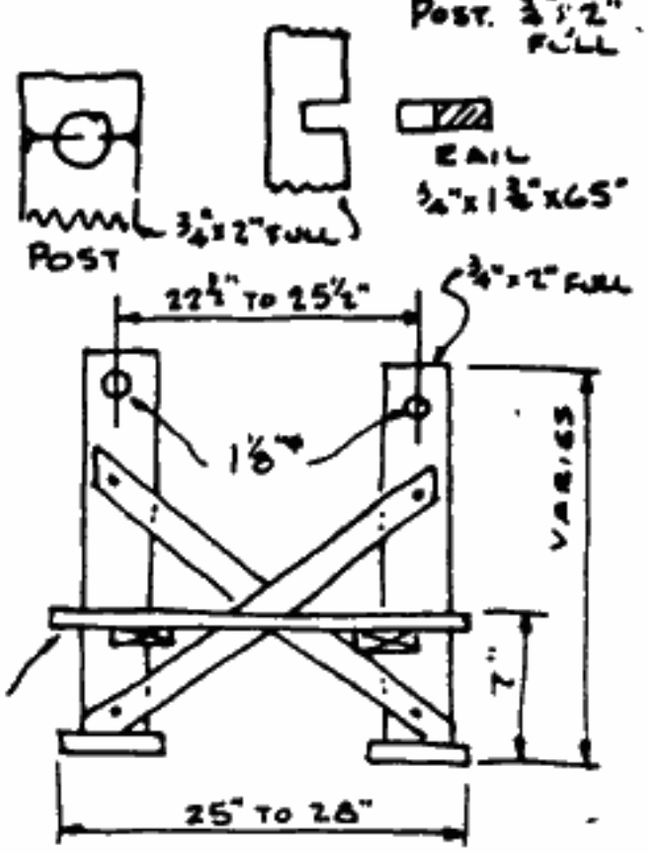
DESIGNED & CONSTRUCTED
BY TROOP 22
NIAGARA FRONTIER COUNCIL
BOY SCOUTS OF AMERICA.

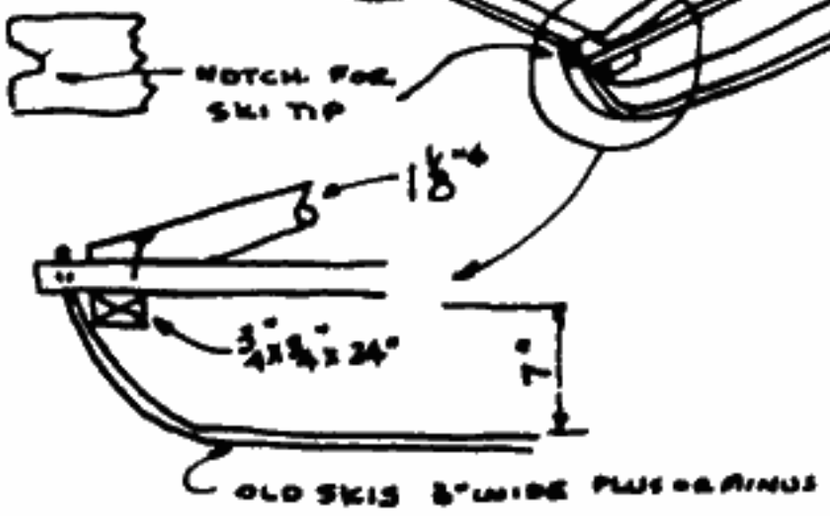
COPIED FROM ACTUAL SLED 12-7-63
REDRAWN SEPT. 20, 1966

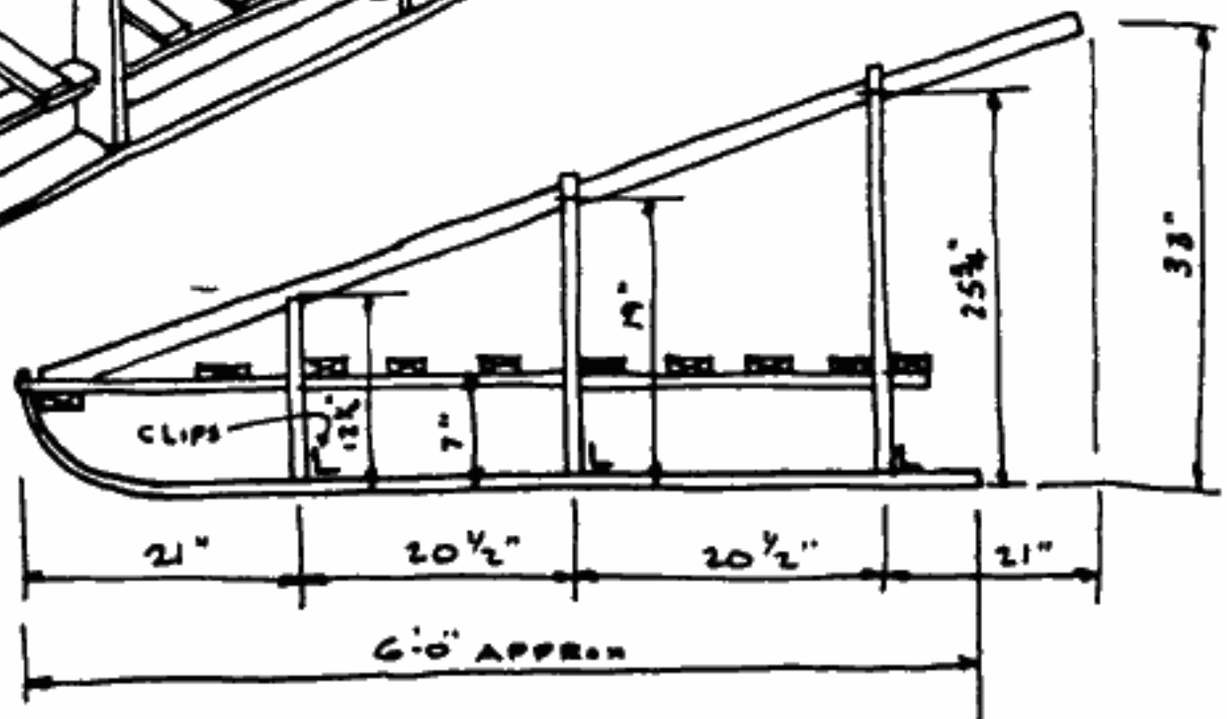
LUMBER USED - SCRAP.
MOSTLY SOFT WOOD.

NOTE: WIDTH COULD BE INCREASED TO 18" OR MORE









RAWHIDE BINDINGS USED FOR MOST FASTENINGS — SCREWS USED SPARINGLY AT MAJOR POINTS OF STRESS

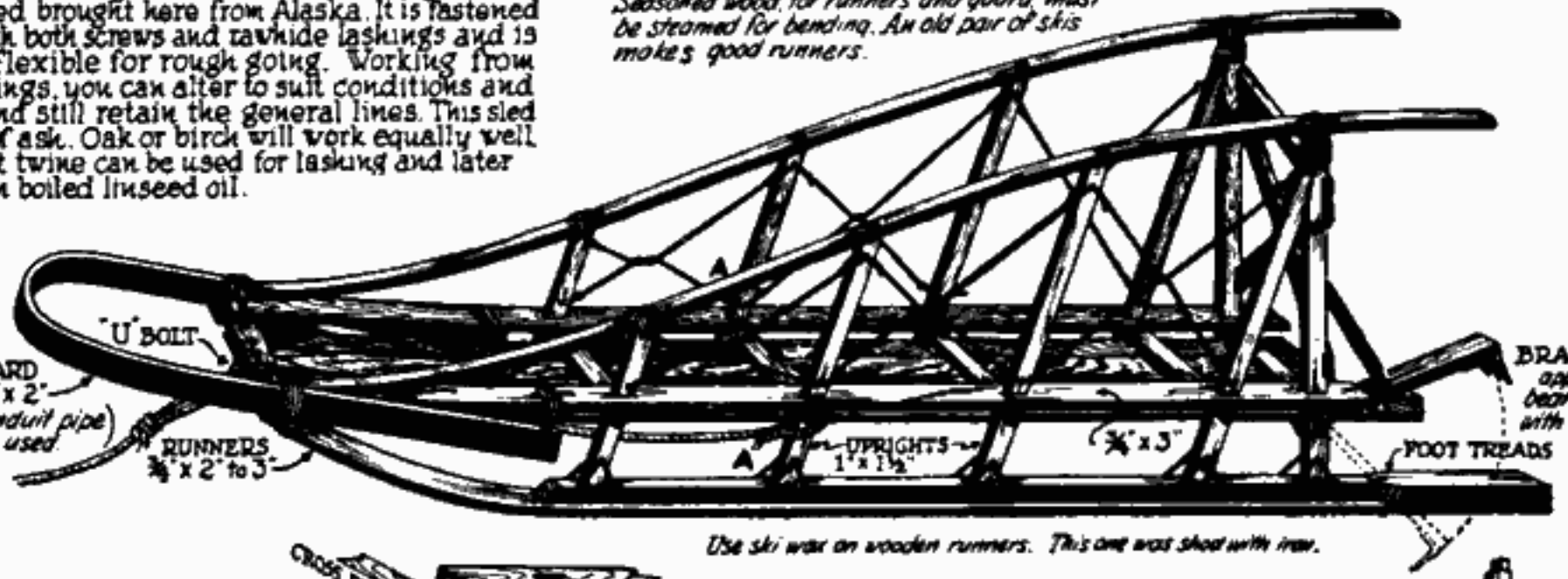
THIS DRAWING REISSUED FOR KLONDIKE DERBY IN CONJUNCTION WITH WINTER FESTIVAL 1967

KLONDIKE SLED

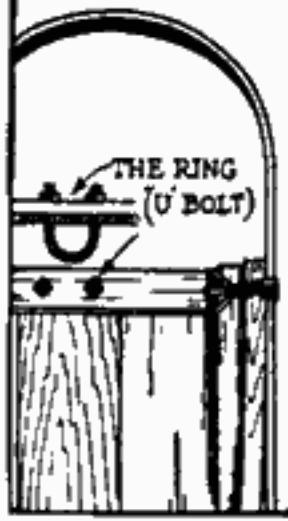
20" wide x 6' or 7' long is a good size for scouting.

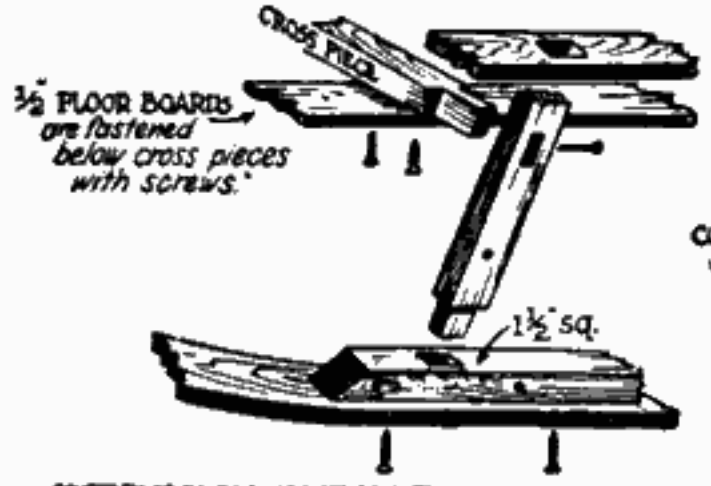
I made these drawings from a real honest-to-goodness Klondike sled brought here from Alaska. It is fastened together with both screws and rawhide lashings and is sturdy, yet flexible for rough going. Working from these drawings, you can alter to suit conditions and materials and still retain the general lines. This sled was made of ash. Oak or birch will work equally well and good net twine can be used for lashing and later treated with boiled linseed oil.

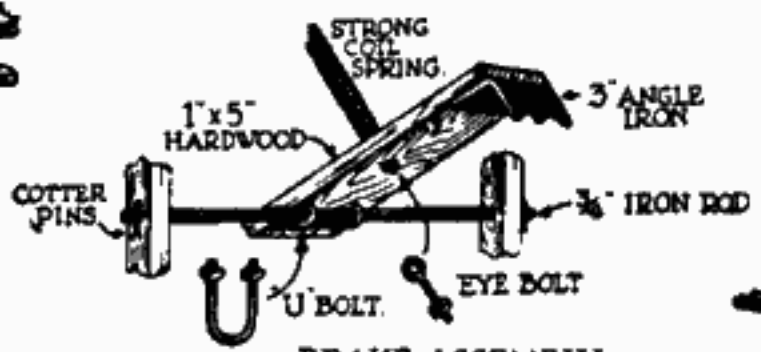
Seasoned wood for runners and guard must be steamed for bending. An old pair of skis makes good runners.



Use ski wax on wooden runners. This one was shod with iron.

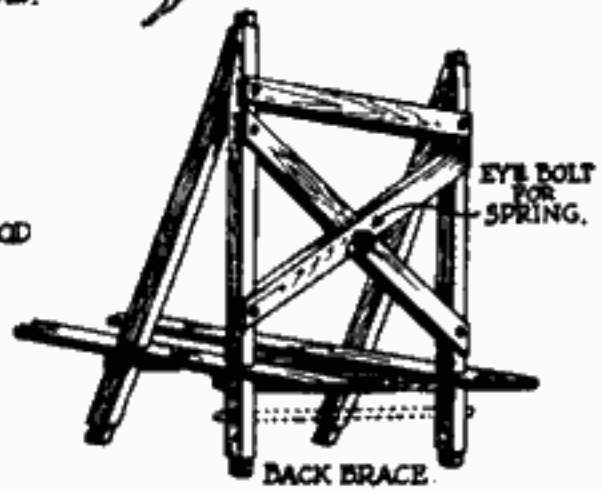






BRAKE ASSEMBLY

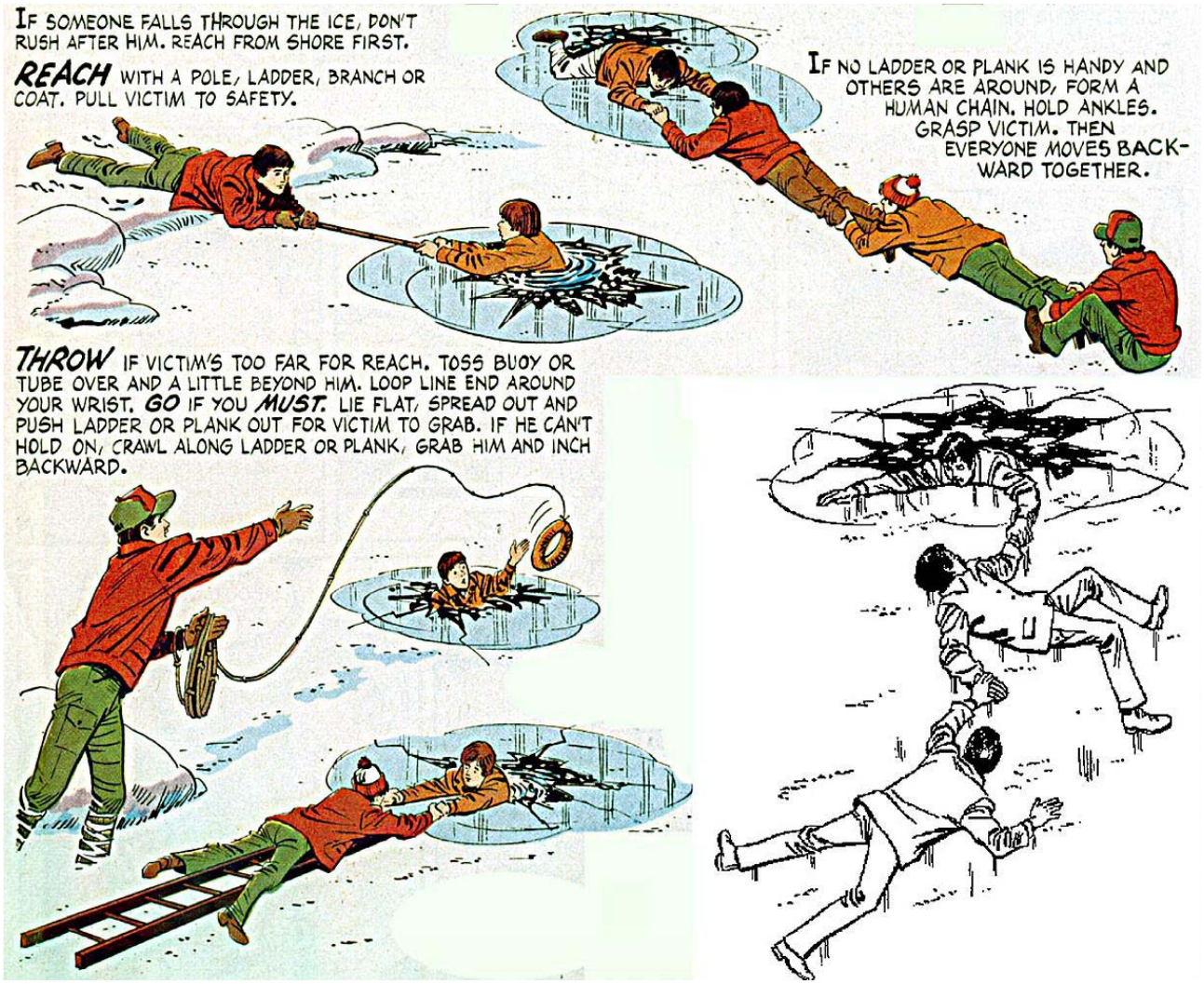
A brake is a must in hilly country or when using dogs. It is usually all metal.

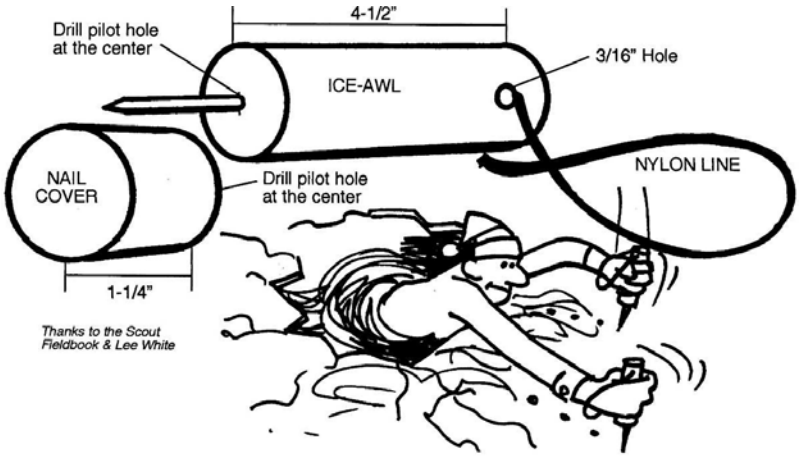


COURTESY OF RALPH & MARGUERITE SCHMITT

3. Ice Rescue

As in any First Aid situation, the key to success is to think before you act. Be sure to send a Patrol member to get help. When approaching the Ice Rescue scenario make sure that all Patrol members have their ice awls with them. Analyze the situation and decide the best method to rescue the victim. Possible methods include reaching for the victim with a Patrol stave, throwing a rope out to the victim (make sure the rope is coiled correctly to avoid knots), and the use of a TEAM rescue involving the ice awls. When performing a team rescue be sure to spread out across the ice and connect each other hand to hand! When the victim is pulled safely to shore, immediately treat for Hypothermia and shock – Use the Wool Blanket!





Over The River And Through The Woods

Snowshoes get you where you want to go.

Trekking through snow is loads of fun, until you get stuck in knee-deep drifts. That can be tiring and take the fun out of winter.

But sturdy snowshoes will keep you near the top of the snow's surface. With an adult's help, you can build your own pair.

You'll need two pieces of ¾-inch-thick plywood, 24 inches long by 8 inches wide; four pieces of ¾-inch-thick plywood (for the bottom cleats), 6½ inches long by ¾ inches wide; 12 ¾-inch-long round-head wood screws; two ¼-inch poly-ropes, each 42 inches long; and two 1-inch-wide strips from a tire's inner tube.

You'll also need a ripsaw, a coping saw, a drill and bits, a screwdriver, waterproof wood glue, a ruler, a circle-drawing compass and pencil, and sandpaper.

Step 1: Mark one end of a board TOE, the other HEEL. Four inches from the toe end and 2 inches from each side, draw the 4-inch by 4-inch opening for your boot toe. Drill starter holes A, B and C, using the ¼-inch bit followed by the ½-inch bit (use two different sizes so the wood doesn't split).

Step 2: With the compass set for a circle with a 2-inch-radius, draw the rounded corners at the toe end. Change the setting to 2¼ inches for the heel end, keeping the compass centered between sides.

Step 3: Draw a line across the board 9 inches from the heel end. Using the ruler, connect the 9-inch mark at the sides with the edge of the heel half circle you drew with the compass.

Step 4: With the ripsaw, cut along the tapered lines. Next, use the coping saw to round out the heel. Now round off the edges at the toe end.

Step 5: Remove the coping saw's blade and insert it through A. Reconnect the blade to the frame. Following the rounded shape, cut from A to B. Turn the coping saw and cut as far as you can toward C. When you can't cut any farther, place the saw back through A and cut to C. Then turn the saw and cut from C until you've joined B.

Step 6: Mark rope holes E, 1 inch from the side, and F, ¾ inch from the side, 1¼ inches apart. Do the same for D and G. Drill the holes using a ⅛-inch bit, then follow with a ¼-inch bit and a ¾-inch bit.

Step 7: Draw the two cleat positions on the bottom, one 2¼ inches from the toe end and the other 10 inches from the heel end. Drill holes through the cleats with three screws.

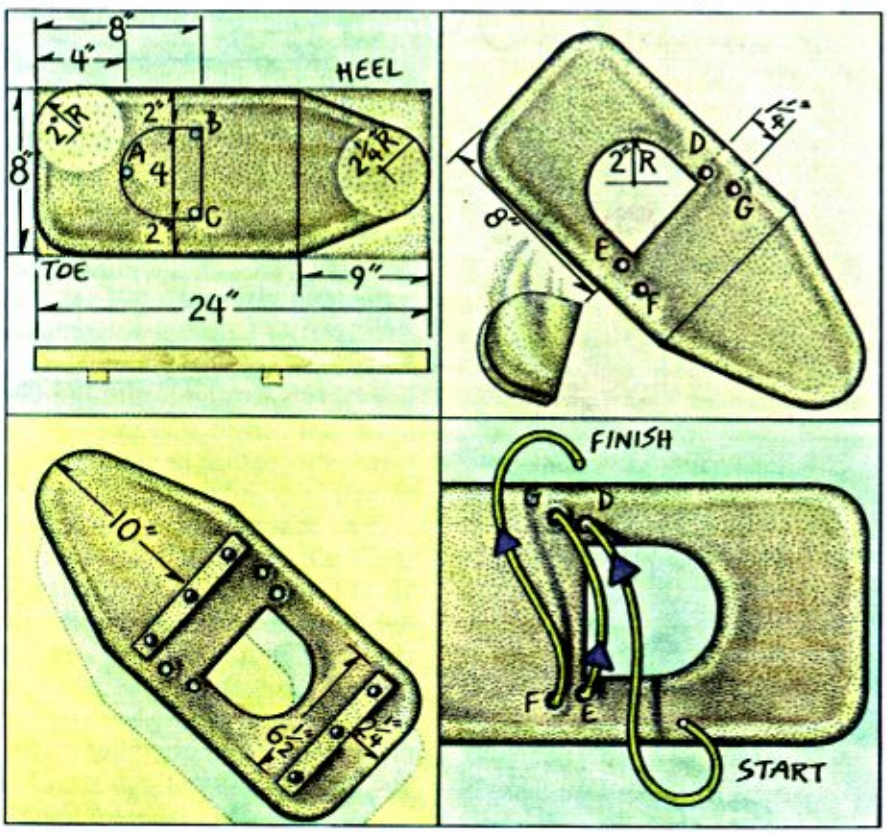
Step 8: Spread waterproof glue on one side of each cleat, then position and screw in cleats. Sand all edges. A coat of marine spar varnish or outdoor paint is optional.

Step 9: Working from the top of the snowshoe, slip a poly-rope end down through D. Pull across and thread through E. Take it across the top and pull down through G. Then come across and up through F. Tie a square knot and whip or heat-seal the rope ends.

Step 10: Slip the inner tube around the ankle of your boot. Slide the boot under the knotted ropes until it fits snugly, tightening the knots if needed. Then pull the inner tube over the boot's toe, under the boot.

Remember, use a wider stance when walking. Otherwise, the shoes may overlap—and you may go flying. Lift your feet and keep the front ends tilted up.

Make sure you practice; a hiking staff will help keep your balance. Then trudge on—the snow won't stop you now! ✚ *—Martin I. Engel*



Michael Marykwas