

SECTION 112 -TIMBER ROADS AND MATS

2515. Timber roads and mats are expensive in time and labour but, where timber is plentiful, they are useful for short lengths over soft ground. Life is limited under heavy traffic intensities and constant maintenance is required. The main types are summarized in table 91.

Corduroy and Plank Roads

2516. Corduroy roads. Corduroy is formed of round or half-round timbers about 150 to 200 mm in diameter. Timber must be straight. Larch, spruce, or firs are preferable, as they have less pronounced taper. Timber is cut 3 m long to form a one-way road 3 m wide. The method of construction is described below and illustrated in Figure.

2517. Slab or plank road. Squared timber, eg railway sleepers, or planks about 225 mm by 50 mm, can be formed into plank or slab roads. The method of construction is similar in principle to that for corduroy roads

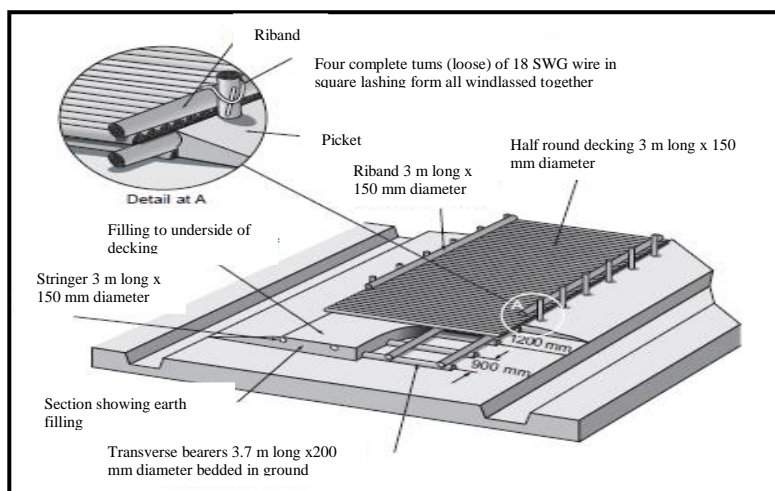


Figure 25-4: Three-Metre Corduroy Road (Diagrammatic)

Construction of One-Way Timber Roads

2518. In both corduroy and plank roads, fixing are by spikes (nails are unsatisfactory) and holes for them must be bored with augers to prevent splitting: this is a lengthy process. Soil from the side drains is used to pack in between the stringers. Normal setting-out methods are used and the stages in construction are as follows:

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- a. The ground is roughly levelled by removing any stumps, paring off high spots and filling in depressions. Camber 1 in 20 on the formation.
- b. Transverse bearers are bedded in at 900 mm centers. If the ground is swampy, it may be necessary to place a layer of brushwood fascines under these bearers.
- c. Stringers are laid on the transverse bearers and spiked to alternate ones.
- d. Soil from the side drains is filled in and rammed between the stringers.
- e. The surface is laid. Timbers should be close-spaced and spiked to every stringer. The end spikes of every sixth half-round timber should be omitted to allow for spiking the rebind. The half-round timbers of the corduroy surface are laid flat side down.
- f. Rebinds are laid and spiked to the roadway at 1 m intervals. Riband lengths should not abut end-to-end: a small gap should be left through which surface water can escape.
- g. Stout pickets are driven in at 1 m intervals to provide lateral support to the ribands which are spiked or wired to the pickets.
- h. The surface is blinded with gravel or sand (not earth) to lessen the unevenness and to provide a non-skid surface.
- j. Excavation of side drains is completed. It may be necessary to rivet the sides using a material on the inner (road) side through which water from the subgrade can percolate, eg brushwood or small mesh wire netting.

Construction of Two-Way Timber Roads

2519. Two-way timber roads, which have a carriageway approximately 6 m wide, are constructed as shown in Figure 8/5. The side drains act as intercepting

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ditches and the material excavated from them is used to raise the level of the formation and to provide a camber of 1 in 20. Construction of two-way timber roads follows the procedure for one-way roads described in Paragraph ---, with the additional need to spike the centre runners together with timber dogs (*see* Figure 25.5(a)). Extra material (preferably gravel) may be required for filling between stringers. Stores necessary for a 100 m length of two-way corduroy road are as follows:

Poles, 200 mm diameter x 3.65 m 234

Poles, 150 mm diameter x 3.0 m 450

Poles, 1/2 round, 150 mm diameter x 3.0 m 1,390

Pickets, 150 mm diameter x 1.20 m 232

Spikes, 12 mm x 250 mm 440

Spikes, 8 mm x 175 mm 1,500

Wire plain, 1.20 mm diameter 28 kg.

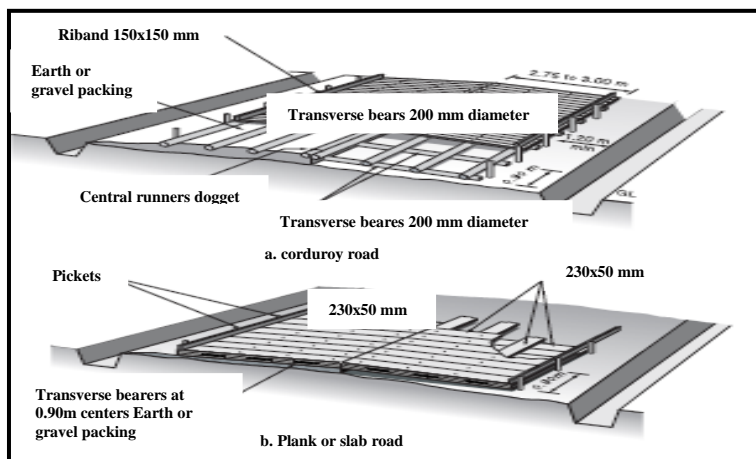


Figure 25-5: Construction of two-way Timber Roads

Construction of Timber Wheel Tracks

2520. For normal traffic, the timber tracks should be 0.75 m to 0.90 m wide and the inner edges about the same distance apart. The advantage of this form of construction is economy in stores, labour and time (*see* Table 25.2). The disadvantage is that water tends to collect between, and then under, the tracks: this reduces the bearing capacity of the soil at the place where support is required. Timber tracks are, however, suitable for light vehicles in small numbers. For types of construction, *see* Figure 25.6.

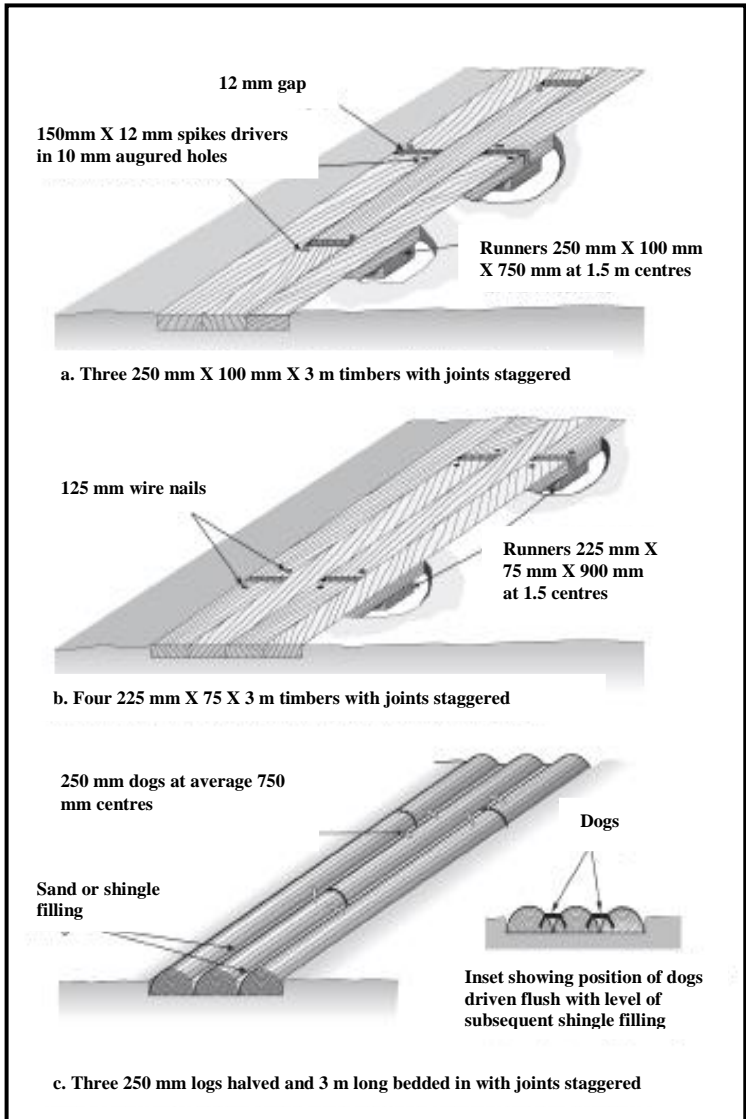


Figure 25.6: Wheel Track Road

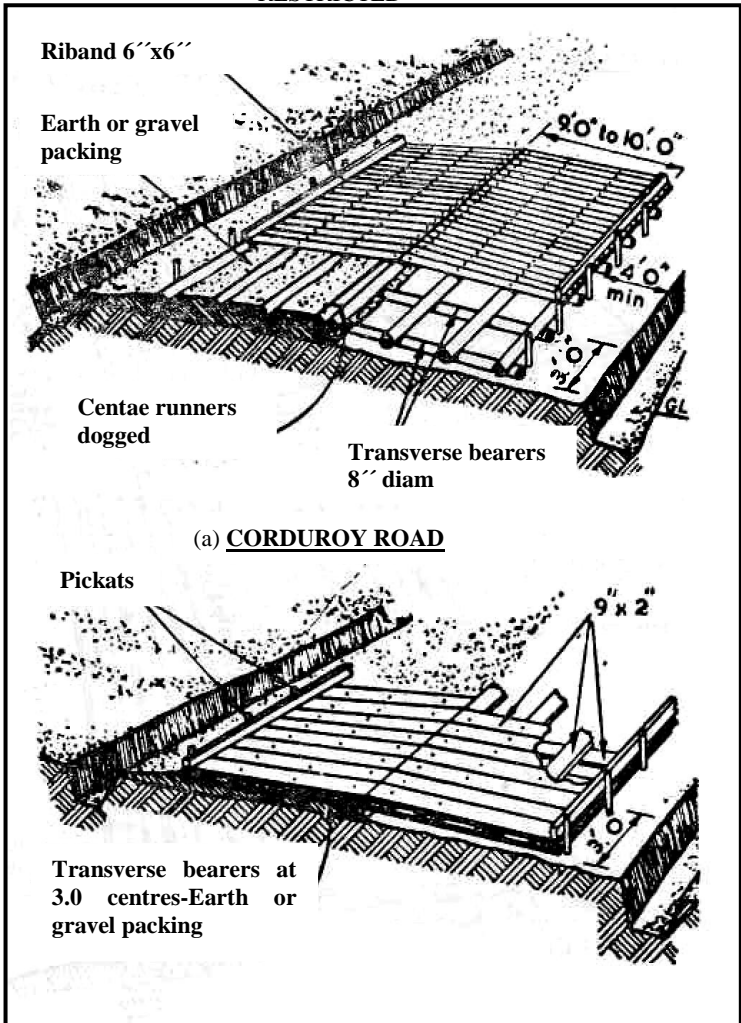


Figure 25-7: Timber road construction

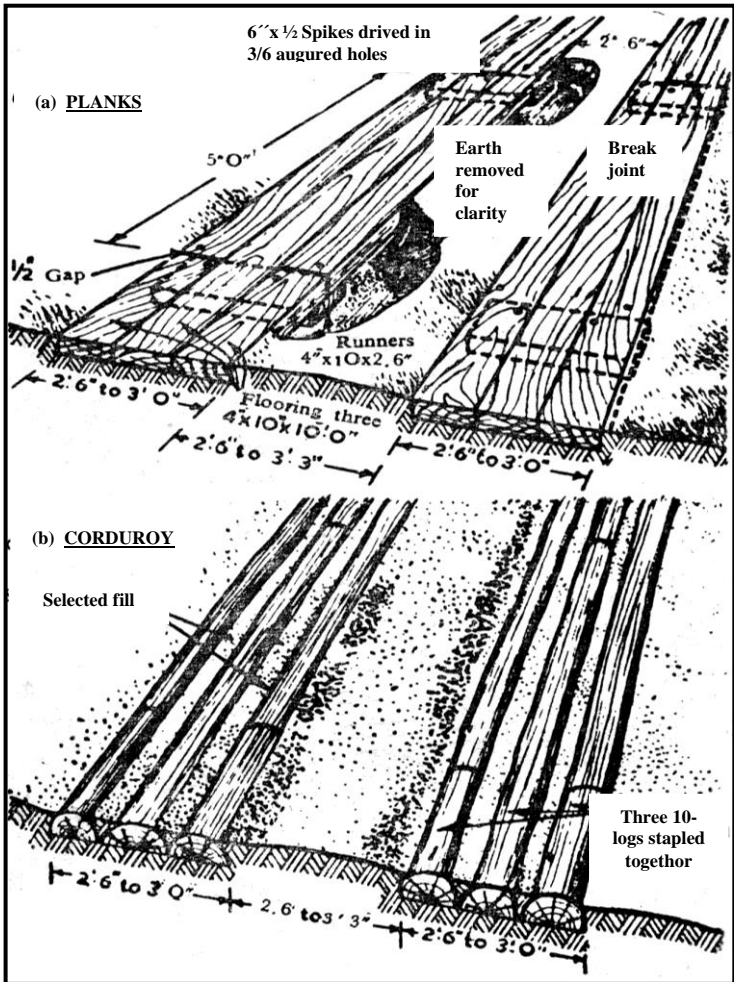


Figure 25-8: Wheel Track Roads

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Table 25.2 PLANNING DATA FOR FABRICATED ROAD AND TRACK SURFACES

(Based on 3 m wide (one-way) carriageway and working party of 1 NCO and 10 men)

Ser	Type	Reference Figure No	Requirements per 100 m length				Time for surfacing only (hour)
			Track Stores (including spares)	Quantity	4 tonne truck loads	Tools (per party)	
1	Corduroy track (fir or pine)	8/4	Poles, 200 mm diameter x 2.7 m Poles, 150 mm diameter x 3.0 m Poles, 1.2 round, 150 mm diameter x 3.0 m Pickets, 150 mm diameter x 1.25 m Spikes, 12mm x 250 mm Spikes, 8mm x 175 mm Wire, plain, 18 SWG (kg) Total weight = 26 tonnes	106 204 630 210 395 2310 25	9	2 picks 4 shovels 4 augers, 12 mm 4 augers, 8 mm 4 sledge-hammers 2 machetes or hand axes 2 hand saws 2 wire cutters	50
2	Plank wheel tracks (softwood)	8/5	Planks, 205 mmx10mm x 3.0 m Spikes, 8mm x 175 mm Total weight = 4 tonnes	220 380	4	3 picks 3 shovels 2 augers, 8 mm 2 sledge-hammers 2 hand saws	16

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TABLE 25.3 EMERGENCY SURFACING

Serial No	Type	Dimensions	Unit weight	Gross weight per 100 yds (incl pickets etc)	Time for laying only 100 yd strip (1 NCO and 10 men)	Approx number of 3 ton track leads for 100 yds	Remarks
1.	Coir matting	75'-0" x 12'-0" 9also available in 37'-6" and 50'-0" lengths, 6'-0" and 9'-0" wide.	Average 750 lb per standard dard roll	1.4 tons (approx0	½ hour	-	Should be used only as an underlay delow metal or slatted surfacing. May also help to extricate vehicles in soft mud
2.	Chespale (1 win)	25'-0" x 3'-0" (also in 4'-6" widths)	250 lb (approx.)	2-75 tons	½ hour	2	Normally laid to form wheel-trucks. Mats 12'-0" x 6'-6" can also be used with 12" central

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							overlap, to form 12 ft roadway.
3.	Wire netting or chain-link	Rolls 75 or 150 ft long various widths, gauge and size of mesh	*	*	*	*	Wire netting should be gauge 18 or heavier and mesh size should not exceed 1 in. 3 layers of wire netting approximately equal one layer of chain link.
4.	XPM	Usually in sheets about 8'-0" x 8'-0" of varying gauge and mesh.	*	*	*	*	-
5.	Somme field track	75'-0" x 10'-7" or 37'-6" x 10'-7"	630 lb 315 lb	1.93 tons	1hours	½	-

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6.	Flex boards (twin)	9'-0" x 3'-0" x 1 ½ "	126 lb	3.75 tons	½ hours	See serial no 7	-
7.	Somerfield Sandwich	See serials no 5 and 6	See serials No 5 and 6	7.5 tons	2 ½ hours	Standard 3 ton truck load is 100 yds of track and 24 flex boars	The sandwich, mainly used for beach roadways, com prises 2 layers of Somerfield track with twin flex board wheel- tracks between them.
8.	Square mesh track	a. Rolls 77'-3" x 7'-3" b. Panels 12'-2" x 6'-3"	550 lb 80 lb	Approx 1 ton per roll width approx. 1 ton per panel width	3 hours per width 2 ½ hours per panel width	1 ½	Used primarily for airfields in 1939-45. War side and end overlap 6 ins, secured by special clips. Track should be strained by

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							strained by winch truck every 100 yds
9.	Channel track	6'-0" x 11' - 0"	180 lb	2.33 tons per 6 ft width	1 ½ hours per 6 ft width	1	Used primarily for airfields in 1936-45 War. Special joint covers and spacing clips required. Most convenient laying party is 1 NCO and 20 men. Men should wear gloves.

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* No Figures can be given for weights or laying times, owing to widely varying characteristics. These materials are useful expedients for getting vehicles over sand or oft going, but life is very limited.

An underlay of coir matting, hessian, or PBS greatly improves performance and life.

I if available, BRC mesh designed for concrete reinforcement can be used for emergency surfacing. Size of mesh and gauge of metal vary: no dimensions, weights, or laying times can be specified.

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TABLE 25.4 TIMBER ROADS AND MATS

Serial no	Type	Dimensions	Unit weight	Gross weight per 100 yds (incl pickets)	Time for laying only 100 yd length (1 NCO and 10 men)	Approx number of 3 ton truck loads per 100 yds	Remarks
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
1.	Corduroy 10 ft wide	Bearers 8" diam Stringers 6" diam Flooring 6" (½ round) Ribands 6" diam	a. hardwood 48 lb/cu ft b. Softwood 40 lb/ cu ft	a. 32 tons approx. b. 27 tons approx.	50 hours	15	Side pickets 6"x 4'-0" at 3 ft intervals. Riband and floor spikes ½" x 10" long
2.	Corduroy road mat (twin)	Each mat 10'-0" over all x 3'-6" x 7" approx.	400 lb approx.	12 ½ tons approx.	1 ½ hours for prefabricated mats delivered as required	5	

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3.	Plank or slab 10 ft wide	Bearers, stringers and flooring 9" x 2 " Ribands 6"x6"	Softwood 40 lb/cu ft	21 tons	50 hours	8	Side pickts 6"x 4'- 0" at 3 ft intervals. Figures given are for the lightest permissible construction. Railway sleepers or beech alabs about 120"x4" are preferable.
4.	Twin wheel tracks, slab	Each track 2'-6" wide Flooring 4" x 10" x 10 long Sleepers 4"x 10" x 2'-6'	40 to 48 fb/ci ft	12 tons approx.	16 hours	4	Similar wheel tracks can be made in corduroy, using either four 8" diam or three 10" diam logs, dogged together. Weight in increased by about 50%

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2521. Particular points to note are:

- a. Shoulders at least 4 ft wide are essential on both sides.
- b. In very soft ground fascines may be required under the transverse bearers and side ditches may have to be revetted.
- c. Holes must be drilled for all spikes to prevent splitting. Wire nails are unsatisfactory.

TABLE 25.5 MATERIALS PER 100 YARD LENGTH OF CORDUROY ROAD, 10 FEET WIDE

Ser no	Material	Quantity (no)	Tonnage per 100 yd length (theoretical weights only)	
			Hardwood at 48 lb/cu ft at 40 lb/cu ft	Softwood at 40 lb/cu ft
(a)	(b)	(c)	(d)	(e)
1.	Transverse bearers; 8 ' diam, 10 ' long	100	7.47	6.23
2.	Stringers: 6" diam, 10" long	120	5.01	4.20
3.	Flooring) ½ round): 6" diam, 10" long	600	12.60	10.50
4.	Ribands: 6" diam, 10" long	60	2.52	2.10
5.	Pickets: 6" diam, 4" long	200	3.36	2.80
6.	Riband spikes: ½ " x 10"	200	-	-
7.	Floor spikes: ½ " x 10"	2.400	0.88	0.88

* For a two way road 20 ft wide, serials no 1, 2, 3 and 7 should be doubled.

Wheel Tracks

2522. Timber Tracks. Wheel track roads can be made in either slab or corduroy construction, as shown in Figure 25.8. For ordinary mechanical transport the tracks should be 2 ft 6 ins to 3 ft wide and the maximum distance apart should be 3 ft 3 ins. Their main disadvantage is that water tends to collect under the tracks and to reduce the bearing capacity of the soil where the greatest strength is required.

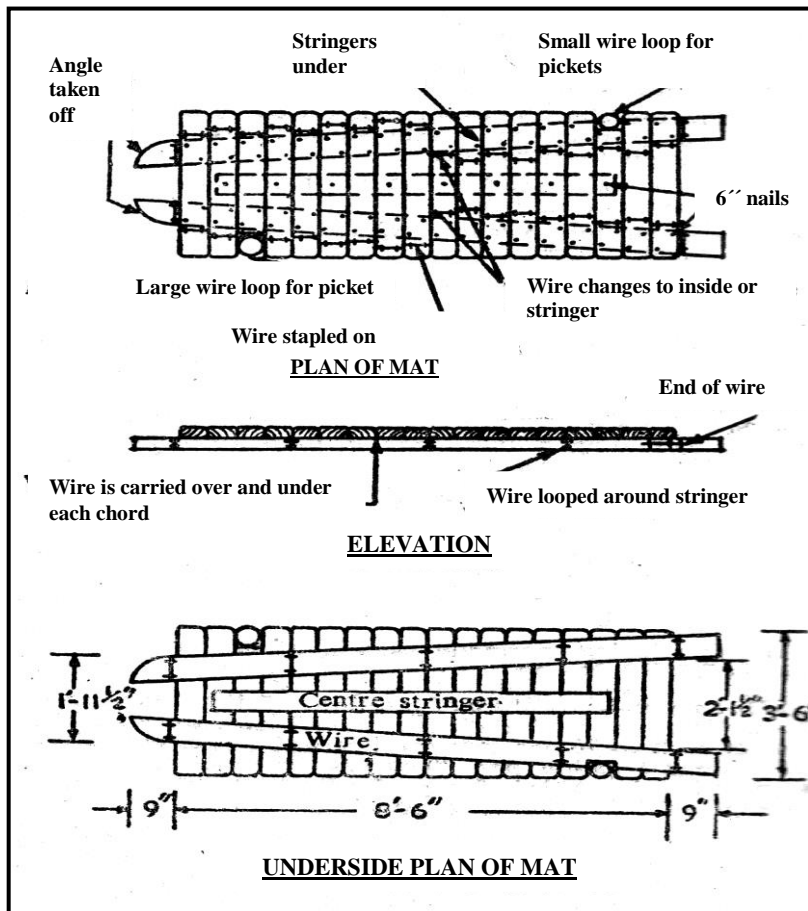


Figure 25-9: Corduroy Road Mats

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2523. Corduroy road mats. Prefabricated corduroy road mats make good wheel tracks and are easily handled and laid. The recommended design is shown in Figure 54. They must be made with reasonable accuracy to ensure that they will fit together. The method of manufacture is:

- a. Lay stringers in the correct position on the bench using a gauge.
- b. Nail in position the fast cord at the male end and fix temporarily the cord at the other end.
- c. Fix the remaining cords with a stout wire over and under each cord looping it round the outer stringers at intervals and stapling to both cords and stringers. Nail alternate cords to center stringer.
- d. Form stout wire rings for side pickets let in to the structure at diagonally opposite corners of the mat.
- e. Nail cords to outer stringers.