



# BUILDING RESEARCH NOTE

B.R.N. 6

## HAND MOULDING TABLE FOR BUILDING BRICKS

### Introduction

Over the past several years, building brick industry is facing an acute shortage of skilled moulders. This shortage has partly resulted

from increased employment opportunities offered by growing industries including the agricultural sector. Kiln owners are, therefore, obliged to engage unskilled moulders at high wages which has seriously affected the quality of bricks.

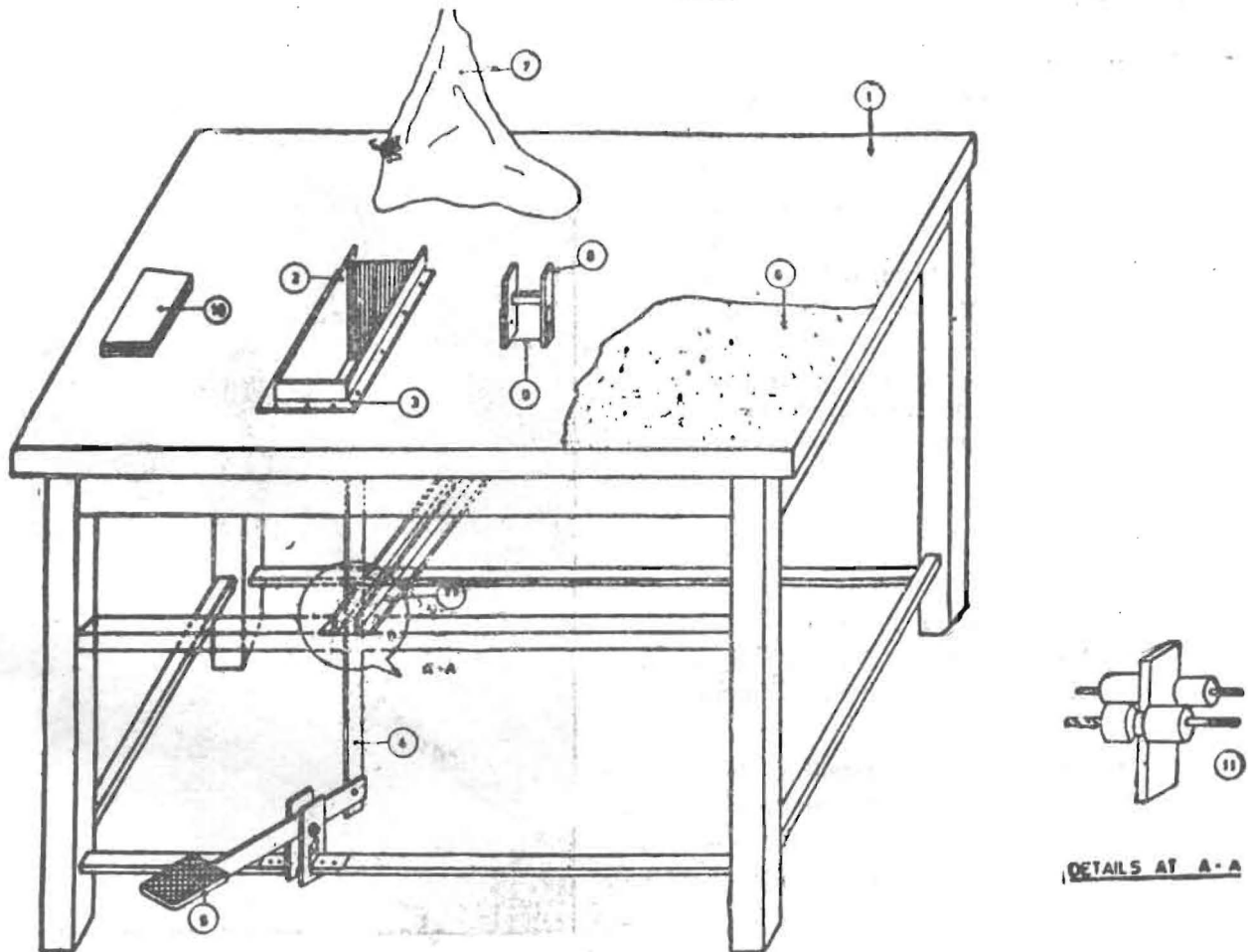


Fig. 1

HAND MOULDING TABLE (ASSEMBLY DRAWING)

This Institute has designed and developed a hand moulding table that enables bricks of accurate shape and size to be moulded by any brick moulder of average skill.

### Salient Design Features

An assembly drawing of the moulding table is shown on page 1. The table essentially consists of a wooden table (1) to which a metallic/wooden mould (2 & 3) is fixed. The mould is provided with a movable bottom plate (ms) centrally attached to a vertical ejector shaft (4). The top edge of the mould projects about 5mm above the table top. A frog is fixed to the base plate immediately above which a false bottom plate with its centre cut out to accommodate the frog is loosely fitted. The plate rests on four bolt heads, the height of which is adjustable so that the loose plate can be correctly levelled. A gap of about 10 mm is provided between the two base plates.

The vertical shaft (4) is actuated by a foot-operated lever mechanism, so that, when the pedal (5) is pressed down, the base plate is pushed up level with the top edge of the mould. Two guide rollers (11) are provided for the smooth vertical movement of the shaft. On releasing the pedal, the base plate drops down to rest on four corner blocks, the position of which is also adjustable. The total linear shrinkage of the clay to be used must be predetermined to fix the dimensions of the mould box and the depth of the loose base plate from the top edge of the mould.

### Operation

For moulding bricks, clay is mixed with water and kneaded in the same manner as in conventional ground moulding process except that the consistency of the mud is marginally stiffer.

To achieve better preparation, the clay mass (7) should be wetted, pugged and left to stand at least for 24 hours. Before moulding, the clay is pugged once again and then supplied to the moulding table.

At the moulding table a quantity of clay is rolled into a clot slightly larger in volume than

the mould.

The clot is then rolled over fine sand (6) and thrown with some force into the mould (Fig. 2). Surplus clay is cut off by a wire bow (8.9) and removed. The exposed face of the brick is sprinkled over with fine sand and a wooden pallet (10) is placed over it. The brick is then ejected by pressing down the pedal (5) and is lifted off the frog by holding it between the loose bottom plate and the top pallet (Fig 3). The pedal is then released and the base plate drops to its original position.

The moulded brick is then turned on side and the bottom plate adhering to it is pulled out and returned to the mould box. Another wooden pallet is then placed on the top face of the brick which is then carried away to the drying ground. There it is placed on edge to dry (Fig 4). Bricks are carried to the drying ground either singly or several at a time. These may be carried on wooden/metallic trays which are returned to the moulding table after transferring the bricks to the ground.



Fig. 2 CLAY BEING THROWN INTO MOULD



FIG. 3. BRICK BEING REMOVED FROM MOULD



FIG. 4. BRICK BEING PLACED ON EDGE FOR DRYING.

As soon as the loose bottom plate is returned to the mould box, it is ready to receive another clot. While sand moulding has been generally satisfactory, with some plastic and sticky clays, it may be necessary to wipe the inner sides of the mould with an oily rag after moulding 4 or 5 bricks. Waste engine oil, 'neem' oil, rice bran oil etc., can be used as a lubricant.

#### Field Trials

For production of bricks on a commercial scale, a moulder and two labourers were engaged for digging and preparation of clay, moulding and drying of bricks. Extended trials conducted in a local brick field showed that a rate of production of 1000 to 1500 bricks per day could be achieved. All the bricks had sharp edges and corners, with little variation in dimensions. The quality of moulding was distinctly superior to conventional ground moulded bricks.

In this system bricks are not touched by hand till leather hard and as they are placed on edge, they dry faster than ground moulded bricks placed flat on the ground. Table moulded bricks have also been observed to suffer far less damage during transport to the kiln and loading.

#### Principal Advantages

Hand-moulding table provides the moulder with an inexpensive yet efficient tool to produce well shaped and dimensionally accurate bricks. Uniformly shaped bricks have a direct bearing on improving the uniformity of setting in kilns which, in turn, results in greater uniformity in burning and hence better utilization of fuel. Improved dimensional accuracy of burnt bricks facilitates accuracy in masonry construction and results in considerable savings in mortar consumption.

The estimated cost of a table fitted with a mould is about Rs. 2,500. Twenty tables are required for a production rate of 30,000 bricks per day.

#### FABRICATION OF THE TABLE

Details of fabrication of the table are shown in figs. 5, 6 & 7.

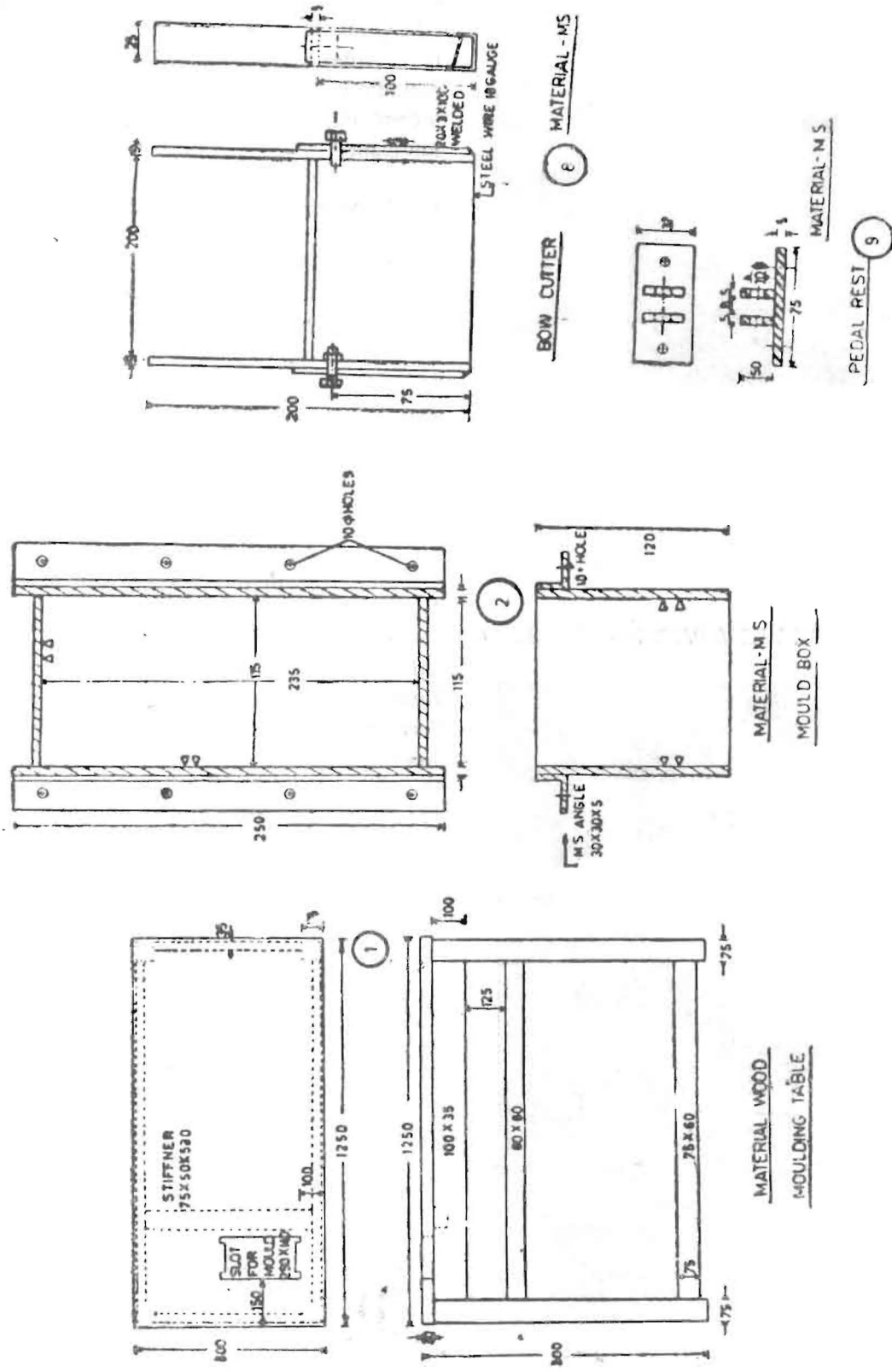


Fig. 5. HAND MOULDING TABLE



SL. No.	LEGEND	MATERIAL	SL. No.	LEGEND	MATERIAL
1	TABLE	WOOD	6	FOOT LEVER	M. S.
2	BRICK MOULD	M. S.	7	FROG	WOOD
3	EJECTOR	M. S.	8	FLANGE	M.S. ANGLE IRON
4	EJECTOR TOP PLATE	M. S.	9	EJECTOR SUPPORT	M.S.
5	LEVER GUIDE	M, S.	10	LOOSE PLATE	M.S.
5A	ANGLE IRON	M.S.	11	ROLLER	M. S.

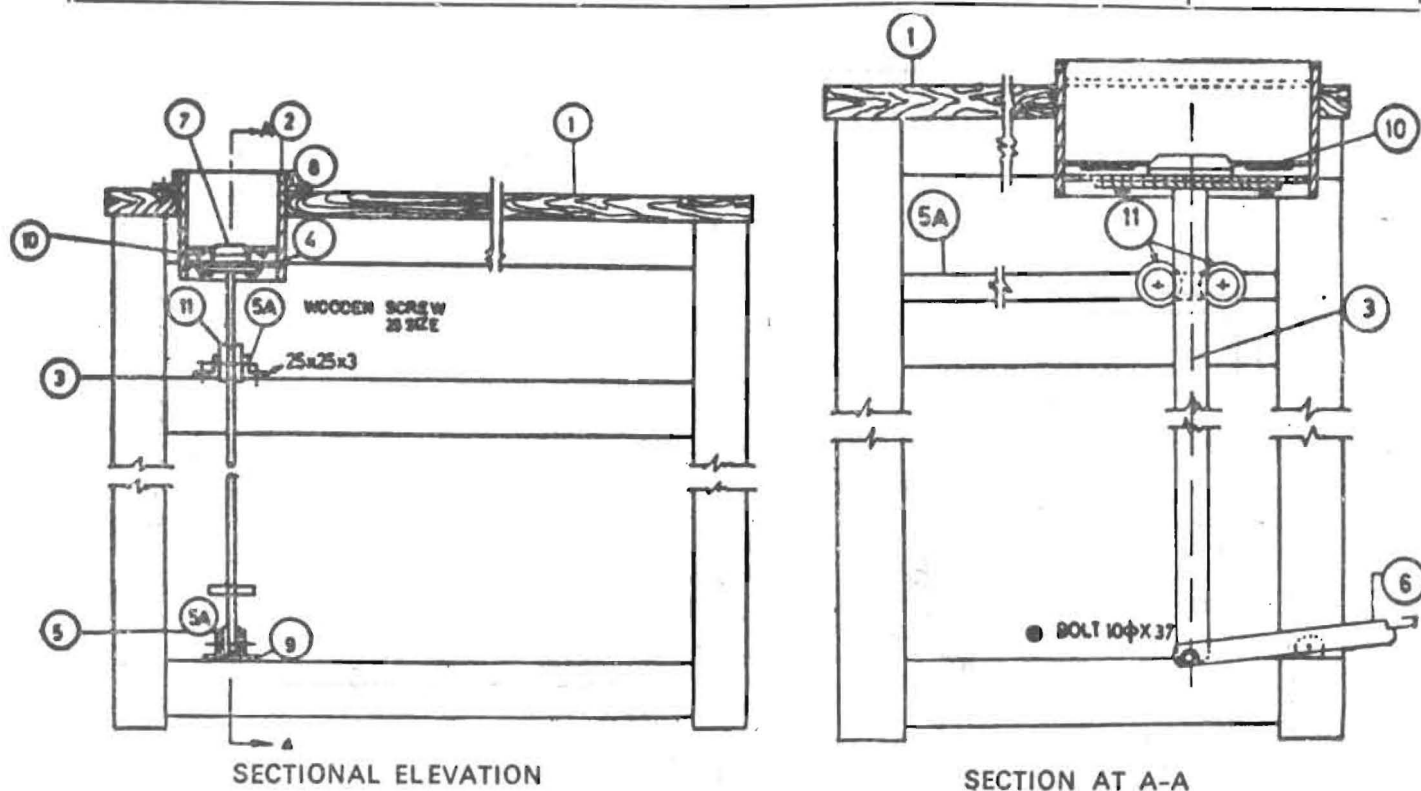


Fig. 7 BRICK MOULDING TABLE

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