

## *Design Narrative 2*

*a g rao*

### **Coal Stove or Chula**

This was in 70's. Our team: Myself, Prof. Jagadish and M.S.G.Rajan. We had worked together earlier on another project, 'Improving the efficiency of Kerosene Stove'. Sabastian, who was a mechanic in wood studio of IDC was another member. He helped us in making prototypes.

It was early years of my design career. We were eagerly looking for 'design opportunity'. After coming from the very first batch of NID (National Institute of design, Ahmadabad), one felt very confident. I had an engineering degree to back up as well!. I was least intimidated by the engineering faculty around, especially from the department of Mechanical Engineering who felt we are not technical enough! In general they dealt very little with practical Industrial problems!

There was one professor who did not know anything about, or ever worked with, plaster of Paris. He advised me to use a 'wooden block' inside a plaster block, while casting! He said,"this way you can save the cost, as wood can be reused. He thought POP(Plaster of Paris) is very expensive. He never bothered to imagine how to cast a plaster block with wood in the centre, covering all sides!

There was yet another professor who had done a Phd in Soviet Union on 'Metal forming'. He saw a 'gamela'(a basket shaped metal container used for carrying earth etc.,) in metal at IDC, designed by a student. It was formed by traditional hammering technique which was common for making brass vessels at that time. He asked me how it was made. Before I could answer he declared, " It is a casting" to a person who had come with him. When I tried to correct him politely, he refused to listen and said emphatically to his friend that 'it was a casting!'.

Among these, there were some 'gems and angels!'. One was Prof. B.S.Jagadish, whom everybody lovingly addressed as 'Anna'(brother). One could never see signs of aggression even in the most trying situations in him (alas, he is no more now). He was senior to me by 10 years. Heat Power was his specialization. Trained in IISc(Indian Institute of Science) a premier institute in the Country, located in Bengaluru, before coming to IITB, he was sound in his fundamentals. MSG Rajan was in charge of our *studios*. He was a man of action.

*There is an interesting story why these workshops at IDC got named as 'Studios'!*

*When the initial proposal for IDC was put up, the administration said, 'there is already a huge Central workshop next door, why do you want another?'. It was a night mare to do or get anything done in the central workshop! Prof. Nadkarni realized the problem of not having workshops in IDC. It would have been impossible to run a design programme without 'day and night running' workshops. Such working culture was quite new to IIT Central workshop. So he*

*introduced the term 'Studio' in place of 'workshop', which was a great innovation and it brought a new culture of working at IIT.*

Interestingly 'Science laboratories' always had such a culture of working day and night, which solved problems of IDC studios for working in the night at IIT.!

As I said before we used to look for design opportunity everywhere! There was a great urge to change the world around . 'Design of a new energy efficient (i.e. fuel saving) coal stove for house hold purpose' was a competition announced by Coal-board of India . We took it up. We had in our mind a coal stove which was commonly used in South and Western India. The fuel is 'wood-coal' readily available in the market. Jagadish (that is how we used to address him) had already taught me what contributes to 'efficiency' in combustion during the design of a Kerosene stove. Full burning of fuel and the heat thus produced reaching the food to be cooked without losing out to the surrounding are the key factors. In the Kerosene stove, we had discovered that it is wiser to use air gap as insulator instead of solid materials like 'asbestos'. When we were testing a kerosene stove, the insulator itself absorbed lot of 'heat' in the initial phase. In a shorter span of cooking like ½ an hour to 1 hour this resulted in reduced efficiency, as the heat did not reach the water to be boiled!

Other problems we indentified were 'ease of fabrication with low investment, ease of cleaning the ash after cooking and of-course 'good looks' to attract a house wife who is aesthetically sensitive!

Jagadish had explained during the Kerosene stove project, the ingenuity of wick stove which created a 'blue flame' with normal wicks burning in between two metal tubes with holes. The holes controlled the oxygen supply for burning and created a 'blue flame' at the top. So I came out with a solution: a cylindrical 'coal burning chamber or furnace' in the middle. It had a grating at the bottom and holes all around to supply oxygen evenly! We could control the supply and distribution of air by choosing size and gaps between holes! The furnace Chamber could be easily removed for cleaning later. The ash from furnace chamber would fall into a bottom plate which was hinged to the outer body. This facilitated easy cleaning of Chula' after cooking.

*I had seen my mother spending lot of time in cleaning the conventional chula after cooking.*

The outer body was shaped into a 'square box'. Each corner of the stove was formed by folded sheet metal. It had a strong healthy look. In each of the faces I introduced a hinged opening. A standard door hinge was riveted to the 'body'. Body was built by riveting. The hinges acted as small doors and facilitated air flow for quick burning. All these doors on four sides could be opened. They could be also closed to the extent needed selectively so we could achieve fast burning with the Chula as well as slow burning for special cooking!

We built a Prototype and tried it out. We were quite happy with the result. The Chula was looking modern! It was attracting every body's attention! We took (Black & white) photographs.

Colour transparencies were still not so common. The film was expensive. It was used very selectively. Each time you shoot, a full roll has to be finished to send for development to city! Then only we could see the result! Such priority gets ruled out when you are working for a competition with your own funds! We sent our entry for competition. It was a report with drawing and photographs ! It got immediate attention! After few months of wait we got a call to come and demonstrate our 'Chula' at "Ranchi"! Myself and MSG Rajan, decided to go! At that time IITs were not flush with Funds! We had to bear all the costs of prototype making as well as travel ourselves. We were going to Ranchi for the first time! We were lucky to get 'Company'. One of our students 'Avinash Pendse' who was working at NID after M Des, as Faculty joined us along with his student Jatin Bhatt! Incidentally Jatin's Father Dr.Panubhai Bhatt had taught us 'History of Painting' at N.I.D. He was a visiting Professor at NID! We had become very close to him due the small number of students(10). Avinash and Jatin had also designed a 'smokeless chula' for the competition and were called for demonstration!

The competition, and demonstrating one's prototype was a 'Great Experience'. We had reached Ranchi in the morning The train was late! We hurried up to the place where we were to demonstrate our 'Chulas'. There were others! We looked around. One of the Chula's was huge! It looked like rocket! It had a chimney with a height of 4feet. But the whole event got delayed. We didn't have our break-fast and were very hungry. Then the surprise came! We were totally bowled when we saw the fuel given to us! It was mined rock coal! We were seeing it for the first time! The local entrants to the competition were quite prepared for it. They had brought enough kerosene to light up!

But the judges for the competition turned up late and were busy having lunch! It was a open space with few trees around! Nice aroma of Chicken curry made us still more hungry! The organizers didn't even bother to offer us tea!

Then the word came asking us to light up the Chulas! We got into a great difficulty. The mined coal, hard like rock would not catch fire easily. Local competitors who had Kerosene could 'light-up' after sometime! The rocket Chula started burning with a roar! Then we discovered that the person had used a whole bottle of Kerosene! No wonder the Rocket Chula was burning like a space rocket!

Myself and Rajan managed to light up our Chula after struggling for a while. Once it caught fire it started burning. Alas! Our NID friends had trouble. Like us they had only tried with charcoal before! They could not light up their Chula. Smoke-less Chula remained fireless!

The judges came leisurely after their lunch! There seemed to be no criteria for judging the efficiency! One of the judges, a woman, was appreciative of our design because it looked nice! We were told that the results will be intimated to us later! So we came back!

An announcement came after 6 months that 'they found none of the entries suitable for award!' We were not surprised. Competitions by Govt. Agencies at that time were known to collect 'free' ideas! The organizers were totally unaccountable and got away with it! Only we learnt hard lesson!

But the Trip had a great boom to me! It was to change and set a new direction in my life! My journey to Bamboo was initiated ! In the local market I found a beautiful tetrahedron shaped bamboo basket. It had very sophisticated shape! The skill, the resolution of 3D form and use of material surprised me! the price was only 60paise. What 'Charles Eames' had told us when we were students at N.I.D. echoed in my mind. He had said, " Look guys, you are the first batch of industrial designers in India! You are the pioneers! A heavy responsibility is on your shoulders! You have rich traditions in your country! How are you going to take it forward?"

This basket became my 'shyamantak mani', the famous diamond stolen by Jambawanta and recovered by Krishna! Till today this basket adores Bambu Studio at IDC, which I was fortunate to create! What happened to the well designed Chula ? we did not leave it. With IDC support we made 10 pieces, tried out here and there! But there was no pull. So no momentum ! We were always busy with new projects and they were exciting too ! On reflection I can see, unless a required 'context' exists products do not get into use! In case of a product like 'chula" which had little commercial potential, it became a study / research project!

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