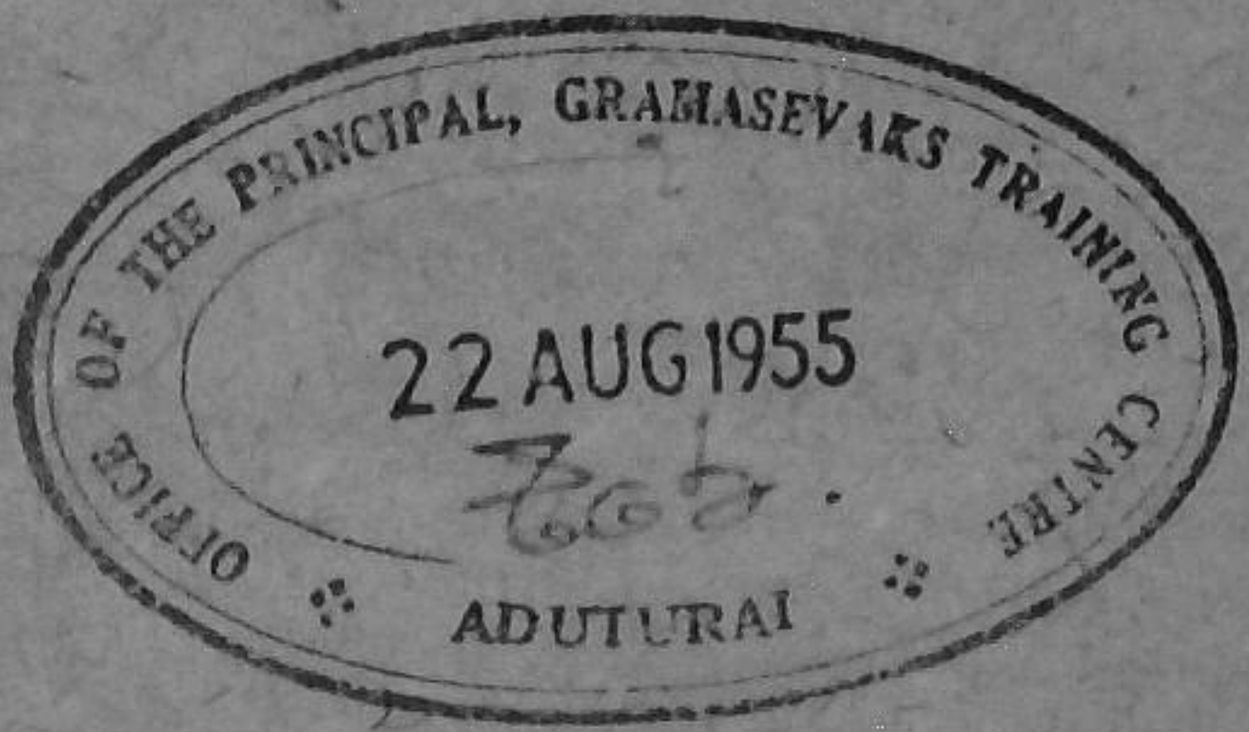
THE ALL-INDIA VILLAGE INDUSTRIES ASSOCIATION

MAGAN DIPA

(A Vegetable Oil Lamp)



MAGANVADI
WARDHA
1949

First Edition 1941
Second Edition 1943
Third Edition 1949

Printed on Handmade Paper

PRICE Rs. 0—8—0

Published by— J. C. Kumarappa. Organiser & Secretary,
The All India Village Industries Association,
Maganvadi, Wardha, C. P.

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MAGAN DIPA

A

The lighting problem is not a new one. From ages immemorial we kept the light burning. Almost till as late as 1840 no one knew what kerosene oil was. Electricity came into vogue still later in early 20th century. The "Dipas" were the order of the day and torches (Mashals) were used for out-door purposes.

Today the problem before us is to give light to the people in a more convenient and more easily available form. There are four sources (a) vegetable oils (b) mineral oils (c) fuel gases (d) electricity. With the large population and extensive area that India has, it will be a long time before we can provide everybody with energies like electricity. Electrification will come not merely for lighting, it will also bring along with it the use of complicated and enslaving labour saving machines-the root of unemployment and exploitation-to the remotest parts of the country. Even should a day come when rural electrification becomes possible without its drawbacks, the need for mobile lamps will still be felt. Hence for the present, ruling out the source of electricity and similarly gas-for both of them tend to complicate and degenerate life according to our conception-we have only kerosene and vegetable oils to deal with. There are no two opinions about the fact that the use of the latter is more independent. A country like ours where mineral oil reservoirs are very limited and for which it depends almost absolutely

on imports, must necessarily, for the sake of self-sufficiency strive to minimize the use of the mineral oil.

India has to import 80% of its Kerosene from abroad, of which 50% comes from Burma and rest from U. S., Persia and such other countries. The latest figures are not available but the table below shows how our demand for this product has been steadily increasing :

1933-34	...	191,946,602 gallons
1935-36	...	202,623,939 „
1936-37	...	217,287,550 „

This increase in the demand has been created by the vested interests and a definite policy of positive help to them by the Government-in-power. Every possible measure is taken to render the kerosene oil look economic to the consumer. The railway freight at a concession rate-in spite of the special transport arrangements to be made for the inflammable material-undue import tariffs, and absence of duties go a long way to restrict us to the utilization of kerosene oil for lighting purposes.

Kerosene oil forms one of the waste products of the Petroleum industry and hence its use is restricted to lighting in such countries where electricity is not available. Thus in the interests of European owned petroleum companies-especially of Burma-it becomes imperative for the foreign rulers to make India into a perpetual buyer of their bye-product kerosene. The enthusiasm and administrative capacity exhibited in the distribution of kerosene, even in the hard days of the war, show that the vested interests did not want us to realise our dependence on others for kerosene. Tactfully they tried to conceal this bond of our slavery which they

had successfully tightened round us. The publications of the reports are a jugglery of figures. It calls for a shrewd eye to pick up the naked truth from them. For example in the column of production and imports of kerosene Burma is included in India, but when consumption is concerned " India excluding Burma " is written.

However it is a well known fact that mineral resources of the world are limited whereas the vegetable growth is not. It must be realised that what took nature billions of years to prepare is being recklessly consumed without any long range view as to the effect it will make on the coming generations. Apart from all this, the petroleum products are highly explosive in more senses than one. They form the bone of contention between the dominant world powers resulting in bloodshed and destruction. If we want no share in these wars we should try to avoid all petroleum products as far as possible.

The other source of lighting energy at our disposal—vegetable oil—comes to our rescue. India produces the largest variety of oil seeds in the world and is the second largest oil producing country. The table below will give an idea as to the extent of surplus we have at present ;

Average Annual Export of Oil Seeds from India (in tons)

1.	Mustard and rape	27,000
2.	Linseed	45,000
3.	Sesamum & til	7,000
4.	Castor	39,000
5.	Groundnut	630,000
6.	Cotton seed	3,000
	Total	**751,000**

(Calculated from figures for 35-36 to 40-41)

Is it not foolish to import, otherwise useless kerosene oil and export things of primary needs in exchange when all the time our excess vegetable oils can give us a good substitute for it? Looking to the practical side of the subject we face the following issuses—

1. That kerosene oil is cheaper than fatty oils.
2. Vegetable oils are edible and so we should not burn them.
3. It is inconvenient to use vegetable oils.

Examining the above three questions carefully we find (1) that kerosene oil being cheaper need not be any attraction if it is used as a means of slavery and its import leads to export of essential goods in exchange. Even the fact that it is cheaper, if probed deeply, will reveal the fact that its price is fixed arbitrarily being a bye-product and does not represent its cost. This makes it appear less costly to us. It is definitely a device to make us depend upon this imported product for fulfilment of one of our primary needs. As electricity and other sources of energy are replacing the kerosene consumption in other countries - after taking out petroleum which they need for high speed motors, kerosene is a product least required elsewhere-the vested interests find it convenient to convert India into a suitable dumping ground for it.

(2) The plea that vegetable oils are used for edible purposes and so must not be utilized as illuminants betrays gross ignorance of facts. Multitudinous vegetation that India possesses, with numerous oil bearing seeds, is an immense asset which has been deliberately allowed to be left unexploited. If we stop exports of oil seeds and tap the available sources of oil from wild trees and plants we shall surely

have more than enough illuminating oils without affecting our needs for edible purposes.

(3) The third objection *viz.* the convenience in handling is really a poor reason. It only shows the wrong development of science in our country. "Necessity is the mother of invention" yet when the ruler wields his power to harness every available talent by a silver yoke to the benefit of the exploiting classes, the people of the land are not able to see even what is their necessity. By supplying us kerosene at a seemingly cheaper rate it has stopped us from devising anything else which will serve our purpose. There is no reason why if proper researches are carried out, the vegetable oil lamps cannot be made as convenient as, if not more than, kerosene oil lamps.

An unbiased long range view of things and a close economic study of the subject deems it essential that we ought to give up the use of kerosene as an illuminant and rely on our own resources for fulfilment of our primary requirement. If we understand the importance of the issue we shall strive for the emancipation from this slavery imposed by foreign trade. No amount of inconvenience in the utilization of our vegetable oil as an illuminant should deter us from doing what is beneficial to the country. Thus shall we be able to bring the country to be self-sufficient in regard to one of its primary necessities.

B

The Economics of the Magan Dipa

Kerosene is a mineral oil pumped out from the bowels of the earth. Man does not produce it but he merely extracts it from stock held by nature. Its economy belongs to the economy of predation and, its exploitation being in the hands of private enterprise today, its prices are determined under conditions of cut throat competition, or by destructive, powerful combines, or by speculation. India consumes annually about 90 crores of seers of this product, worth about 20 crores of rupees. It brings practically no employment with it for the people, but it takes away Rs. 20 crores of their produce and this also from the poorest of the poor and from the remotest villages. The story does not end there. To burn this oil we obtain lamps, mostly from foreign countries, costing about an equal amount. The supply of these lanterns also, like that of the oil, affords no employment to the masses. When consumption is based on local production, creation and distribution of wealth go hand in hand. But when articles produced elsewhere are consumed, it constitutes a drain on local production. The effect is much the same even when production is by one stratum of society and the consumption confined to another though in the same locality. Unless a reverse current is also in operation to establish equilibrium, the conditions described above will lead to increasing poverty. If we aim at avoiding such a contingency, we have to seek a way by which people can be made to supply their own

primary needs, Illumination is a primary necessity and it will be contrary to our interest to depend on foreigners to obtain it.

India is an outstanding producer of oilseeds in the world. It exports over a million tons of castor, groundnut and linseed alone every year. Oil expressed from such seeds can well be used for illumination though, because of their many alternative uses, it may prove expensive. There are, however, other sources of oil like mahua, neem, karanjia, rayan, agar, polang, cashew nut, etc., which are being used in villages for this purpose, and which can be made cheaper to use than kerosene oil, even commercially. The use of such oils, which man produces annually, places us on an economy of permanence, affording a perpetual source of employment, where the reservoir will not be exhausted upsetting our order, and where production and consumption will enrich the people.

The Magan Dipa burns about 20% less oil in a given time than a kerosene lamp with the same size of wick. On this basis we shall need 72 crores of seers of vegetable oil to replace the present consumption of kerosene oil. Without disturbing the other uses of oilseeds, if we stop our oilseed export, we can press that amount of seeds by using 1,50,000 bullock ghanis and obtain about 45 crores of seers of oil. This course, apart from providing work for 1,50,000 families of telis, bringing them an income of about 4½ crores of rupees, will yield 4 crores of rupees worth of oilcake for our ill-fed cattle and exhausted land. In addition, 1,50,000 bullocks, which work the ghanis, will be better fed and employed. The oil produced will be worth about **Rs. 17 crores.** Such stoppage of exports and the crushing of the seeds locally will add Rs. 4½ crores to the wealth of the country. The balance of

27 crores of seers of oil needed can be obtained from the non-edible oils we have referred to above. This will give employment to another 1,00,000 ghanis, families and bullocks, and bring in about 3 crores of rupees to the families engaged in this operation.

Besides benefitting the farmers and telis and providing fodder and manure, the lanterns themselves will be made by our tinkers, and the chimneys by the glassblowers. This will run into another Rs. 20 crores of business per annum and draw away from the over-crowded land a great many workers, relieving the pressure on the land and increasing the average income of the villager. This makes towards a better equilibrium amongst occupations, and creates skilled artisans, which in itself will provide scope for the development of the faculties of the people, and on the material side, these considerations lead us to expect that switching over from kerosene to vegetable oils will add about 27½ crores of rupees of employment to the people.

C

The Construction of the Magandipa.

The construction of the Magan Dipa has been so simplified as to enable a village tinker to make it after he is once instructed carefully.

Adaptation of a Kerosene Lamp (Sketch I)

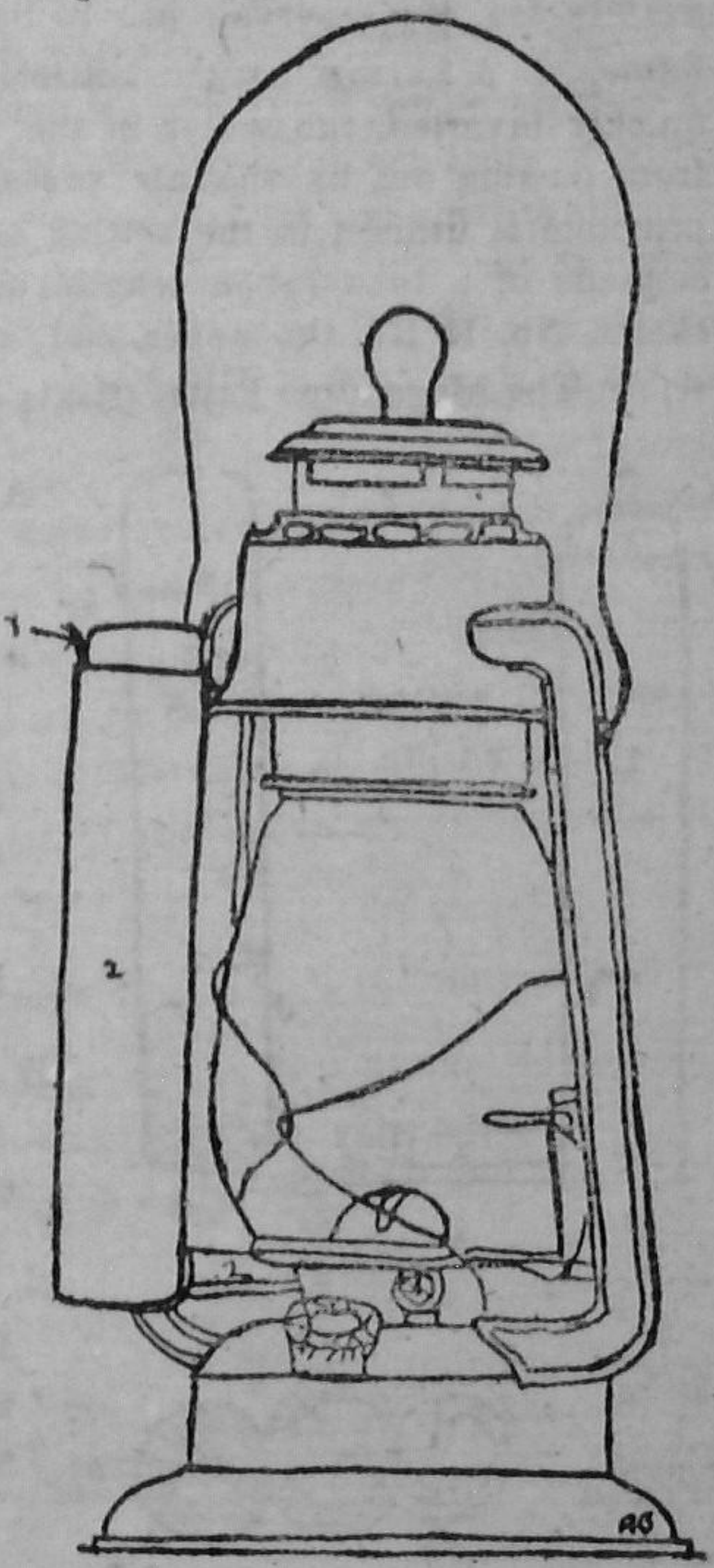
Magan Dipa

(Scale ½" for 1")

Projection 45°

References.

1. Reservoir
2. Supplementary oil tank fitted with burner.
3. Trimmer or the wick regulator.



To convert an old kerosene lamp to burn vegetable oil the following parts of Magandipa have to be attached to the supporting side on the left, as directed below:—

(Sketch II A)

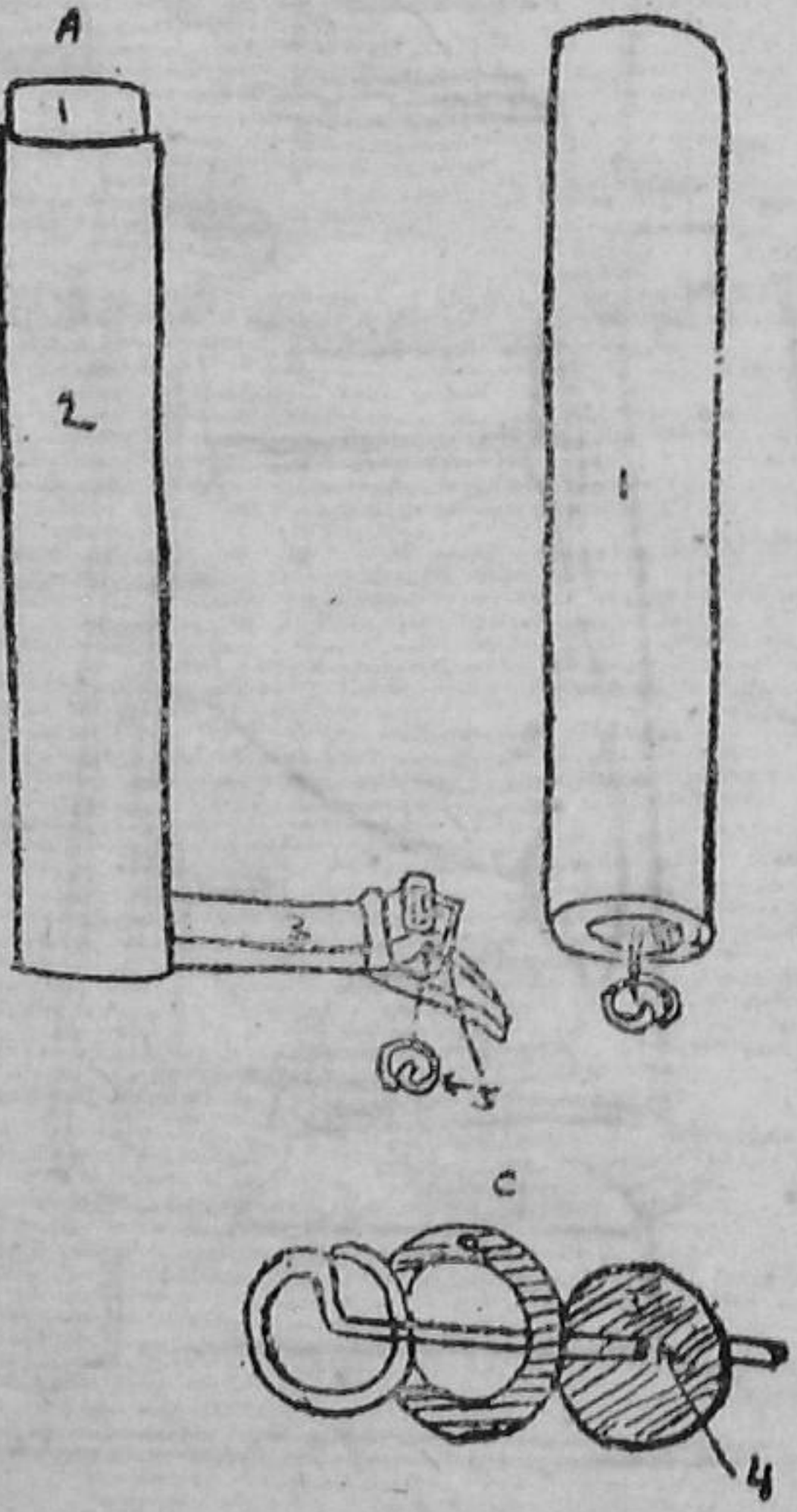
Parts of Magan Dipa.

The attachment parts are divided into two main parts

1. The oil tank or the reservoir. Sketch I (1) or sketch 2 (B.)
2. The supplementary oil tank over which the burner and the trimmer is fitted Sketch I (2.)

The Reservoir : As the oil in this lamp has to be gravity fed, the reservoir has to be above the level of the flame. If a narrow necked bottle is filled with water and quickly inverted, the water in the bottle will be prevented from flowing out by the air pressure at the mouth. This principle is utilised in the setting up of the reservoir which is made of a tube $7\frac{1}{2}$" in length and $1\frac{1}{2}$" in diameter (see sketch No. II B), the upper end of which is closed.

The Magandipa Parts (Scale $\frac{1}{2}$" for 1") Sketch II



A. Attachment (Supplementary oil tank with the reservoir put in position).
   1. Reservoir.
   2. Supplementary tank.
   3. Burner.
   4. Cup to drain overflowing or unburnt oil.
   5. Trimmer.

B. Oil tank or the Reservoir.
   1. Tank
   2. Bottom valve

C. Bottom Valve.
   1. Wire knob.
   2. Punched piece
   3. Shutter to which wire is soldered at No. 4

Size and measurements described in these parts are suited to 12" Hurricane Lanterns available in the market. To the lower end of this tube a valve shutter is fitted. This tube has to be perfectly air tight on all sides except the valve opening as other-wise the verticle column of oil in it cannot remain above the level of the burner or even the valve opening but will flow out through the valve making it serviceless. The preparation of the valve is very simple (see sketch II C) Take a lid that can close the lower end of the reservoir. Punch out a hole in it of $\frac{3}{4}$" dia. Now take another round piece of tin sheet and cut it to the size not larger than the above mentioned lid nor smaller than the hole punched to it. This should be of the size that can move smoothly through the tube. Now take a piece of wire and bend it round in such a manner that its one end does not escape through the hole punched. Insert this wire through the punched hole in the lid and solder it in the centre perpendicularly. A clear idea can be had from sketch II C. The tin piece soldered to this wire should be made a little bit heavy by affixing a piece of lead to it. This finishes the making of the valve needed. Now this valve should be fitted inside the rim of the lower end of the above mentioned tube, and the oil reservoir is ready.

The Supplementary oil tank over which the burner is fitted:-

This is the second important part of the Magar-Dipa This is so simplified that one can easily understand it if he sees it once-(see sketch No. 2 A). For explaining it easily, we shall divide it into two parts, (i) the supplementary oil tank and (ii) the burner and the trimmer.

(i) The Supplementary oil tank is a tube of 7" in length and a little more than $1\frac{3}{4}$" in diameter. The diameter

of the tube should be such as to allow the insertion of the Reservoir in it without any difficulty. The lower end of this tube is closed and made oil-proof In order to make the burner, two strips of tin sheets of 3¼" are taken. The breadth of one side is 1½" decreasing to 1" at the other; on the narrow side of one of it three long holes are punched (see sketch II D.) Thrcugh these holes wick regulator wheels work. Then both these strips are bent about ¾" at the narrow end and shaped to the size of the burner by beating with hammer, making into cups fitting into one ancther. When the burner strips are joined and ready it forms one part named Burner. This is joined to the bottom of the supplementary tank.

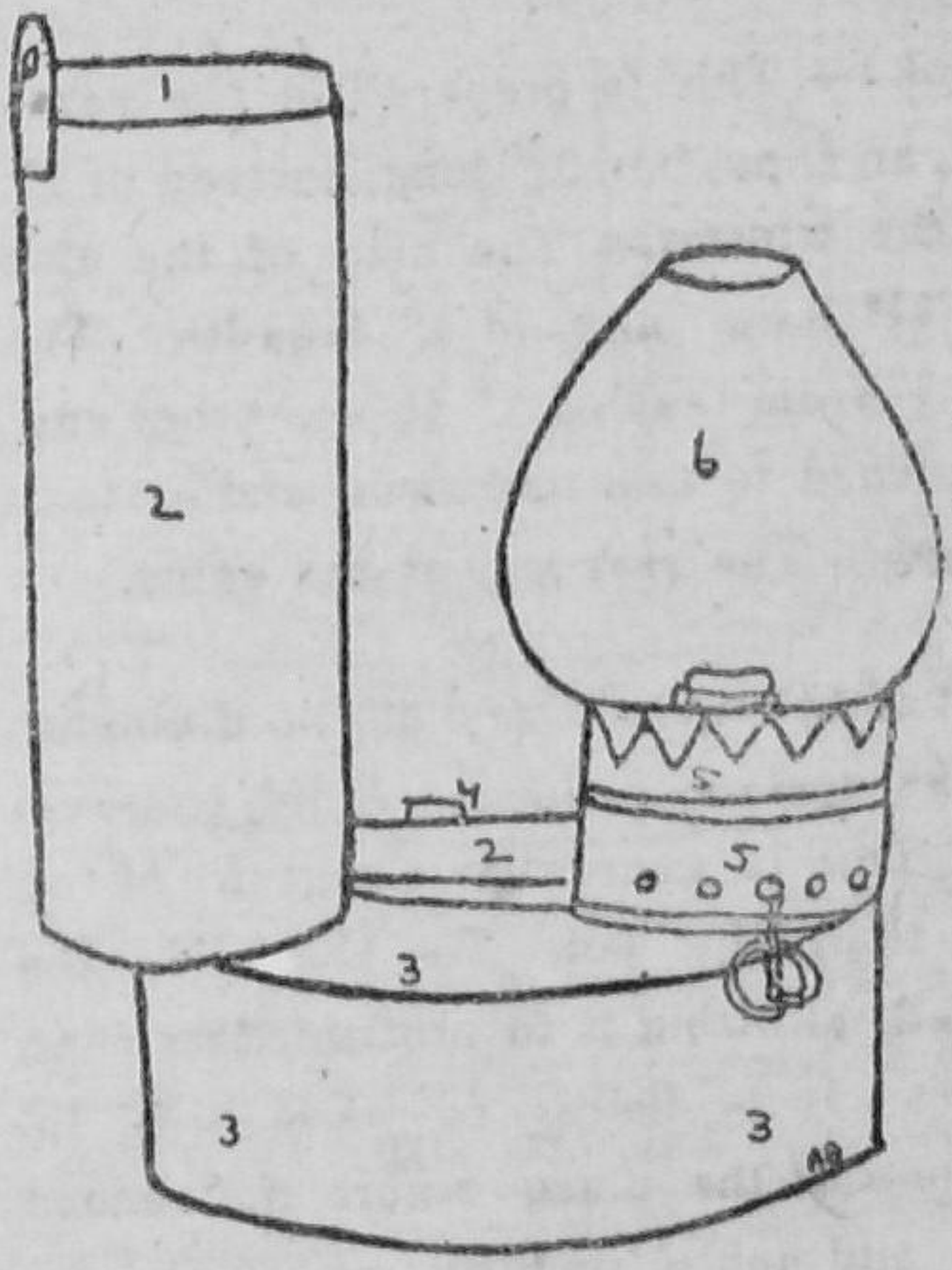
With a cup under the toothed wheels the trimmer (wick-regulator) is joined to the burner (See sketch No. II A 3 & 4) and just below it another cup is soldered. This latter cup collects the leaking or unburnt oil and drains to the air chamber while the former one acts to prevent any oil leakage through the wick-regulator- holes.

Now the second part of the Magan-Dipa is ready. This part is fixed to the ordinary lantern to the supporting side on the left. The burnner cap is cut at the necessary places to fit over the burner and below the trimmer rod a small piece of tin is fixed to close the gap through the cut of the burner cap.

The important fact in preparing this part is to see that the joint of the burner to the supplementary tank should be 1/8 inch below the level of the trimmer road. It may be noted that oil in the tank will be always at the level of this joint and if the trimmer rod is too low, the oil may escape

through it or if it is too high, the lantern will not burn well, due to the lack of oil supply. Therefore, proper care should be taken to keep the burner well bent and properly connected so that the end of the burner should not be more than $\frac{1}{2}$" above the oil level.

Construction of the Bed lamp



Sketch III

Bed lamp

(Scale 1" for 1.2")

References :

1. Oil tank
2. Supplementary oil tank fitted with burner and trimmer.
3. Stand or base
4. Shutter with perforatod cap.
5. Chimney holder
6. Glass chimney

The Bed lamp or wall lamp can be dealt with in three parts, instead of two as in the case of the Magan Dipa Lantern, but the basis of construction is the same as that described above. The only extra parts made are base or a stand, and a chimney holder, and they are as follows :—

1. The oil tank or the reservoir.
2. Supplementary oil tank over which the burner and the trimmer are fitted.

3. Stand or the base, over which chimney holder is fitted

1. The Reservoir:—The construction of the reservoir is quite similar to that of the Magan Dipa, but a little shorter in length. It is made from a tube of 1½" dia and 4" in length.

2. The supplementary oil tank and the burner:—As stated in the construction of the Magan Dipa, this part is divided into two main parts.

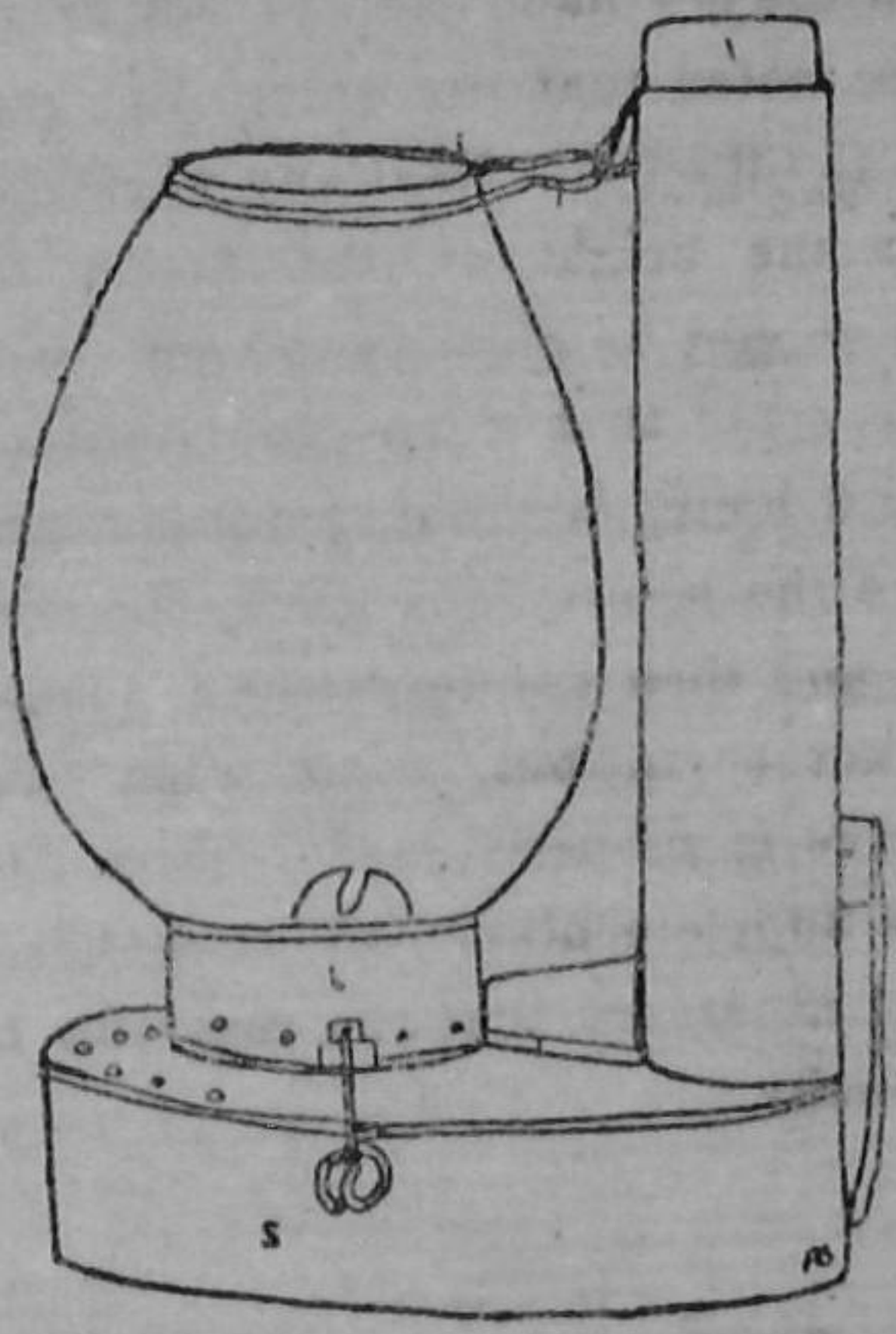
(i) Supplementary tank:— This is prepared in the same manner as that of the Magan Dipa, but 3¾" long, instead of 7".

(ii) The burner with the trimmer-. The size of the two strips to be utilized is 2¼" long and of 1" breadth. The strips become narrower to ¾" from that of 1" to the other end, and 2 long holes are punched to this narrower end instead of 3 as in the Magan Dipa. The rest is just the same.

(iii) Stand:— A tin pot of 1¼" height and 3" in diameter, with open mouth is used as a stand or base. A lid, to cover it properly, is selected. This is generally about ¼ of an inch wider in diameter than the pot. To this lid, the supplementary tank is fitted, allowing it to protrude less than ½ inch outside the base pot. It is better to have this lid punched in two places, - one at the place where the second cup (that which collects and takes unburnt oil to the air chamber or the base pot) touches the lid; and to the opposite side of the trimmer. This second hole should be fitted with the perforated cap, so that the rushing air may not have much effect on the size of the flame while burning.

The chimney holder is fitted on the lid, round the burner. This is made from a strip of tin 4½" x7/8".

Table Lamp



Sketch IV.

Table Lamp

(Scale 1" for 1½"

References :

1. Reservoir
2. Supplementary tank
3. Burner
4. Trimmer
5. Stand or base
6. Chimney holder
7. Clamp

This also is constructed on the same principle, as used in the Magan Dipa, and is of the same structure as the bed lamp. The size and construction of the reservoir, supplementary tank and the burner are just the same as in the parts constructed to suit a 12" hurricane lantern, and a burner cap is also fixed as in the lantern. The only addition is perforated round plate over the burner neck like the one in the hurricane lantern. Besides this a wire clamp is fitted to the supplementary tank, as is seen in the picture, (See sketch IV—7) to hold the upper (top) ring of the glass chimmey fitted in position.

The stand or the base on which the fitting is fixed should be 5" in dia. and 1½" in height.

Filling oil :

The Reservoir is held in the left hand keeping the valve end upwards, when it will be noted that the valve lid goes down making a big opening to fill oil in. Next any vegetable oil is poured into it up to the height of the inside tin shutter. The oil to be filled should be clean and not very thick. Insidentally it may be noted that clean groundnut oil burns very satisfactorily for 8 hours without requiring any trimming of the wick. When the reservoir is filled, the wire button is held by 2 fingers and then the reservoir is turned upside down. The oil does not come out, even when the button is left free, if the valve is porperly made. Now this reservoir is inserted in the supplementary oil tank till it touches the bottom. It is not necessary that the reservoir be filled with oil to its full capacity.

D

Directions For Use

There are three models of Magandipa put on the market and as all of them are manufactured on one and the same principle, these directions apply to all of them.

The most important thing for getting the best performance from Magandipa is to see that the lamp, chimney, wick and oil are very clean. Dry ash is useful for cleaning glass.

Inserting the wick : Before inserting a new wick it should be seen that no portion or piece of the old wick has remained in the wick-holder. A thin wire will be found to be useful in pushing out the old piece of wick.

A wick of sufficient thickness and breadth, properly trimmed should be inserted. In case it does not enter in smoothly, the reason for this should be sought out and if any piece of wick-thread is caught in the teeth of the wick-regulator, it should be removed to make the wick-regulator have a free play. Hurricane and table lamps can hold $3\frac{1}{2}$ inches x $\frac{3}{4}$" wick and a bed lamp can hold only $2\frac{1}{2}$" x $\frac{1}{2}$" wick.

Position of the Burner Cap :

(In the case of Table and Hurricane lamps)

It is essential to see that the burner cap is properly placed. Otherwise the wick may touch it in some position resulting in diminishing the light.

Filling The Oil : Oils which freeze, such as coconut or mahuva, and drying oils like linseed and safflower should be avoided. Of these the last two should never be used in the lamps. In the case of coconut or mahuva, mixtures with other oils may be used.

When sufficient oil is filled in, the reservoir is turned upside down taking care to see that no oil gets spilt and is put in its proper socket. In doing so it is advisable to hold the knob up to its mouth by the wire ring attached to it.

Lighting the Lamp :

Compared to any vegetable oil, kerosene oil is highly inflamable. Therefore vegetable oil takes a slightly longer time to catch fire. This is especially long in the case of a brand new wick. The wick should be first well moistened with the oil. Next one corner of the wick alone should be lighted by continuously holding a burning match near it until that portion catches fire. In subsequent lightings of the lamp, the '*gul*' present is removed by 2 fingers and a burning match held at one corner of the wick which catches fire almost instantaneously. A measure for this is that with a single burning match it must be possible to light at least three Magan Dipas. There are some additional hints also :—

1. The oil should be clean and poured slowly into the reservoir.
2. The wick should be trimmed by 2 fingers every time the lamp is to be lighted and not with a pair of scissors.
3. The lamp should be cleaned in a boiling soda solution **at least once in 2 months. This is especially necessary** if the lamp has been put to disuse from a long time. The lamp should be dried thoroughly before being lighted.

4. In case the wick is choked due to impurities, it should be boiled in soda solution, dried well and then used again.

5. No smoke should issue from the flame. Even if the smallest amount of smoke comes out, it should be taken to mean a mishandling of the lamp or defective ventilation.

6. If at any time it is found necessary to keep the flame low, it should be borne in mind that a great lowering of the wick will put out the lamp in a short time. Hence the wick must not be lowered to a great extent. The maximum extent to which the wick can be safely lowered can be easily determined after a few trials.

7. As far as possible, the flame should be white, flat and steady. Tall, sooty and reddish flame shows defective burning. To increase the brightness, do not raise the wick too high. The wick *should not rise* above the burner level.

8. Proper supply of oil to the wick depends on the position of the lamp. Therefore the lamp must not be placed on an uneven surface. If the normal level of the lamp is disturbed then either the intensity of light goes down or the oil begins to trickle down rapidly into the bottom auxiliary tank.

9. It should be understood that the lamp is working satisfactorily only if it gives out white, steady light and develops no '*gul*' in 4 hours at least.

10. There should be no leakage of oil in the lamp. The vegetable oil is not volatile and hence any unpleasant sign it leaves on the floor etc. is highly resistant to cleaning. If there is any leakage it should be first attended to and got rid of.

11. The lower tank is meant for catching and collecting any accidental dropping of oil from the opening near the wick. If oil continuously collects in the tank it should be taken to be a defect in the lamp and the level of the reservoir got adjusted.

12. Vegetable oil flame is more resistant to draughts of wind than the kerosene oil flame. Hence Magan Hurricane lamp can be taken out even when strong winds are raging.

13. When the light from the wick is to be made brighter usually the wick is raised. In case of our lamps, it is essential to remember that there is a critical height to which the wick can be raised to secure the maximum amount of light. If the wick is raised beyond this height intensity of light falls rapidly as the vegetable oil can not reach the tip of the wick by capillary action.

14. If the lamp surface is oily, dust setiles on it and the lamp is unclean. So keep the lamp always clean.

15. While removing the "*gul*"take care not to allow it to fall inside the lamp, as otherwise it clogs the path of overflowing oil from the cup which finds its way to undesirable parts of the lamp thus rendering the lamp surface dirty.

16. For pouring back the oil from the bottom auxiliary tank to the side reservoir take care to empty the outer cylinder first and then the bottom tank, as otherwise oil from both sides will come out

E

Scope For Improvements

Magandipa, as it is today, is not the ideal vegetable lamp of our conception, but it is certainly the best type which answers our requirements.

We aim at a vegetable lamp which :—

(a) Can be prepared by the village artisans

(b) Can be prepared out of materials easily procurable in villages

(c) Is simple to manipulate, and

(d) Is as convenient and as efficient as, if not more, than the kerosene lanterns.

If these four tests are fulfilled by the lamp, it can be deemed perfect. There are many vegetable oil lamps in the field. Most of them are a mushroom growth due to wartime scarcity of kerosene and none perhaps suited to village conditions. Magandipa does fulfill the tests (a) and (c) fully and (d) partly.

(a) It is being prepared by village artisans and any tinker can learn the art in less than a month. We also supply the tools and other equipments to the tinkers.

(b) The raw materials are old tin canisters and old unserviceable kerosene lanterns, some iron wire etc. All of these are easily available everywhere though none of them are produced in the villages.

(c) The simplicity in manipulation of Magandipa, though in comparison with the kerosene lamp, cannot be vouchafed, yet it stands unique in all the vegetable oil lamps as the simplest and best. The oil cistern has a large capacity and so once filled it burns on for twelve hours or more (according to the size). The other arrangements also have been designed with a view to simplicity.

(d) It does not claim to be as convenient as the kerosene lamp as there are certain difficulties natural to burning vegetable oil. Researches are yet to be carried out to overcome these difficulties.

Three defects we observed in our Dip after burning for a few hours, are (1) the formation of '*gul*'* (2) want of proper ventilation and (3) the susceptibility to overflow of oil on being shaken. We have tried to tackle these keeping in mind that any change or improvement, if introduced, should be simple to operate and also not call for frequent attention from the user.

The rapid formation of the '*gul*' is attributed to the impurities of the oil. This we have tried to overcome by purifying the oil by household methods, as for example filtering hot oil (70°C) through a bed of finely powdered and specially prepared charcoal placed over a layer of cotton. There is considerable improvement in the quality of oil. The '*gul*' formation period is observed to be longer than in the case when impure oil is used.

Proper ventilation is a serious problem in vegetable oil lamps. We have tried several experiments to improve the

* A crust formed on the tip of the wick which stops the flow of oil

ventilation. The burner used in hurricane and table lamps requires modification (We are at present using the burner of the kerosene oil lamps). Some more experiments must be carried out to evolve a suitable burner for vegetable oil lamps. Similarly the best shape for the glass chimney yet remains to be worked out.

Our lamps do not stand shaking. The trouble lies in the arrangement we have for feeding the oil. If a device is found in which the oil feeds itself (in proper proportion) to the wick then effect of shaking can be overcome. In this connection it is of interest to note the *Thundamani Velakku* of the Madras Presidency. In this, the oil flows out only to a constant level and the lamp is unaffected by normal shaking. If this principle can be incorporated into our Dipa one of the major defects will have been overcome. We are trying some experiments in this direction.

Thus we conclude that in spite of the present shortcomings of Magandipa, it has in it the seeds of formation of an ideal vegetable oil lamp for village India. The day is not far when the scientific skill of the talented will eradicate all its defects and make us free from one of the strong chains of slavery in respect to a prime necessity of life.

Is it too much to expect that during this period of experimentation people will use this lamp in a spirit of service and give us their experiences and suggestions for improvement and share in this important field of work ?

THE ALL-INDIA VILLAGE INDUSTRIES ASSOCIATION
MAGANVADI, WARDHA C. P.

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