

1
NAGGAR
Kulu
Punjab

Sep 11 1929

S.C.Seal, Esq
15-7 Lakshmi Dutta Lane.
Bagbazar.
Calcutta.

Dear Sir,

With reference to your advert in
the Sptmbr copy of the Modern Review, please
send me to my above address in one V.P.POSTal
parcel

4 separate bottles (or whatever the packing
may be) of 1 dram each of your ge-
nuine LOTUS HONEY eye cure.

Please pack very welll, as mail is very roughly
handled by postal runners up hill here.

Awaiting your early delivery,

Yours very truly

HCL

acids. HCL.

H. No. 3.

Calomel 1 pound

5 lb. Sal Ammoniac -

8 oz opium

Sulphur

Sublimed -

Mercur. rot.

~~Howe's~~
~~Calomel~~
 best Mercur.

~~Ad Cl~~ ~~HO4~~ Fe Sly
~~R~~

Ag Sly + Calomet

Fe Cl + Ag +
 Calomet
~~Calomet~~

(5).

3

4 both at 1 bl each

of Ether Sulph (best
chem) dish of Sodium
as 2/4/-

1 lb. Acet Hydrate

purest Merck

leaf

1/12/-

4 oz. Oil of Cinnamon

8 oz Oil of Nutmeg

4
NAGGAR
Kulu
Punjab

Dec 10 1929.

Messrs B.G. Jack and Co.
Lamington Road
Bombay. 4

Dear Sirs,

I have been recommended your firm for medical, chemical and scientific appliances, and we are very often in need of these, I shall be glad if you could kindly send me a copy of your catalogue, together with prices.

The nearest railway station being some hundred miles away from here, everything has to be sent by V.P. Parcel post, but I expect you can arrange to pack glassware etc. safely in wood-wool and wooden boxes.

Thanking you in anticipation of your early reply

Yours very truly,

P.S. If there is any charge for your catalogue, or postage I am well prepared to carry same.

5
NAGGAR
Kulu
Punjab

May 21 1930

Messrs Daniram,
Harware Merchants
LAHORE.

Dear S^rs,

Following my recent order for screws, which I hope is well on the way, it occurred to me that you may possibly also stock

VERNIER CALLIPERS

same as or similar to W.LESLIE's No:484, page 127, of whom you no doubt keep a copy. If you have such or similar callipers, to cost 5 to 6 Rs., then please send them by V.P.POST WELL PACKED in wooden box as mail is very roughly handled up hill here.

It is ABSOLUTELY essential that the callipers:

- 1) show both inches and millimeters.
- 2) that they have a vernier
- 3) that they have a depth gauge attachment
- 4) and that they show up to at least $4\frac{1}{2}$ inches.

If you have none like this, then please describe and quote price for nearest you can offer.

Thanking you in anticipation of your early reply
Yours very truly,

6

July 20 1930

Calcutta
Messrs The ~~Pharmat~~ Lab. and Chem. Works,
35/1 Panditia Rd, Ballygunge.
Calcutta

Dear Sirs,

In connection with our orchards we are constantly in need of all sorts of chemicals, and shall therefore be glad if you would kindly send us your complete pricelists WITH ALL PRICES, for the complete range of chemicals you stock.

Should you have Strontium nitrate and Lithium chloride in stock, please send by return 2 oz of each by V.P.POST Also please send 1 lb Plaster of Paris powder, 4 oz of colophony, 4 oz Gum arabic, 8 oz potato starch, 1 lb rosin, 4 oz glycerine (pure medical), 2 oz graphite (powdered).

The Gum arabic required should be best quality, genuine, and all chemicals should be pure.

Thanking you in anticipation of your early delivery

Yours very truly

7
July 20 1930

Messrs Butto Kristo Paul and Co.
Manufacturing Chemists
1 & 3 Bonfield's Lane
Calcutta

Dear Sirs,

In connection with our orchards we are constantly in need of all sorts of chemicals, and shall therefore be glad if you would kindly send us your complete pricelists WITH ALL PRICES, for the complete stock you sell.

Should you have Strontium nitrate and Lithium chloride in stock, please send by return 2 oz. of each. by VPPOST

Thanking you in anticipation of your early
reply

Yours v. truly

P. C. 50.....

The Calcutta Chemical Co., Ltd.

35-1, Panditia Road, Ballygunge.

Calcutta, 30.7.32, 192 .

Dear Sir,

Re your ~~4th~~ enquiry of 20.7.32. Please refer to

- ✓ 1. We thank you for your order which is receiving our best attention.
2. Please send an advance of Rs. _____ to enable us to execute the order.
- ✓ 3. The Articles mentioned below are ^{not in} ~~out of~~ stock. Please let us know whether we shall execute the order omitting them.
4. Please confirm the prices noted below.
5. We have not received the said order. Please send us a copy.
6. Your order has already been executed and the goods have been despatched for booking. R/R will be sent as soon as the same is received.
7. Please send us an early reply to our letter of _____
8. Please let us know why the V.P.P. for Rs. _____ sent in execution of your order _____ has been refused.
9. Full instructions of despatch are requested.
10. Your order/address is unintelligible. Please write clearly.

✓ 11. We have no printed pricelist at present for chemicals at present.

✓ 12. Lithium Chloride (we can supply lithium citrate instead)
Colophony.

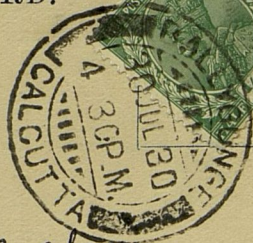
Yours faithfully,

The Calcutta Chemical Co., Ltd.



A soap to cleanse, purify and beautify the skin and complexion.

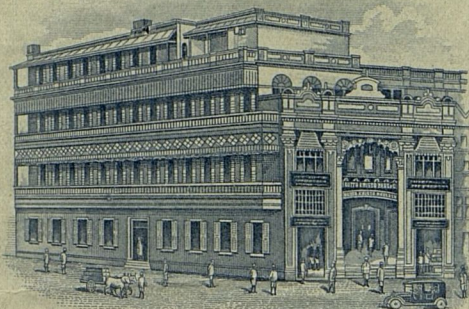
POST CARD.



The Secretary
Hall Estate
Naggar
Kulu
Punjab

No.
PLEASE REFER TO NO. & DATE OF THIS LETTER.

Codes used { A.B.C. 4TH & 5TH EDITIONS.
LIEBER'S STANDARD CODE.
BENTLEY'S CODE.



BRANCH: 92, SHOVA BAZAR ST
FACTORY AND WORKSHOP) DUM DUM JUNCTION (E.B. RY.)
LONDON OFFICE, 17, ST HELENS PLACE, E.C.3.

Suppliers to the Govt Medical Stores,
Municipalities, Hospitals,
Tea-Gardens, etc.

BY APPOINTMENT TO

H.R.H. THE PRINCE OF WALES

ESTABLISHED 1265.B.S.

POST BOX 359.

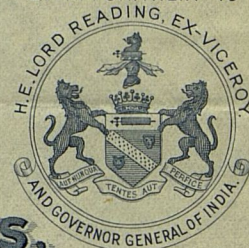
TELEPHONE NOS 4510 & 4511 CALCUTTA.
TELEGRAPHIC ADDRESS: "BHUTY," CALCUTTA.



CHEMISTS & DRUGGISTS,

HEAD OFFICE, 1 & 3, BONFIELD'S LANE,

BY APPOINTMENT TO



Calcutta the 14th August, 1930.

Ref: LE/2350.

14713

COPIED.

The Secretary,
Hall Estate,
P.O. Naggan
Kulu,
punjab.

Dear Sir,

In acknowledging with thanks receipt of your esteemed order dated 20.7.30, we regret very much to inform you that Lithium Chloride is not available in our stock for which we hope to be excused. We are now in a position to supply Strontium Nitrate which if required, will be sent separately on hearing from you in reply. Further we beg to say that we got no pricelist at present but we shall be glad to quote our lowest rates on receipt of a list of your requirements which please note.

Yours faithfully,

B.K. Paul & Co.

Aug 4 1930

Messrs The Calcutta Chemical Co., Ltd
35-1 Pandit Road
Ballygunge. CALCUTTA

Dear Sirs,

With reference to your postcard No:50 of the 30th ult. asking us whether you shall execute the order as per our letter of July 20th, omitting the articles not in stock, we request you to kindly send us the rest of our immediately, as we are much in need of same.

Thanking you in anticipation of your early delivery

Yours very truly,

11
Aug 26, 1930

Messrs B.A. & Brothers
11 Ezra Street
Calcutta

Dear Sirs,

With reference to recommendation of our friends from
"Waltonia Farm" Katrain, please send us by V.P.POST, well packed
as mail is very roughly handled in the hills here

6 tubes ZELIO Paste against rats, at Re:1 each. plus postage

Thanking you in anticipation of your early delivery

Yours very truly,

Secretary

Calcutta Office
8, Clive Street.

Established 1853

D. Waldie & Co., Ltd.
Chemical Manufacturers.

Managing Agents—ANGLO ORIENTAL (India), Ltd.
Head Office & Factory

12
Telegrams & Cables
"WALDIE" CALCUTTA
Codes
A. B. C. 5th & 6th Editions
BENTLEY'S
Telephone
366 Calcutta.

Ref. No. 5769/

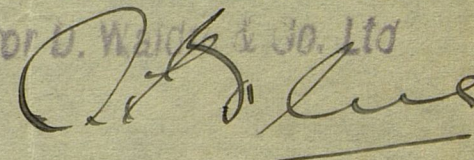
KONNAGAR, 14th October, 193⁰.

V. Shibayeff Esq.,
Naggar,
Kulu,
Punjab.

Dear Sir,

With reference to your order of the 30th ultimo, for 2x1 lb. bottles of Carbon Bisulphide, we regret to advise that in accordance with postal regulations Carbon Bisulphide cannot be forwarded per post, and we shall therefore be pleased if you kindly will let us know the name of the Railway Station to which you wish the parcel despatched.

Yours faithfully,

D. Waldie & Co. Ltd


13
NAGGAR
Kulu
Punjab

Oct 25 1930

Messrs D.Waldie and Co. Ltd
3 Clive Street
Calcutta.

Dear Sirs,

In reply to your letter of the 14th inst. #5169/
please send the Carbon Bisulphide (THREE bottles at one lb each,
instead of two as ordered previously) well packed in wooden box
to the Clive Transport Co. Ltd, Jogindarnagar, N.W.Ry. by
passenger train (if possible) sending us the r/r by V.P.POST.

This method is rather inconvenient, as it will take
weeks longer to reach, and we were somewhat surprised that carb.bis.
cannot be sent by mail, since we received recently two bottles
of your own make, though ordered through another chemist. But
since you state you cannot send we have to request you to send
it through Jogindarnagar, though this is connected with much
extra expense and great loss of time.

Yours very truly

14

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NAGGAR, Kulu
Punjab.

Dec. 20th 1930

Messrs Thacker, Spink & CO.
Postbox 54
Calcutta

Dear Sirs,

With reference to your Bookshelf Issue July 1930,
page 45, we require urgently

GR 1 British Association Rain Gauge, as described,
priced at Rs:29/-

Which we request you to kindly send us CAREFULLY PACKED by
V.P.POST.

We also require

- 1 Mercury Barometer with Vernier
- 1 Aneroid Barometer (Casella preferred)
- 1 Aspiration Psychrometer

for which we request full particulars, specifications and prices.
(with illustrated leaflets if available).

It is customary for scientific and educational institutions to receive a special discount on purchase, and as we receive such discount from all other firms, we trust you will also allow us a discount on the above Rain Gauge, as well as on other scientific instruments we intend purchasing from you.

Please also add to the above parcel 2 sets of Dennisons Alphabetic Indexes A-Z.

Thanking you in anticipation of your early delivery and reply
Yours very truly

Secretary.

15
()
Naggar,
Kulu,
Punjab
Br. India

Jan. 31st 1931.

Messrs Martin and Harris Ltd.
8 Waterloo Street
Calcutta

Dear Sirs,

We got from Thacker and Spincks' Directory that you are the India Agents of Messrs E. Merck Chemical works, Darmstadt. Please send us a complete catalogue with PRICES of their chemicals, you have in stock here, and please also let us know whether you can allow us some discount of your prices, as is customary with scientific Institutions, and as we usually receive on equipment and chemicals.

I shall be obliged if you would kindly send you catalogue by registered mail, as such parcels are otherwise liable to be lost en route.

Thanking you in anticipation of your early reply

Yours very truly

Secretary.

Telegraphic Address—**UNCUT.**

Telephone—1990, Calcutta.

Industrial Machinery Co.

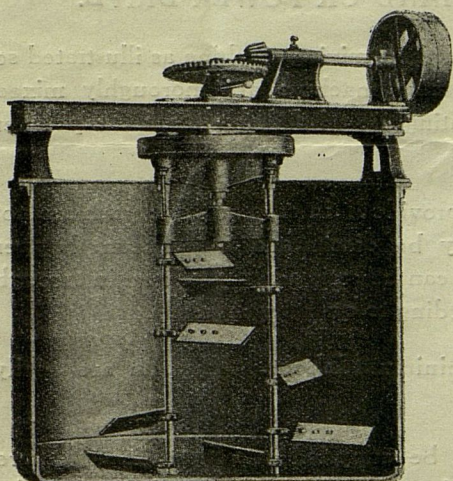
14, Clive Street, Calcutta.

MIXING MACHINE for Paste or Powder.

HAND OR POWER DRIVE.

This machine is well suited and adopted for the thorough mixing and blending all kinds of Pastes and dry powders as well as face creams, snows and all sorts of toilet powders. In this machine the stirrers work on the planet system that is to say the stirrers revolve on their on axis and at the same time travel round the inner surface of the mixing pan.

The special design and construction of the machine give the following important advantages.



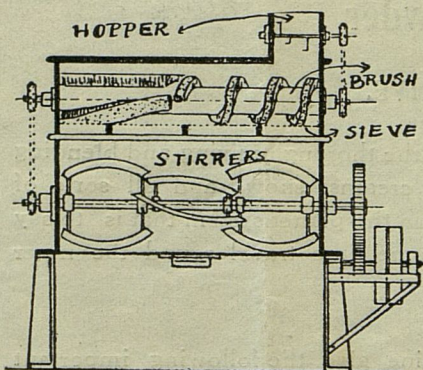
1. Perfect amalgamation of the component parts of the mass and a perfect mixing is brought about by the stirrers.
2. Suitable for working up mixing of tough dough like consistency as well as more or less heavy oils and liquids.
3. Also equally well suited and adapted for thorough mixing and blending of all kinds of dry powder like substances.
4. Stirring apparatus and mixing pans can both be quickly and easily removed.

Construction.—The mixing pans are of copper thickly tinned inside and outside. The stirrers are of brass nickelled or tinned as desired. If required the mixing pan may be water jacketted at an extra cost.

Size	No. 1	Hand power	Capacity	1	Gallon	Rs.	38/-
"	"	2	"	"	2	Gallons	60/-
"	"	3	Hand or power	"	6	"	120/-
"	"	4	Power drive	1 to 2 H. P.	Capacity 25 gallons	Price—Rs.	250/-

Sieving Machines Hand or Power Drive.

This machine is very suitable for sieving powders of any kind. From the hopper the material is taken up by a helical brush which cleans the holes of sieves and at the same time carries the coarse material, which does not pass through the sieve, to a discharging outlet at the outside. Every part is completely closed and packed with felt so that there is no escape of fine material to the outside of the receptacle box.



The sieve frame is easily detachable and that of different mesh can be changed quickly. There are two inspection doors one providing access to the brush and the other to the underside of the shifter.

The illustration shows a combined sieving and mixing machine. In case of only sieving machine the mixing machine is replaced by a receptacle box.

Price of the machine with one kind of sieve—Rs. 75/-

Extra sieve frame " 7/- to 10/-
according to fineness of mesh.

SIEVING AND MIXING MACHINE HAND OR POWER DRIVE.

The above sieving machine is combined with a mixing machine as illustrated so that after sieving, the powder which falls in the mixing machine are thoroughly mixed by the stirrers revolving in the same and thus agitating the whole contents. The powder is finally taken out by the outlet at the bottom.

Also there is a Hopper pocket which is provided, in case any materials are not required to pass through the seive but can easily be discharged direct from hopper into mixing chamber. Essences and other liquids can be satisfactorily passed in through this pocket by means of a simple drip bottle according to quantity required.

The cleaning of the machine is reduced to a minimum labour. All parts are easily accessible.

Spare parts such as seive, brush, etc., can be supplied in a short time. Where colour or essence are used, we would advise having separate sieves and brushes for various colours and flavourings.

If desired the mixing machine can be provided with wood lining at an extra cost.

Price—Rs. 140/-

Capacity—lbs. 60.

Telegraphic Address—UNCUT.

Telephone—1990, Calcutta.

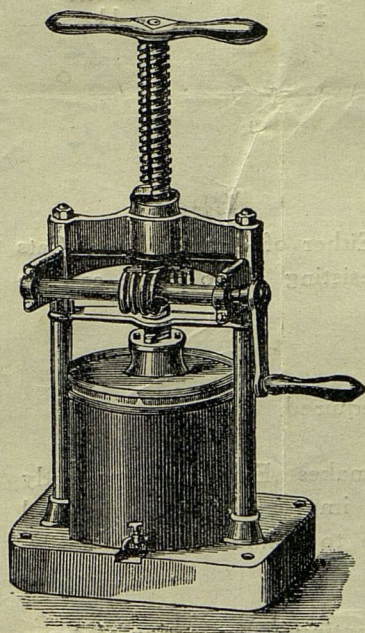
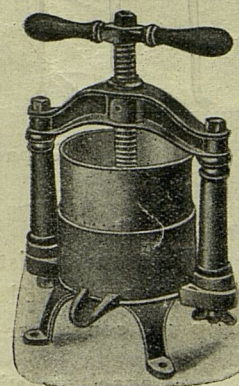
Industrial Machinery Co.,

14, Clive Street, Calcutta.

Pharmaceutical Machines.

Juice Extracting or Single-Action Tincture Press.

These Presses are strongly built of iron. The base through which the liquid finally passes is enamelled white to prevent any action on the metal. The perforated cylinder in which the substance is pressed is heavily tinned. The juice flows from the channel at the front. The press is excellently suited for extracting juice from fruits, crushed herbs, leaves etc., and also for producing raw meat juice. It is also used as Tincture Press. These are built in several sizes from 1 gallon to 4 gallons



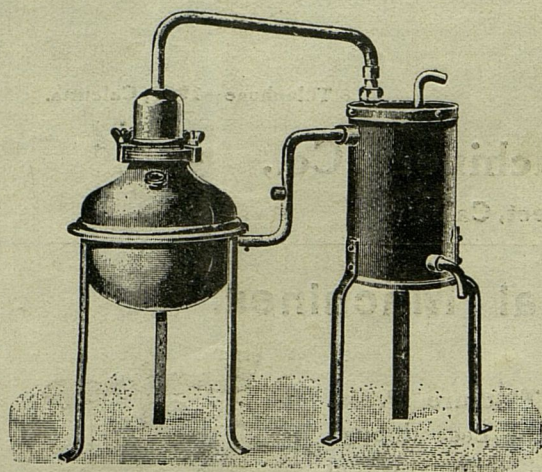
Capacity of	Gallon.	Gallon.	Gallon.	Gallon.	Gallon.
the cylinder	$\frac{1}{6}$	$\frac{1}{4}$	$\frac{1}{2}$	$\frac{3}{4}$	1
Price. Rs.	18/-	22/-	32/-	45/-	68/-

Double action Tincture Press.

The Presses are fitted with large steel screw deep slot and stout steel keys. After filling the strainer or cylinder, pressure is brought to bear by means of the lever and screw and afterwards a greater pressure is applied by means of worm and wheel. The fluid passes into the outer cylinder and can be drawn off at interval, pressure being retained the whole time.

Capacity of	Gallon.	Gallons.	Gallons.
the cylinder	1	2	4
Price. Rs.	150/-	250/-	450/-

Hydraulic Tincture Press. These are built for Pressures of 30, 45 & 75 tons pressure with Boxes of 8, 12&15 gallons capacity. The hydanlic Pump is driven by handpower. Prices on application.



Distilling Apparatus. It consists of a copper still tinned inside and fitted with a draw off cock. The still is connected to a pure block tin condensing worm in Tank by a tinned copper swan-neck and between the still & worm is an automatic feed water regulator. The apparatus simply requires connecting by India Rubber tubes to water mains and heating the still by stove or coal-stove. The water enters and passes by a rubber tube to the bottom of the worm tank, overflows warm from the worm tank into the still in which it is heated and vapourised and as each particle is condensed into distillate so is an equally proportionate amount fed automatically into the still.

Capacity of the Still.	Gallons.	Gallons.
	2	4
Price. Rs.	65/-	110/-

Vaccum Distilling Apparatus. The same is provided with water bath or steam heated and capsule of porcelain or copper with thermometer, ejection air pump and condenser of copper with receiver of copper.

Capacity of still of porcelain with water bath.	Gallon.	Gallons.
	$\frac{1}{4}$	$1\frac{1}{4}$
Price. Rs.	600/-	725/-
Still of copper steam heated		
Price. Rs.		975/-

For greater capacities prices on application.

Steam Jacketted Boiling Or Evaporating Pans. Either of copper or of Cast iron coated with Gebbler's enamel highly acid or alkali resisting. Also these can be provided with stirring arrangement and tilting system.

Prices on application stating capacity required.

Percoiators. Prices on application stating the sizes required.

Emulsifiers Or Homogenizer. This machine makes Emulsions perfectly homogeneous or fixed and which will not separate. It improves the colour and distintegrates the oil globules and causes the Emulsion to assimilate more easily. Capacity 11 gallons per hour Price Rs. 450/-

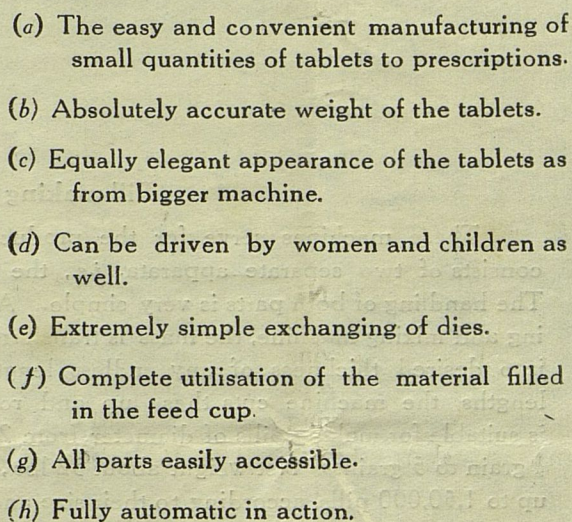
Extraction Apparatus. The apparatus is used for continuous extraction of drugs etc by hot spirit percolation and ultimate recovery of the spirit. It consists of steam jacketted copper still with copper container fitted with wire basket and contents, gauge Reflux copper condenser and pipes. Standard sizes 10, 20, 30, to 100 gallons Prices on application.

Telephone—1990, Calcutta.

14, Clive Street, Calcutta.

Serial No. 3.

1. **Hand-power machine.**—This machine is extensively used by pharmaceutical firms and ink tablet manufacturers. The handling of the machine is exceedingly simple. The following are the advantages of the machine:—



It makes tablets from $1/8"$ to $1/2"$ diameter or according to specific gravity up to 12 grains in weight. The maximum thickness 100 tablets compressed is $\frac{7}{16}"$. It compresses 100 tablets per minute.

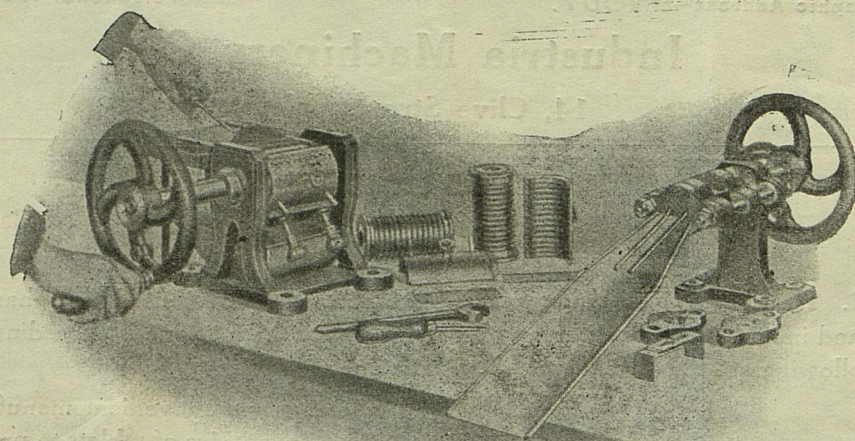
The machine is 18 inches high and weighs 75 lbs.

Indian make with two sets of dies and punches	...	Rs. 150/-
American make	...	Rs. 325/-
Indian-make dies and punches	...	Rs. 10 per set.
American	...	Rs. 16 "

2. **Large size machine, hand or power drive.**—It makes tablets up to 1" dia. The machine is heavy in construction and very durable. It is very conveniently used for the manufacture of medicinal tablets, ink-tablets, chemical and confectionery tablets such as peppermint, chocolate, lozenges, mineral water tablets, etc.

Price with one set of dies and punches hand and power-drive	Rs. 350/-
Extra set of dies and punches	Rs. 20/-

With each machine, a booklet containing full instructions for working the machine and for making tablets with formulas of various standard preparations is supplied.



Pill-making Machine.

These machines serve for the production of medicinal pills. A single machine consists of two separate apparatus, i.e., the string press and the pill-cutting machine. The handling of both parts is very simple. After preparation, preferably on a kneading and mixing machine, the mass is transferred to the string press where it is conducted into desired thickness of any endless length. After having the strips divided into lengths, the machine cuts these up and rounds the pieces into pills. The machine is suitable for making pills of diameter from 2 mm. to 10 mm. (25.4 mm. = 1 inch) or $\frac{1}{8}$ grain to 5 grains. Net weight about 52 lbs., gross weight 95 lbs. Capacity in 10 hours up to 1,50,000 pills, according to their size and the dexterity of the workmen.

Price with die for one size of pills— Rs. 285/-

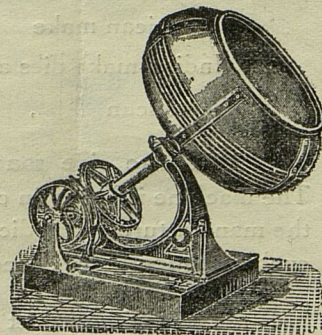
Extra dies— Rs. 105/-

Granulating Machine.—This machine is driven by hand and is indispensable for tablet manufacturing firms. It is a rapid worker and turns out a large amount of an excellent granulation that will dry readily.

Capacity— 10 lbs.

Price— Rs. 90/-

Sugar-Coating Machine.—This machine is used for coating tablets or pills with sugar, chocolate, gelatine, etc. These are built in sizes from 24 to 48 inches diameter of pans. The pans are beaten from thick copper and are made very deep and will carry heavy load. The pans are with or without steam-heating coils. If required, blowers for blowing air into the pan are provided. For coating with silver or gold foil, glass pans are used. H. P. required— $\frac{1}{2}$.



Capacity of pan without steam coil—24" Diameter Price Rs. 562/-

" " " " " 16" " Rs. 185/-

" " with " " 24" " Rs. 727/-

Extra Polishing Head for coated pills and tablets Price Rs. 60/-

—do— 150/-

For 16" Dia.

For 24" "

Machine with glass pan for gold or silver coating Rs. 225/-

THE IDEAL-TRIUMPH-MILL.

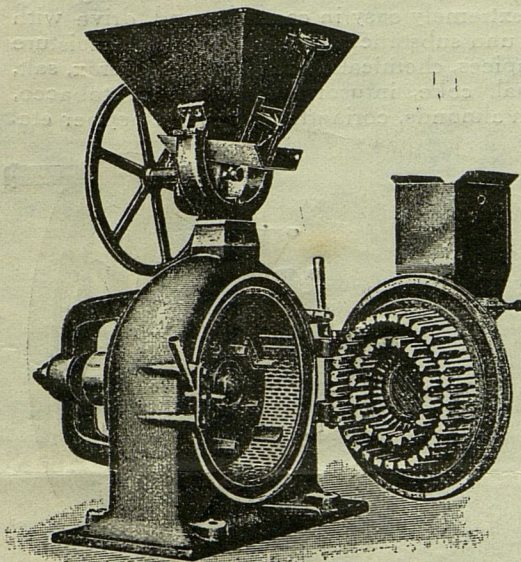
The **Ideal-Triumph-Mill** has the largest output with the smallest power and space. Its construction is so simple with few wearing parts which are interchangeable, and it will grind any article to any degree of fineness.

The **Ideal-Triumph-Mill** will take pieces according to the size of the machine, up to lumps as large as the fist and grind to perfect fineness in one operation. It grinds materials which cannot be economically or completely pulverized in any other single machine and consequently takes the place of two or three ordinary grinding Mills.

All parts of the **Ideal-Triumph-Mill** are interchangeable.

The **Ideal-Triumph-Mill** grinds: Asbestos, Ammonia Salts, Aniline, Cotton Seed Cake, Chicory, Chemical Products, Cacao Shell, Colours, Cork, Chalk, Sulphate, Clay,

Salpetre, China clay, Cloves, Dextrine, Drugs, Dyewoods, Oilcakes of all kinds, Graphite, Ginger, Napthalene, Paper, Potash, Pulp, Rubber, Soap, Saponin, Starch, Silcate, Straw, Leaves, Flowers, Roots, Fruits, Tanning stuffs, Barks, **Drugs**, **Sugar**, **Spice**—in fact almost anything.



Size No. 0. No. 1.

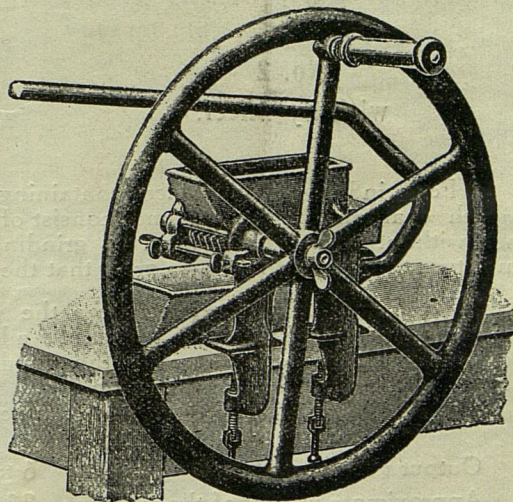
Output per hour 35 to 250lbs. 70 to 500lbs
according to
fineness ma-
terial.

Power required 1.2 H. P. 3.4 H. P.

Price 220/- 415/-

Cutting and Crushing Machine.—

This machine is indispensable for preliminary treatment of material which cannot be ground suitably before any operation. It cuts into small pieces and crushes very tough, hard and fibrous substances such as Nux Vomica, roots, barks, bone, horn, nuts, etc. The substance to be ground is put in a funnel shaped recipient and pressed by means of a lever with wavy shaft-shaped cutters which are made of best steel.



Hand power	...	Size No. 1
Power drive	...	" No. 2
Hand	" "
Power	" No. 3

Output per hour 15lbs. Price Rs.

"	"	30lbs.	"	"	45/-
"	"	20lbs.	"	"	75/-
"	"	60lbs.	"	"	65/-
					175/-

Telegraphic Address—**UNCUT.**

Telephone—1990, Calcutta.

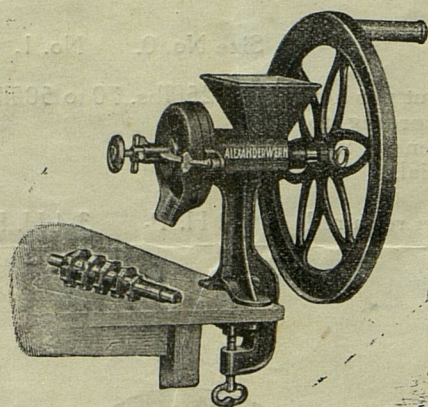
Industrial Machinery Co.,

14, Clive Street, Calcutta.

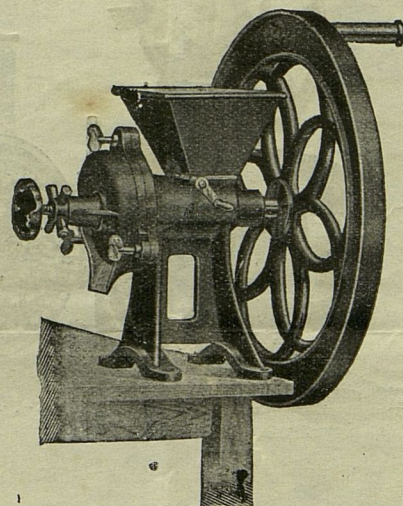
GRINDING MACHINES.

Suitable for households, laboratories, Ayurvedic purposes, apothecary and druggist shops, dealers in spices, bakeries and various other industries.

These machines work with a toothed breaking-up roller which is in the form of dented work, shown in Fig. No. 2 below, and interchangeable chilled toothed or grooved discs of first class material and so a preliminary breaking up is not necessary. All parts are strongly built and can readily be taken into pieces for cleaning. The degree of fineness is adjustable. The rotation becomes extremely easy in case of hand drive with fly wheel. The machine grind dry substances and substances containing a little moisture and oil, such as corn, pulses, maize, rice, etc., spices, chemicals, such as alum, borax, salt, soda, etc., colours, toasted bread, coffee, coal, coke, infusorial earth, sulphur, tobacco, glass, starch, roots, sugar, mustard seed, ajowan almonds, coriander, nutmegs, pepper etc.



No. 2
with fly-wheel.



No. 3
with fly-wheel and adjustable side-in
hopper for regulating feed,

For grinding dry substances containing a little moisture and oil the toothed discs, which sharpen themselves and consist of best special material, are used. These discs are without rival with respect to grinding capacity and durability. The richness of moisture or oil must not be so great that the toothed discs become sticky.

For completely dry substances the grooved discs are used. For coarse and fine grinding, the grinding discs are easily adjustable by means of a thumb-screw with lock-nut. The pressure caused by the grinding operation is taken up by ball-bearing located at the front end of the worm.

	Machine No. 2.	Machine No. 3.	Machine No. 5. Power-drive.
Output per hour	6 to 8 seers.	10-15 seers.	25 to 30 seers.
Approximate weight of the machine	22 lbs.	45 lbs.	60 lbs.
Price with one type of grinding discs German make	Rs. 28/-	Rs. 58/-	Rs. 105/-
Indian make	Rs. 23/-	Rs. 47/-	Rs. 75/-
Price of extra discs German make	Rs. 8/-	Rs. 14/-	Rs. 14/-

*extra
fine*



THE NEW CHART OF THE ATOMS

According to Hubbard
Secretary U. S. Bureau of Standards, Washington, D. C.

Latest 1931-32 Edition

Larger—42x64 Inches

Combined in one chart are:

1. The Periodic Table, showing atomic number, symbol, and atomic weight.
2. The Atomic Weight Table, with the elements arranged alphabetically—latest revised values.
3. A Chart of the Atoms giving forty characteristics and properties of atoms and their component parts.

New edition with explanatory matter on the chart.

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The new chart shows the following forty different fundamental properties and characteristics of the atoms:

1. The Mendeleeff Table
2. The New Periodic Charting of the Atoms
3. Atomic Number
4. Atomic Name and Symbol
5. Atomic Weight
6. Groups (Columns or Families)
7. Periods (Rows or Series)
8. Electron Orbit Groups
9. Configuration of the Atom
10. Ionization Potential
11. Atomic Structure Number Formula
12. End-Atom Cubic Structure
13. Planets and Their Motions
14. Orbit-type Transition
15. Quantum State of Last Added Electron
16. Nuclear Composition
17. The Negative Electron
18. The Positive Electron (or Proton)
19. Electron and Proton Constants
20. Crystal Lattice.
21. Radioactive Atom Transformations
22. Isotopes
23. Atomicity
24. Valence (Electronic)
25. Valence (Ionic)
26. Electropositeness
27. Electronegateness
28. Atomic Radius
29. Mass of Atoms
30. Mass-Energy Equivalent
31. Density
32. Compressibility
33. Melting Point
34. Boiling Point
35. State
36. Specific Heat
37. Expansivity
38. Paramagnetism
39. Diamagnetism
40. Lowest Spectral Term of Normal State

Revised Edition

PERIODIC CHART OF THE ATOMS

Compiled by
Henry D. Hubbard
OF THE U. S. BUREAU OF STANDARDS

Electronic

The Atoms Grouped According to the Number of Outer (Valence) Electrons

Planetary electrons
in the completed orbits

Atom No. = $2(1^2 2^2 3^2 4^2)$

Orbits ↓ Valence ↑	Planets →	I	II	III	IV	V	VI	VII	VIII	Orbits ↓ Valence ↑								
1	0-e 0-p	1 H 1.008							2 He 4.00	1								
2	2 He	3 Li 6.940	4 Be 9.02	5 B 10.82	6 C 12.000	7 N 14.008	8 O 16.000	9 F 19.00	10 Ne 20.2	2								
3	10 Ne	11 Na 22.997	12 Mg 24.32	13 Al 26.97	14 Si 28.06	15 P 31.027	16 S 32.064	17 Cl 35.457	18 Ar 39.91	3								
4	18 Ar	19 K 39.096	20 Ca 40.07	21 Sc 45.10	22 Ti 48.1	23 V 50.96	24 Cr 52.01	25 Mn 54.93	26 Fe 55.84	27 Co 58.94	28 Ni 58.69	4						
		29 Cu 63.57	30 Zn 65.38	31 Ga 69.72	32 Ge 72.60	33 As 74.92	34 Se 79.2	35 Br 79.916	36 Kr 83.9	36 = 2+8+8+18 End of the 4-orbit series	Final Quota in red 18 8	5						
5	36 Kr	37 Rb 85.44	38 Sr 87.63	39 Y 88.9	40 Zr 91	41 Nb 93.1	42 Mo 96.0	43 Tc 96.9	44 Ru 101.7	45 Rh 102.91	46 Pd 106.7	5						
		47 Ag 107.880	48 Cd 112.41	49 In 114.8	50 Sn 118.70	51 Sb 121.77	52 Te 127.5	53 I 126.932	54 Xe 130.2	54 = 2+8+8+18+18 End of the 5-orbit series	18 8	6						
6	54 Xe	55 Cs 132.81	56 Ba 137.37	57 La 138.90	58 Ce 140.25	59 Pr 140.92	60 Nd 144.27	61 Pm 144.91	62 Sm 150.43	63 Eu 152.0	64 Gd 157.26	6						
		65 Tb 158.9	66 Dy 162.5	67 Ho 164.9	68 Er 167.3	69 Tm 168.9	70 Yb 173.0	71 Lu 175.0	72 Hf 178.6	73 Ta 181.5	74 W 184.0	75 Re 187.2	76 Os 190.8	77 Ir 193.1	78 Pt 195.23	7		
		79 Au 197.2	80 Hg 200.6	81 Tl 204.39	82 Pb 207.20	83 Bi 209.00	84 Po 210	85 At 210	86 Rn 222	86 = 2+8+8+18+18+18 End of the 6-orbit series	2+8+18+32+18+8	8						
7	86 Rn	87 Fr 223	88 Ra 226	89 Ac 227	90 Th 232	91 Pa 231	92 U 238.07	93 Np 237	94 Pu 244	95 Am 243	96 Cm 247	97 Bk 247	98 Cf 251	99 Es 252	100 Fm 257	101 Md 258	102 No 259	103 Lr 262

*58-71 Rare Earths

The rare earths form the complete lanthanoid series of 14 atoms (79-92), 89-91 when E=4 in the equation $2(20-11-1)$

64
Gd
157.26

65
Tb
158.9

58
Ce
140.25

59
Pr
140.92

60
Nd
144.27

61
Pm
144.91

62
Sm
150.43

63
Eu
152.0

64
Gd
157.26

65
Tb
158.9

66
Dy
162.5

67
Ho
164.9

68
Er
167.3

69
Tm
168.9

70
Yb
173.0

71
Lu
175.0

72
Hf
178.6

73
Ta
181.5

74
W
184.0

75
Re
187.2

76
Os
190.8

77
Ir
193.1

78
Pt
195.23

79
Au
197.2

80
Hg
200.6

81
Tl
204.39

82
Pb
207.20

83
Bi
209.00

84
Po
210

85
At
210

86
Rn
222

87
Fr
223

88
Ra
226

89
Ac
227

90
Th
232

91
Pa
231

92
U
238.07

93
Np
237

94
Pu
244

95
Am
243

96
Cm
247

97
Bk
247

98
Cf
251

99
Es
252

100
Fm
257

101
Md
258

102
No
259

103
Lr
262

No. 4854 New Periodic Chart of the Atoms, according to Hubbard, with 24-page Key.....\$5.00

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Recent research gives a physical basis for the Mendeleeff Table.

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Atomic weights and all data brought up-to-date.

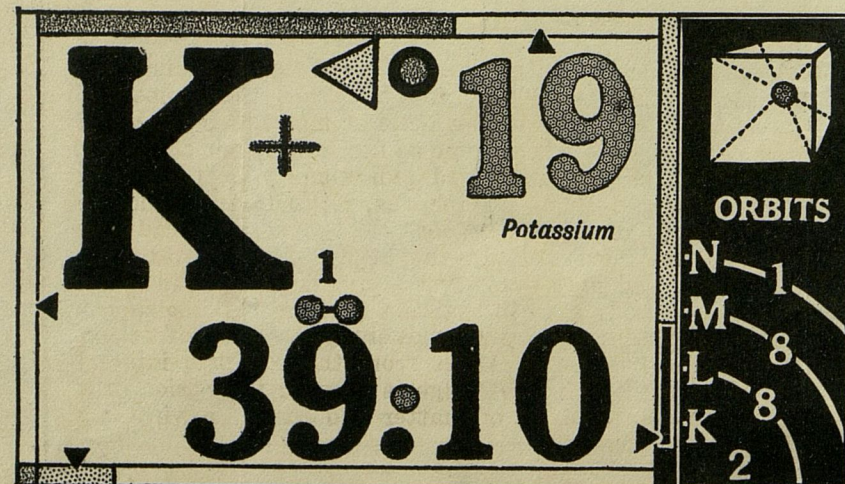
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An encyclopedia of information regarding the atom.

See last page for more detailed information of charted data.



The rectangular space at the left gives a full size reproduction in one color only of the rectangle in which is shown potassium. All data is large enough to be easily read. The color combinations add to its legibility and attractiveness.

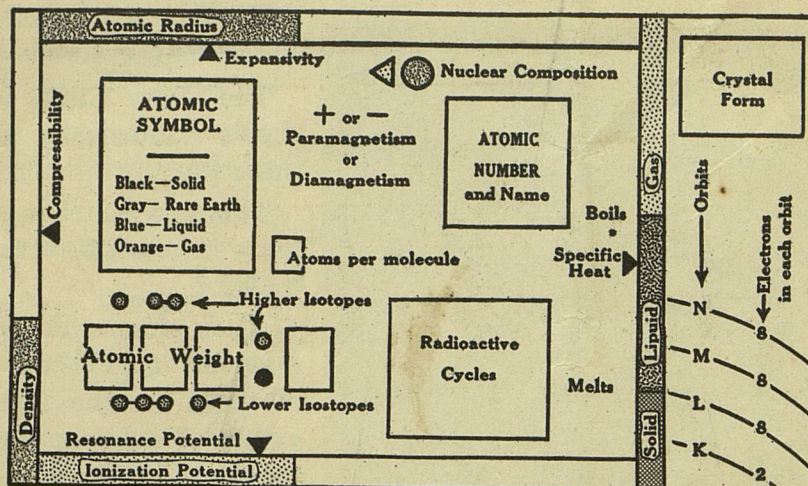
See last page of this sheet for more detailed information of chart data.

"The new Periodic Chart of the Atoms is designed to give the physicist, chemist, and student a vivid grasp of the unity of the atoms, their structure and behavior, their mode of formation and disintegration. The atom is today the outstanding topic of interest to the world of science. When its magic is more widely known the atom will become as fascinating for study and experiment as radio has become. Indeed, the varied properties and individuality of the atoms already form a subject of surpassing interest: the light-giving phosphorus, magnetic iron, odorous bromine, light-sensitive selenium, the superhardness of crystal carbon; the softness of lead; the toughness of tantalum, the explosive radium, the inert helium, the active oxygen; nitrogen, the keystone of unstable molecules of food, drug, and high explosives; copper, the speedway for electrons; chlorine, the scavenger; iodine controlling body growth; gallium that never boils, carbon that never melts, helium that never freezes; chromium the color maker; and scores of others having equally interesting individuality and unique behavior. Apart from the intrinsic interest in the new knowledge of the atom, the importance of such knowledge is seen in the vision of a new power given to the chemist of tomorrow to create forms of matter and energy having any desired properties."

At the lower right of each chart appears a key similar to the following key, which enables the student to clearly interpret all of the graphic illustrations on the chart.

"As language is in the alphabet, so is entire nature, the play of all its laws in one atom."
Emerson.

"Nature with all her craft has but one stuff . . . to serve up all her dreamlike variety."
Emerson.



"Matter is a microcosm of innumerable and, it may be, immaterial motes."
Galton.

"Les propriétés des corps sont les propriétés des nombres."
Chancourtois.

The colored graphs are drawn to scale. Some of the scales of plotting are as follows:

Atomic Radius is drawn to the scale of .036 Angstrom units per millimeter.
Boiling and Melting Point are plotted to the scale of 56° Absolute per millimeter.
Compressibility is plotted to the scale of $.92 \times 10^{-6}$ per millimeter.
Density is plotted to the scale of .34 per millimeter.
Expansivity is plotted to the scale of $.033 \times 10^{-6}$ per millimeter.
Ionization potential is plotted to the scale of .37 volts per millimeter.
Specific heat is plotted to the scale of .018 per millimeter.

Isotopes are shown by red dots above and below the Atomic Weights. They indicate Atomic Weights which are whole numbers above or below the whole number portion of the accepted Atomic Weight, and the red dot over the decimal point indicates the whole number of the accepted Atomic Weight as being an Isotope.

In addition, a twenty-four page booklet or key giving first, a summary of the modern conception of the atom, and, second, a complete explanation of each characteristic and its meaning is included with each chart.

Besides the characteristics shown on each rectangle containing the specific data of each atom, there is also shown in separate spaces on the chart other general features and constants as follows:

The Configuration of the Atoms, that is their geometrical form, is shown at the top of the chart.

Constants of electron and proton which are fixed properties for all atoms are also shown as follows:

- Mass of Atom and its method and computation.
- Mass Energy Equivalent.
- End-Atom Cubic Structure.
- End-Atom Number Formula, etc.

The chart as a whole shows the Group (column or family); Orbit-type transitions from one group to another; the Period (row or series) which depends on the number of orbits; Electronegateness or Electropositiveness of the atom and the Electronic and Ionic Valences.

The explosion series for the radioactive atoms and the products of their disintegration are shown in colored graphs.

More specific and complete information is tabulated separately on the chart regarding the radioactive explosion series, the Configuration of the Atoms, Data on the Electron and Proton, Isotopes, Crystal Type, Paramagnetism, and Diamagnetism.

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No. 4854 Chart of the Atoms, complete with 24-page Key.....\$5.00

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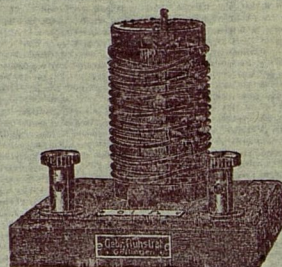
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3. Methyl violet (stain), solids or prepared — 100. c.c.

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X 5. Methylated spirit — 500. c.c.

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