## Business and ixeronal.

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non-conducting coverings in use. They can be easily applied by any one at a cost of from 25 to 50 per cen less than is usually charyed for inferior coverings. H.
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See Bentel, Margedant \& Co.'s adv., page 413.
See Bentel, Margedant $\&$ Co.'s adv., page 413.
The circulation of the blood has been demonst The circulation of the blood has been demonstrated
by the microscope. and the proof of the circulation of by the microscope. and the proof of the crculation of
Esterbrook's Pens is that they are found every where. The American Electric Co., Proprietors and Manu-
facturers of the Thomas Houston System of Electric facturers of the Thomas Houston System of Electri
Lighting of the Arc Style. See illus. adv., last or nex number.
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struction and durable. Prices reasonable. Send for struction and durable. Prices reasonable. Send for
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estimate 3 on all classes of american machinery and patented devices. Agricultural rmplements and Hard
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supplied with a gravitating valve; others substitute a spring, which soon getts out of order. The only pen accompanied by a written guarantee from the manufac
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chinery, address H. A. Crossler, ninery, adess H. A. Cnsler, Geveiana, Ohio National steel Tube Cleaner for boiler tubes Adjust-
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Clark Rubber Wheels adv. See page 381.

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ing, Bridgeport, Conn. Blast Furnace Construction and Management. The metallurgy of iron and steel. Prac tical Instruction In Steam Eng ineering, and
Spht Pulleys at low prices, and of same strength an ppearknce as Whole Pulleys. Yocon
Wrans, Driner St., Philadelphia. Pa.
Presses. Dies, and Tools for working Sheet Metal. etc Eclipse Portable Engine. See illustrated adv., p. 382 Nickel Plating. Sole manufacturers cast nicke: an pure nickel salts, importers Vienna lime, crocus,
tc. Condit. Hanson \& Van Win:le, Newark, N. J., an 32 and 94 Liberty St., New York
For Yale Mills and Engipes, see page 381
Wright's Patent Steam Engine, with automatic cut off. The best engine made. For prices, a
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Rollstone Mac. Co.'s Wood Working Mach'y ad. p. 366 Blake "Lion and Eagle " Imp'd Crusher. See p. 397. 4 to 40 H P. Steam Engines. See adv. p. 381.
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\& O'Brien, M'f'rs, 23d St., above Race, Phila.., Pa. Steam Hammers, Improved Hydraulic Jacks. and Tub xpanders. R. Dudgeon, 24 Columbia St., New York
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50,000 Sawyers wanted. Your full address for Emer-
son's Hand Book of Saws (free). Over 100 illustrations nd pages of valuable information. How to straighte Frank's Wood Working Mach'y. See illus. adv., p.413. Peerless Colors-For coloring mortar. French, Richards \& Co., 410 Callowhill St., Philadelphia, Pa
For Pat. Safety Elevators, Hoisting Engines. Friction For Separators, Farm \& Vertical Engines, see adv.p. 413 For Patent Shapers and Planers, see ills. adv. p. 412. Tight and Slack Barrel machinery a specialty. John
reenwood \& Co., Rochester, N. $\mathbf{Y}$. See illus. adv. p. 412 Greenwood \& Co., Rochester, N. Y. See illus. adv. p. 412
Elevators, Freight and Passenger, Shafting, Pulley d Hangers. L. For Heavy Punches, etc., see ill
ment of llilies \& Jones, on page 413 .
Comb'd Punch \& Shears: Universal Lathe Chucks. LamReed's Section, Lovering for , N.J. See ad. p. 413 one can apply it; can be removed and replaced withou injury. J. A. Locke, Agt., 32 Cortlandt St. N. Y. For Mill Mach'y \& Mill Furnishing, see illus. adv. p.413 A profitable business for a person with a small capi-
tal. Buy a Stereopticon or Magic Lantern, and an in teresting assortment of views. Travel, and give public exhibitions. For particulars, send stamp for 116 page.
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S. Hocker. Kansas City, Mo.: Ramsey, Villett \& Hudson.
Dr. Hocker has given in a very small pamphlet what
he considers "a short and concise solution of some of the problems which have, of late years, attracted th attention of our most profound scholars in Europe and America." In other words, he sets right the "mistakes
of Darwin and infidel scientists " in the usual style of those who have but a remote hearsay knowledge of sci entinc facts and theories.
Examples of Household Taste. By Wal ter Smith, State Director of Mass.
School of Design. New York: R. Worthington. 4to pp. 521. \$6.
Mr. Worthington has lard students of industrial ar
(and all who wish a permanent remembrance of the (and all who wish a permanent remembrance of the
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important fleld of domestic sanitation, the necessity of
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ple, and the simpler methods of securing such desirable results. The flrst on the list discusses tine fundamenta conditions of healthy living in a manner so admirabl
in every gespect that we should be glad to gee it made text book in every school in the land. There is no branch of vitally useful knowledge so commonly neg lected in schools and other institutions of learning, no
any that the community can so ill afford to neglect Corfield's book comprises a course of Cantor Lecture before the London Society of Arts. It aims to furnish a short and practical exposition of the means by which dwelling houses may be made and kept wholesome
Though addressed particularly to sanitaryengineers and Though addressed particularly to sanitary engineers and house furnishers, and drawsits illustrations of sanitary
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of this paper. Dr. Hartshorne discusses in a sensible of this paper. Dr. Hartshorne discusses in a sensible and easily comprehended style the teachinge of science and experience with regar to the sanitary influences
of situation of houses, theirconstruction. light, warmth, of situation of houses, their construction, light, warmth,
ventilation, water supply, drainage, disinfection, and kindred topics bearing upon the question how to have ture is an encouraging circumstance. If they could only reach and interest every householder the national sicklist and death rate might be cut down to half thei present amensions.
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A system of secret writing based on a combination of any three letters of the alphabet, the keys to be ar ranged by the correspondents according to mutual
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nies. The rocabulary contains upwards of 18,000 words There is given besides a large collection of banking in common use, geogreords and phrases
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Pemberton. 12me, pp. 112 . $\$ 1$. For
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York.
The author, a draughtsman of long experience, has sought to lay down the elements of the art of draughting in a manner so clear that any young mechanic or
student of mechanics can easily master them. The in struction is practical throughout, and plainly put.
Modern Architectural Deagns and De TAILS. Part 2. New York: Bicknel
$\&$ Comstock. $\$ 1$.
Plates 9 to 16 show details of store finish, store dow caps and hoods, architraves, bases and wainscot ing, balconies, and two designs for cottages, with front side elevations, plans, etc

##  <br> HINTS TO CORRESPONDENTS.

No attention will be paid t.o communications unless
accompanied with the full name and address of the accompa
writer.
Name
n

## Namesand addr

We renew our request that correspondents, in referrin
to former answers or articles, will be kind enough to name the date of
of the question.
Correspondents whose inquiries do not appear after a reasonable time sloovid repeat them. If not then published, they may con
Editor declines them
Persons desiring special information which is purely of a personal character, and not of general interest,
should remit from $\$ 10 \$ 5$, according to the subject, should remit from $\$ 1$ t. $\$ 5$, according to the subject,
as we cannou be expecte: to spend time and labor to as we cannol be expecte: to spend time and
obtain such information without remuneration. obtain such information without remuneration.
Any numbers of the SCIENTIFIC AmERICAN MENT referred to in these columns may be had at this ce Price in cents each.
(1) M. T. asks: What is best to use in a wooden cylinder for smoothing up small turned wood
work ? A. It is qeneralls sufficient to tumble the artiwork? A. It is generalls sufficient o tumble the arri-
cles together without the addition of anything. You might. however. add harlwood turnings or planer chips
(2) J. M. asks: 1. What is the best ar rangement to get the greatest amount of heat from a
small battery or pile $\&$ A. By passing the current through a fine platinum wire 2. What is the bes
waterproofing process for cotton cloth, outside of caoutchouc and oil? A. See Scientific American, Vol. 41, p. 251 (5).
(3) W. R. D. asks whether there is any way of drawing or forcing out escape steam rising from The room is about 75x120x35 feet high. with four com mon ventilators about $4 \times 4 \times 8$ feet high. A. It would re lieve your trouble to increase the height of your venti
lators to 18 or 20 feet, but if this is not sufficient, a lators to 18 or 20 feet, but if this is not sumficient, a
fan blower will $\mathbf{d o}^{2}$ it. 2 . Is such steam necessarily infan blower will do it. 2. Is such steam necessarily
jurious to health ? A. The vapor of water at the pressure of the atmosphere is not injurious to health.
(4) A. H. G. asks: What proportion should the heating surface of a boiler be to the radiating sur-
face in steam coils? I have 13,450 lineal feet of one inch pipe in my building. How many square feet of heating surface should my boiler have to do the work
easily ? A. In your climate, a horizontal multitubula
boiler of about 600 square feet of surface properly oiler of about 600 square feet of surface, properly set
and fred, will be enough, say, 16 feet long by 48 inche diameter with from 40 to 50 three inch tubes.
(i) P. B. asks: 1 How many one gallon ravity cells would a physician need for all kinds of
cauterizing ? A. Use the Grenet or Byrne battery for cauterizing. The gravity is not suited to this work. 2. Can sulphate of copper and bichromate of pota: h
cells, be united in one battery? A. Different kinds of cells, be united in one battery? A. Diffe
(6) J. C. H. asks: 1. Can a room 180x 40x11 be heated quicker and more uniformly by placiug
say 1,290 feet of one inch steam p.pe around the room ay 1,290 feet of one inch steam p pe around the room ext to the wall (the wall being brick), than by placing diators, to be placed at equal size pipe in four ra diators, to be placed at equal distances apart, elthe
next to the wall or in the center of the room? A. Yes 2. How much one inch pipe ought it to take to heat pro perly a room 180x40x11 feet, by either method, for person to sit to work? The building is exposed on all sides, built of brick. The room is in third story, under tin roof, the room being ceiled overhead, windows four reet apart all round the room. The lower part of
building is kept warm. Steam pressure of the boiler is 60 lb . A Not knowing the window surfuce we can not say correctly, but would think from the description of your building 2,000 to 2,500 feet of one inch pipe dis ributed around the walls of the building should be suf ficient. If you place th, me amount of pipe in four
radiators, place them where you will, you cannot warm radiators, place them where you will, you cannot warm
such a room properly; any one siting in front of a uch a room properly; any one sitting in front of (f) J
(7) J. S. and others ask how to make tele phone connections for an open circuit line A. The
annexed diagram shows all of the connections for one annexed diagram shows all of the connections for oue
end of the line, both ends being alike. The connections

acall is received the carrent passes from the line through he switch, E. button 1, key, top contact of the key,
bell-magnet, and ground wire, A , to the ground. When the key is depressed to call a distantstation, the key ing the current through the button 1 ing the current through the button 1, switch, E, and
line to the bell and ground of the distant station. The line to the bell and ground of the distant station. The
current returns by the ground and wires, $A, C$, to the battery. After calling, the switch, E , is moved to button 2 , and the switch, $F$, being connected with the
switch, $E$, by an insulating connection is at the same time moved to button 4 , as shown in dotted lines. Now the line connection is through the switch, E, button 2 wire, $\mathbf{G}$, receiver, the secondary wire of the induction
coil to the ground. The switch, $F$, when turned ae decoil to the ground. The switch, F, when turned as de-
scribed completes the local circuit, the current passing from one cell ofthe battery through the wire, D , switch, $F$, button 4 , transmitter, primary of the induction coil ground wire, A , and wire, C . The connections are now correct for talking Should the transmitter be of the class capable of withstanding a heavy current, the wire D, will be connected so as to include all of the element. of the battery, and the wire, B, instead of being con-
nected with the battery will be connected with the button 3. The diagram shows the connections adapted to the class of transmitters employing but a single battery element, and to a line requiring several cells of battery to
call. If a single cell of battery is sufficient to call, the call. If a single cell of battery is suffic
wire, B, will be connected with button 3 .
(8) E. F. F. writes: I want to know the veiocity of the "electric telegraph." I have consulted many prominent books, but have never been able to
ascertain the fact. A. If you mean velocity of the ascertain the fact. A. If you mean velocity of the
electric current, it varies according to the conditions electric current, it varies according
from 13,500 to 62,000 miles per second.
(9) A. E. R. asks: 1. Is it best to keep a boller that is not used but a day or two every three
months, full of water or empty? No danger of frecz ing, as it stands beside others in use. A. Keep it full. 2. Do you consider try cocks in a water column as safe as when tapped into the boiler the old way? A. No. (10) M. S. writes: I have a portable 10 water containing organic matter, as it causes foaming, Why is this? A. We think either you have too little steam room, or the circulation is bad. 2. What is the best way to loosen a pump (suction pump) in which the
piston is frozen fast. and what is the best preventive of piston is frozen fast. and what is the best preventive of
freezing? A. Thaw by the use of hot water. To pre freezing? A. Thaw by the use of hot water. To pre-
vent the freezing open the bottom valve with a hook or vent the freezing open the hottom valve with
othermeans to let the water out of the pump.
(11) J. A. Y. asks: Where does ice form during the freezing process-upon the surface or the
bottom of the stream or vessel ? A. Usually on the surface. Anchor ice is an exception.
(12) F. E. K. asks: Will the strings or wires in a well made piano, when tuned ready to send nut of factory, stretch enulng to lower the pitch, sup-
posing the tuning pin is securely fastened ? A. When piano strings are of the best quality of steel, and have been put on a good pianoforte, they are tuned (in first
class establishments) somewhat above concert pitch, starch about equal to the glue taken, first having boiled
and are kept there by repeated tunings, until the piano
forte has settled and the strings have fully stretched, forte bas settled and the strigs have fully stretched aich is known by the instrument remaining at pre cisely the same pitch for some time. After this th temperature, which will lengthen the iron frame on which the strings are stretched, or by hard use, when, under the constant concussion of the hammers upon the
s.rings, the latter will stretch more or less and get ou
(13) G. R. B. asks: 1. Can you inform me if an induction coil is required with the pan telephon described on page 162, No. 11, current series of the Scientific American? A. Yes. 2. Should the induc tion coil used in Blake transmitter be the same resist ance as coils in each telephone? A. It should have
(14) R. R. R. writes: In the Faradic battery operated by an open Smee's cell, I believe the
primary wire of the induction coil is composed of two layere of No. 16 or No. 14 cotton covered copper wire I wish to make an induction coil with the core of the same length and same diameter to be operated with small Greset cell. 1. Should the primary wire be constructed as in the former case 9 Or if modified, in what respect ? A. Use three layers of No. 18 wire for the
primary.
2. With the same sized core primary. 2. With the same sized core how should the primary be constructed to give the best result with a Bun-
sen and with a large Leclanche respectively? A. The sen and with a large Leclanche respectively? A. The
same construction will answer.
3. With core same size as above, and with secondary coil composed of, say, 10 layers of No. 40 telephone wire, what cell should be used, and how should the primary coil be constructed
to get the best results ? A. Make the primary as above to get the best results: A. Make the prim
described, and use a single cell of Grenet.
(15) "Honolulu" writes: I saw a notice in Sctentific American some time ago of the applicaknow the best method of applying it? A. It could not be profitably applied. It is an interesting experiment droughts here, and would feel obliged to youbled with could give mesome idea how to overcome them. A. Your only remedy is artiffcial irrigation. We know of no way of inducing rain.
(16) A. G. N. asks: W bat style and size battery would be the most economical to run one elec-
tric light on the incandescent principle? A. It depends upon the kind of incandescent lamp and on the time you wish to run it. To run a Werdermann or Regnier lamp for a few hours, probably 20 to 25 one quart cells
of Bunsen battery, or one of its modifications, would be the best. To run a single Edison lamp would require
(17) W. A. McA. writes: I have a speci men which I think contains lead and silver. Will you
give in the Notes and Queries of the Scientific AmeriCAN the most simple tests by which thene two metals may be made to tell their presence? A. Powder the ore and boil in pure nitric acid mixed with half its weight of water for some time; dilute somewhat with
water, and filter. Add to the filtrate a small quantity of water, and filter. Add to the filtrate a small quantity of
sulphuric acid. A precipitate indicates lead. Filter sulphuric acid. A precipitate indicates lead. Filter drops of pure hydrochloric acid. A white precipitate, insoluble in boiling water, and which changes in color by the action of sunlight, indicates silver. When only very small quantities of the metals are present. unless these tests are performed with great care, the reactions
are apt to escape notice altogether. In ores where the are apt to escape notice altogether. In ores where the
silver is in the state of chloride, bromide, etc., this test does not give indications, especially if the silver is present as chloride. The best test
is the fire assay (scorification assay).
(18) F. D. C. asks (1) how to saw petrified wood or other flinty material for sleeve buttons. A. of a thin iron disk revolved in the lathe. For full particulars as to stone cutting consult Byrne's "Handhook write on oil paper for a stencil to print from? A. Try nitric acid alone
(19) "Subscriber" asks how to make a black ink suitable for staining leather. A. Use a moderately strong aqueous solution of copperas. The tannin
in the leather will develop with it the black color.
(20) V. B. H. asks for a good black paint or something else that will answer to black small cast-
ings by dipping them in something that will varnish. A. Dissolve asphaltum in oil of turpentine and add a little lampblack or fine bone black
(21) L. C. C. asks: 1. Can you inform me where to purchase the ammonia used by the ice macalled gaseous ammonia, which is liquefied by pres called gaseous ammonia, which is liquefied by pres-
sure? A. Liquefied ammonia is not an article of commerce. It is only prepared as required for use. 2.
What is known as a 20 ton ice machine 8 A. Onethat produces 20 tons of ice a day
(22) G. W. L. asks what the difference is between tin crystals and tin salts, as used in dyeing.
A. Both refer to stannous chloride or protochloride of A.
tin.
(23) E. A. J. asks how to remove the scale from brass castings, to give a surface on which solder may be flowed with a hot copper. A. Dissolve 6 oz.
h.chromate of potash in three pints of warm water when cool, ald 6 fluid oz. of sulphuric acid. Rinse the
(24) F. R. G. asks how to paint a smoke stack on a small portable engine. It requires some-
thing that will resist the action of heat. I have been advised to use asphaltum dissolv, d in turpentine. A Good asphalluishes for this purpos
(25) H. M. A. asks: What is the best "stickum" Por labels on boses, also labelson casks: off easily? A. Soften glue in cold water and dissolve off easily? A. Soften glue in cold water and dissolve
it in strong vinegar. Mir with it a quantity of dry
(26) W. J. H. asks if there is any preparation for polishing or staining India-rubber. A. We
know of no satisfactory way of staining rubber. Hard rubber may be polished with a little pumice stone and oil.
(27) H. F. P. asks how to make gold ink or writing and printing. A. Triturate gold leaf with a little honey in a mortar until the metal is reduced to a fine state of subdivision; dissolve out the honey with
warm water, and mix the gold with alittle gum water, warm water, and mix the gold with a little gum water,
used is usually applied subsequent to the printing.
(28) H. L. S. asks: 1. Is there any known substance that if a thin piece of it, say like a piece of paper, window glass, or tin, were placed between a per
manent magnet and piece of soft iron would prevent the magnet from attracting the iron? A. No. 2.I would like you to give me a simple illustrative explana-
tion of the theory of how electricity is generated by a tion of the theory of how electricity is generated by a
dynamo-electric machine. A. You will find this information in an article on dynamo electric machines, in trplement No. 161.
(29) W. E. M. asks: Can you inform me of any metal or alloy that will dissolve by the applicachon of some of the acids (such as sulphuric, hydro be incapable of any action on fatty substances (such to oils)? A. Metallic zinc is attacked and dissolved oy dilute sulphuric acid. The dilute acid has little effect on most oils when used cold.
(30) J. E. S. writes: I wish to make a hol low prism to hold carbon bisulphide, but have no found a cement that will resist it. Can you tell mc
what to cement the glass with? A. The composition of glue and glycerine used in printing ink rollers (31) very well. It melts by aid of heat,
(31) J. E. S. asks: Is there any rapid and practical purpose ty which bright copper can be made oacquire the dark rich coior that is seen on copper coins unused for many years? The oxide formed by
heating scales off easily. A. Clean and dip them in a strong aqueous solution of cupric chloride.
(32) T. R. W. asks: What will take aniline violet and aniline black ink stains out of linen and
bleached cotton fabrics ? The salts of lemon and oxalic acid seem to have but littleinfluence on it. A. Try solution of bleaching powder or javelle water.
(33) A. L. H. asks: What effect does galvanized iron pipes have on drinking water-good or
bad? $!$ A. Bad, with certain kinds of water,and especially if allowed to stand in the pipes for any length of time very bad.
(34) J. C. asks: 1. How can I harden plaster of Paris after making a mortar out of it with water ? A. After the plaster becomes thoroughly dr you may soak it in glue size. When this becomes dry cid is used in taking a transfer from a premical or and transferr takng a transer from a printed cat Caustic potash on a plain block of boxwood? A make a mouldout of plaster of Paris ? A. Oil the patcream with cold water, and pourinto the mould at onc'. When hardened set aside in a warm place to dry. Is there a book in the market that gives instruction in sculpture: if so, where can it be obtained? A. Address
(35) M. C. S. asks: What substances are best to absorb the moisture in a refrigerator? Is crude
chloride of calcium (bittern) good 9 Is lime good? A. Fine unslaked lime will answer about as well as anything. Chloride of calcium is an excellent absorbent of

Minerals, etc.-Specimens have been reeived from the following correspondents, and examined, with the results stated:
c. S. C.-It conists principaly silicious liaolin.

index of inventions

## for which

Letters Patent of the United States
Granted in the Week Ending November 30, 1880 ,
AND EACH BEARING THAT DATE. ['Those marked (r) are reissued patents.]

A printed copy of the specification and drawing of any patent in the annexed list. also of any patent issued
since 1866 , will be furnished from this office for one dollar. In ordering please state the numberand date of the patent desired and remit to Munn \& Co. 3i Park Row,
New York city. We also furnish copies of patents granted prior to 1866; but at increased cost, as the speciflcations not being printed, must be copied by hand.

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From November 23 to November 30, 1880, inclusive
Beverage, A. W. Armstrong New York city.
Celluloid. decorating, A. IIart et al.. New Yo Celluloid, decorating, A. Hart et Yl. New York city.
Crayon holder. J. Reckendorfer. . . Crayon holder, J. Reckendorfer, New York city.
Electric light apparatus, H. S. Nlaxim, Brooklyn. N. Flax breaker, G. Milliken, Philadelphia, Fa.
Furnace, J. Wolstenholme Buffalo, N. Y. Furnace, J. Wolstenholme Buffialo. N. Y.
Gas making apparatus. C. F. Dietrich. Baltimore, Md Gas making apparatus. C. F. Dietrich, Baltimo
Heel stiffeners, Lamp, w. B. Robins. Cincinnati, Ohio. Loom. J. Iy yall, New York city. Oil extracting apparatus, J. E. Borne, Brooklyn, N.
Packing. metallic, E.. . Morroe. New York city. Pliers, J. F. Cranston, Springfield, Mass. Pliers, J. F. Cranston, Springtield, Mass.
Pumps, ship, J. Edson, Boston, siass. Slicingmachine, J. Herts, Brooklyn. N. Y.
Telephone switch, C. D. Haskins, New York city.

