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S. will find directions for making lard oil on p. 283, vol. 30--H. C. W. should read our article
on the management of boilers on p. 293, vol. 36. As to on the management of boilers on p. 293, vol. 36. As to
testing boilers, see p. 246 , vol. 34.-W. - . can plate brass,
etc., with nickel by the procesa described on p. 235 , vol. etc., with nickel by the process described on p. 235, vol. 33.-O. E. will find directions for making oil of peppermint on p. 219, vol. 31.-E. O. T. will find an excellent
recipe for cement for mending roofs on p. 187, vol. 35.recipe for cement for mending roofs on p. 187, vol. 35.-
J. B. will find a recipe for tough glue on p. 43, vol. 32D. A. G. will find directions for making impression
paper on p. 378, vol. 88.-T. S. L. can remove paint spots



 Cripton of the nitrate of silver procean or maxitign in kalsomining on p. 351, vol. 24.-P. A. N. does not send
sufflient data.-R. F.I. will find directions for building an ice house on p. 251, vol. 31.-E. B., C. F. Q., J. W. B.
N. C.,
wh. P., R. . . ., J. F. P., W. .., J. P., and others, entiffc subjects, should address the booksellers who firms, for cato
(1) O. C. K., of Leipsic, Germany, says: To make lead pipes nearly harmless, as regards the fll the pipes for a short time with dilute sulphuric acid $\left(\mathrm{SO}_{4} \mathrm{H}_{2}+10\right.$ or $20 \mathrm{H}_{2} \mathrm{O}$ ). The pipes will become covered
with a thin coating of sulphate of lead ( $\mathrm{SO}{ }_{4} \mathrm{~Pb}$ ), which with a thin coating of sulphate of lead ( $\mathrm{SO}_{4} \mathrm{~Pb}$ ), which
is far more insoluble in water than the is far more insoluble in water than
lead $\left(\mathrm{PbOH}_{2}\right)$ generally formed.
(2) A. G. says: I have a rough chamois skin leather bag, intowhich, by some mistake or other,
there came some English vermilion, dry. How could I clean it outs A. Vermilion is a compound of mercury with sulphur, and there is no solvent forit that woul of it as you can with a stiff brush, and then cause an energetic stream of water to impinge upon the discolored surface, so as to mechanically carry off the particles of the pigment.
(3) G. B. S. asks: 1. Will -tin (old cans, tc.), copperplated, do for the coppers in a gravity battery? A. Yes. 2. Will salt (sodium chloride) do for the
saline substance? A. Better use sulphate of zinc. saline substance? A. Better use sulphate of zinc.
Will common plate (window) glass do for the plate in an ctric machines A. Yes, but it is not the very beat (4) W. M. M. says: I have a magic lantern, and want to know what kind of oil gives the best light
for it. A. Kerosene gives as good a light as any, and etter than most others.
(5) C. M. asks: What can be applied as a depilatory on horses, destroying the plgmentary granles yet not destroying the life of the hair? "The object
in view is to brand colored horses with a white brand A. This is not practicable. The color of the hair above the cuticle may be bleached by the application of chlorine water or nitro-muriatic acid (aqua regia). It is not
probable, however, that the action of these will be rapid nough for your purpose
(6) C. E. H. says: Four years ago I had in a mill an upright shaft of eight inches diameter which, withattachedgearing, weighed several thousand pounds.
The toe on which it turned commenced cutting badly. It was impossible to remove the toe. Washers of steel raised the shaft too high out of the step, wore out rapnumber of machine shops for advice. One told me to brind it out with emery; another said my only course
was to take down the shaft and send it by rail to th hop, and none could cal cure for the trouble. At length I met the rightman, who told me to raise the shaft and put under the toe
(in the step) an old-fashioned large-sized copper cent. (in the step) an old-fashioned large-sized copper cent.
This I did, and the heating and cutting ceased at once, and the difflculty was permanently overcome. Since then I have put small cents in the steps of millstone spindles and always with good effect. The grooves
nlled up with the copper, and the toe looked as though it were copperplated and burnished. I even got to introucing a small copper cent under each
(7) A. J. F. asks: How can I set the lenses plano-convex lenses. A. The Huyghenian eye lens is one third the focus of the field lens, and is
own focallength with the focus of the latter.
(8) A. L. S. says: I learn from tables on he heat of water with steam, that 60 lbs. pressure equal $292^{\circ} 6^{\circ}$ Fah. Is this the degree of heat under any and all
circumstances? A. This is for fresh water. The temperature changes, if the water contains impurities. (9) G. W. K. says: I have tan vats which wave not been used for some time. I keep them full of from breeding in them? A. Cover them'tightly.
(10) E. C. H. says: I wish to fill up a low much will it settle after leveling it off 1 foot deep with no packing? Surface of plot is a rich loam, subboil a clay bottom. A. From $1 / 4$ to 15 .
What is the thinnest circular saw I can use 10 -inches In diameter for sawing2 inch white oak, saw running on of No. 16 gauge, or about $\frac{1}{20}$ of an inch thick.
(11) I. says: Nearly all lugs or supports riveted to steam boilers have three on each side, one of sem in the midde of the boiler; so, if either end of the is hung by the middle. This is all wrong. There should either two or four supports on each side of the boiler, the longest space between the two inside ones. Is not
this sop A. Yes. We could not tell you why the former course is pursued, except that common sense is
scarce.
Why is it that persons at this period of mechanical science place tightening pulleys on the load line or pull-
ing side of a belts A. We do not know, but we are glad to call attention to these points again, as we have fre-
(12) G. H. A. says: I sometimes preserve ggs in limewater, and they keep well, but look limyaf ter taking out of the solution, notwithstanding that I let the lime settle in the water till it looks clear, and dip it out, leaving the lime behind. Is there anything that I can put in to remove what little lime stays in the
water9 A. Wethink flltering will answer the purpose Place a piece of filtering paper in a funnel, and pour in
(13) C. S. O. asks: 1. Has the compound
of stroke over a aingle cylinder sufficiently long to se-
cure an equal amount of expansion? A. It is claimed cure an equal amount of expansion? A. It is claimed
that the machinery can be made lighter, with the comthat the machinery can be made lighter, with the com-
pound engine, for high grades of expanion. 2. Will highly volatile liquids give more power than water
(14) G. S. C. asks: Could not hot air bal (14) G. S. C. asks: Could not hot air bal-
loons be used for aerial navigation, if a light furnace rent into the balloong would constanily riffult to carry enough fuel for an extended voyage. Fire balloons have been used succeasfully for short trips.
(15) A. S. E. says: The centrifugal force on the sea board and that on the top of the highest on the sea board and that on the top or the highest same. Let a globe be turned rapidly, and water put on;
it climbs to its greatest diameter, and fies off. Two canals are cut at the same declivity, one north and the other south; the velocity is the same in both. Neithe law that counteracts this influence and produces the equilibrium? A. There is a slight dif
fect of gravity at the different levels.
(16) C. G. V. P. says: Is it practicable to heat the passenger cars with the steam from the locomotive? If so, in what manner is the steam conducted
from the boiler? It seems to be a failure in Europe, and some of my European friends ask me what the Sci ENTIFIC American thinks about it. A. It might be possible, but it would be necessary to incresse the size and in similar manner to the air pipes used with continuous brakes.
(17) M. W. H. says: How many lbs. pressA. Between 300 and 400

1. What is a high pressure engine and boiler? Is it not one that condenses its steam, and uses the water over again A . In the common acceptation of the term, a high pressure engine is non-condensing. 2. What
steam pressure will a vat sustain, if made of 2 inch plank of oak, matched, and covered with heavy sheet ron, both out and insides It is 3 feet in diameter and 10 feet hign ? A. Your data are insuffleient.
2. How can phosphorus be made into solution for usingon gun sights after night and other similar pur-
poses? Idiesolved some in hot olive oil, also in turpentine, but it settled and formed a hard body as soon as cooled, in both. What is the trouble? A. Probably the perature in which phosphorus will glow or show light? A. About $32^{\circ}$ Fah.
(18) F. R. H. says: I have an iron tank 4 feet in diameter by 12 feet long, in which I put dead
stock to be steamed out. This tank is supplied with steam from a portable boiler and engine. The steam dome is 1 foot high, and the pipe rises from the dome $11 /$ feet in three turns, and goes 6 feet down into the tank in the bottom. When I turn on the steam to the tank the water blows from the boiler faster than I can
pump it into the boiler, at the same time running the team down. It has only begun acting so lately, Can you tell me how I can overcome this difflculty? A. It is not unlikely that your pump is out of order. You can
regulate the amount of steam let into the tank, so that regulate the amount of steam let into the
the pump will supply what is taken away.
(19) W. F. A. says: I have tried to bend basswood, but have failed. I gave it a long steaming,
and it would break off short. Then I tried a sho $t$ and it would break off short. Then I tried a sho t
steaming, but it worked in the same way. Can you give me some information? A. It is very possible that the pecimens you tried were not suitable. It may be tha treatment, but the methods are not generally known. There is now for sale in this country bent-wood furni-
ture, which is, we believe, manufactured abroad by a secret process.
(20) A. B. says: I saw in the Scientific American, of January 20, an engraving of a new water
velocipede. Please tell me if the two fioats would be better if they were of the shape of a triangle, and what should be the distance between the floats? How long, wheel be? What should be the thickness of the floats, and what would be the best material to make them, in case of stones or rocks in the river? A. We think the
cigar shape is best for the fioats. Their size depends cigar shape is best for the fioats. Their size depends
on the load to be carried, and must be calculated for any particular case. Distance apart, 2 to 4 feet, according to capacity, will do. They could be made of ligh
(21) F. W. B. asks: What power can I use run a dental engine and a small polishing lathe head
have tried water motors, but they fail. A. We think have tried water motors, but they fail. A. We think
hereare water motors in the market that will answer. There are also small steam and electric engines suitable
(22) S. N. M. says: 1. I read that the earth's rotation is retarded 22 seconds a century $=0.22$ seconds a year. Also that two thousand million years ago, the
earth was rotating twice as fast as now. I flgure thus: Earth now rotates in $86164 \cdot 09$ seconds, and $\frac{86164 \cdot 09}{2 \times 0 \cdot 22}=$ 195,327 years ago earth rotated twice as fast as now. Am
I wrong? I also find the following: "It therefore folwrong! 1 also ind the following: is certainly diminishing, the epoch of solidiffcation cannot be more'than ten or twelve millions of years ago." Howcan this bef A. Your calculation does not seem to be correct. The assumption is for 0.22 seconds a year at present. We presume the article gives reasons for
the second statement, which is not very alarming to the esent generation, even if true.
(23) W. C. W. asks: How will a cast iron vertical boiler, 3 feet high and 15 inches in diameter, and firebox in base of boiler, with 15 tubes, as compared with a wrought iron one of similarform? A. We think the wrought iron boiler is preferable on many ac-
counts, and advise you not to use cast iron.
(24) W. H. P. asks: Will it require less
atmospheric pressures Would there be a decided gain
in the expense of fuel in thus in the expense of fuel in thus evaporating water? A The amount of heat required would be a few per cen
less in the case of the vacuum.
(25) A. B. says: 1. We intend to put a si pon to draw the water from a part of mines, the heigh to which the water has to be lifted perpendicularly is 2
feet from the summit. There is 600 feet of tunnel with a gradetowards the other end of 6 inches to the 100 feet We can extend the pipes to a depth of 35 feet, so tha the discharging end will be 18 feet below the suction end. Length of pipe in all will be 700 feet. Will it work? A. It will be necessary to have an air valve a
the highest point, which must be opened occasionally or the highest point, which must be opened occasionally o
may be made automatic. 2 . We intend to use 3 inch ga may be made automatic. 2. We intend to use 3 inch ga
pipe for the siphon, but the present supply of water will probably run through a $11 / 2$ inch pipe, and the wate will increase in quantity. Can we regulate the siphon so that the present supply of water will run in a continual stream through the 3 inch pipe by putting a stopcock on the discharging end and keeping it open $1 / 4$ or
time-as the supply of water varies? A. Yes.
(26) A. A. H. asks: How can I remove ink stains from fabrics, fingers, and paper without in juring the article staned. A. To remove ordinary ink (tanno-gallate of iron) stains, the following treatmen
is recommended: In many cases lemon juice will often prove efficacious. If this fails, try an squeous solution of oxalic acid ( 1 part to 2 parts water) and rub well with a soft cloth. Or use a solution of chloride of tin (1 par to 3 parts water, or pure dilute muriatic acid ( 1 part $t$ 10 parts water). Apply with a camel's hair brush, and then wash in cola water. Where the colors of the fab ric are affected by the above treatment, moisten the
spots with fresh milk and cover with fine salt. This spots win freshmilk and cover with fine salt. Thi should be done before washing. If the fabric is ine
and delicate, the stained portions may be dipped in melted tallow and then pressed for some time between layersof warm pipeclay. Stains of indelible ink (made from nitrate of silver) may be removed by moistening them with a brush dipped in a strong aqueous solution of cyanide of potassium, and then well washing the Pabric
ous.
How can I gild book covers, picture frames, etc.? A Fine gold leaf is used for ornamenting books. It is framped in the covers by a press. On gilt picture
frames leaf is also used, but in many instances the gold-like finish on these frames is produced by lay ing on first silver leaf, and then lacquering this with an alcoholic solution of orange shellac, to which is often added gum sandarac and dragon's blood, saffron, gam
(27) J. W. S. says: Can you give me goodformula for making a fluid extract of annottor A red, and red lead. Macerate it with twice its weight of alcohol for several hours and filter
Please tell me how to make a good stencil ink, which
contains no oily matter and will dry quickly? A. Rub contains no oily matter and will dry quickly? A. Rub up a quantity of lampblack in a mortar with enough of a strong, hot solution of dextrin in water to form a
paste, and add a little alum water. Solution of soap is (28) J. R. K. asks: By what process can I (28) J. R. K. asks: By what process can I
remove the silver from old mirror backs, so that it can crystal porcelain vessel. If the coating is an amalgam of tin and mercury, use mercury, and loosen the fllm by rutIngwitha cloth.
I have some walnut furniture finished in shellac. It got wet in moving; and wherever the water touched it, the spots with a little oil mixed with Venice turpen tine.
Is arsenite of copper called Paris green? A. No. Ar-
senite of copper is known as Scheele's green; Paris green is an aceto-arsenite of copper.
(29) G. J. H. asks: Is there any way to separate tin and copper which have been melted to of the tin may be burned out by prolonged exposure to the air at a high temperature. This is the only practica method we know of. Small quantities of the alloy ma be dissevered by dissolving it in a slight excess of
strong nitric acid. Theinsoluble oxide of tin will then settle to bottom of the vessel, when the copper solutio may be decanted and the copper precipitated out as ox ide with.an excess of potassa, soda, or lime. This pre cipitate may be reconverted into metallic copper by firs drying it thoroughly, and then mixing it in a crucible with powdered .charcoal, and exposing to a high tem
(30) W. B. M. says: I want to build a tank 48 inches deep by 48 inches wide by 96 inches long, for
boiling linseed oil with steam. What amount of pipe will be required to dissoive the manganese used in boil ing that amount of oilp A. Thire 150 to 200 feet of inch pipe, but this, of course, is dependent on the tempera ture attained and the length of time allowed for the op
(31) W. B. asks: Is there any possible way to get the turpentine taste out of rosin? A. Pulverize the rosin and boil it for some
(32) O. E. says:I will advise R. L. D., who asks how to harden an eggehell, to lay the egg in vine can stretch it like a piece of rubber. Lay it in a strong olution of saltpeter for two weeks, and then you can atrike it to pieces with a hammer.
(33) A. J. J. asks: How can I make an in delible mixture of nitrate of silver, using oilp A. You ing them up together in a mortar. It is better to use cerin instead of oil. Mordant with a
(34) H. E. W. asks: 1. In the manufacture electric annunciators, will malleable iron casting castings? A. Yes. 2. If the magnet cores are screwed
directly to the malleable iron frame, without a connect ing piece of iron, will it answer as well, the malleable
iron acting as the connecting piece? A. Yes. Which is cheaper, to cast small articles in brass, or to cut them with dies? A. Castings will probably be found
(35) W. P. E. asks: 1. Have you any knowledge of a speed of 25,000 revolutions per minute having been obtained by a single motion, without gear-
ingof any kind? A. We do not remember having seen or heard of such a device. 2. Could such a speed be fog horn for the Signal Service, or for other purposes, provided the machine giving the motion was not too ex pensive? A. It might be usefully applied to numerou
(36) A. M. W. says, in reply to D. W.'s query as to his singular phenomenon: This does not ap pear to me at all singular. It is very evident that the
bearing, or step, had become dry. It is a common oc currence, where steel runs in or on steel, that the bear ing will, if allowed to get dry, become heated to such a cutting and almost weld together. The statement that the plate was bent by the hammer shows that theplate
was soft then, evenif it had once been hardened. D. W. says that sufficient oil was found above the plate collar but he does not say that there was oil on the plate wher it was most needed. In my experience, I have never properly lubricated, and I think it impossihle to produce that effect except by a pressure that would expel every may be ground together when dry without losing the tem per; but they would not adhere with the tenacity that D both stones gave the possible that the time taken to rais give off the heat to the cast foot and bed. In my opinion, the construction of the oval end spindle would have a tendency to run dry even under common lubrication, a it would only bear on a small part of the end, which might, with the weight of the stone, force itdry. Hard ened steel bearings do not often give any notice of be
ing dry, except by refusing to do duty, a very few revo lutions being sufficient to announce the fact and ruin the bearing. I would suggest to $\mathbf{D}$. W. that he make his spindle so that its end rests its whole surface on the step with a hole in the latter opposite the center of the spindle. The spindle should be made like a cup, so as
to form a reservoir for the oil, and so deep that the end to form a reservoir for the oil, and
of the spindle shall be immersed.
(37) J. S. B. says: I have found a specimen of tantalite. Can you tell me anything about chis rare mineral8 It is said to cons ist of tantalic acid and iron,
and is valuable, especially when found in crystallized forins. May we expect to find it in veins or beds. or on high or low landside of tin replacing part of the fer rous oxide. Some specimens are nearly destitute of Its luster is nearlypure metallic, somewhat adamantine its color is iron black, and streak reddish brown $t$ black. It is opaqueand brittle, and its hardness varie from 6 to 6.5 . Its specinc gravity is from 7 to 8 . It confined mosily to alhite or oligoclase granite, and ated with gigantolite in albitic granite, and with lepido lite, black tourmaline, and colorless beryl. The name the average analysis of which gives $\mathrm{Si}_{2}(80 \cdot 60)$, Fe ( $15 \cdot 57$ ), $\mathrm{MnO}(500), \mathrm{Sn} \mathrm{O}_{3}(\mathrm{~s}$ trace)
(38) T. McC. says: 1. I am building a small stroke. What size of boiler would Ineed for it, and what should be the thickness of the iron? A. Make it 15 inches in diameter, 24 inches high, of $1 / 8$ inch iron, for 601 bs. pressure. 2. What would be the best speed to run it at in order to get the most power? A. You may
run it at 250 revolutions a minute. $\quad$ 3. Could I make a cylinder of an engine with 2 inches bore and 4 inches stroke with Babbitt metal, that would stand the steam pressure as well as brass or iron? A. No.
(39) H. P. S. says, in reply to A. B.'s questions as tothe violin: There are two or three different tools with which the grooves are cut. One of the best
I ever used or saw, I constructed myself; but it cannot well be described in a limited space or without illustra tions. With it a perfect groove can be cut around a vio
lin plate in half a h hour. A perfect groove cannot lin plate in half an hour. A perfect groove cannot be
made without a tool well adapted to the purpose. The threads mentioned by A. B. are known as purfing, and similar slips of ebony, and are glued into the groove before the plate receives its final finish. Staining is, in most cases, done upon the wood, with thin, transparen dyes of different composition, and varnish laid on ove that in the ordinary manner; but the technicalities of ment in brief space. See Business and Personal col umn of this issue.
(40) D. H. M. says, in reply to D. W.' query as to the welding of his mill spindle: I sugges
that the mill had been in use long enough to wear the lower end of the spindle to such a nice fit on the step
that no oil could get under it, which caused friction sufficient to produce heat enough to weld it, and as it wa done sadaenly, he heataia not extend cooled it down again. While the oil that it was coving preparation, and at the same time excluded the at mosphere sothat no change of color of the heated part was in the lower end of a water wheel shaft welded to the step when it was three feet under water. The force welded; and when it was taken out the piece could not cked off the step with a sledge hammer.
(41) R. L. C. says, in reply to D. W.'s query as to the millstone spindle and step: I have re ground or welded to the steel plates npon which they
run. In one case the steel point was $11 /$ inches in diameter, andprojectedfrom the spindle (which was 4 inches
in diameter) a bout $31 / \sqrt{2}$ inches. It was twisted off about pearance thoroughly welded together. In the second case, the point was of about the same dimensions a thefirst; but instead of twisting the pointoff, it turned in the spindle (which of course cut it badly), where it stuck to the plate. After considerable hammering, they were broken apart, but not where they were welded, as part of the plate came away with the point when they separated. Iaccount for indes to run togeng as two perly lubricated, we have no grinding or welding if they re proportioned to the work they have to do. In the above cases, the person in charge of them said there was plenty of oil in the pots. It often happens that the passageways get stopped up and the oil fails to reach the

## stantly

(42) M. D. L. says: We desire to manu acture for our own use in large quantities, carbon plates ize and greater length than we can find in the mare What mixture of materials secures best results? What degree of compression is required? How is compression ompression? What kind of mould isused? How can A. In his work on "Electricity and the Electric Tele raph," Prescott says: "The finedust of coke and cok geoal is first put into a closeiron mould of the shap required for the carbon and exposed to the heat of the and unfit for use, but brrepegeqtedly soaking it in thick yrup of gas tar and reheating it, it at length acquires
(43) R. J. J. asks: How can I make a galnic machineforgiving shocks from the wire of the elegraph sounder? A. You can get a prettystrong hock from an ordinary telegraph relay, if you have on atue. The connections are made in the following men ner: The relay is jomed up in circuit with a battery an echanical vibrator for interrupting the circuit, and two wires with handles, to be held when taking the shock re connected to the binding screws of the relay's he
(44) H. A. H. says: I have a glass jar, about wo feet of insulated wire, some blue vitriol and some ulphate of zinc. Please tell me what more I want to make a battery with? A. Get a copper plate, attach the ire to it, and place it on the bottom of the jar with with a weak solution of sulphate of $z \mathrm{mc}$ and water, an uspend a zinc casting, provided with a terıninal wir rom the top of the jar; let the zinc just dip below th surface of the solution. Now drop a few crystals of lue vitriol on the copper plate and join the wires for

Minerals, etc.-Specimens have been eived from the following correspondents, and xamined, with the result stated
Will J. M. P. send us a specimen of the residue from his limestone water !-G. S. A.-The piece of rock con nalysis to determine all of the other constituents. It iso contains a little arkansite-titanic acid. Th your ladle, together with some titanic acid.-J. Z.-So far as we can discover, the segar contains only very
strong tobacco. The odor is due to certain essential oils peculiar to tobacco, and canno's well be imitated.G. H. P.-Itis a variety of mica called muscovite, consting of potash, alumina, and silicic acid. It is no valuable.-B. F. C.-It consists principally of carbonate
of soda. We do not see that it would be likely to prove very efflcacious as a scale preventive. It will not injure pasteboard box have received some minerals in a sma mposed of oxide of iron, mo ica. No. 2 is chondrodite-a silicate and fluoride of
magnesium. No. 3 is spinel-magnesia and alumina.
D. F. H. asks: How is the tubing of brass band instruments formed, and how are the dents rewooden organ pipes, but they do not give more than a whistling sound.

## COMMONICATIONS RECEIVED.

## The Editor of the Scientipicamericanacknowledges,

 with much pleasure, the receipt of origina:On Spiral Springs. By J. T. G
On Man's History. By J.E. W.
On Kerosene Oil for the Hair. By G. H. S. On the Origin of Solar Light. By G. P. H. On Canceling Postage Stamps. By H. D. M Hso inquiries and answers from the following:
H. P. G.-S.-T. A.-G.H.-W. B.-P. M. G.-J. M HINTS TO CORRESPONDENTS. Correspondents wo then published theappear should that, for good reasons, the Editor declines them. Th address of the writer should always be given. Inquiries relating to patents, or to the patentability
inventions, assignments, etc., will not be publishe here. All such questions, when initials only are given are thrown into the waste basket, as it would fill half o our paper to print them all; but we generally take pleas-
ure in answering briefly by mail, if the writer's addre ure in answ
is given.
Hundreds of inquiries analogous to the following are sent: " Who sells square lenses for magic lanterns?
Who sells telegraph instruments for learners? Whose is the best theodolite? Who sells the best anilinedyes? Why do not makers of steam plows advertise in the Scientific American?" All such personal inquirie ness and Personal," which is specially set apart fo that purpose, subject to the charge mentioned at th head of that column. Almost any desired informatio can in this way be expeditiously obtained.

## index of inventions

Letters Patent of the United States we in the Week Ending
April 10, 1877

## ND EACH BEARING THAT DATE

A complete copy of any patent in the annexed lis Arnished from this office for one dollar. In ordering please state the number and date of the patent desired, remit to Munn \& Co., 37 Park Row, New York city
Animaltrap, M. Early
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Bale ties, etc., cutting. J. R. Tobin
Barrels, etc., lining, M. Laflin...... Barrels, etc., lining, M. Laflin......
Barrels compressing, O. D. Goodel Beal bottom, spressing, s. F. D. Fraoklin (r)
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Beer cooler, F. V. Baudelot. Beer cooler, F. V. Baun
Bench plane, G. Gocher
Bevel, J. F. Klinglesmith
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