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nt Pulley Cover is warranted to do double the work enf
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Machinists－Price List of small Tools free，
Gear Wheels for Models，Price List free，Chucks and Gear Wheels for Models，Price List free；Chucks and
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enant．Canlmers spence company，foot East th St．，Nein
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Company， 588 Water Street，New York．

## 

W．N．B．asks：Can I use tubes both above same percentage of power from the water which
shoula getif I took it only above or below？ 1 wish to when tit is tanenfract romelther only．The friction on the step is sogrrat thatit will not stand，as，if taken from
below，the wheel cannot be held down without great

 evolutions will the wheel make？
P．A．asks if oyster shells，standing in a
heap for a a number of years，are as good as new shells heap for a number of years，are ag good
formaking $11 m e$ for bulliding purposes．
S．A．D．says：In eating canned fish one fre－
quently find the vertebre turithrze bones holidng their form ana crusinnn under the teeth like wet chalk；while
fre smaller bones are completely absent．By what pro－ cess are the small bones thus robbed of their bon
C．D．R．asks where paper or pulp is being H．H．asks：What kind of varnish or
 edge can
varnish？
N．C．says：I have a great deal of trouble
every yearin brandingmy cattie． every yearin ir innding my cattle．I Inale to thaso and nand burn the brand in the hide．Could not some of our
and scientists invent some actid that would leave a mark on
the hide，preventing the growth of hair and save the orture to the animal by burning？
W．L．says：I am troubled with a hissing notse in my left ear，the result of cola caught last fall，
thns．Do any of your readers know of a remedy，or of anything that will alleviate the nolse？
S．N．G．would like to know the process of
naking crystal or sponge gold for dental purposes． J．L．C．asks for a preparation that can be

used（in liguid form）for cleaning and removing heat | stains from hot |
| :--- |
| steam chests，ete |

B．F．B．asks if there is anything in the
manuracture of articles made of malleable cast tron． Which renders them llable to rust．＂I have had trouble
Vith things made partly of common cest tron and partl） vith things made partly of common cast iron and partly
of malleable cast iron，from the malleable parts rust ing．＂
in
in F
S
 articles，by placing the articles in an iron kettle with cainot maske it work．should the cover of the wessed be luted on，and should any particular coal be used，and
how long should the baking continue？ W．S．asks how best to cut glass tubing W．M．McD．asks：Is there anything which
will Eill coal tar on wood，so that the latter can be painted in light colors without danger of the dark hue coming through again？
F．A．S．asks for directions for constructing
astove for drying fruit，etc．，which will not change the
A．B．W．asks how to make logs durable． A．B．W．asks．What is the best method
or hardening gold，silver，and brass pin tongues，hinks， A．J．Ba asks for the best means of separa－
ting the base metals from silver and gold ores． B．F．B．says：I find need of a portable am troublea as to what to burn in it．Is there any oil except whale oft that will burn without a chlmney，or 1 i
here any device forburning serosene without a chim ney，which 18 succe esfulu ？


P．P．Jr．，will find directions for black en
amei on iron，on p．203，vol．28．－C．T．S．and E．B．
E．wil
 on p ．10，vol．25．－J．W．W．Wil find a waterproof cement
for leather deseribed on p． 119 ，vol． 28. ．J．C．M．will find
 our journal，in which full
or all puiposeses are $\begin{aligned} & \text { tiven．}\end{aligned}$
J．H．says：We are desirous of coating the
inside of a wrought iron etana pipe ，of 126 feet hight
 soluble glass has occurreat to me；willit answer，for any
length of time？Answer：If the pipe is subjected to
 coating would be liable to crack and break off．Proba－
bly the best coating for your pipe would be that used by the cities of New York and Brooklyn and largely em－ ployed in England．Heat coal tar pitch（from which
the naphtha has been distilled，and which has the con－
 the metal has acquired the same temperature．The pipe must be free from rust and perfectly clean，before alp．
ping．It is well to cover it with linseed oil，before coating it with the coal tar pitch．
V．W．K．asks：Will a machine have the
same powerif driven by a 10 nch pulley that itnow has，
 leys being the same？Answer：Yes，if the belt does not
silp any more，after the change is made，than it did for－
merly．


 mill to raise the water．Now how deep shall I pace the
cylinderin the well to get the best result？Answer：Put cylinderin the well to get the best result？Answer：Put
your pump within 20 feet of the level at which you are S．asks：$:$ Are there any glasses made which
will enablea shortsightea eye，now able to read ordina－ ry type at a distance of 3 inches without glaseses，to read
ti 2 fect or more？Can such glases be used 1 n mpectacte at 2 fect or more？Can such glasees be used in spectacle
frames？Answer：You can probably get such glasses from a good opticlan．They oulld be used in spectacle
frames，but if they were very thick，the ordinary frames
would not
E B．asks：Can you inform me how I can Horm of Paris green，placeadin the crevices of the floor
Answer Arsenc in near the sinks，is much used for the purpose． 11 is sure
death to the roaches－and other members of the fanily c
C．B．U．asks：Can you inform me of any method or liquidito dissolve or clean hard polish，such
as piano variish，from carvings，without sand papering or otherwise scratching the wood？Answer：Try alco J．N．J．asks：Why is it that farms on the lakes that were high and ry rfty years ago are now
bandoned，and water standing on them？Does the water risi，higher now than it did then？Answer：Care．
wul observations of the coast iline for a serles of yeat have shown that there is a regular depression iof the land going on in one section，and a steady elevation in
another．The cause of this is ascribea by many to the
and internal cooling
contractions．
J．E．says：I have a cistern from which the
water is pumpead through a leaden plpe running to the bottom of the cistern．What can be attacheded to the end
ofthe pipe in the cistern to act as a filter？The water
俍 t certain seasons tastes badly；can this be remedied by any thing used to pass the water through？Answer：
Put the end of the plpe tnto a aarrel fileal with charcoal
 months，when it will require to be cleaned out．



an elevation of 30 ofeet，at $C$ ，to the iron tank at $D$ ．The
pump at a has a 12 inch steam cylinder，and a 4 inch orl
 side diameter of 2 Inclese．When pumping at the rate of
100 barrels per hour，the pressure at B ，a s shown by the
 pipe frequenty burats at he highest point of elevation，
and seldom shows a leak at the polnt where gage shows highes；pressure．Please explain this semming paradiox．
Answer：
The $p$ pipe 18 split by the impact of the oil．If he pump ts stoppea，the ofl will fall a a way at etther side
trom the highest point．On starting up the oll from he highest point．On starting ap，the ool ma 3eparate
The follown ninoin will rounh in with great velocity，ana，
its motion beins suddenly arrested，will react upon the pipe，et her splittingit at once，or weakening it so much nat it will afterwards break．Water pipes in house
are frequenty burst in a a similar manner，the motion of the water being arrested by suddenly closing the supply

J．B．E．Says：Suppose that car oil is fired
ander ain old ooiler of poor iron，and the boller springs two leaks［see diagram］A B，in the second sheet，shortly
after the oll is Ared ；and sup pose that the is fleren ；and sap．
 more than a year）sometitimes for
seven weeks without cleaning．
The iron wasapparentlyalliright The iron wasapparentlyallilight
one evening，ani the night man ailo wed steam to run down to 10
los．and then fread car oil to get
up stean．The nexs day，when
and

the rivets and edge of sheet
around the first patch was not done．This edge always leaked consilerably after brushing out all the corners．
1．Was it the muad or the fir ing of the oil that caused the
 throughout the boller，leaving the bottom as clear as any other part under water？Thus，if a boiler runs for
four weeks and more，one fifty－ixth of the water is Cour weeks and more，one fift－81xth of the water is
blown out twice a day，and there will always be nearly the same amount of mud in the boiler，excepting the
scale which adheres to the bottom．In twenty minutes after blowing off steam，pulling out the fire，and open．
ing the manhole，the water is settlea as clear as it ap． peared before entering．Is it a positive fact that mud
华ature even and high enough to agitate the water？ Anewerss 1．Wedio not know what our correspondent
means by car ofllunless 11 is one of the hym rocarbons； Which must be tributed to corcely cause the leak； the circulation is unusuanly good in a boiler，or unles the bollie primes，most of the mud will be at the bot
tomect Whan abiler leaks，a current 18 created in the
drection of the leat directio
point．
H．B．asks（1）which will require the most
power to saw a bourd 12 inches wide， $\mathbf{2}$ circular saw just large enough to react through it，or one one large enough to saw 24 thches with the same feed．2．Will 5 5
inch saw with 40 teeth roquire any more power than Inch saw with 40 teth require any more po wer than one
ofthesamesize with 28 teeth？Answers： 1 A saw just OArge nought to cut through a board Fill require 1 ess
later
power than a saw larger，thenumberof teeth，speed and the thicknenss evingequal in each．2．The more teeth，
the more poowr，provided the thickness speed and feed

ber．The thinner the saw，the more teeth will be re．
quireat to carry an equal amount of feed to each revolu－ tiro of the saw，but always at the expense of power．－
J． ． ．of P $\underset{\text { bevel gear：}}{\text { A．asks }}$ feet 6 ．Which is the strongest itc a and 12 inches face， pitch and 10 inches face？The pinions in each case are
early to a．Answer：If the pinions have the same early to t．Answer：If the pinions have the sam
elatite size in each case，and the power applied is the P．P．Jr．，asks how to dissolve india rubbe oa as to run it in a mold and then harden it，and it
plaster cof onit plaster of Paris would answer to make a mold with．I purpose as india rubber and be equally elastic？
Is hhere any convenient way of taking the fluid content out of a barreland putting the same into a can without
psing a pump，supposing the barrel to lie on the floo asint pump，supposing the barrel to the on the fioor
and the top of the can to be about 7 feet from the fioor？ nswers：See answer to s．J．N．In No． 24 ofourvoum
XXVIII．2．There are several kinds of liting pum made for this purpose．If you want to take out only a tail q quanct of tice of tin leader or tubing and have it made to
take taper almost to a point at each end．on putting it int Che cask it will fill up to the level of the surface of the
iquid ；then stop the uper end with your thumb an oucan safely lift out the tube andcontents．Small ap ists under the name of pipettes，and are so graduated as

E．J．M．says：Thereis a difference of opin－
on as to which side of a gum belt，the inside or outside as usually put up in coile sould be next the pulle． he inside．＂Our army swore terribly in Flandera， had the Scientific Ampricas been in existence then，
our army， I opine would have done w weot Texasd swear by it．Answer：This seems to be one of tho Ase cases in which bothmajority and minority arer righ belt are precisely allke，so that it caul make no differene Which side is next to the pulley．We are muoh obliged
for our correspondent＇s goodopinion of the paper which is only one of the many kind testimonials we are con
it

X．Y．Z．asks why it is that large files are
ut coarser than small ones．＂I will say that they would be much better if cut fine，as they would do more work
nd io it better． 2 ．Would it not benefit a large class or haustrial ra offling saws，the saws to be flead to do the best work
with the least power？I find it rare for even a first class workman to know anythnng about the principle of
fling a amw to do nice work．In twenty years expert
fing I ence，that not recollect seeng more than two hould be so．＂Answers： 1 It is more diffeult to cut large file finely than a amall one；though if there wa
much demand for the kind of files mentionea by our
correspondent，they would probaly be med ．The idea of offering a premium for the best method of lingsaws 18 g good one，and would be productive of
seful results，if carred out．Per haps those of our readers who are experienced in saw fling will favor us A．B．W．asks what is the best mode of ith plaster of Paris．
J．L．G．says：Some time since a yentleman went away．While absent he died，but before edying， panner in which it was buried．We have made several neffectual efforts to discover it according to the des． cription of the place and directions furnished by thede．
ceased．We Feel sure that tit t buried o ad ．Weel sure that tit is buried there，ani desile oy which it may be disco overed，or that would aid us in
信
G．B．M．says：1．Please give some method What is the capactly of the Croton aqueduct and the estrimated water supply to the city of New York？ 3.
What are the standarari works on mineralogy and where can they be obtained？Answers： 1. Flowerscan bepre．
served by dipping them in melted paraffl．This applies
 The Croton aqueduct is capable of conveying 120，000，000 to $130,000,000$ gallons of water per day．The amount con－
sumedis abo t $90,000,000$
per day, or 0 orer 90 umedis about to， 0000000 per day，or orer 90 gallons to
each man，woman，and child．The largest reservorr in he Central Park has a capacty of $1,000,000,000$ gallons ；
 only 20，000，000 gallons，or enough to last about 6 hours． 3．Dana＇s＂Mineralogy＂Is the very best work estant．It．
sells for 810 ．There are smaller works，such as Profes－ sor Eggleston＇s＂Lecture Notes＂，which
for reference：but＂Dana＂is the best．
G．L．R．asks for the best authorities on hemicals on wooarvenererally．Answer：You will find an excellent article on this subject in Wagner＇s＂Hand－
book of Chemical Technology，＂translated by Crookes． Several extaustive articles on this subject，by D．D．A．
Ott，appeareal in the Engineering and Ninivg Journah November 22，1870，and Journal at Applied Chenaistry October and November， 1870. Colonel J．T．Crane，
United States 9th of september， 1870 ，to the Chief of Engineers，United States Army．This was published in the Amerioan
Chemist for February， 8872. In this report，tabular re． Chemist for February，1872．In this report，tabular re．
sultt are given showing the comparative time which ties，etco，，1atead when treated in
espectall relating to creasoting．
J．H．asks for our opinion on the following
matters： 1.1 a am using an engine 7380 ，running at 60 rev olutions per minute．The boiler is nearly new，of 30
inches diameter，with 26 tubes 9 feet long and 3 inche nameter．The esteam pipe from boller to engline is 28
dis feet long and of 2 inches internal diamieter．When all our works are on， 3 i ibs．on the boliter more than rivives
our entin at full speed．How much po wer should that pressure give？The pipe and the engine are left bare． 2．I am using，for this annount of power，an enormous
quantity of coal，and $I$ want to know if I cover the steam dome pipe to engine，the engine，and the feed
 be well to slow the engine nearly half，driving the shaft
same as now；then I could get about 50 loss．to the inch n my enf ine before the governor would close，instead
of 20,25, or 30 ibs，as at present？
4 ．How much coal
shouid we really use to get the above power? 5. M ven
gine is a plain slide valve in very good condition. A should we really use to get the above power? 5. Mven-
gine is a plain slide valve in very good condition. At
how much cut-off should the slide valve be set? Anhow much cut-oft should the slide valve be set? An-
swers: 1 . Our correspondent does not state the point at which steam is cut off, so that we cannot tell what power the engine is developing. 2. Considerable saving
of fuel would be produced, by felting the pipes; possibly as much as ten per cent. 3 . Instead of reducing the speed of the engine, it would be better to cut oft the team at an earlier point of the stroke and increase the initial pressure. Questions 4 and 5 show that this is a
case where it would be well to consult a good engineer, who would probably sugg est improvements which would
B. says: 1. I have, in a 40 horse power five water, when the water is cooled down to $60^{\circ}$. What will be the pressure on the outside of the boiler (pre suming the boiler to be airtight)? 2. When I begin to
get up steam, should I let out the air in the boller as et up steam, thould I let out the air in the boller as ast 2s the pressure will force it, or keep it contined?
3. Will the corrosion around rivets that leak become dangerous? What is the easiest way to stop such leaks Answers: 1 . The pressure outside the botler will be
about 14.7 pounds per square inch. The pressure inside the boiler, 2 bove the water, will be about $1 / 4$ of a poun per square inch. Below the water line the pressure
per square inch will be the weight of a column of water of one inch cross section and with a hight equa level. .2. In raising steam, the best plan is to keep the
safety valve open untll steam isformed. 3. Yes. If the eaks eannot be stopped by caulking the heads of the
rivets, the rivets must be cut out and replaced by new W. A. B. says : 1. Will nitrate of silver do
W.
fater he lunar caustic sold in drug stores. 2. Will a piece wrought or cast iron do for one of the poles of the Bun
sen battery, instead of carbon? 3 . Is there any differ ence between cyanide of potassa and cyanide of potassimm ? 4. How much silver and cyanide of potassa does it take to make one gallon of solution? 5. Doesit mak
any difference if the vat, in which you place your solu ton of cyanide of silver, be made of cast iron? An wers: 1. Lunar caustic, or coin and silver scraps dis
olved in nitric acid, may be employed in making cyan de of silver for electro-plating. 2. Iron will not answe arge pleces of gas carbon gratis from any cas house When they are cleaning out retorts. It is very hard,
but can be sawn with a fine saw, if you have patience. but can be sawn with a fine saw, if you have patience.
3. Cyanide of potassa is incorrect; it should be cyanid of potassium. It is very poisonous and requires care in
using. 4. Dissolve $3 \%$ ozs. of cyanide of potassium in quart of distilled water; and in this solution, dissolv well washed chloride of silver (precipitated from nitric cid solution by hydroohloric acid) until a saturate ith an equal bulk of water. 5. An frois vat will cause he silver to be deposited upon it unless lined with par
finn, asphalt or other non-conductor.

## COMMUNICATIONS RECEIVED.

The Editor of the Scientific Americal acknowledges, with much pleasure, the reeipt of original papers and contributions upon the following subjects
On Using Water as Fuel. By A. W. T On the Southern Canal. By P. K. McM.
On Life Saving Inventions. By J. C., and by L. S.
On Asiatic Cholera. By C. McD
On the Ponca Fossil Remains. By C.W. P On Psychic Force on the Slate. By S.C.D On the Million Dollar Telescope. By T. M. P.

On a Transatlantic Balloon Voyage. By c. R.

On Screwing in Studs. By J. W. T. On Slivers. By J. M.
On the Australian Water Cooler. By . C. W.
On Corundum in Pennsylvania. By W.K.S On Metallurgy. By J. T.
On Deep Sea Soundings. By -
Also enquiries from the following
A. M. - L. G.-A. G. J.-A. H.-R. W. Co
C. R. - E. M. H.-W.K.C. - J. H. P. $\&$ Co

Correspondents who write toask the address of certain manufacturers, or where specified articles are to be had,
also those naving goods for sale, or who want to fnd partners, should send with their communications a amountsufficientto cover the cost of publication under he head of " Business and Personal," which is spectall evoted to such enquiries.
[OFFICIAL.]
Index of Inventions FOR WHIC

Letters Patent of the Enited States were ranted for the week ending June 3, 1873
and each bearing that oate
(Those marked (r) are relssued patents.)


Gurner, gas, D.E. Ryan.........,
utter worker, W. N. Golden
Button hole cutter, W. C. McGill Canceling stamp, hand, E.H. Thomas.... Car brake, rallway,J. S. Anderson
Car, dumpling, Hav ford \& Wood..
Car pusher, A. S. Bailey..
Car seat, F. Farrell...
Car, bleeping, J.S. \& D. R. Leighton
Card cylinders, etc., traversing, F. Herboth
Carr case, Miller \& Bennett.
Carriage hook, landau, O.
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Engine, steam, Babcock \& Wilco
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Harvester, W. K. Miller..
Harvester, w. K. Rairigh
Harvester, w.
Harvester, corn, Spears \& Wells
feel burnishing machine, $\boldsymbol{H}$. S. Vrooman.

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Hook, back hand, J. Straus......................
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Lamp post, L. A. Gouch........
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Manching, etc., machine, futting, Cummings, smith \& Jordan
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rill, cider, w. Rice
hill feeder, C. P. St
Millstones, hanging, A. W. Winall
Millstones, leveling, W. Ring......
Nail assorting appsratus, J. Coy
ail assorting appsratus, J. Coyne
Onl wells, increasing capacity, E. A. L. Roberts,(r)
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Ores, etc., apparatu
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Picks, evaporating, G. W. Storer
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Pipes, etc., introducing water, Fritz \& Pooley
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Planter, corn and cotton, z. B. Sins
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Post wire attachment,J.P. Terre
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Pulley, friction clutch, J. D. Crocke urifler, middlings, E. N. Lacroix. Rack and boot jank, towel, C. I
Railroad crossing, J. Wood.... Railroad switch, J. F. Linthicum. Rallroad tie, Peck \& Richmond. Rivers, removing sand bars in, A. Garnham
Sad, fluting and band iron, A. S. Mann Sad, fluting and band fon, A. S. Mann. Saw, band, C. A. Young.................... Seed dropper, J. M. Forden.
Sewing machine caster, J. H. Plank...
Sewing machine caster, G. K. Proction
ewing machine cutter, J. E. Wiggin

1


APPLICATIONS FOR EXTENSIONS. Applications havebeen duly fled, and arenow pending
for the extension of the foilowing Letters Patent. Hearingsupon the respective applications are appointed fo the days hereinafter mentioned:
25,237.-Horizontal Wheel-A. Andrews $25,373 .-$ Paper box Machine.- S. B. Terry. August 20. 2,434.-Cotton Scraper.-J. F. Mitchell. August 27. 25,506.-LAsip.-H. Halvorson. September 3.
25,544.-TRY Cock.-J.F. Cook. September 3. 26,243.-Water Closet Basin.-W. Boch, Sr. Nov. 12.

EXTENSION GRANTED. 24,304.-Iron Movine Machine.-C. Hewitt. DISCLAIMER.
DNCLLAMER.
DESIGNS PATENTED.
,694.- Hat and Coat Hoor. - A.D.Judd,New Haven, Con

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\begin{aligned}
& \text { 6,67.-HEATive STove.-J. Beesley, Phlladelphia, Pa. } \\
& \text { 6,698.-WATCH HANDS.-B. A. Goodell, Waltham, Mass. }
\end{aligned}
$$

TRADE MARKS REGISTERED. 1,286.-Perrolevm.- Brown Brothers, Erie, Pa.
$1,287 .-$ WATchess.-Courvoisier \& Co., New York city 1,287 - Wa theies.-Courvoiser \& Co., New York
$1,288 .-$ Sirirs. -W. A. Farr $\&$ Co., Boston, Mass. 1,2899-Chair SEat, etc.-Gar
pany, Glen Gardner, N.J.
,290.-Toort Brusirs.-S. L. Mintzer, Philadelphia, Pa 1,291-SoAP.-J. Oakliey \& Co., New York city
,, 292 to $1,291$. -Writskiss.- Walsh \& Co., Cinci


1,298.-Beverage.-S. F. Stowe, Providence, R.I.
SCHEDULE OF PATENT FEES: On each Caveat......
On fliting each application fora Patent (17 years) n issuungeach orig nalPatent.
On appeal to Exauniners-in-Chief
On appeal to Commissioner of Patents.
On application for Reissue................
On application for Extension of Patent.
On application for Extensio
On granting the Extension.

nan application for Design (7 yeara

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