New Mechanical Inventions.

An improved Machine for Separating Fur from Pelts or Hides has been invented by Mr. Samuel M. Ball, of Fanwood, N. J. In this machine the fur is removed from the skin by a combination of pickers, carrying aprons, and separating screens, arranged in a compact manner. The machine is cheap as well as simple.

Mr. Gideon McBride, of Dover Hill, Ind., has invented an improved Tellurian for the use of schools, etc., which in a simple manner illustrates the elliptic orbit of the earth around the sun and that of the moon around the earth, together with all the phenomena resulting from the relation of these bodies to each other.

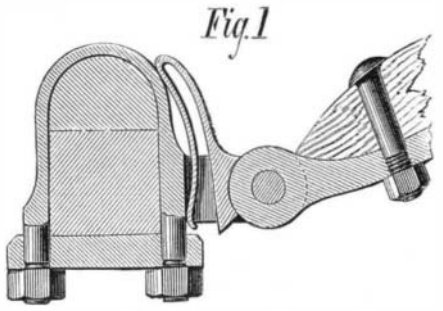
Mr. Lorenzo Meeker, of Oswego, N. Y., has invented an improved Lifting Jack. This has a peculiar construction of a clutch and lever for lifting the load, in combination with a clutch for sustaining it during the alternate movement of the lifting clutch, and differs from other lifting jacks in the construction and arrangement of the sustaining clutch and lever, and in the devices for disengaging the clutch from the bar when it is desired to retract or lower the latter.

In a new Millstone Gearing devised by Mr. Garrett W. Schreurs, of Muscatine, Iowa, the spindle of the runner stone is so stepped and geared that its motion can be instantly stopped at pleasure or in event of an accident.

BEARD'S THILL COUPLING.

The annexed engravings represent a new invention designed to prevent carriage thills from rattling. It consists of

Fig. 1



a steel spring, and the manner of its operation will be seen at a glance from our engravings. It is claimed that this spring is neat, cheap, effective, and far more durable than rubber. It can be inserted without uncoupling the thill or removing any part of the vehicle. Fig. 1 is a section of the entire device, and Fig. 2 shows the spring separate. It was patented October 30, 1877, and is sold by Luke Beard, 75 Hubbard avenue, North Cambridge, Mass.

Fig. 2

A Telephonic Alarm.

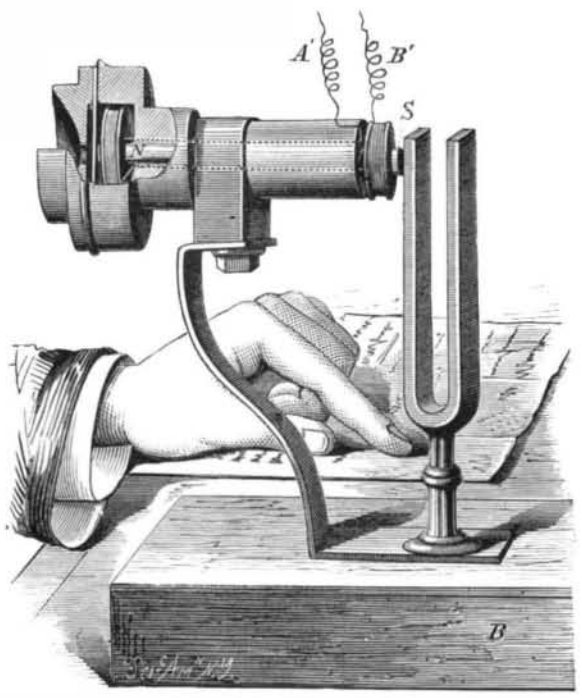
The speaking of the telephone is admittedly so weak that it can only be caught by keeping the instrument in immediate contact with the ear. Hence there is transmitted through the telephone in its present form no sound which would be intense enough to announce to any one who was in a large room, and who did not hold the telephone close to his ear, that a message was about to be sent from the transmitting station. The consequence is that a warning apparatus must be attached to the telephone, so that there may be no fear of missing a projected telephonic conversation.

It is clear that the conducting wire of a telephone can be used to sound a bell as an alarm by means of a current from a galvanic battery, and thereby the defect referred to would be supplied. But the necessary apparatus would considerably raise the price of fitting up a telephone apparatus, and besides, one most important property of the telephone, viz., producing the required electric current automatically, would be partly lost. I have, then, invented another warning apparatus, which, I believe, is quite workable.

Hitherto telephones have been so constructed that only one pole (N in the figure) of the magnet is effective; I now use also the second pole, S, by providing it with a coil of wire, which is simply inserted in the circuit behind the first coil. (The dotted lines in the figure will explain this connection; the two ends A′ and B′ are connected with the binding screws fastened to the telephone; from this the circuit goes to the second telephone.) Before this pole of the magnet a tuning-fork, A, may be very easily set up, which, with the telephone, is simply fixed on a resonance case, B; this arrangement should be made both at the transmitting and receiving stations, and both forks should be in unison. If now the sending station wish to signal that a conversation is to be begun, the fork of that place will be sounded with a fiddle-bow; the currents thereby induced in the coil are powerful enough to set the fork of the receiving station in such intense vibration that the sound may be distinctly heard in a large room; warned by this signal a person can in the usual way put the telephone to his ear and listen to the words from the transmitting station; and so *vice versa*.

I have made an experiment in a large room, when about 100 people were present, and all could hear the sounds of the fork, which in the manner described was set in vibration by a second fork in a distant room. The two forks were König Ut_4; lower forks give less clearly heard tones; with higher forks I was unable to make any experiment, since I had not two similar ones at my disposal.

Let me mention two other experiments which I have made. The first is of importance in connection with the question as to how the clang-tints of tones are reproduced through the telephone. In one of the two telephones described substi-



THE TELEPHONIC ALARM.

tute for the Ut_4 fork a higher one, and sound this by means of a fiddle-bow, and there will be heard with another inserted telephone of the ordinary construction tones of even 12,000 double vibrations per second, a sign that the variations of the magnetic condition of a magnet perceptibly occur, even when the forces producing these variations change their size 24,000 times in a second. This result, moreover, was not to be expected, since, as is known, magnetic polarization requires time to accomplish. Whether these higher tones are comparatively weaker than the deeper cannot be determined, but probably this is the case.

In another experiment I used the telephone to test the electric vibrations indicated by Helmholtz and others, which are produced by the opening of the primary current of an induction apparatus in the induced coil, when the ends of the latter are connected with the armatures of a condenser. For this purpose I inserted the telephone in the circuit between coil and condenser, and observed the effect when the current in the inducing spiral was opened.

When the ends of the induced spiral were not connected with the condenser, I heard a dull report in the telephone; when again these ends were connected with the condenser, this report was accompanied by a shorter, higher sound, whose vibration-number might perhaps be determined by a musical ear; a proof of the existence of the vibrations mentioned in the last case. The observations were made with a telephone the iron membrane of which was very thin and had a very deep tone.—W. D. RÖNTGEN, *in Nature*.

A FOWL MONSTROSITY.

BY JOHN MICHELS.

An interesting instance of a strange malformation in the head of a fowl has been exhibited alive at the New York

A FOWL MONSTROSITY.

Aquarium, and as Professor Fr. Stengel of Columbia College vouches for its authenticity, it may be presumed to be a genuine specimen.

The illustration will convey an excellent conception of the peculiarities of the fowl in question, which is said to have a monkey's face. It will be noticed that the ordinary beak of a bird is absent, and that the nose and lips of an animal are fully developed.

The nose appears to be formed by an extension of the comb, which at the point of junction suddenly changes from a bright red to a pale fleshlike color; the lips, which are large and protruding, having the same hue.

Both lips and nose are formed of a moderately hard cartilagenous substance, having a smooth surface, the nostrils being very similar to those observed in many species of monkeys.

The tongue is also modified in form, rounded at the point, and having unusual power of lateral motion.

With the exceptions I have named, or shown in the illustration, the general appearance of the specimen is normal, and indicative of its being of the Cochin China breed.

We have doubtless here an interesting specimen of one of those strongly marked and abrupt deviations of structure which occasionally occur without any apparent cause.

Such cases are rare with birds in a state of nature, but happen with greater frequency with those which have become domesticated.

This monstrosity probably arose from an arrest of development rather than arrest of growth, and is doubtless capable of being transmitted. Breeders take advantage of such freaks of nature to produce what is called a variety.

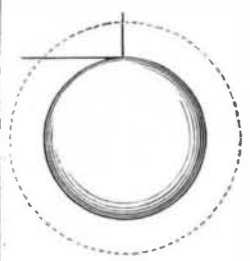
Speaking generally, it is conceded that changed conditions and external influences produce variation from type, and considerable effect upon organisms of all kinds.

There are, however, instances in which decided variation arises without any apparent exciting cause, and Darwin with his usual caution "provisionally" calls it "spontaneous;" he attributes such variations, whether consisting of slight individual differences or of more strongly-marked deviations of structure, as depending much more on the constitution of the organism than on the nature of the conditions to which it has been subjected.

The Apparent Size of the Moon.

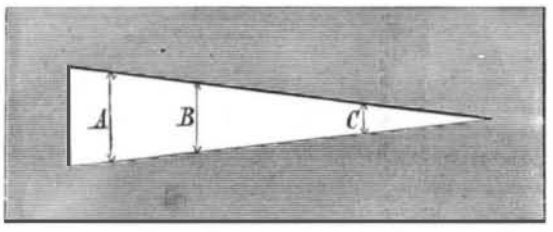
To the Editor of the Scientific American:

You have frequently noticed that the moon looks very much larger when it rises and sets, than when it is nearly overhead, on the same night, the objects on its surface appearing magnified. I have accounted for the variation in its apparent size on the principle of the refraction of light, more rays being bent and brought to the eye while they pass through the dense medium, when the moon rises and sets, than when the rays pass through a rare medium, as when the moon is nearly overhead.



The rays, when the moon is near the horizon, pass through more air than when directly overhead.

I have heard it said, and think I read it in the SCIENTIFIC AMERICAN, that the moon only looked larger by comparison with objects near the horizon. It did not occur to me how to test the matter until a short time since I made a triangular hole through a piece of card board and placed it 21 inches from my eye and looked through it at the moon. When it was rising near the horizon it would fill the space marked *A*, sometimes *B*, and (when overhead) *C*.



Does not this prove that the moon does really look larger by being magnified through the medium of the air?

Please mention this in your paper with remarks, which may enlighten others. Yours, etc, OBS.

LACONIA, N. H., Dec. 25, 1877.

A. This apparent difference in the size of the moon, according to its position in the heavens, is (as has been frequently explained before) merely an optical illusion.

When we regard the celestial vault, it has the appearance to us of a very much depressed spheroid, instead of a hemisphere, and, for this fact, the zenith looks much nearer. In looking at objects along a horizontal plane, we are accustomed to estimate their relative sizes and distances by comparison. Now, in viewing objects situated above, as we lack the same means of comparison, and hence are apt to greatly under-estimate their distance, the rising moon may appear much larger than a tree placed beside it on the verge of the horizon; but, when she reaches the zenith, the tree (which at the horizon served to give us an idea of greater distance) being absent, we with our under-estimate of vertical distance unconsciously make an exaggerated allowance for it, and, doing this, we likewise underestimate the apparent size of the moon and see it smaller.

COL. W. H. REYNOLDS has concluded a contract with the English Government by which the Post Office Department has adopted the Bell telephone as a part of its telegraphic system. In a recent telephonic experiment in connection with the cable, 21¼ miles long, between Dover and Calais, there was not the slightest failure during a period of two hours.

Photo Hash.

BY E. V. DAKE.

To clean Negative Glass.—Put them in a stone jar; fill it up with cold water, set it on the stove till it boils; when cool wash up by laying them flat on a board and using a common splint scrubbing brush.

To prepare Albumen.—Take the whites of 8 eggs, be sure and take out the germ; to this add 24 drops of glacial acetic acid, diluted with 1 oz. pure water. Stir well, leave it stand 2 hours, then strain through a piece of muslin, then add 1 drachm of ammonia, and you will have a stock solution that will keep for a year at least. For use, take 1 oz. of stock solution and add 30 ozs. pure water, filter through 6 thicknesses of muslin.

The Albumen Brush.—Instead of flowing the plates with the albumen, use what I think is called the mansard brush—make it yourself, as follows: Take a piece of glass three inches wide and 6 inches long, fold four thicknesses of Canton flannel over one end, and slip on a rubber ring to hold it in place—wash it thoroughly to free it from lint and dust, and set it in the dish containing the albumen (a glass goblet is a nice thing). After washing the plate, dip it into a pail of pure, warm, filtered water, let drain a moment, then draw your brush from top to bottom, and the work is done.

To prevent Pinholes.—There is a great deal said about pinholes in negatives, and their cause; one great hobby is an over-iodized bath; now, say you have 2 quarts of bath, 45 grains strong, iodized to saturation. That bath will not give pinholes, if dust and foreign matter is kept out, unless you impoverish it or waste the bulk of it. I claim that if you keep the same quantity of bath with the same strength of silver, you never will get pinholes from over-iodizing.

Retouching Varnish, for a soft pencil.—Alcohol, 8 ozs.; gum sandarac, 7 drachms; Venice turpentine, ½ oz.; camphor, 1 drachm; dry without heat—gives a soft tone to the negative, increases the intensity, and gives a tooth that will take hold every touch.

Varnish for a hard pencil.—To do a very fine job, take white lac, 1½ lb.; alcohol, 1 gallon; dry the lac and pound it fine, add to the alcohol, keep warm till dissolved, then filter; should be as thick as you can flow without ridges.

To prepare the varnished surface for retouching, take some powdered pumice stone, sprinkle over the face, and with the ball of the second finger commence a circular motion and grind the surface till you have the desired tooth; in touching, if you get too much lead on some part, you can easily remove it with a piece of rubber by dipping it into the pumice stone and grinding that particular spot.

A tray for floating paper and toning.—Make a box 4 inches deep, 19x24 inches inside; have the bottom in one piece, and put the bottom in the middle so you will have a double tray, one side for toning and the other for floating paper; to prepare it for use, take 1 lb. of good beeswax and melt it, lay the tray on the stove and warm it well, then flow the wax all over the inside, let it cool, then flow again, then give an extra flow around the corners. I made one seven years ago; has never leaked a drop, and is clean and healthy to-day as you could wish. Washing trays can be made by using half inch boards well nailed together the size you wish, and lined inside with white oilcloth, fitting it into the bottom well and tacking on the outside edge; very cheap, and will last for years.

To remove the Hypo.—Seven years ago Mr. Newton gave a formula for cleaning prints from hypo in a very few minutes. In the *Mosaics* for 1877 he reiterates the statement, and I have often wondered whether photographers generally have availed themselves of this little dodge. I have used it ever since I first saw it, and have made prints every year for the past seven years, and whatever other faults may be found with them, they have never been troubled with hypo. I use the acetate of lead, 2 ozs. in 16 ozs. water, which is a stock solution—2 ozs. of stock solution in 1 gallon of soft water form the wash for prints. Pass the prints through three waters after fixing, then into the lead wash; keep them in it for ten minutes, then rinse three times and your prints will be perfectly clean; if the water turns milky when you add the lead, add a few drops of acetic acid, and stir just enough to make it clear.

When to trim.—I visited a gallery in a city larger than ours not long since and found the printer trimming his prints, but they were all toned, fixed, washed, and dried. I don't know but what most printers do the same way, but they could not do it for me; times are too hard to squander time and money that way.

After printing, trim all your prints nicely to just the size you wish before toning; if you are an artist you will not tear one in ten thousand in the subsequent manipulations; by doing so you can save your clippings for the refiner, and won't need more than half the gold to do your toning.

When your prints are washed, lay them face down in a pack, press the water out of them, then paste the first one, take it by the corner and lay it on the card and rub down, and so with the next; in this way you will save silver, gold, time, and labor.

Corn starch makes a splendid clean paste. You can get just as good a gloss on your prints by rubbing them over with a piece of white Castile soap as you can to dissolve it in alcohol, and soak your prints up with that. Try it.

Have a rule to work by; don't guess so much, even if you are a Yankee; a handful of this and a cupful of that in a careless way may work well seven times out of ten, but may fail you the next three times, and cause you to lose your time, temper, money, and your customer.

How to get gold and silver.—Because there is a good margin in photography, it is no reason you should not practice economy. I have a friend who has been squinting through the camera for the last ten years, does good work, and always has a fair run of business, and yet he has not seemed to get along financially as he ought to. Of course there may be many reasons why, but when I visited his rooms this summer I found out some of them: When he develops a plate, he does it over the sink, and all the excess of silver goes out the waste pipe; washing from prints goes into the sink, and consequently the silver goes out the waste pipe; makes new toning every time he tones a batch of prints, and when done with it throws it into the sink, and so the gold goes out the waste pipe; three fourths of the money he spent for silver and gold was a dead loss; it went out the waste pipe to return to him no more forever. Try another way: develop over a stone pan, let the excess of developer and silver go into it, also the first water that covers the plate in washing; it will keep evaporating, so you can use it for a year before you clear it up and send the contents to the refiner.

Save the first three waters from your prints in a cask or tub, and at each saving add common salt and stir well. When full, let settle, then draw off the water to within three inches of the bottom by putting in a faucet, or even by boring a hole and fitting a plug to it nicely.

Wipe out your holder every time you use it with a cloth; when the cloth becomes foul throw it in with your clippings—catch every drop of silver solution on something; the bulk of your bath is composed of drops, and every drop contains money.

Keep up the price of your work for mercy's sake don't make people think you are only a half-made photographer by offering them work at half price; people are willing to pay a good price for good work.

Never force your work on your customers; if they are not suited with it do not let them have it at any price; they will soon learn that you think as much of your reputation, as an artist, as you do of their money.

Keep your temper before your customers (now I know I am setting you a hard task, but it must be done); even after giving Miss Nancy four sittings, while others are waiting, and then she finds that one of her spit curls has not got just the exact curve she desires, and must sit again; let her sit, for you can plainly see and hear that she has a tongue (and I believe all women have), and that tongue had better wag in your favor than against you.—*St. Louis Practical Photographer.*

ASTRONOMICAL NOTES.

BY BERLIN H. WRIGHT.

PENN YAN, N. Y., Saturday, February 9, 1878.

The following calculations are adapted to the latitude of New York city, and are expressed in true or clock time, being for the date given in the caption when not otherwise stated.

PLANETS.

	H.M.		H.M.
Mercury rises	5 52 mo.	Saturn sets	7 43 eve.
Venus sets	7 06 eve.	Uranus rises	5 53 eve.
Mars sets	11 45 eve.	Uranus in meridian	0 44 mo.
Jupiter rises	5 43 mo.	Neptune sets	11 34 eve.

FIRST MAGNITUDE STARS.

	H.M.		H.M.
Antares rises	2 41 mo.	Sirius in meridian	9 20 eve.
Regulus rises	5 58 eve.	Procyon in meridian	10 13 eve.
Spica rises	10 35 eve.	Aldebaran in meridian	7 09 eve.
Arcturus rises	9 38 eve.	Algol (var.) in meridian	5 41 eve.
Altair rises	3 58 mo.	Capella in meridian	7 48 eve.
Vega sets	6 07 eve.	7 stars (cluster) in meridian	6 21 eve.
Alpheratz sets	10 33 eve.	Betelguese in meridian	8 29 eve.
Fomalhaut sets	5 31 eve.	Rigel in meridian	7 48 eve.

REMARKS.

Mercury rises 1h. 10m. before the sun, and 9° 6′ 24″ south of the sunrise point, February 10. Venus has the same right ascension, and is only 53′ south of η *Aquarii*, the southeast star of the λ. Mars and Neptune are in conjunction; Mars being 3° north. They are in *Aries*, almost directly south, at dark. Jupiter rises 1h. 19m. before and 9° 44′ south of the sun. Saturn is in *Aquarius*, 15° southeast of Venus. Uranus is 26′ north and 1′ west of Regulus. This and the following week will be the best time to look for Uranus this year. Algol at minimum brilliancy February 11, 7h. 52m. evening. Mira will not attain its maximum brilliancy until the middle of October, 1878.

Turnery Woods.

In the Eastern Archipelago many woods are found which might probably be utilized if they were better known and introduced into European commerce. A few notes are therefore furnished of some.

Sawoe or sauw (*Mimusops Kauki*, Lam.) is found in Bali and Java. The wood is red and flamed, of hard texture, close grained, and easily worked. It equals box for turnery work and engraving. The hard seeds, called kitjeh, are used for markers in games.

The gray wood of Seroet (*Streblus aspera*, Lour.) of Java, deposited for some time in running water, petrifies, and is used for making bracelets and other ornaments. Under the name of Tjautige or sautige several small trees grow in the central and eastern mountainous regions of Java which are known for their hardness as iron woods. The brown close wood is said to be good for turnery work.

Papila.—This, one of the Rubiaceæ, is a tree of thirty feet high by eight inches in diameter, growing at Gorontalo. The wood is straw colored, lustrous, of a compact texture, resembling ivory. It is easily worked, is like boxwood, and would be of great value for wood carving or delicate turnery work. Another similar wood is Tolotio, which is either *Kleinhovia hospita*, Lin., or would seem to be allied to the genera *Nauclea* and *Blackwellia.*

Toulimoe, a fruit tree of Gorontalo, has a straw colored veined wood, with fine undulated fiber. It is knotty and not easily worked, but seems fit for turnery.

Doenata (*Glochidion molle*, Bl.).—This is another tree of Gorontalo, about eighteen feet high by eight inches diameter, which has a fine, compact, straw colored wood, well fitted for wood carving and turnery work.

Doedock (*Pemphis acidula*, Forst.) is a small tree growing on the sea coasts, with wood of a fine solid texture, brown color and velvety luster. It is knotty, but fit for turners' work.

Glingsem (*Blackwellia tomentosa*, Vent.) grows in Central Java. The inner wood is of a lustrous brown with glossy spots. It is compact and heavy, and much used for turnery work.

Kajoe-fanasa, an undefined tree growing in the Arru Islands, south of New Guinea, has a satiny yellow wood, hard, fine grain, fit for turnery purposes.

Kemoening (*Murrya paniculata*, Dec.) is much valued by turners.

Lameh (*Alstonia spathulata*, Bl.) grows in the mountain regions of Preangan, Java. The wood is clear, dense, with pure grain, works well, and is used in Europe for carving.

The Letterwood of Amboyna has a close resemblance to that of Guiana, and is probably a variety of *Brosimum Aubletti.*

Deamoedjoe (*Podocarpus cupressina*, R. Br.) is found in the higher regions of Preangan. The wood being light colored, and of a pure grain, is much valued for technical purposes, especially for wood carving.

Djoengkiel (*Celtis reticulata*, Torr.), found in the west of Java, has a firm and solid wood, which is useful for different technical purposes.

Before concluding these few notes, it may be added that the wood of the Gummarium, genus *Ignotium*, of Brazil, is said to be an excellent substitute for box for wood engraving.—*Journal of Applied Science.*

Cultivation of the Sunflower as a Protection against Malaria.

On this subject we have received from a correspondent a communication which, containing no facts that are not already familiar to the public, we deem unnecessary to publish.

However, for the benefit of those persons who may still be cultivating the unsightly sunflower, under the impression that it really possesses some hidden power to ward off malaria, we may state that this notion was long ago exploded, and now ranks only with such remedial absurdities as the carrying about in the pockets of horsechestnuts and potatoes as prophylactics of rheumatism, or the equally ludicrous one of basking in light that streams through "blue glass."

Notwithstanding the romance attached to its origin by mythology, it is about as coarse, ugly, and useless a plant as we know. With nothing about it to please the eye, with no medicinal qualities whatever to give it value, the only possible economic use to which it can be put is that of cultivation for the sake of an oil that its seeds yield. But whatever value it might have for this purpose is more than counterbalanced by the positive injury it does to the soil, for it is well known as an insatiable consumer of potash, and would rapidly exhaust any land of this already too scarce salt, and hence render it unproductive. The proper place, then, for this unpromising exotic is where we chiefly find it—the gardens of rural districts, in which it is often planted to hide objects that have the misfortune to be still more unsightly.

As regards the *eucalyptus*, which our correspondent incidentally mentions, we believe it is not generally held by scientists that the mere presence of the growing tree in any district will prevent the occurrence of malaria, but that its value as a remedial agent depends on the presence in its leaves and bark of a resin and alkaloid (in considerable quantity), that have been found to possess all the febrifuge qualities of cinchona and its derivatives.

NORWAY will send to the Paris Exhibition some fish skins tanned for gloves, eel skins prepared for harness, shark skins over 10 feet long and 3 wide, and whale skins nearly 60 feet long, for driving bands.

PROFESSOR SIR WYVILLE THOMSON has been created a Knight of the Royal Order of the Polar Star by the King of Sweden.

Inventions Patented in England by Americans.

From December 18 to December 28, inclusive.

BERTHS.—Chas. Emery, Boston, Mass.
BOXES FOR TOBACCO, ETC.—W. L. Hubbell *et al.*, New York city.
BRAKE MECHANISM.—A. F. Gue *et al.*, Boston, Mass.
CABINET DESK.—Joseph A. Moore, Indianapolis, Ind.
CAR COUPLING.—Frank Gibford, Newton, Iowa.
DRAFT REGULATOR.—R. F. Hyde, Springfield, Mass.
FARE CHECK.—Geo. Beadle, Syracuse, N. Y.
FIREARM.—D. B. Wesson, Springfield, Mass.
FURNACES FOR STEAM BOILERS.—R. K. McMurray, New York city.
GEOGRAPHICAL CLOCK.—W. A. Cates, Union, Oregon.
HOT AIR FURNACE.—W. F. Nast, St. Louis, Mo.
MAGNETO-ELECTRIC MACHINE.—Edward Weston, Newark, N. J.
PUNCHING AND SHEARING MACHINE.—David Brickner, New York city.
RAILWAY SWITCH AND SIGNAL.—Joseph S. Williams, Riverton, N. J.
REAPER AND GRAIN STRAW BINDER.—W. A. Wood, Hoosic Falls, N.Y.
SIREN FOG SIGNAL.—Felix Brown, New York city.
STEAM GENERATOR.—Chas. Tyson, Philadelphia, Pa.
TELEGRAPH CABLE.—David Brooks, Philadelphia, Pa.