ished. In gases the centrifugal force predominates and there is a constant tendency of the atoms to separate.

Mr. Walling exhibited drawings and models, and gave a mathematical demonstration of the stability of a system made up of atoms moving as described, and proposes to pursue further the investigation of the subject.

[For the Scientific American.]

BREAKAGE OF CAR WHEELS--THE CAUSES AND REMEDIES.

The subject of car wheels has not had the attention its importance demands, and so important is it to the public that many have thought a Government Inspector should be appointed to inspect every wheel before it is put in use. The lives of millions of our citizens are constantly in jeopardy while traveling over our railroads, and what may insure greater safety should receive the earnest attention of the National Government. If the inspection of boilers on steamboats is necessary, surely the same precaution is desirable in railroad trains.

Cast-iron wheels are so fully established in this country, that it is scarce worth while to attempt the introduction of wrought iron or any other kind of wheel, but what may improve the quality of wheels is worthy the attention of all railroad managers, car and locomotive builders. A proper chill on poor iron may insure a wheel under favorable circumstances to wear as long as a wheel made from iron of a better quality. If, however, any unusual strain comes on the wheel, the poorer iron may fail in the time of need, when the better iron would have withstood the shock. Cheap wheels seem to be more sought after than those of a better quality costing more. The best charcoal iron, remelted in a cupola, always deteriorates in quality. It becomes anthracite iron and assumes all the qualities of anthracite iron, and will rarely show a tenacity of over eighteen to twenty thousand pounds to the square inch. High tenacity, when the proper degree of mottle is maintained, will always produce the best wheel, as it not only has tensile strength but a greater degree of toughness. This has been fully demonstrated by General Rodman in the manufacture of his incomparable guns, which are unequalled by any other made in any part of the world.

To insure good wheels the tenacity should never be less than thirty thousand pounds to the square inch, and this without the iron being too high, so as to endanger brittleness. If an inspector would require this tenacity we would seldom hear of broken wheels. Car wheels, like carriage wheels, will wear out, and good wheels, if replaced in time, will generally insure against accidents. The same may be said of car axles. Hammered axles are better than rolled axles, and yet rolled axles are coming into general use because they can be made cheaper. Let us have Government Inspectors for each, and greater safety will be the result.

Cold-blast charcoal iron is best for both car wheels and axles, and yet but little is used by the manufacturers of car wheels. Many of the manufacturers of wheels are interested in furnaces which are hot blast because the yield is greater with hot than with cold blast.

Charcoal iron remelted in reverberatory furnaces, if not permitted to become too high, will not deteriorate in quality, but Nos. 1 and 2 pig will improve in strength till it reaches No. 3, after which it deteriorates.

Some car-wheel manufacturers mix anthracite iron with charcoal iron in their wheels. Anthracite iron is usually much poorer in quality, and never uniform, and the practice should be discountenanced and condemned.

Castings from reverberatory furnaces are always superior in strength and toughness to those made from cupolas, and machinery castings, chilled or sand rolls, and car, wheels, should only be made from iron remelted in reverberatory furnaces. MULHOLLAN.

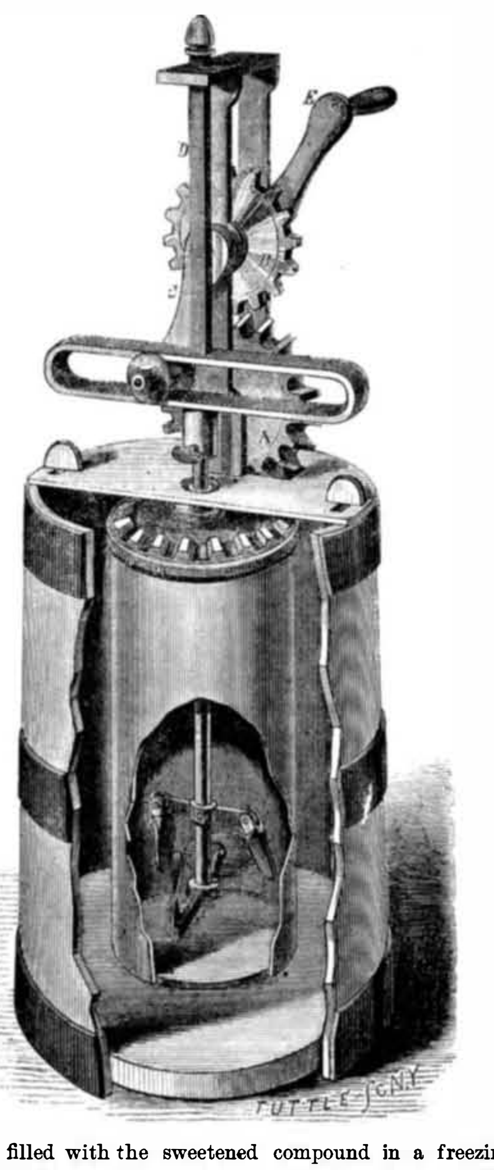
[Mr. H. C. Luce, of Jersey City, N. J., has addressed to *Engineering* a temperate, matter-of-fact statement of the case of the American car wheel, neither claiming nor admitting more than is reasonable. He says that the best American wheels sometimes break, and sometimes wear out in a few months; and yet, if made from good iron and treated properly, are the best wheels in use. He puts down the average wear under large business, at two years in passenger traffic and from three to seven years in freight. It is estimated that 25 per cent of the best wheels will fail in the first year in one way or another: the remainder will run for very various periods beyond the above average; sometimes as high as fifteen years. —EDS.

Proscription of Merit.

The only point upon which the English railway managers stood out against the demands of their locomotive hands, appears to have been that of uniformity of wages and uniformity of promotion. The motive to this demand is obvious. The meritorious hands to whom more than average wages or promotion had been accorded were of course a minority. The others could conceive of no reason but favoritism for any one being preferred above themselves, and being the majority were able to vote as the sense of the Union that all discriminations would be in practice controlled by favoritism, and ought to be abolished; so that long and faithful service, skill, care and courage should be qualities henceforth of no use to the possessor, but a free gift to the employers and the public. The obvious interest of the payers of wages would be potent enough to secure a valuable equivalent for extra pay in general, although favoritism might sometimes succeed in defeating that object; and a system of merit records to determine promotion and exclude favoritism might easily be arranged if the argument were sincere. But so long as excellence *is* excellence—*i. e.*, the exception and not the rule—for first-rate men in any craft to submit themselves to the dictation of a majority in trade matters, is equivalent to surrendering their well-earned rank and its just rewards to the envy of their inferiors. Wherever merit "wont pay," universal deterioration and loss of prosperity must follow, and the last state of that craft will be worse than the first. It ought to be a fundamental and unalterable part of the constitution of every trade association, for their own permanent advantage, that no check shall be imposed upon individual promotion or pay.

LIPP'S ICE CREAM FREEZER.

The process of procuring that delicious compound for summer weather, known so favorably as ice cream, is sufficiently familiar to all. It is merely the thorough and even freezing of eggs, milk, and sugar, so that the mass shall be of the same consistency, without lumps and perfectly homogeneous. On the even freezing of the mixture much of the delicacy of flavor and satisfactory results depend. We have known good ice cream produced by simply turning an ordinary covered



tin pail filled with the sweetened compound in a freezing mixture of ice and salt in a common tub, but it was a labor requiring time, elbow grease, and patience. We give an engraving of a machine intended to shorten the time, reduce the amount of labor, and secure superior results.

In this machine the ordinary shaped ice receptacle is used, inside of which is a can which rests and turns upon a stud and step, one on the can bottom and the other on the ice tank. By means of a bevel gear which forms the top of the cream can, to which it is secured by a simple clamp, the can is rotated by a crank on the horizontal shaft which carries the gear, A, that meshes into that on the top of the can. The upper gear, B, also engages with A and gives motion, when so engaged, to the crank, C, and by a roll sliding in the horizontal loop, to the dasher shaft, by means of the guide, D, in a reciprocating, vertical movement. This dasher shaft has two arms, the lower one carrying a fixed curved scraper and a curved disk pivoted to the cross bar, while the upper one has two spoon shaped scrapers which assist in removing the frozen cream from the inner circumference of the can and throwing it toward the center. The times of motion between the revolving cream can and the upward and downward movement of the dasher shaft with its appendages are so arranged that they are not in unison, and consequently the contents of the cream receptacle will be removed from the sides as fast as frozen and sent to the center, while that in the center, not exposed to the freezing mixture, will be thrown by the centrifugal force of the revolutions of the can to the outside. The crank, E, can be placed on either shaft to revolve the can alone, or to give the vertical reciprocating motion to the dasher shaft. For this purpose the gear, B, is made to be shifted from a feather or fixed key on its shaft to a smooth place where the turning of the shaft will not affect it. It may therefore be used to raise and lower the dasher shaft or not, as may be required, or slipped into and out of gear to suit the progress of the work.

This improvement was patented through the Scientific American Patent Agency, February 26, 1867, by Lewis A. Lipp, whom address at Coatesville, Pa.

MAGNESIUM LIGHT is introduced into the human mouth in dentistry with great advantage, enabling operations to be performed at all hours, better than by the light of day.

Correspondence.

The Editors are not responsible for the opinions expressed by their correspondents.

The Philosophy of the Cracking of a Whip.

MESSRS. EDITORS:—In No. 16, Vol. XVI., April 20th, E. L. B. of N. Y. inquires "What is the explanation of the sound produced by the cracking of a whip." You reply, "The concussion of the lash with the air and the concussion of the air in closing up the vacuum left in the path of the lash. The sound produced by the concussion of air with air is illustrated by the whistling of a bullet."

Not so clear. Why is the report occasioned by the lash louder than the whistling of the bullet? The bullet is larger than the *end* of the lash—which produces the report. Is the vacuum or concussion less? A lash without a "cracker" *will not* make a loud report. A whipstock without a lash will produce a whistling sound.

Again, why the well known difference, if the lash has a silk thread instead of tow-string or other cracker? If the report is due solely to concussion and displacement of air, why the difference in sound produced by a lash tipped with metal and one tipped with silk thread? The metal as in the case of the bullet will make some sort of whistling sound. The cracker will make a loud report.

If you are cornered please "face the music" and let us have more light, for that is what we expect to get out of the SCIENTIFIC AMERICAN. T. M.

Allegheny City, Pa.

[The ordinary sensation of sound is dependent upon rapid movements or vibrations of the air. This motion of the air is always the result of impact or collision, either of air with air, or air with another substance. The striking of solid and liquid substances should only be considered an indirect cause of sound; for the immediate antecedent to the movement of the air is not the striking but the movement of the substances which results from it, and which movement by collision is directly communicated to the air. The ringing of a bell, therefore, may be looked on as a case of collision of a solid with air. If the cracking of a whip is not included in this theory, which is simply another way of stating our answer—we are cornered and will face the music. It may be complained by some who accept the theory that it does not sufficiently take account of the details of the case of the cracker. For such we add further explanation. The sharpness and loudness of the crack depend on the suddenness of the impact and the size of the cracker. A metal cracker, on account of its inertia, would interfere with the suddenness of the impact; its weight would act to stretch the elastic lash and so to ease off the motion. A silk cracker on the other hand has little inertia and is brought up suddenly at the greatest extension of the lash; moreover its greater bulk compared with metal or tow gives a greater volume of impact, and consequently of sound. A cracker for a given lash may be too heavy or too light, too large or two small, and for a given cracker a lash may be too long or too short, or too light or too heavy. There is a chance on this subject for a mathematician to write a book.—EDS.

A Correction.

MESSRS. EDITORS:—I have subscribed to your paper for many years, and seldom read a number without getting some new ideas to store away for future use. But do you not think you are getting careless in your replies to your correspondents, many of whom—mere tyros—esteem every opinion and rule of yours as an axiom and indisputable? In your last number you tell T. A. M., of N. J., to multiply the hight of a tank by the area, and divide by 144 when you mean 1728. Again, you tell him the area of a circle is its diameter multiplied by 3·1416 when you know that it is the "square of the radius," multiplied by that number, or more simply the square of the diameter by the fraction of 0.7854, which is the same thing. It would be absurd to accuse you of ignorance on such elementary matters, but very much harm may be done, as you well may conceive by this carelessness, especially when you take into consideration the class of your enquirers who have had little or no education.

[Our correspondent is somewhat severe, but he is perfectly correct. We do not pretend to infallibility, but we desire to be right in our replies to inquiries. In this case two answers became unaccountably and inextricably "mixed."—EDS.

Testing of Boilers.

A section of the new water tube boiler invented by Mr. J. Howard, the agricultural machine maker, of Bedford, Eng. was lately tested with a hydraulic pressure of 1200 pounds to the square inch. Every joint remained absolutely tight; yet one of the tubes was afterward disconnected and taken out in five minutes, and not over ten minutes were required for replacing it as before. *The Engineer* makes this incident the text for a discussion of the question of over-testing. It would seem that if anything could spoil a good boiler and prepare it for mischief, it might be this excessive test. It is a little like the old-fashioned hydraulic test for witches: if they floated they must be burned, if they sunk they must of course be drowned. Our contemporary opposes the usual plan of taking as a basis the maximum working pressure demanded, and calculating the proper test by multiplying it. It is recommended on the contrary, to take the calculated strength of the structure, and apply a test equal to say one third of what it ought by analogy to bear. The theoretical strength of the boiler is thus tested practically to one third of its extent: if not started by this, there is a margin of twice as much probable strength to resist any injury from the strain. Assuming the test point therefore as a safe point, the proper working pressure may be taken from that datum with any proper margin for further security.

Hints for Inventors on Steam Condensers.

MESSRS. EDITORS:—In the article under this caption, published Feb. 2d of this year, two important facts were presented, viz:—

(1.) That upon depriving water of the air incorporated with it—in other words, in distilling it—it is rendered incapable of ebullition, and upon converting it into steam in this condition it explodes with force.

(2.) That this explosion takes place not at the boiling point, but at 45° to 75° F. above it—generally at about 280° F., though frequently not under 300°.

Upon these data, well established by Donny, Tyndall, and other experimenters, it is assumed:—

(*a*.) Than if a condenser enforce or permit the escape of air from its vacuum, it should on the contrary provide for its impregnation with the "feed" to supply the loss and to preserve the normal status of the water.

(*b*.) That all gases, oils, etc., corrosive or explosive *per se*, or rendered such by combining with air, or each other, should be discharged, absorbed, or otherwise disposed of and disarmed.

If condensers are not constructed in subjection to the first principle (*a*) set forth, they increase the liability of boilers to burst, for they tend to exhaust the "feed" of its air, thus carrying the boiling point above its legitimate place and approximating it to that of explosion.

To illustrate: if upon trial, with the engine at rest, the pressure in the boiler is found to be only 30 lbs. to the square inch, while the temperature of the water stands above 241° F., say at 300°, the engineer should apprehend imminent danger, because it is evident that the heated liquid is nearly freed of air and may at any moment be converted into steam with destructive energy. The injection of cold water into the boiler at such a crisis would instantly precipitate the catastrophe.

In the face of these facts, every boiler, whether working with a condenser or without one, should have delicate and accurate instruments attached for registering two things, viz., the *pressure* of the contained steam and the *temperature* of the water under it. A thousand disasters charged to high pressure, unequal expansion and contraction, hot flues, gases, oil, etc., might thus be readily avoided, or traced home to their true cause.

The following table may be of use to novices or skeptics in conducting experiments in this direction entitled to confidence:—

PRESSURE AND TEMPERATURE OF STEAM.

Pressure in lbs. per sq. inch.	Corresponding temperature, F.	Pressure in lbs. per sq. inch.	Corresponding temperature, F.
15	212·8°	130	352·1°
30	231·6°	150	358·4°
45	276·4°	170	370·6°
60	295·6°	190	382·9°
75	311·2°	210	391·5°
90	324·3°	230	399·1°
110	339·2°		

From this table it may be observed that when the pressure is that of the atmosphere (15 lbs.) the temperature of the water is at about 212° F. It should however be borne in mind that these figures are not correct when the water is not quite pure. Thus if common salt be added, the boiling point, under the 15 lbs. aforesaid, ascends to 224° F.; if the liquid be saturated with nitrate of potash, it rises to 238°; if with chloride of calcium, to 264°, and so on.

Hence the importance of knowing the condition of the water used and of relieving it of impurities. Whatever carries the boiling point above its true level, under assigned pressure causes undue consumption of fuel and may provoke alarming consequences.

If condensers are not constructed in subordination to the second principle (*b*) laid down, the explosive and corrosive gases, oils, and other agents generated or introduced, may inflict serious injury by accumulation or combination and expose the boiler to convulsions or explosions. Hence full and effectual provisions should be made for ridding the vacuum of these facile and refractory elements and thus guaranteeing the purity of the feed water on the one hand and its integrity on the other.

From these considerations it would seem that inventors in this field should aim to produce condensers—

1st, Which free the steam of all obnoxious and explosive constituents, or which, by combining with each other or with air, may be rendered such.

2d, Which restore to it or the feed water the air lost from any cause, thus preserving the "feed" in a normal condition with respect to its constituents of air and water.

From these considerations it would also seem that manufacturers and others who make or use boilers or condensers should look well to their plan of construction and their system of operation, not only in contemplation of safety but of interest.

Have we boilers constructed with the *registers* noted attached?

Have we condensers built in conformity to the two principles above enunciated? SUGGESTOR.

A Simple Plan of Determining the Ordinates of Circles.

MESSRS. EDITORS:—A few days ago I was obliged to calculate the ordinates for a part of a circle of 500″ rad., the tangent taken as axis. By using the formula, $y = R - \sqrt{R^2 - x^2}$, I found:—

$x = 1''$; $2''$; $3''$; $4''$; $5''$; $6''$; $7''$; $8''$; $9''$......
$y = 0{\cdot}001''$; $0{\cdot}004''$; $0{\cdot}009''$; $0{\cdot}016''$; $0{\cdot}025''$; $0{\cdot}036''$; $0{\cdot}049''$; $0{\cdot}064''$; $0{\cdot}081''$... } No. 1.

the ordinates representing in the third decimal the squares of the numbers 1, 2, 3, 4, 5....with sufficient accuracy for abscissas not exceeding 25″.

It seems to me that this fact might come very handy to draftsmen and engineers generally for drawing parts of circles of large radii, because it is very easy to keep in mind the above progression. This progression, however, enables us to find by one single division the ordinates for circles of 4, 5, 10, 25, 50, 100, 125, and 250 rad., no matter whether inches, feet, or yards—abscissas and ordinates being of the same unit respectively.

Suppose the ordinates for a circle of 125′ rad. are wanted: 125 is the fourth part of 500—thus we find by dividing progression No. 1 by 4:—

$x = \frac{1}{4}'$; $\frac{1}{2}'$; $\frac{3}{4}'$; $1'$; $1\frac{1}{4}'$; $1\frac{1}{2}'$; $1\frac{3}{4}'$......
$y = 0{\cdot}00025'$; $0{\cdot}001'$; $0{\cdot}00225'$; $0{\cdot}004'$; $0{\cdot}00625'$; $0{\cdot}009'$; $0{\cdot}01225'$... etc.

If we do not mind the trouble of a single division and following multiplication, we are able to find also the ordinates for 6, 8, 9, 12, 14, 15, 16, 18, 21, 22, 24....radius.

For instance, the ordinates for a circle of 24′ rad. would be calculated thus:—We have to calculate first the ordinates for a radius of 4′ by dividing the progression No. 1 by 125 (or multiplying it by $\frac{8}{1000} = 0{\cdot}008$:—

$x = 0{\cdot}008'$; $0{\cdot}016'$; $0{\cdot}024'$........
$y = 0{\cdot}000008'$; $0{\cdot}000032'$; $0{\cdot}000072'$.....

If we multiply these figures by 6, the result will be the ordinates for 24′ radius:—

$x = 0{\cdot}048'$; $0{\cdot}096'$; $0{\cdot}144'$........
$y = 0{\cdot}000048'$; $0{\cdot}000192'$; $0{\cdot}000432'$.....

It is easy to understand that we must choose the abscissas according to the scale used and the purpose the curve is drawn for. It would be sufficient in the last case (24′ rad.) to take from progression No. 1 only $x = 3'$; 6′; 9′; 12′, etc., because $x = 3'$ is the first abscissa which corresponds with an ordinate measurable by the aid of dividers.

A. HARDT, Draftsman P. & E. R. R.

Williamsport, Pa.

The Grammatical Problem.

MESSRS. EDITORS:—It is an exceedingly rare thing to find in your paper any statement on which a question can be raised, but in your issue of March 30th, under the head of "A Grammatical Problem," you imply that the apostrophe and s in the possessive case of nouns is a contraction of the word "his." If this is so, how does the same form ('s) make also the possessive of nouns of the feminine gender, as well as the possessive plural which should be, on the same principle, a contraction of their? Does not the apostrophe denote the omission of the letter e of the old Anglo Saxon genitive case in es? The Anglo Saxon gives no authority making the possessive plural in the same way, but the English language finding a good form for the possessive singular adopts the same form for the possessive plural. The rule then for the formation of possessives becomes very simple; for the possessive singular add es to the nominative singular, which for compactness drops the e; for the possessive plural add es to the nominative plural, which for the same reason, drops the e, and to avoid the hissing sound of two s's coming together, drops also the final s. This explains why the apostrophe comes before s in the singular and after it in the plural, which has always been a puzzle to schoolboys. It also makes your ground perfectly tenable, that the s in possessive cases of nouns ending in a sibilant can be properly omitted. C. P. G.

Boston, Mass.

The Roman Numerals.

MESSRS EDITORS:—Being a constant reader as well as subscriber to your valuable hebdomadal, I was lately very much interested in the plausible theory given by one of your correspondents concerning the derivation of the numerals now in use from those of the Arabs.

Can you enlighten me as to the origin of the Roman numerals? We can readily understand the C and the M, the initial letters of the Latin words, *centum* and *mille*, but why should V represent five, and X ten? In Worcester's Dictionary we are told that the letter V was used to designate the number 5 "perhaps from its resemblance to an outspread hand." Will Shakespeare says, "Our fathers had no other book but the score and the tally, thou hast caused printing to be used." These primitive sticks or tallies, one of which was in the hands of the creditor, the other of the debtor, were cut or notched simultaneously so that they might tally together. Now, may it not have been that when the tally among the Romans was superseded by the arts of writing and printing, that the numerals notched on the sticks, one, two, three, four, then crossed by a diagonal line to denote five, may have been supposed to bear a resemblance to the letter V? Might not the X in the same manner have been suggested by the two diagonal lines of the tally. E. M. G.

Baltimore, Md.

THE GOLDEN HEGIRA.

At the date of the discovery of America the whole amount of gold in commercial Europe was estimated at $170,000,000. During the succeeding one hundred and twelve years the opening of new fields of supply added about $6,387,500,000, so that had there been no loss nor shipments, there should have been at the commencement of the present century $6,557,500,000 in the commercial world. If to this we add the enormous receipts from California and Australia developed in late years and the continued supplies drawn from the older fields, the statement will seem incredible that instead of accumulating, the stock of gold in Europe is actually on the decrease. The inquiry then naturally arises, what becomes of the precious metal?

In a paper read before the Polytechnic Association Dr. Stephens stated that of our annual gold product, full fifteen per cent is melted down for manufactures; thirty-five per cent goes to Europe; twenty-five per cent to Cuba; fifteen per cent to Brazil; five per cent direct to China, Japan, and the Indies; leaving but five per cent for circulation in this country. Of that which goes to Cuba, the West Indies, and Brazil, full fifty per cent finds its way to Europe, where, after deducting a large per centage used in manufacturing, four fifths of the remainder is exported to India. Here the transit of the precious metal is at an end. Here the supply, however vast, is absorbed and never returns to the civilized world.

The Orientals consume but little, while their productions have ever been in demand among the western nations. As mere recipients therefore, these nations have acquired the desire of accumulation and hoarding, a passion common alike to all classes among the Egyptians, Indians, Chinese and Persians. A French economist states that in his opinion the former nation alone hide away $20,000,000 of gold and silver annually, and the present Emperor of Morocco is reported as so addicted to this avaricious mania that he has filled seventeen large chambers with the precious metals. The passion of princes, it is not surprising that the same spirit is shared by their subjects, and it is in this predilection that we discover the solution of the problem as to the ultimate disposition of the precious metals. This absorbtion by the Eastern nations has been uninterruptedly going on since the most remote historical period. According to Pliny, $100,000,000 in gold was in his days annually exported to the East. The balance of trade in favor of these nations is now given as $80,000,000 annually.

Actual loss to the world, to a great amount, is yearly caused by sinking in the ocean, and in some of the processes employed in the arts, as plating and gilding. In concluding, an estimate concerning the actual loss of coin in circulation by abrasion may be proper. In a report made by the director of the United States mint a few years since, is given the following results of some careful and comprehensive experiments made at the mint to ascertain this loss, showing that waste of gold and silver by this cause has been generally greatly overestimated. "On our silver coins taken promiscuously the average amount of loss from abrasion was ascertained to be one part in 6·30, while the gold coins tested seperately showed an average loss on the half-eagle of one part in 3550; the double eagle one in 9000; and a careful estimate as to the proportions of the various sizes of coins actually in circulation in the United States, made of two metals, led to the conviction that the yearly loss does not exceed one part in 2,400."

Life-Saving Inventions.

The session of the Board of Commissioners, appointed under the authority of the Secretary of the Treasury, to examine in to the merits of inventions of a life-saving character, seems likely to be quite a protracted one. About three hundred inventions have been registered for examination, but a small proportion of that number have as yet been put to a practical test. Having, however, now thoroughly systemized their labors, the work will be pushed forward with greater speed. All the inventions presented for examination have been ranked under the following classes:—

1. Boilers, safety valves, steam and water gages, anti-incrustators, steam pumps and siphons, hose and hose couplings, fusible alloys.

2. Life boats and rafts, detaching gear, lowering apparatus and life preservers.

3. Steering apparatus, drags, windlasses and capstans.

4. Fog signals, signal lights, devices for reefing top sails, and nautical instruments of all kinds.

Under a fifth division are classed all other life-saving inventions not specially included in either of the foregoing. The first section has been disposed of and the Board are at present engaged in testing the numerous devices of disengaging tackle.

The Commissioners consist of the following gentlemen: Joseph Cragg, Local Inspector of Steamers, district of Baltimore, Md.; Supervising Inspectors—Asaph S. Bemis, Ninth district, Buffalo, N. Y.; Alfred Guthrie, eighth district, Chicago, Ill.; J. V. Guthrie, sixth district, Louisville, Ky.; William Rogers, tenth district, New Orleans, La.; Col. Chas. L. Stephenson, fifth district, Galena, Ill.; John M. Weeks, Local Inspector, district of New York,; Capt. Wm. M. Mew, General Superintendent of Steam Inspection. A. S. Bemis, esq., is President, and M. A. Clancy, Esq., Secretary.

Coal Oil as a Lubricator.

D. W. S. of St. Louis says: "I have found after three years' use of an article styled in the market 'lubricating oil,' which costs here fifty cents per gallon, that it answers my purpose quite as well as lard oil. Our machinery runs very fast, from 1,000 to 4,000 revolutions per minute, and I find the bearings to be in a better condition than when we used lard oil. At first we were not successful in procuring a good article."

Our correspondent asks where menhaden oil can be obtained. This is not the first inquiry we have had for this oil, and the manufacturers would do well to advertise it. It is manufactured extensively on Long Island, but we cannot give the name of any party engaged in its sale.

ALLOY FOR HARD TOOLS AND BELLS.—20 parts iron turnings or tin waste, 80 steel, 4 manganese, and 4 borax. To increase the tenacity, the proportions may be varied and two or three parts wolfram may be added.

THE TRADES OF FRANCE are to be represented at the Exposition by delegates both male and female, elected by their constituents. Every working man and woman of Paris is to be allowed one free admission.

PRODUCTION OF ANILINE.—By adding to nitro-benzole an acid solution of chloride of tin, a strong reaction is obtained in a few moments, great heat is evolved and aniline is produced.