degree of resistance that could be attained with considerable quantities of copper present. Nos. 3 and 6 were substantially of the same resistivity but No. 3 was more sluggish in pouring. Very little difference could be detected between Nos. 5 and 6, hence the latter was taken as a basis for further experiments. It was evident from the impossibility of securing perfect cast material from No. 6 that a study must be made of purging agents to clear the bath of oxides and dissolved gases. Aluminum could be used to advantage in this regard while at the same time the resistance to the acids was slightly increased. Tungsten was a slight further aid and manganese up to an amount equaling 1 per cent. did not appreciably augment the solubility factor. Other deoxidizers and denitrifiers in various forms were used, such as boron, silicon, titanium and vanadium—the effect of the last one, seemingly, to increase the solubility. The others in fractional percentages were effective both in improving the resistivity and the texture as well. The average range of values employed was approximately as follows:

TABLE III.—SHOWING COMPOSITION OF ACID RESISTANT ALLOY.

Ni	66.6
Cr	18.0
Cu	8.5
W	3.3
Al	2.0
Mn	1.0
Ti	0.2
B	0.2
Si	0.2
	100.0

Not all of the difficulties of casting the material have been eliminated by any means. In proportion as the texture and soundness have been improved upon, the difficulties connected with casting the material have increased. The contraction of the metal at the moment of solidification is very pronounced and shrinkage cracks are very likely to occur. However, these difficulties are chiefly physical and mechanical and in each specific condition they can doubtless be finally overcome. The alloy draws into wire and spins readily and may have numerous interesting applications.

As a method for more precisely measuring the acid resistance of the material, test pieces were prepared having an easily determined superficial area. These pieces were subjected to $4N$ HNO_3 and in mixtures of nitric and sulphuric acids of similar concentration, for 24 hours at room temperature. The loss in weight was calculated to a unit area of 100 sq. cm. per hour. The comparative values are given in Table IV.

The various melts differed slightly in composition, the attempt being made to determine the limits of certain ingredients, especially manganese, copper and aluminum. The best results were obtained with compositions conforming most nearly to the values given in Table III. The solubility in sulphuric acid was found to be as a rule no greater than in nitric acid, hence, the solubility tests were made on mixtures of the two instead of upon the sulphuric acid alone.

Very few tests on hydrochloric acid were made. As a rule the solubility of this type of alloy is considerably

TABLE IV.—SHOWING LOSS IN MILLIGRAMS PER 100 SQ. CM. PER HOUR.

NUMBER OF MELT.	$4N HNO_3$. mg.	$4N H_2SO_4$ mg.	$4N HCl$. mg.	1 vol. $4N HNO_3$. 2 vol. $4N H_2SO_4$. mg.
23	0.03			1.95
	0.03	0.79	1.95	1.98
	0.50			
	0.06			
25	0.19			0.0
	0.08			0.17
40	0.4		1.10	0.09
	0.3		1.30	0.10
				1.00
54	0.3		3.70	0.8
60	0.2		1.95	4.8
	0.4		2.05	5.2
64	2.0		2.70	0.3
	1.85			0.2

greater in hydrochloric acid than in nitric or sulphuric acids.[1] Indeed, a study of the various properties of the material up to the present time has been preliminary and largely qualitative. The detailed examination on structure, solubilities, physical and electrolytic properties has been deferred until a practicable or workable alloy could be obtained. This has now been accomplished in a very satisfactory manner and further work as above indicated will be continued. As illustrating the practical value of the alloy a calorimeter bomb was constructed and has already served for heat determinations upon an extended series consisting of sugar, benzoic acid, ethyl-benzene and coals. The pressures employed have ranged from 25–50 atmospheres and charges of material up to $1^1/_2$ grams have been used. The results are all that could be desired. An illustration of the cap or cover to the bomb was given in my article published in THIS JOURNAL, page 746. The interior surface which comes in contact with the corroding gases retains its polish and luster without any evidence of chemical action. The details of the behavior of the alloy in this apparatus were given in a paper entitled "Some Tests on a New Calorimeter Bomb," by Dr. R. H. Jesse, Jr., THIS JOURNAL, page 748.

UNIVERSITY OF ILLINOIS,
URBANA.

MODIFIED BUNSEN VALVE.

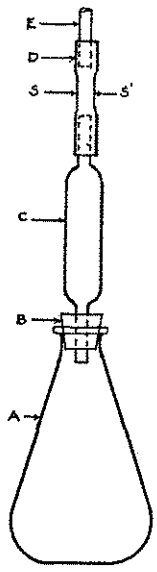
By LESLIE RUSSELL MILFORD.

Received August 12, 1912.

In making analyses of total iron, the following scheme has been adopted by the author in working on the Saratoga Mineral Waters. When reducing the ferric compounds to ferrous, by means of nascent hydrogen, an Erlenmeyer flask with a Bunsen valve attachment has been used. The accompanying cut shows at a glance the modification which has been satisfactory.

A, Erlenmeyer flask.
B, Cork.
C, Bulb cut from 10 cc. pipette.
D, Rubber tubing.
E, Glass plug.
SS′, Slits for valve.

[1] "Stellite," a cobalt-chrome alloy described by E. Haynes, THIS JOURNAL **2**, 397 (1910), shows a solubility under the same conditions of 17 milligrams per 100 sq. cm.



Instead of an ordinary straight piece of glass tubing a bulb, C, from a discarded 10 cc. pipette is used, one end of which is inserted into the cork B, projecting just below the surface into the Erlenmeyer flask A; to the other end is joined a piece of rubber tubing, D, carrying a glass plug, E.

The ferric solution to be reduced is put into the Erlenmeyer flask, dilute sulphuric acid and zinc dust are added and the flask is then placed on the steam bath. The nascent hydrogen produced by the action of the acid on the zinc reduces the iron rapidly. When all of the zinc is in solution the flask is taken from the bath, placed on a wire gauze and the contents are brought to boiling so as to eliminate any hydrogen in the flask as this would decompose the $KMnO_4$ solution when added. It is at this point that the improved valve works to advantage. The steam in escaping expands in the 10 cc. bulb, condenses and runs back into the flask. This eliminates the excess pressure and blowing out of the stopper. After thorough boiling, the flask is taken from the gauze, the stopper removed, the sides washed down, and a very little C. P. $NaHCO_3$ is dropped into the flask to generate an atmosphere of CO_2. The solution is then titrated with standard $KMnO_4$.

STATE HYGIENIC LABORATORY,
ALBANY, N. Y.

A SIMPLE FORM OF LABORATORY SUPPORT.

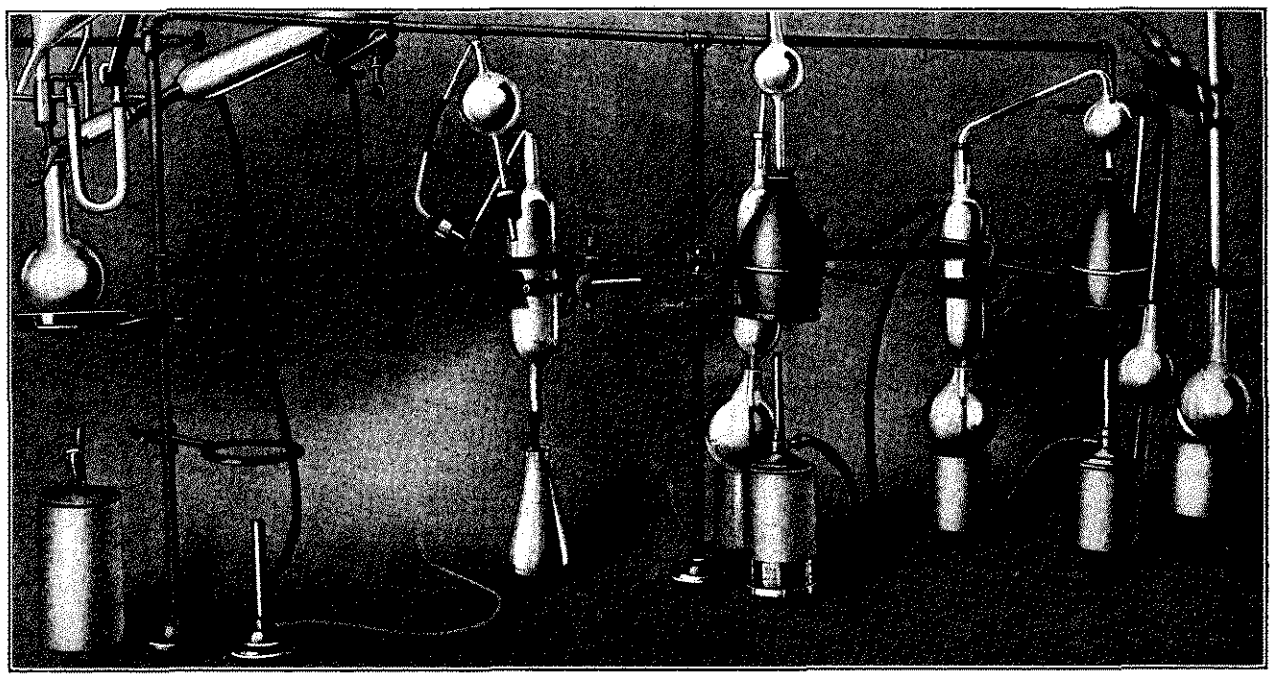
By T. LINSEY CROSSLEY.

Received August 21, 1912.

The accompanying illustration shows a form of support for apparatus which has been found very useful in this laboratory.

It consists of $^3/_8$ inch rod and pipe fittings. The footing pieces are screwed into round plates and fastened to the bench. The size of rod is such as to suit the usual retort stand fittings. It has the advantages of lightness, firmness, adaptability, and cheapness. It does away with the heavy undergrowth of retort stand footing.

Any pipe fitter can make such apparatus very quickly. Other forms and uses will readily suggest themselves. The apparatus shown is carrying three vertical condensers and apparatus for Kjeldahl distillations, a Liebig condenser and a Jones reductor, with space for other work, taking the place of five retort stands and several tripods with their accompanying risk of breakage.



MONTREAL, QUEBEC.

OBITUARIES

MORRIS LOEB.[1]

Morris Loeb, President of the Chemists' Club of New York City, died at Seabright, New Jersey, October 8, 1912, from typhoid fever and double pneumonia, after an illness of eighteen days. He was born in Cincinnati, Ohio, May 23, 1863.

Morris Loeb was a man in speaking of whom I wish I might have had time to choose my words with more deliberation. His nature showed itself always in such a refinement as to command its tracing only with the most delicate touch. Tender

[1] Presented at the October meeting of the New York Section of the American Chemical Society.