

within each other by pressure, instead of upon each other, as with the ordinary form of spiral spring, having thereby greater extent of motion.

By arranging the springs in screws one above the other with plates between each screw, will allow the use of short, stiff springs if desired, without loss of motion, as that may be obtained by additional tiers to make up the difference for the shortening the spring. His object in having slides on the side of the case or box, is to allow the ready examination, and if necessary, the removal of any of the springs, thereby saving time and trouble.

The Committee also exhibited a Gas Carburetter invented by Mr. U. B. Vidal.

Mr. V. proposed by the use of his apparatus to force the gas through coal oil, by which the illuminating power will be increased, the gas becoming saturated with the oil, which at the same time will act as a regulator to the flow of gas.

The case is supplied with oil to about one-third of its capacity, the gas is let on, the pressure of which raises the cup until the holes around its lower edge reaches near the surface of the oil, when the gas passes through the oil, into the outside case to the burner. As the gas is consumed, the cup rises and falls in regular motion, fast or slow, according to the pressure of the gas.

Annual Report of the Board of Managers, for the Year 1864.

In accordance with the By-Laws, the Board of Managers presents its Annual Report of the condition of the affairs of the Institute.

At its stated meeting in March last, upon the recommendation of the Board, the Institute caused an application to be made to the Legislature for such amendments to its Charter as would permit an extension of its scope and powers. This Charter was granted by the Legislature in April of last year, was approved and signed by the Governor on the 25th of the same month, and duly accepted by the Institute in the month following. The Charter thus granted permits the issue of Capital Stock and gives considerable latitude in the details of its organization, so that such alterations may be made from time to time as may appear to be expedient.

At the stated meeting held in June, the new Charter having been accepted, a set of By-Laws was adopted, which, among other changes provides for the transfer to the Board of Managers of the power hitherto exercised by the Institute in conducting its business affairs; the substitution of a resident Secretary, under compensation, to take charge of its library, scientific affairs, and correspondence, instead of the two Secretaries hitherto elected: and the election of all officers except the President, Secretary, and Treasurer, for three years, one-third being elected annually, thus giving a more permanent character to the policy of the Institute.

The present condition of the manufacturing interests of our City, which by their development have advanced her to the front rank of manufacturing localities in the country, renders the establishment of such an Institution as the Franklin Institute on a permanent basis an

imperative necessity. To the well directed efforts of this Institute in past years much of this development is due, but the agencies by which it has worked hitherto, must, in some measure, be replaced by others more suited to the wants of the times, and in some respects, be made more practically useful.

Our library, already valuable in scientific works, and enriched by the collection of British Patents, requires enlargement and classification. More departments should be added to it, each of which, as well as each existing department should be increased by adding such works and periodicals as are required to keep its readers informed in the improvements and discoveries of the day. In this connexion it becomes a subject of interest to determine, whether great advantage might not be derived from such extension of its library as will include standard works not scientific in their character; by thus providing for the literary wants of members, a resort to other libraries would be unnecessary, and our own would become more attractive.

To our lectures on Mechanics and Chemistry, should be added others on subjects connected with their application to the arts.

The building now occupied has become inadequate to our purpose, and if longer used will require alterations so that its rooms may be more comfortable and attractive, as well as more suitable to the purposes for which they are used.

The stated meetings held monthly, might be made far more instructive by the presentation thereof of written papers on subjects connected with the practical arts, and discussions thereon. Steps have already been taken for this purpose; the meeting, being no longer in great measure devoted to the details of conducting the affairs of the Institute, more time is left for scientific discussion; and in December last the first of a series of papers was read on an important subject, that of Photo-lithography. It is believed that persons thus, familiar with the construction of great works in engineering or architecture, and with important processes of the arts, as well as those who may make discoveries in science, will find a suitable place and time for bringing them to public notice, and not only add to the general stock of knowledge, but by a comparison of views enlarge the minds of our members and lead to other discoveries and improvements. The additional interest thus created in the meetings, would render it desirable to hold them in the lecture room, thus avoiding any disturbance to those using the library.

The election of a suitable resident Secretary, whose presence at the Hall will render it always attractive to scientific or practical men, who will intelligently classify its library and see that it is supplied with the most valuable or recent works; who will select from domestic and foreign journals, each month, such valuable hints or descriptions as may be of general interest and who at the stated meeting will share this knowledge with the members, will, it is believed, modify the character of the Institute, making it more useful to its members in their business life, and more a place of resort to them, as the Exchange is to the merchant.

To carry out the improvements already indicated, as well as others which may suggest themselves, requires an expenditure far greater than the Institute, in its present condition, having upon its list many members who have ceased to contribute to its support, since it has ceased to hold exhibitions; and encumbered with a large debt and accumulated interest, the result of an unfortunate effort to advance its position many years ago, is able to carry out. Hence the necessity of enlarging its income, which we believe will be accomplished by the issue of the Stock.

This stock, to the amount of six thousand shares, of a par value of ten dollars each, represents the entire property of the Institute. Its security is good, because that property would bring in the market more than the entire amount of indebtedness. It is of two classes. The First Class, not registered for use, pays no annual fee and may be held to any amount by a single individual. It may, however, be converted into single shares of registered stock, (Second Class) when it becomes liable to an annual tax of three dollars per share. The annual fee for membership having been raised (from necessity) to five dollars, it is not only cheaper to hold a share, but the holder of the share has an ownership in the Institute while he enjoys every privilege of membership. The holder of ten shares not registered for use, enjoys the privileges of membership, and pays no annual fee. He is thus in all respects on a par with life members paying fifty dollars, with the additional advantage of bequeathing this privilege to his survivors or of assigning it to another.

It affords the Board much pleasure to state that by the efforts of individual members, nearly one-half of this stock has been subscribed in sums of 100 shares each by principal manufacturing houses and persons friendly to the arts, in this city; and they believe that a well directed effort on the part of their successors will result in the disposing of nearly all the balance of it in this way; so that a demand will immediately be created for the stock, by persons desirous of registering it for use.

The number of Life Members now on our list is 625, and of annual members in good standing 592, while about half as many more have their names still on the list but have not regularly paid their annual fees. During the past year 57 resignations have been accepted; 3 members have died; and 97 members have been elected; thus adding 37 to the membership. This result in the face of an increase of fees, is gratifying.

But it is hoped and believed that so soon as the efforts now making to re-organize the Institute shall have imparted to it increased vitality, and shall have shown the benefits it can confer, if conducted on an enlarged basis, our list of membership will be very greatly increased. Your Board believes that by its past history, and its past and present objects, the Franklin Institute has a just claim not only on Philadelphians, but on all who are benefited by the progress of the Mechanic Arts and especially on those who live by their exercise.

By the report of the Treasurer it will be seen that the receipts during the past year have been as follows:—

Balance in the Treasury, January 1st, 1864,	.	\$ 667-81
Receipts during the year,	.	9098-78
		<hr/>
		\$ 9766-59

And the expenditures have been, . . . 9455.68

Leaving a balance in the Treasury of	\$ 310.91
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And that the indebtedness of the Institute is as follows:—

	Principal.	Interest accumulated.
5 per cent. Loan,	13,650	4817-50
6 " "	4295	381-26
Mortgages,	7000	210-00
Temporary Loan,	500	110-50
	<u>\$ 25,445</u>	<u>\$ 5519-26</u>

Total loan and Interest \$30,964.26

Annual interest payable on 5 per cent. Loan,	\$ 682-50
" " " " " "	257-70
" Mortgages,	420-00
" Temporary Loan,	30-00
Total,	<u>\$ 1390-20</u>

It is believed that an earnest effort to induce persons holding certificates of loan, to relinquish them in exchange for the stock of the Institute at par, would result in the sale of a considerable amount of stock and correspondingly reduce the liabilities of the Institute.

The Journal of the Institute, conducted since its foundation and now numbering 78 volumes, is still published monthly, and is a valuable record of the inventions and discoveries of the times. Its publication results in a small pecuniary loss to the Institute, but when its indirect value in the foreign and domestic exchanges is considered, this loss disappears.

During the past year the principal subjects of investigation have been, The adoption of a uniform standard of screw threads, bolt heads, and nuts for general use throughout the United States; and, A comparison of the results practically to be obtained by different measures of expansion of steam, to be determined by experiments now in progress in New York, under the auspices of the Navy Department, and conducted by a joint commission representing the Navy Department, the National Academy, and the Franklin Institute.

In conclusion, your Board would express the conviction that the changes now in progress, when fully consummated, will, with the hearty co-operation of the members of the Institute, be successful in enabling it to become a great instrument for good in the education of all classes in the mechanics and practical arts.

All of which is respectively submitted on behalf of the Board.

JAMES DOUGHERTY, *Chairman.*

A Comparison of some of the Meteorological Phenomena of JANUARY, 1865, with those of JANUARY, 1864, and of the same month for FOURTEEN years, at Phila., Pa.
 Barometer 60 feet above mean tide in the Delaware River. Latitude $39^{\circ} 57\frac{1}{2}'$ N.; Longitude $75^{\circ} 10\frac{1}{2}'$ W. from Greenwich. By J. A. KIRKPATRICK, A. M.

	January, 1865.	January, 1864.	January, for 14 years.
Thermometer—Highest—degree, .	51.00°	65.00°	65.00°
“ “ date, .	10th.	29th.	29th, 1864.
“ Warmest day—Mean, .	43.50	52.50	58.33
“ “ date, .	10th.	28th.	15th, 1863.
“ Lowest—degree, .	6.00	7.00	—5.50
“ “ date, .	28th.	2d.	23d, 1857.
“ Coldest day—Mean, .	12.83	12.00	—1.00
“ “ date, .	27th.	2d.	9th, 1856.
“ Mean daily oscillation, .	11.90	13.74	11.93
“ “ range, .	7.14	5.85	6.53
“ Means at 7 A. M., .	22.85	29.89	27.78
“ “ 2 P. M., .	29.90	37.48	35.27
“ “ 9 P. M., .	26.85	32.24	31.13
“ “ for the month, .	26.53	33.20	31.39
Barometer—Highest—Inches, .	30.315 in.	30.271 in.	30.704 in.
“ “ date, .	8th.	7th.	28th, 1853.
“ Greatest mean daily press. .	30.303	30.207	30.609
“ “ date, .	8th.	21st.	28th, 1853.
“ Lowest—Inches, .	29.141	29.257	28.911
“ “ date, .	7th.	19th.	23d, 1853.
“ Least mean daily press., .	29.402	29.347	29.086
“ “ date, .	10th.	19th.	23d, 1853.
“ Mean daily range, .	0.234	0.206	0.218
“ Means at 7 A. M., .	29.843	29.886	29.956
“ “ 2 P. M., .	29.795	29.847	29.915
“ “ 9 P. M., .	29.828	29.913	29.945
“ “ for the month, .	29.822	29.882	29.939
Force of Vapor—Greatest—Inches, .	0.347 in.	0.396 in.	0.505 in.
“ “ date, .	10th.	1st.	11th, 1858.
“ “ Least—Inches, .	.051	.025	.023
“ “ date, .	28th.	2d.	22d, 1857.
“ “ Means at 7 A. M., .	.106	.133	.133
“ “ 2 P. M., .	.114	.137	.150
“ “ 9 P. M., .	.119	.140	.145
“ “ for the month, .	.113	.137	.143
Relative Humidity—Greatest—per ct., .	96.0 per ct.	100.0 per ct.	100 per ct.
“ “ date, .	6th.	18th.	often.
“ “ Least—per ct., .	40.0	34.0	24.0
“ “ date, .	14th.	26th & 28th.	25th, 1860.
“ “ Means at 7 A. M., .	81.1	73.1	79.8
“ “ 2 P. M., .	65.3	57.8	67.9
“ “ 9 P. M., .	75.6	69.5	76.3
“ “ for the month, .	74.0	66.8	74.7
Clouds—Number of clear days,* .	9	13	8.9
“ “ cloudy days, .	22	18	22.1
“ Means of sky cov'd at 7 A. M. .	50.0 per c.	60.0 per c.	62.3 per c.
“ “ 2 P. M. .	65.8	52.9	63.0
“ “ 9 P. M. .	45.8	41.6	48.4
“ “ for the month, .	53.9	51.5	57.9
Rain and melted Snow—Amount, .	3.598 in.	1.878	3.263 in.
No. of days on which Rain or Snow fell, .	12.	10.	10.8
Prevailing Winds—Times in 1000, .	N69°56'W-331	N78°41'W-319	N61°41'W-319

*Sky, one-third or less covered at the hours of observation