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PREP

JUNIOR

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THE BOSTON
SCHOOL
B.S.

B. Alvord



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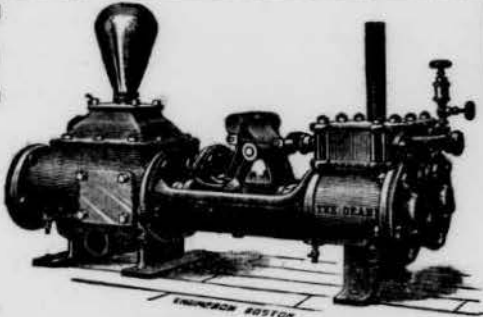
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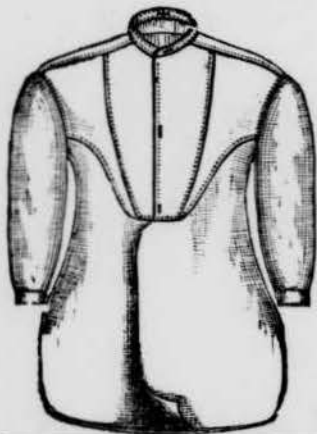
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"TIS hard to say, if greater want of skill
Appear in writing or in judging ill;
But of the two, less dang'rous is the offence,
To tire our patience, than mislead our sense.

* * * * *

Whoever thinks a faultless piece to see,
Thinks what ne'er was, nor is, nor e'er shall be."
—Pope.

ONCE again to all its friends the W P I sends greeting. Only three years ago the publishing of a school paper was but an experiment, now it is an established certainty. That Board of Editors which attempted this experiment could have had none of the confidence which comes to the present Board. Their minds were filled with doubts and fears for the success of their paper. We, too, have fears, but of a very different kind. They had a reputation

to establish; we have one to maintain. That we do not underestimate our task, our fears will testify.

In our editorial capacity we shall live "Not for ourselves, but for others." It will be your interests, the interests of the school, which we shall seek to promote. Our work will be yours to judge and to criticise, to praise or to condemn. If, when our work is done, we can know that it has been of some service, our reward will be ample.

PERHAPS it would be well to say a few words, especially to those of the Alumni who are interested in the athletics of the W. P. I., in regard to why we are to have no field-day this fall. It may be regarded by some as an indication of waning interest in general sports, but we do not consider it so at all, and trust that none of the graduates, who have marked the steady advance the Tech has made of late years in this direction, will be in the least troubled over its career in the future. The students this year seem more energetic than ever, but decided to have no regular field-day this fall for the following reasons:

As is very well known to the present members of the school, as well as to the members of '88, and possibly '87, the Athletic Association has been heavily in debt for a year or more, and as the Fall field-day very seldom pays for itself, it

was thought unwise to run any risk of increasing that indebtedness.

This was agreed to all the more readily as it was learned that the Y. M. C. A. gymnasium was to hold two field meetings this fall, in which our fellows were invited to take part, and thus get the same chance for practice that they would if we held the meetings ourselves. In this way we escape all pecuniary responsibility and at the same time can devote the greater part of our energies to foot ball, in which most of the interest is centred at this time.

OWING to the refusal of the Academy team to give us a game our Eleven was obliged to open the season with the game against the Harvard Varsity. This was rather unfortunate as but four of our men played on last year's team, but, although quite badly beaten in this game, when we consider who their opponents were, we think the work of our Eleven that day was very encouraging. It showed that they are not afraid to face a heavier team, and the manner in which they held, and in some instances drove back the Harvards, gives us strong hopes of their success against teams of their own weight.

We will not know before we go to press the result of the game at Hartford; but whether victorious or not, we trust the game will receive all the encouragement and support possible from the rest of the school. And about the best way to show this is to come out in good numbers every night, prepared to play, and thus give them practice. Practice is absolutely necessary, and, as Capt.

White said in his notice, which, by the way, we are afraid was not seen by all, "every able-bodied man at the Institute should feel it his duty to do all he can to help by playing on the second eleven." It was rather discouraging the first few weeks, when a second eleven was most needed, to have so many fellows around, while only six or seven would take hold and do anything. We hope and expect to see more of the right spirit manifested hereafter.

UNTIL the election of the present Board of Editors the several classes had each chosen the men who were to represent them on the W P I. Last Spring a change was made, and the election of new men on the editorial staff was made by the men then in charge of the paper.

With this change several others also were instituted. Up to this time the editors have held office for the term of one year, and, with the beginning of a new volume of the paper, an entire new board has come into office. This has made it very hard for the new men, as it is by no means an easy task to learn at once all the "tricks of the trade" necessary to the publishing of a college journal. From this time on an editor's term of office expires after the issuing of the March number in his senior year, though he may resign at any time.

Volume V. will begin with the April number, and after that the end of the year for the paper will be in March.

When the W T I was started it was regarded as the property of the school, and it was hoped that all the students would use its columns as a means of ex-

pressing their views on any questions of general interest. No constitution to define the duties, or govern the actions of the board of editors was adopted.

It was soon found that the labor of preparing the matter for its columns fell almost entirely upon the editors, and, as the work of publishing the paper became greater, and its circulation increased, the want of a constitution was felt. Accordingly last year's board drew up and adopted a constitution, which practically makes the W P I the property of its board of editors, and which establishes the changes which have been mentioned above.

This constitution will be printed, and bound with Vol. III. of the W P I, and this book will be left in the library at the institute, where it can be examined by any member of the school.

Although it has been found, as stated before, that the students have been very few who have contributed to the paper, yet the editors wish it understood, that its columns are still open to students and alumni, and you can hardly imagine how welcome your contributions will be.

ROUNDS IN THE LADDER.

EVERYONE wishes to succeed. Do we do all we can in order to succeed?

No better examples of success and the means necessary to obtain it can be found than the lives of many of the scientists, inventors and literary men.

Although it is action more than study which forms our characters, no study can be more profitable,—if we will only force ourselves to follow their example,—than the lives of men of this class.

Many will find in it something fascinating. There is something of romance in the self-denial, resoluteness and persistency with which these men carried out their ideas which appeals to our imagination. If we examine the lives of a few of this class we shall find the same traits of character prominent in each. Men who have obtained the greatest success have come from all classes and conditions of life. The day-laborers have given us Brindley the engineer; masons and bricklayers, Edwards and Telford; carpenters, John Hunter the physiologist. The life of John Hunter furnishes a good example of what can be accomplished by energy and intense application. He received little education until about twenty years of age and with difficulty learned to read and write. In early life he worked as a carpenter in Glasgow, but afterwards went to London to join his brother, who was a lecturer on anatomical subjects. He soon advanced beyond his brother in these subjects, partly by means of great natural ability, but mainly by his patient application and great industry. He was one of the first in Great Britain to devote himself to the study of anatomy, and it took an eminent professor ten years to arrange the objects he had dissected. The collection contains 20,000 specimens and is the best ever accumulated by one man. Hunter used to spend every morning from sunrise until eight o'clock in his museum; through the day he carried on his private practice, performed his duties as surgeon at the hospital and as deputy surgeon to the army; he delivered lectures and superintended a school of anatomy at his own house; he also

found time for experiments on the animal economy, and for writing works of great scientific importance. To find time to accomplish all this work he slept only four hours at night and an hour after dinner.

When asked how he obtained success in his undertakings, he replied, "My rule is, deliberately to consider, before I commence, whether the thing be practicable. If it be not practicable, I do not undertake it. If it be practicable, I can accomplish it if I give sufficient pains to it, and having begun I never stop till the thing is done. To this rule I owe all my success."

In the lives of all men who have obtained great results in any worthy undertaking we find displayed integrity, perseverance, energy, intense application, self-denial and self-reliance.

In like manner can we obtain success, in our school life, in our future work. It is the same now as ever before, the patient, industrious, oftentimes plodding student, although he may not outrank his classmates, will often reach far greater success in the actual struggle in life.

Everywhere, application, energy, and self-reliance are the passports to success. Where any difficult thing has been accomplished it has been done by a strong will and energetic application. "Nothing is denied to well directed labor; nothing is obtained without it." Great results must be obtained step by step. "To know how to wait is the great secret of success." To wait is not to remain idle, it is to do contentedly and well what we have at hand, devoting all our spare time and energy in those directions which will help us in our future course.

MY VACATION.

AS I look back over the few short weeks which formed my summer vacation, I see, spread out before me, as it were, a picture, which, although by no means a masterpiece to be admired by all, is, nevertheless, quite interesting and attractive to me.

To be sure the groundwork, and I may state here that there was a great deal of groundwork to some parts of it, is laid in rather dull and lifeless colors, but for this very reason, perhaps, the few bits of bright color which are included in the view, appear all the brighter and more full of life. For the most part it is a country scene, but in two distinct places I catch glimpses of the sea, with its boats and other attractions, and I rather think I enjoy looking at these the best of all.

I left Worcester directly after commencement day and spent the next three weeks, or so, at home, doing work enough to earn a little spending money and keep me out of mischief. Among other things I tried my hand at the mason's trade, and at last got so that I could mix very good mortar and cement—at least that is what the old Frenchman I worked with said—and could even pile up stones so skilfully that when I returned the next day I was moderately sure of finding them in their same relative positions. But perhaps my greatest achievement in this line was the wonderful manner in which I cleaned old bricks; everyone declaring that, but for the white appearance given them by the old mortar, they looked just as good as new. I also tried haying, grading and turfing

a lawn, digging, chopping, and other light exercises as I felt inclined. My only excitement during this period was taking half a dozen young boys to see Forepaugh's circus. I will not stop to describe all the wonderful things we saw that day, but the most wonderful to me, perhaps because I had always looked upon it as an impossibility, was how I managed to get three tickets for a dollar. It has puzzled me ever since.

Towards the end of July I accepted a place as cook on board the "Tech," a very seaworthy cat-boat of about 20 feet in length. My duties were not very onerous, as I found that the rest of the crew, the captain and the able-bodied seaman, preferred crackers, sandwiches, buns, etc., to anything which I could manufacture for them. A week was spent very pleasantly and profitably on board. We visited Onset, Mattapoissett, Fairhaven, New Bedford, Newport and Providence, and saw all we could of the different places in our limited time.

We spent a whole day in Newport, at the beach and taking the famous cliff walk, and I think we were all rather sorry when we had to leave such a beautiful place, where there is so much to be seen and done. We left at 4.30 the next morning and sailed till 9.15 at night, in the teeth of a northeaster, which was well filled with rain and wind, and which, of course, made sailing rather hard and disagreeable work. But we arrived safely at Onset again, and next morning I started for home to attend a church picnic at Lake Washacum. This, too, like the circus, I will simply mention, as I presume you all have attended

Sunday-school picnics, and this was about like the average.

The three or four weeks following the cruise I spent at home in a vain endeavor to have an exciting time, my only regular duty being an hour or so a day spent in teaching a few young boys how to use simple wood-working tools, usually followed by more or less practice in simple surgery. Every few days we would plan an excursion or picnic, but as the party usually consisted of but seven people, six of whom were of the gentler sex, they were rather monotonous to say the least. Therefore I used to always look forward to Saturday, partly because it put an end to the week, and partly because we had ball games every Saturday P. M., in which I was permitted to play second base. As a usual thing I played a very quiet game, but one day I remember, I attracted the attention of all. There happened to be three men on bases; the batter struck a low fly right into my hands (there were two men out already), I muffed it, but quickly picked it up and threw wild to first, clearing the bases. I shall never forget the applause which followed.

On August 20, owing to the fact that I had not been feeling well, I went to the shore, and, as usual, gained at once, under the influence of salt-water bathing and the general change of surroundings. I had a delightful time while there; played tennis considerably, went sailing and rowing, and attended several picnics and parties. But I was soon obliged to leave these pleasant scenes, and to return again to my home, where I spent a short time in making preparation to return to my school work, which began Sept. 1st.

ATHLETIC MEETING.

NEVER in the history of the W. P. I. has its athletic association experienced such an impetus, at least in a financial point of view, as it received upon the 17th of September last, when a scene occurred which must have made the denizens of the picture frames in Chapel aghast with amazement; for to a stranger the actions of some in that meeting would seem to indicate that they were inmates of such an institution as that which it is prophesied our last year's prophet will eventually inhabit, rather than members of such a respectable institution as the Tech.

A few minutes after twelve President Bartlett called the meeting to order and desired some one to state the business of the meeting. This was done, and in substance was to consider the advisability of omitting the fall field-day, and in its stead of devoting the energies of the school to foot-ball, in which it is confidently hoped we will equal, if not surpass, our fine record of last year.

An upper classman moved that the constitution be laid aside for the purpose of omitting the customary sports. After this was seconded the president vainly endeavored to put the question, but some of '91's illustrious sons, who wished to keep the question from being put, and, perhaps, also to show a little of their superior debating talent acquired in the Sumner Club, started a lively discussion, which lasted some considerable time. When, however, the question was finally put and the vote counted, the vote was challenged on account of a

doubt in the minds of some concerning the right of certain members to vote.

Immediately the constitution was searched to find out what actually constituted the right of suffrage, and it was found that no one was entitled to vote who had not actually paid his dues.

As '91 wished for certain definite reasons of her own to poll a large vote, the question as to whether a man's promise constitutes actual payment or not arose. Since '91 was in that dolorous condition where she couldn't pay cash down, consequently, just as drowning men catch at straws, she eagerly endeavored to convince '89 and '90 that such was the case.

It was indeed amusing to watch future statesmen bringing forth convincing arguments for their cause with the most extravagant gesticulations, while embryo orators shouted themselves hoarse in their vain attempts to make themselves heard.

The confusion caused by this question of voting seemed to grow more and more complicated as the debate went on, and no effective settlement of this question was reached until it was moved and seconded that the whole matter be left with the athletic directors. Thus this question was at last virtually settled when this motion was carried, since a majority of the directors are known to be in favor of no field-day this year.

The motion to adjourn was then quickly made, seconded and carried, but while some only adjourned to late dinners, those of the juniors who adjourned to afternoon practice without any dinners at all, deserved a better reward for their class loyalty.

THE SUMMER SCHOOL AT NORTH-FIELD.

THE town of Northfield is situated upon the northern border line of Massachusetts, and is joined by the State of Vermont on one side of the Connecticut river and the State of New Hampshire on the other. This is a very quiet place, devoted to farming, but its beauty of scenery and healthfulness of air have recently induced the rich people of the cities to make it a place for summer retreat. The town is however distinguished as being the native place of the well known evangelist, D. L. Moody, who still makes his home there. Mr. Moody has founded there a young ladies' seminary, which is now in successful operation, having some three hundred students. The seminary buildings, which are five in number, are large, handsome structures, well appointed for recitations and dormitories. In the summer vacations, Mr. Moody is accustomed to assemble here a conference of college students to study the book of books.

To this place there swarmed on the first of July students from all parts of the United States, Canada and even from Europe. The Y. M. C. associations of over one hundred institutions were represented by delegates. Yale sent some forty men, Princeton, Cornell, Amherst and Harvard were well represented, while almost all well known institutions of the West, as well as of New England, had each one or two delegates present. Beside the students from Toronto and Ottawa there were also students from Oxford and Cam-

bridge universities, England, and from Edinburgh, Scotland. Such was the gathering to which your delegate went and you will surmise that at a meeting of five hundred odd, there will be considerable activity. Such was the case. The afternoons were wholly given up to athletics, which were under the charge of A. A. Stagg, captain of Yale ball team. Two ball fields were laid out and a dozen tennis courts. These with a cricket ground, a river for swimming and mountains for climbing, furnished sufficient opportunities for all to enjoy themselves. The boys threw themselves into all these pastimes with great zeal but this was not the inducement which brought them there. Those who were first in the sports would be seen a few hours later with bibles in their hands studying or listening to the words from some distinguished speaker, with the same eagerness that they had before shown in their play.

You might perhaps think that one would have a very dull time studying biblical subjects, listening to two sermons a day and attending missionary meetings. If you could look into that hall and see those hundreds of strong, active, fun-loving young men listening with eager faces to the words of Dr. Broadus, Dr. Mackenzie or Mr. Moody, you would see at once that there was something of living interest there for each one of them, and if you should attend a like convention, you would soon find the same interest. In such a meeting there is an inspiration to be gained which will make the life of each one higher and nobler. Probably Dr. J. Hudson Taylor, the founder of the great

China Inland mission, made as deep an impression upon the students as any man there. Dr. Taylor has spent the last twenty-two years, giving both his time and his money, to uplift and Christianize the despised race of Chinese. His experiences, hair-breadth escapes, persecutions and hardships would fill many a volume. A hero of heroes he is, although from his appearance you might not think so, for he is a small man with a very modest air and a quiet voice, but as you listen to him you cannot fail to be impressed with his nobility of character. About ninety men joined the missionary band owing to his influence for the most part. These students in taking this action, pledge themselves, as soon as their education is completed, to go as foreign missionaries. Thus giving up all the advantages of this land for the hardships and trials of a missionary's life. They, however, esteem it a privilege to go to the millions in darkness and heathenism and try to carry salvation to them.

The two weeks spent at Northfield are memorable ones, both for the pleasure and profit obtained. A man can not come from there without bringing away broader ideas of life. The inspiration got there cannot fail to make his life nobler, his aspirations higher and his convictions deeper than they have ever been before. In holding this conference the colleges are brought together, so that they feel an interest in one another. The plans of work carried on in all parts of the country are described and discussed and many valuable hints may be obtained. The good done by holding such a convention is incalculable and to

Mr. Moody is due the success that has attended it. It is hoped that next summer a large delegation from the "Tech" may be present. S.

THE HARVARD-TECH GAME.

THE foot-ball season closed last year for the Techs in a pouring rain and with Harvard men for opponents. In a like manner it opened this Fall on the 6th of the present month, when the Harvard 'Varsity played the Tech Eleven on the Grove St. grounds.

There had been a drizzling rain all the morning, but at noon the clouds broke away for a little. This little soon passed, however, and the clouds closed in thicker than ever. Before two o'clock the rain began to fall again, and continued to come harder and harder all through the game.

The Harvard men put in their appearance at the grounds shortly after two o'clock, and immediately went into the field to practice. Beside them the Techs looked almost like pigmies, and it is a wonder that the "sand" did not leak out of every member of the Tech team at the mere sight of their opponents, but it did not as their playing soon showed.

Mr. S. E. Winslow, Harvard '85, had been selected to referee, and Mr. Geo. E. Camp, W. P. I. '88, to umpire.

Soon after 2.30 the two teams took their positions. They were made up as follows: Harvard. Fitzhugh, full-back; Vic. Harding and Hunnewell, half-backs; George Harding, quarter-back; Perry, Davis, Cranston, Morse, Finlay, Trafford and Cumnock, rushers.

Tech. Patterson, full-back; Lake and White, half-backs; Allen, '89, quarter-back; Dawson, Follett, Gilbert, Allen, '90, Churchill, Rice and Crosby, rushers.

Harvard had the ball and by a series of rushes soon carried it over the goal line for a touch-down. The try (?) for goal after this touch-down, as also that after the next, appeared some like an attempt to run up the score.

During this half Harvard made ten touch-downs, from which four goals were kicked. These touch-downs were not by any means easily made, for not often would a Harvard rusher get ahead a great ways with the ball, before one or more of the Tech men would have him plowing in the mud.

The tackling of some of the Techs was especially fine, while more than once the rushers broke through the heavier line of their opponents.

After a rest of ten minutes the second half was begun. During this half the Techs took a great brace. Once they had the ball within Harvard's 25 yard line, and Patterson tried to kick a goal from the field, but the ball was stopped by one of the Harvard rushers, and was rushed back into Tech territory again. Harvard scored only four touch-downs in the last half, from three of which goals were kicked.

This made the score for the game 70 points for Harvard.

Captain Sears of the Harvard team was not present, owing to the fact that he had missed the train, and Vic. Harding acted as captain.

Judging from the playing of the Tech team it gives promise of becoming with

more training and experience the strongest team the Tech has ever put in the field.

FOR SCRIBBLERS.

THE writer had occasion, a short time ago, to visit a Paper City paper mill, and there saw the process of converting rags into as fine paper as one would wish for the most tender epistle.

The process, seemingly, at first thought, a long and complex one, is in reality very simple, and when one has seen it he is struck with its rapidity and novelty. It begins in the dusting-room, where the air is so filled with particles of dirt that the man feeding the "thrasher," as the dusting machine is called, can hardly be seen.

The rags are brought to this room in huge bales, which have been made up either in the United States or in foreign countries; and indeed paper manufacturers are obliged to import large quantities of rags, for either the housewives in the United States are not thrifty enough, and destroy their rags, or are too thrifty, not bartering them for tin-ware, but using them for mats and other like productions. In either case, the paper manufacturer is forgotten, therefore the importation.

The men who feed the "thrashers" cannot do it steadily for more than a few years, as they contract a disease of the lungs which threatens them with death. Although their health and life are thus endangered, they receive only very ordinary wages. The manufacturer has two objects in view when these bales of rags

are opened. One is to purge the material of everything but perfectly clean, clear fibre; the other to reduce this fibre to a pulp of uniform consistency. The "thrasher" is one of the machines required to attain the first object, and consists of a large box in which is a shaft with wooden arms revolving at a high rate of speed. The shaken rags are next carried to the sorting-room, where the sorters, usually women, cut off any buttons, strip large pieces by means of upright stationary scythe blades, and throw into different baskets the varieties of stock. Now they go to the "cutter," where they are chopped into smaller pieces by revolving knives, something after the principle of a hay-cutter. After this ordeal they are put into the "duster," a revolving conical sieve, which relieves them of any remaining dirt which may be removed without washing. Discharged from this to a moving endless belt, they pass along, under the eye of two or three inspectors, on their way to the boilers to be further cleansed.

The boilers vary in size, but are generally about eighteen feet long by six feet in diameter, and hold from two to three tons of rags. They are filled through a man-hole in one side, which is brought, by rotating, into conjunction with a hole in the floor above. When filled, lime-water, a strong bleaching and softening agent, is introduced, the belts are put on and the immense hollow cylinders revolve until the colors and impurities are tumbled out, leaving a mushy material, nearly white, which is now ready for the "washers" and "beaters," the machines that prepare the food for the Fourdrinier. These are

oval tubs three feet high, ten feet long and five feet wide, with an upright middle partition, the ends of which extend to about two feet from the ends of the tub and forms, with the sides an elliptical passage or course, around which moves the material taken from the boilers. A revolving roll with knives loosens the fibres, and any dirt falls to the bottom, where it passes out. The pulp, for such it now begins to be, is taken from this machine, if a fine quality of paper is wanted, to the beater, a similar machine, after going through a bleaching vat, and is by this time clean enough to eat. It looks like the curd on milk as it floats around on the surface of the water. In the "beater" the fibre is made yet finer, the coloring matter is introduced, also the sizing, which will fill the pores and give a better surface to the finished paper. White paper is obtained by mixing in Prussian blue, while a cream tint is obtained by using a red coloring matter. When the pulp leaves the "beater" it is ready for the Fourdrinier, that wonderful machine which receives a watery mass of fibre and gives out a continuous stream of paper, which may be taken in long rolls or in sheets cut to a required size.

On entering the Fourdrinier-room there greets the ear a deafening clatter, which is found, on investigation, to proceed from one end of a long machine that appears to the casual glance to be made up of nothing but a network of bands and belts, with their rolls and pulleys. Most of these machines are over a hundred feet in length. The pulp and water are pumped into a regulating box, which, having an overflow at the top, allows the

pressure on the bottom to remain constant. As the pulp leaves the regulating box it floats over a series of very shallow troughs bristling with projecting pieces of wood and covered on the bottom with felt, which operates with the projecting pieces to stop and retain any stray grain of sand. Thence the fibres journey until they encounter a horizontal metal plate having many hundred V-shaped slots, through which, helped by a shaking motion given the plate, they must move, leaving any knotted pieces behind. The shaking of the plate is the cause of the noise previously mentioned. No other noises are noticeable. At the end of this plate is a moving endless wire-cloth band, called the "wire," upon which the fibres are spread by an apron attached to the breast-board of the strainers, while an even spread and the desired thickness are obtained by means of a gate under which they pass. As the "wire" moves along the water drains through into a trough beneath, leaving the fibre matted and ready to be pressed and dried.

The water-mark is put on at this point by a cylinder—a "dandy" roll—which has a woven-wire surface and in it the pattern to be impressed. When this is accomplished the half-formed paper passes between felt-covered rolls, then goes by an endless band to two other series of rolls for pressing and smoothing, after which it is dried by running through two series of steam-heated cylinders, hardened and polished by "callenders," or rolls which are under great pressure. The paper is now made and needs only cutting, which is generally done by a separate machine placed at the end of the Fourdrinier.

Paper comes out at the rate of seventy feet per hour for good paper, and of two hundred feet for cheaper grades, such as news paper. Writing paper is run through more "callenders," ruled by a very interesting automatic machine, folded, pressed, cut to size and packed in boxes ready for sale.

A FRAGMENT.

I WAS dejected, I was filled with misgiving and doubt, I had asked the supreme question and now wished that I had not, for it had given rise to a new question and I constantly asked myself, "What is life?"

I wandered aimlessly about, as in a dream and fate led me into a street called Elm, where my eye was attracted from the American mosaic it had been studying, by a light, as is that of a man intoxicated. It proceeded not from a lamp post but from the portal of the Public Temple of Knowledge. I said, "I will enter and drown these gloomy thoughts in the current, Literature." I entered, and examined the list of periodicals. My eye became suddenly fixed, for there before me was the word of words, I would see: "Life." I sought it with trembling anticipation. I found it in a corner and opened it in feverish haste, to be confronted by these staring words, "Life may be had at the directors' room." I looked there and saw nought but darkness; listened and heard only stillness. No life could be there. I swooned and would have fallen had not a neighbor remarked that the room was not a dormitory.

Thus is the never-answered question evaded.

THE WATERFALL.

FROM its smoothly capped crest overlooking
the valley

It plunges, unmindful of distance or course;

Far adown the lean ledge in its turbulent sally

It hurls its potential with terrible force;

Its roar, as of thunder,

Is cloven asunder

By the bluffs of the mountain that turn it aside,

And it crashes and splashes

As onward it dashes

O'er the murderous rocks that its current divide.

The sense is bewildered at sight of this ocean,

Alive with alignment of beauty and grace;

For though there is moving it seems not like
motion,

The cataract keeps both its form and its place.

It rumbles and grumbles

As downward it tumbles,

But its profile is firm as the face of the sphinx;

Each drop in succession

Falls into procession;—

In the wild evolutions are no missing links.

Then along the rough rapids without an endeavor

It surges and charges in elegant ease,

Till, wholesome and placid and cooling as ever,

It finds its way smooth to the welcoming seas.

Its summer vacation

Of mild dissipation

Was dashing and airy, as such things should be;

Now calmly advancing,

In value enhancing,

It teaches a moral for you and for me.

THE APATITE DEPOSITS OF
CANADA.

THESE are chiefly in the vicinity of
Ottawa, the capital of the Dominion. This city is easily reached from Ogdensburg, New York, by ferry-boat over the St. Lawrence and train for fifty miles from Prescott nearly due north. Thence we may go northwest sixty miles to Renfrew and Pembroke, or northeasterly forty or fifty miles to points near the banks of the Gatineau or the Du Lievre

river. Our *point d'appui* was Buckingham on the latter stream, then up the river by boat. Twelve miles north is the first locality, called the Emerald Mine. Other mines are situated ten to twenty miles farther north and on each side of the river. The deposits of apatite are in seams or elongated pockets in a country, or enclosing rock, which is chiefly gneiss or mica schist. Some of these pockets occur very near the surface, and are reached by digging into the side of a hill, or, where the rock crops out, by following the seam downwards along the incline of enclosing gneiss. At other points shafts have been sunk to the depth of from three hundred to eight hundred feet, and from different levels workings have been made horizontally or upwards, following the slope of the rock. The direction of the ranges of hills in this region, and of the seams or layers, or elongated pockets of mineral, is from northeast to southwest, and the dip or incline of the seams is from thirty to sixty degrees to the southeast. This shows that the disturbances which produced these uplifts are of the same general character and from the same causes as those which attended the formation of the mountains and the crystallizations of the rocks and many of the minerals and ores of the eastern Atlantic border of the United States. The gneisses and mica schists are much like those found about Worcester and probably belong to the same, or a little earlier geological period.

The apatite itself is crystalline, occasionally occurs in nearly perfect hexagonal crystals—from the size of a pipe-stem to ten inches in diameter,—and is

generally green in color, varying from the lightest sea green to a dark drab green. Other minerals are associated and in some pockets or seams to such an extent as to render the *lead* hardly worth working. Pyrite is abundant, also calcite, pyroxene, hornblende and sphene. Less common are asbestos, tremolite, actinolite, various hydrous silicates and iron oxides. At Renfrew zircons are found and the greater proportion of iron oxide colors the apatite brown. On the Du Lievre river mica is mined, and with it occurs fine specimens of microcline but lighter in color than the famous crystals of the same mineral at Branchville, Conn.

Any one visiting this region would find it worth while to tarry a day in Ottawa and visit the Parliament buildings—which are on a magnificent bluff one hundred and fifty feet above the Ottawa river,—and also the Geological Museum which is under the care of Dr. Selwyn, the director of the Canadian Geological Survey, and which is one of the very largest and best arranged of the geological and mineralogical cabinets of the continent.

TWO EDUCATIONAL SYSTEMS.

Tramp (some years hence)—“I see you belong to a college society. So do I. Can't you lend me a dime?”

Man of wealth—“Yes, I am a graduate of Yale, and make \$10,000 a year as a base-ball pitcher. Here, take this \$5 bill and get a square meal. What college did you belong to?”

Tramp—“I am a graduate of Harvard. They don't teach base-ball at Harvard. Thanks.”—*Christian Register*.

TENNIS TOURNAMENT.

AFTER a week of stormy weather it cleared up enough to permit the tournament to be played Sept. 22.

There were twelve entries for the singles, the result of the games being as follows: In the preliminary round Southgate '89 beat Frary '90 6—1, 6—3; Dadmun '91 won by default; Kimball '89 defeated Houghton '89 6—0, 6—0; Sessions '89 won from Hastings '91 6—3, 6—2. In the first round Fish '91 defeated Bradford '91 6—4, 7—5, the playing being quite close and spirited. Dadmun beat Southgate 6—3, 6—2; Kimball beat Sessions 6—2; 6—0; Allen '89 beat Cook '90 6—3, 6—4. In these two sets the play was hard and abounded in brilliant returns, but Allen played the steadier game and finally won. In the second round Dadmun defeated Fish 6—0, 6—3, and Kimball won from Allen 6—3, 6—3, in two well contested sets.

The final round was between Dadmun '91 and Kimball '89, and although the latter was considered the winner, Dadmun succeeded in defeating him. In the first set each won a game from the other's serve, and then Dadmun won four straight making the score 5—1 in his favor.

At this time Kimball's play was very uneven but taking a brace he won three games making the score 5—4 in Dadmun's favor, who won the next game and the set 6—4.

The next set Kimball won by good steady play 6—0. The third set was the most closely contested of all, at the end of the seventh game the count being

4—3 for Dadmun. Kimball then won two games and was within one point of the third and the cup when he went to pieces and lost the next two games; Dadmun thus winning the first position and the Landsing cup 6—4, 0—6, 7—5.

For second place Fish '91 beat Southgate '89 6—3, 3—6, 6—3, and Kimball '89 beat Fish 1—6, 6—3, 6—2, winning second.

In the doubles there were eight entries and the games were played the following Saturday.

Faulkner and Prine '90 beat C. F. Treadway, and Morgan '90 6—4, 6—4; Allen and Kimball '89 beat Baldwin and Houghton '89 6—0, 6—0; F. W. Treadway and Cook '90 won by default and also Harriman and Sessions '89.

In the second round Allen and Kimball beat Prince and Faulkner 7—5, 6—4; F. W. Treadway and Cook beat Harriman and Sessions 6—1, 6—3.

Finals: Allen and Kimball defeated F. W. Treadway and Cook 6—4, 6—2, thus winning first place.

A SURPRISE FOR PAPA.

Little girl—Mamma, I want you to do me a favor.

Mother—What is it, Fanny?

Little girl—I want you to make me a present of a nice new baby brother, but papa isn't to know anything about it until he sees it.—*Detroit News.*

NICE, BUT NAUGHTY.

Quizz—Do you really think that cigarette smoking is as deleterious as they say it is?

Fizz—Yes, I do.

Quizz—What is there about the cigarettes that make them so destructive to the strength and morals of our youth.

Fizz—The pictures that come with 'em.—*Lowell Citizen.*

Scientific Notes.

The *Etruria* made 19½ miles an hour all the way over on her last trip.

The discovery of the electric arc light is ascribed to Sir Humphry Davy.

Venus, Mercury, Jupiter and Mars are evening stars this month; Saturn and Neptune morning stars.

The flour mill at Laramie, Wy. T., is driven by an electric motor.

Richard A. Proctor, the noted astronomer, died on the 12th of last month in New York.

A method of spinning and weaving glass into cloth has been discovered in France.

The first balloon inflated with natural gas ever sent up arose on the 14th of August last from a town in Indiana.

A factory in Michigan turns out 7,500,000 wooden toothpicks daily.

Deposits of tin ore of sufficient richness and quantity to assure an abundant supply of this metal have been discovered in Dakota.

Denver is to have an astronomical observatory that will equal if it does not surpass the famous Lick observatory in California.

In the *Scientific American* of Sept. 22 appears a cut and description of the Walker Twist Drill Grinder.

An electric dog-cart has been built in London for the Sultan of Turkey. The motor is of one-horse power, a current of twenty amperes with an electromotive force of forty-eight volts being used. The power is stored in accumulators placed under the seat, and is said to be sufficient to propel the vehicle at a speed of ten miles per hour for five hours.

There are said to be 150,000 carbons burned daily in the electric lights used in the United States, of which 100,000 are manufactured in Cleveland, O. The

carbons are made chiefly of the residuum of oil after it has been refined, and the deposit about natural gas wells is also coming into use. The material is ground to a powder, a little pitch added, and the substance is then moulded and baked.

A method of removing rust from iron consists in immersing the articles in a bath consisting of a nearly saturated solution of chloride of tin. The length of time during which objects are allowed to remain in the bath depends on the thickness of the coating of rust; but in ordinary cases twelve to twenty-four hours is sufficient. The solution ought not to contain a great excess of acid if the iron itself is not to be attacked. On taking them out of the bath, the articles are rinsed in water and afterward in ammonia. The iron, when thus treated, has the appearance of dull silver; but a simple polishing will give it its normal appearance.—*Scientific American*.

College News.

Smith College commences the year with 450 students.

Williams has a brass band of twenty pieces.

Beecher, Yale '88, will captain the Staten Island cricket club this fall.

Wesleyan opened with a membership of 216, the largest in the history of the University.

The members of the Harvard Athletic Association pay a membership due of \$3 each.

The following colleges have reported more than 1,000 students: Harvard, 1,790; Columbia, 1,489; University of Michigan, 1,475; Oberlin, 1,302; Yale, 1,134; Northwestern, 1,100; University of Pennsylvania, 1,069.

The Freshmen of the University of Penn. have adopted the following class

yell: M-D-C-C-C-X-C-I-I, 'Rah! 'Rah! 'Rah!

The average age of the seniors at Columbia last year was twenty years and three months.

There are forty tennis courts on Holmes' field at Harvard, and frequently they are all in use at the same time.

The editors of *The Cadet*, Maine State College, are appointed by the faculty.

Dartmouth is having great success in raising money for a base-ball building. A man has been sent among the alumni to solicit funds.

Sears, Harding, Cumnock and Trafford are the only members of last year's Harvard eleven who are in training this fall.

Several changes have been made in the marking system at Trinity, the most important of which is that students attaining an average of 8.5 or 9 out of 10 are excused from examination in that study.—*Ex.*

Finlay, '91, the new captain of the Harvard crew, will probably play on the 'Varsity foot-ball team. His weight is 195 pounds.

Williams is taking quite an interest in political matters, three parties being well represented by enthusiastic clubs.

Seven of the eleven men who represented Dartmouth in the inter-collegiate sports last spring have left school, and of last year's ball nine but two are now members of the college.

Several boys of the U. P. have horses that can travel inside of two minutes. Must be this will be a new and interesting feature in the coming field-day.—*Pacific Pharos*.

There are more students in Yale '91, the present sophomore class, than there were in its freshman year. It numbers 214 students now, while only 208 were scheduled in '91 when it was in its freshman year.—*Crimson*.

Mr. Abbot Williams is making a tour of the eastern colleges in the interests of the proposed *Collegian*, a journal to be devoted to the welfare of colleges at large. The *Collegian* will appear monthly throughout the year, and will be made up chiefly of contributions by undergraduates. The price is set at \$3 per year, due on receipt of the first number. Liberal cash prizes will be offered to college contributors.

Thirty-eight out of fifty Tufts College men who were interviewed reported as working during the vacation. Of those there were nine farming, seven clerks or waiters in hotels, five railway conductors; the others were variously engaged as clerks, travelling salesmen, etc.

Cornell has raised its standard for passing examinations from sixty to seventy per cent.

So few entries have been made for the sports at Williams that they will probably hold no Field-day this Fall.

Last spring the students of Union College threatened to withdraw *en masse* if the President's chair, then vacant for four years,* was not soon filled. Union now has a president, Prof. Webster of Rochester, whose election was joyfully ratified by the students. They voted to cut recitations for a week as an expression of their approval.—*Ex.*

What about the cane rush at Cornell the other day? Here are a couple of things about it. Compare them:—

The most exciting cane rush in the history of the college took place at Cornell Wednesday evening. The rush lasted nearly an hour; more than five hundred participated and the freshmen were victorious.—*Willistonian.*

At Cornell this week the freshmen won the cane rush after a desperate two-hours' conflict. The victory was celebrated by a procession through the streets of Ithaca. There were nearly 800 students in the rush.—*The Northwestern.*

At Amherst the examination system has been entirely abolished, and a series of written recitations given at intervals throughout the term at the option of the professor, has been substituted. This order of things is highly satisfactory to the students, and takes away the custom of cramming, which examinations held at long intervals are sure to foster. Class honors at the end of the course are awarded in accordance with the total average grade of a student for the whole four years' course. This plan might be adopted very beneficially in other colleges.—*Ex.*

Exchanges.

With a deep sense of appreciation of the honor conferred upon him your new exchange editor commences in the preparation of this number to overhaul and under-rate our worthy contemporaries, and to clip from their columns gems of wit, news and logic which we hope may be of interest to our readers. We have no statistics at hand but believe that just nine out of ten new exchange editors of college journals commence by giving their opinions either to the public or to their intimate friends as to what a college paper should be, and what should and should not constitute the work of the exchange department. Let us say at once that our modesty prevents us from falling in line here. Even should we be inclined to speak our thoughts our lack of experience would prevent us from giving any new or valuable light on the matter. We propose therefore to let our work speak for itself and take this opportunity to extend to all our worthy exchanges as cordial and hearty a greeting as words may express.

The *Pacific Pharos*, our most distant exchange, was the first to reach us. The college song in No. 2 is very well worded. May it be sung loud and long by the students of the U. P.

The Dartmouth in speaking of the recent fire in the college chapel says: "About one-half the organ was injured and will be used again." We are left in doubt concerning the other half but presume that it is beyond recovery.

The *Willistonian* of Sept. 15 contains an editorial on the subject of tardiness that many might read with profit. The following is a selection:—

"When the perfect uselessness of tardiness is considered it is hard to understand how a lot of active and in most ways energetic young men should fall into a habit in which there is no profit and certainly some loss. * * * Another place where tardiness appears is in the appearance of the foot ball team on the campus after they have been posted by the directors. The practice games would be played with more zest if the men would be on time and there was less of what is known as 'beefing.'"

The Polytechnic is one of the most welcome of our exchanges. The only thing to be criticised is the manner in which one article is strung after another in print without any regard to the appearance of the paper. The last number however was filled with very interesting matter; we would like to print the whole of the article entitled "Friendship" if our space permitted. We quote from it as follows:—

"A great advantage of a college course is the contact with a set of men who are scholars and gentlemen. The exceptions, being quickly noticed, prove the rule that college men are at heart gentlemen. As to contact with scholarly men; it is a fact that students take on even the personal manners of their preceptors and professors. Dr. Arnold, at Rugby, "made the men who are making England. His very presence seemed to create health and vigor, and to give life an interest and elevation." So says Dean Stanley.

Bacon says of the advantages of friendship that it produces a generous nature. It is a source of valuable advice, for man alone is not equal to life. There is a German anecdote of a man asking a store-keeper for a reduction in price, saying: "I am, you

know your friend." The answer was: "But I live through my friends; my enemies never come near me." We do live through our friends, from birth to manhood, and from manhood to death; but not off our friends. They should never be sought with a mercenary object. The giving *quid pro quo* is a sacred law of friendship."

Personals.

Superintendent M. P. Higgins will spend a year in Atlanta, Ga., getting the shop of the Polytechnic Institute of that place into good running order. Mr. W. F. Cole, '83, will have charge of the shop here during his absence.

Professor Smith has resumed his duties in the Department of Modern Languages, after a year's absence.

Mr. S. S. Jennison, '71, secretary of the Alumni Association, has resigned that position, as he intends to go to the West. President Washburn will appoint a secretary to take his place until the next meeting of the association.

Professor Kimball has recovered rapidly from his sickness, and will sail for America on the 17th of this month.

Professor Eaton is breathing the air of the Pacific slope, while Mr. George H. Haynes is molding mathematically the minds of the Juniors.

G. W. Patterson, '88, has been appointed an assistant in the W. P. I. chemical laboratory, and Charles Ferry, of the same class, has a similar position in the Boston Tech.

In a special number of the San Francisco *Mining and Scientific Press* we find an article on the 75-foot dome of the Lick Observatory by Hugo P. Frear, '83.

W. J. Duncan, '88, is with the Hilton Bridge Construction Co., Albany, N. Y., as draughtsman.

A. L. Gomes, '89, has returned from

his visit to Brazil, and will resume his school work.

A long letter from John M. Goodell, '88, appeared in the *Sunday Spy* of October 7th. Mr. Goodell is making a tour through Switzerland on foot, and in his letter describes a climb up Mt. Blanc in a snow storm.

Mr. Augustus Tucker, '83, died at his home in Spencer on the 26th of last month.

Technicalities.

Where is the company of Tech Zouaves?

The Middlers are realizing one of the Professor's remarks that this term they would have "Fuller" details concerning steel.

The Prep Juniors seem to enjoy their advance from carving wood to carving the grindstone.

The building for the Salisbury Laboratories is beginning to resemble its picture.

The Senior Mechanics have commenced work on a modified form of the Washburn lathe, and hope to complete it.

Fall field-day is to be omitted this year, as it is thought best to concentrate our energies on foot-ball.

The Tufts College eleven will play the Techs on the Grove St. grounds Oct. 20th.

The Amherst "Aggies" will give us a game here Nov. 3rd.

A return game will be given Harvard on the 27th.

Four thousand people witnessed the game between the Harvard Varsity and the Worcester Tech.—*Boston Globe*.

The new Alden compound engine for the laboratories is under process of construction at the shop.

The Seniors number 36, the Middlers 42, the Juniors, last but not largest, 60.

Prof.: "Mr. B., how would you correct this sentence? The remedy for drunkenness is not to be ascetic."

Mr. B.: "To be æsthetic is not a remedy for drunkenness."

At the beginning of this term the Athletic Association was found to be in debt about \$100. Toward the liquidation of this debt '89 has paid about \$30, and '90 about \$40. Where is '91's subscription?

The anæsthetic properties of hydrocarbons were recently discovered at the Institute. It took some time to arouse one patient from the torpor into which he had fallen after an application for a half hour.

Business is booming at the shop. A large amount of work, to be used by the American Wire Co., of Cleveland, O., is being put through for Mr. C. H. Morgan. This includes a large hydraulic shear, an accumulator, an automatic reel, fourteen pneumatic cylinders and two elevators.

Mr. Ezra Walls set up an elevator in Holyoke last week, and soon goes to Philadelphia to get another in position.

The shop has just completed a fine passenger elevator for use in the store of Barnard, Sumner & Co.

A freight elevator has been put into J. E. Wesson's boot and shoe shop on Asylum street by the Washburn shops.

The shop has the contract for building a passenger elevator to be used in Lamb's block on Pleasant street.

Thirty drawing stands were recently shipped from the shop to the Manual Training School at St. Paul.

The shop has shipped a roll-top desk to Sweden.

The new Babcock and Wilcox boiler for the Salisbury laboratories has been placed in position. The boiler is of 51 horse power, and is capable of carrying a steam pressure of 200 pounds.

The new foot-ball uniforms: Gray cap with crimson stripe, white canvas jacket, dark mole-skin trousers, stockings striped in gray and crimson.

The uniforms as they now appear: Mud color throughout.

The mowing lot north of Bliss's field has been leased for a practice ground for the foot-ball team, and all the large stones have been removed. What a fine campus could be made by uniting these two fields, and having them graded!

Professor: "Why is magnetite valuable as an ore of iron, Mr. A.?"

Mr. A.: "Because of the large amount of magnesium it contains."

At a meeting held September 22, the Thompson Club voted unanimously to disband and give to the Athletic Association any money which might be in the treasury, together with the proceeds of the sale of the Club's property.

Judging from circumstances, we think that private collections of minerals, based on the collection at the Institute, have been started. The old spirit of R. C. F. is not dead.

That "many hands make light work" was well illustrated on our first holiday of this year, when Techs wielded tools of many kinds and put up some substantial goal-posts, at short notice, for the foot-ball players.

Professor (at the end of a recitation, and nothing done with the advance translation): "Well, here we are again!" (The door suddenly opens and the Principal appears, to the Prof.'s confusion).

The officers of the Athletic Association for this half are as follows: Solon Bartlett, '89, President; F. W. Fiske, '91, Secretary; H. L. Houghton, '89, Treasurer. Directors: E. G. Penniman, '89; H. L. Houghton, '89; W. T. White, '90; E. J. Lake, '90; H. L. Dadmun, '91; F. H. Metcalf, '91.

Although congregational singing is to

be desired, perhaps it would be well to select some members of the choir from '89 and '91, so that on '90's practice days we should not have such a limited number of artists.

The three classes have elected these officers:—

'89. H. V. Baldwin, President; J. A. Baylis, Vice-President; H. C. Stow, Secretary and Treasurer.

'90. H. P. Davis, President; G. H. Nutt, Vice-President; A. B. Larcher, Secretary and Treasurer.

'91. H. L. Dadmun, President; H. P. Eddy, Vice-President; F. W. Fiske, Secretary; E. A. Taylor, Treasurer.

The Guitar and Banjo Club meet every Monday in the chapel, and dispense music under the leadership of C. K. Prince, '90.

The meeting at which it was voted to have no field-day was a long and hot one. Some say the mercury rose as high as 91° in the shade.

The Tech boys rather monopolized the prizes at the Y. M. C. A. Field-day. Several members of '91 took part, and gained prizes to the number of thirteen. Dadmun lowered the half mile record to 2-10½.

'90 has appointed the committee for the half-way banquet, in order to give the funny men time to revise the jokes for the occasion.

During the storm of September 26th we believe all the weather vanes on Boynton Hall, for a while at least, pointed in the same direction; showing clearly the terrific force of the wind at that time.

One of the new men on the foot-ball team is trying to reduce foot-ball playing to a science. He was recently heard by his room-mate to murmur in his sleep: "I wonder where the horizontal projection of the path described by a foot-ball player revolving about an axis

perpendicular to the horizontal plane cuts the ground line."

Twenty men were present at the '86 class supper. It was voted to hold the next reunion at Worcester in 1890. The following class officers were elected: L. A. Whitney, President; N. A. Smithwick, Vice-President; J. C. Miller, 2nd Vice-President; A. T. Rogers, Secretary; and Frank Fay, Treasurer.

Scraps from the Poets.

IF little labor, little are our gains;
Man's fortunes are according to his pains.
—Herrick.

WHAT are we set on earth for? Say, to toil;
Nor seek to leave the tending of thy vines
For all the heat of the day, till it declines,
And Death's mild curfew shall from work assoil.
—Browning.

O CHANCE, suggesting many a plan,
Attaining many an end for man,
How oft, when wisdom's titles shine,
And craft claims praise, the work is thine!
—J. Anstice.

LIKE as the waves make towards the pebbled shore,
So do our minutes hasten to their end:
Each changing place with that which goes before,
In sequent toil all forwards do contend.
—Shakespeare.

FEW rightly estimate the worth
Of joys that spring and fade on earth:
They are not weeds we should despise,
They are not fruits of Paradise;
But wild flowers in the pilgrim's way
That cheer, yet not protract his stay.
He must not these too fondly clasp,
Lest they should vanish in his grasp,
And yet may view and wisely love
As proofs and types of joys above.
—Author Unknown.

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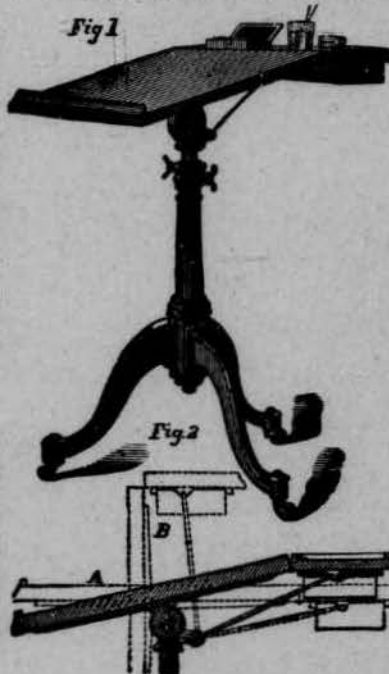
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