

MECHANICAL WONDERS

On Exhibition at the World's Fair.

Somebody told me that a peep into the boiler room of the Machinery Hall would be of great assistance in building up a concept of Pluto's sulphury home. Consequently, I judiciously selected a very cool day to visit this hall. Judged from the exterior, the character of the display within would never be dreamed of. To my taste, it is, after the Palace of Fine Arts and the Administration building, the most beautiful structure on the grounds. It has an architectural tone peculiar to itself. Its turrets and its spires give it an airy, fairy character that is simply delightful to the eye accustomed to the huge business blocks that stand like giants' play-things along Chicago's busy streets. Its roof and steeples are peopled with statuary. On every steeple's dizzy height there stands the statue of a maiden. Her garments are fluttering in the breeze. As though to balance herself, her arms are extended and upraised, and each holds a laurel wreath. Along the ridges of the roof are angels, with wings at rest, and little boys, each blowing two of these long horns with which heralds in olden times attracted attention ere they announced the message they brought. The names of men eminent in their triumph in mechanical arts are written in gold letters along the cornice of the building. Over each of the two main entrances—one to the north and one to the east—supported by a semi-circular row of tall and stately columns, half a dome projects. But better even than the beautiful structures are the sweet chimes that ring from its towers. The daily playing of these bells is the most restful sound that can greet the sight-seer, weary with his hours of continuous moving. Let him wander to the Court of Honor at 6 o'clock in the evening. Near the splashing waters of the fountain let him take his seat. And if ever the tired spirit of a mortal had balm borne to it by the air and poured on his heart, the weary one may float his soul in just such heavenly refreshment. Within the shadows of these steeples I cannot tell you what there is in the music of a chime of bells. But this I know: I would rather hear a simple strain throbbled out in mellow sweetness on the evening air by metal tongue in metal mouths of soft, sweet bells, than listen to the grandest concert man ever heard. I never appreciated the beauty of Shakespeare's

"Like sweet bells jangled out of time and harp," until I heard the chiming bells. I fancy it would be the saddest thing to hear those "sweet bells jangled out of time and harp." The transition of the exterior of the building to the interior is somewhat marvelous. Down one of the 850 feet aisles your eye runs, and such a picture it has never looked on before. Big wheels and little wheels, narrow ones and broad ones are whirling around at a dizzy speed or moving with an aggressive and pronounced slowness that is torturing to the eye of a Chicago man. From sheet-iron cylinders gleaming pistons of steel are leaping back and forth, moving up and down as they drag the bright and shiny cranks around the circle belts, and narrow ones are spitefully cracking as they bring motion from one point to another. Bright bands of copper, as red as the sun, shining bands of brass, polished steel, heavy and greasy iron work, glisten and gleam amid the endless rotation about. And the noise! There are all kinds of noises. There are steam drills pounding away on rocks, the awful rattle of cogs on hoisting cranes, the roar of the distant boilers, the suction of the cylinders exhausting the air, the noise of clattering steam looms for cotton and silk mills, the hiss of steam occasionally escaping, the dull pulsing of ponderous engines,

the clatter of the great moving cranes as they roll overhead from one end of the building to the other, the indescribable rattle of printing presses—in fact a greater variety of noises than there were kinds of rats that the Pied Piper piped into the Weser. After a minute study of the entire display, I came out wondering if there is a machine in existence that is not to be seen in this marvelous collection. I could recall none. I believe there are machines that do everything. The printing press forms one of the most interesting feature of the display in Machinery Hall. It must be conceded, I think, that the Hoe presses are the most perfect. Several of daily papers have their evening editions run off in the building. The World's Fair organ, the Daily Columbian, is printed. And, by the way, this is one of the unique souvenirs to be had on the grounds. It contains the first page of each of the five great dailies in Chicago. That first page being, of course, the issue of that day. I presume there is scarcely a reader of a paper now-a-days, who has not seen the press in operation, seen the virgin page start in to pursue its course through interminable rollers, being cut into size here, receiving an impression there, twisted and turned until it appears at a rather distant point folded after the fashion the newsboy hands it to you in the morning. Standing near one of these marvelous machines, I had a chance to contrast it with an antique concern 150 years old. It was one of the earliest presses used in the country. It was built by Thomas Draper in 1742, was afterwards owned by Thomas Melchor, who was the first state printer in New Hampshire. A little table about three feet square, a twisted lever, which, when drawn towards the operator brought a pressure from above to bear on the paper which was placed over the type set in the table, and that was the total of it. It was being operated for the amusement of the visitors, and was printing two little strips which bore the legend:

"Printed on a press 150 years old."

These were given away as souvenirs. There is also a display of type-setting machines. I fancy a comparatively small percentage of people know how these instruments work. I remember when I first heard of it, I was considerably in doubt as to its possibilities. It was only when told that the machine actually cast the type that I could believe the instrument possible. But there is another machine displayed at the Fair that actually sets the type. In each of the machines referred to, a keyboard much like that which is on a typewriter, is before the operator. In the instrument which casts the type, a touch of any key releases a brass mould, which drops into position. When all the moulds sufficient to make a word or line of any particular length have been set, the machine clamps them and draws them into a peculiar place to receive the metal. This cools quickly and is soon turned out, and the word or line is in one piece. In the second machine referred to, the type are all placed pointing outward in a large metal cylinder beneath which is a revolving circular table. A touch of a key allows one type from one of the grooves in the cylinder to fall on the revolving table which places it on a moving belt. This in turn brings it in a groove immediately before the operator, and a little above the keyboard. Type after type being thus brought into place, the line is pushed along until it reaches a chase. Here the operator makes the necessary divisions and connections before continuing work. This is a rather new instrument, and, it seems to me, possesses many points of advantage over the machine which casts the type. But more marvelous than these machines, do the many looms working in the building appear to the western and southern man's eye. To eastern

people I fancy they are not an uncommon sight, but in the land where the cotton grows and where the gold is dug, that pays for work from the eastern looms, these objects are curiosities. Hence you will always find a crowd of "Southerners" and "Westerns" around the machines. And, verily, they seem to be a more knowing machine than the typesetter. At the last named instrument they see the operator seated. Not so with the loom. No hand seems to be guiding it. The warp is moving up and down. Each time a change is made, a bobbin shoots between and leaves the woof to be caught by the warp as it passed behind it. And the seeming knowingness of those bobbins. Each one is wound with a different colored thread. Just as often as the pattern calls for one color, so often does the bobbin which contains it lay out its tiny thread. In proper time it gives place to another which just as rapidly, just as surely, does its work and then bides its time until needed again. I read a little squib in a paper a few days ago which stated that an entire prayer-book had been woven of silk in France. Not a letter is printed. The loom has done it all. It took three years to complete it. This will not appear astonishing after one sees the looms at the World's Fair. Some are weaving badges which contain pictures of Washington, Lincoln or Cleveland. A picture of the globe appears on them, and woven in the silk an appropriate utterance of the one whose face appears above. The reader who has not seen the looms at work may form some idea of how it is done by recalling to mind a sheet of music paper used in the organetto. The pattern to be worked by the loom is thus marked on stiff manilla paper. At the top of the loom each particular thread of the warp is fastened to a long iron needle. Now, the paper spoken of passes over the needles. Where a needle meets an opening, it rises and thus lifts the thread attached to it. Those needles that cannot pass are drawn down. At the next move of the machine a new set of apertures are above the needles and consequently different needles rise and fall. A similar mechanism brings the woof into proper play. The shuttles or bobbins all fit into compartments, which, as the cut paper permits, are presented to the power that moves them back and forth. Thus it is plain any pattern may be worked. They are weaving beautiful silk handkerchiefs at the Fair with the picture of the building on them. And the beauty of it all is that the machine works with a speed that is simply marvellous. In some instances I could scarcely see the reels as they shot back and forth between the warps of cloth about two yards wide. Marvellous! The word does not say it. Why, addition is an intellectual operation. Yet, there is a cash register at the Fair that, when the key is pressed that throws up the card showing the "amount of your purchase," rings the bells and springs out the drawer, it proceeds—I should say, at the same moment—it adds the amount and registers the total that should be in the drawer. I tested it over and over again—made it add 15 cents to 60 cents and saw it register 75 cents. I made it add 55 cents to \$15.92 and got \$16.47. What next? I said to myself, and lo! before me was a man that, just as fast as he could make a peculiar kind of sewing machine work, was writing peoples names on handkerchiefs covered with beautiful embroidery that that same machine had done. I turned around again and here was a machine that washed and dried dishes, intended, I presume, for hotels. It would be, I fancy, a useless task to enter into the details of some of the massive engine on exhibition. To tell, for instance, of the power gained in this one by a saving of frictional resistance and the power lost here, by weight of the belt-

ing. To tell of the peculiar advantages of one in having its cylinders in a vertical position with the piston working downward and of the power required to overcome the resistance in the machine itself, so much actual power consumed before it can be applied to the purpose for which the machine was constructed. But to be convinced that man's mind had gone into the utmost minutiae, has measured and weighed such subtle forces as heat, steam and electricity, needs but a passing view of the magnificent display in the Palace of Mechanic Arts. It is a glorious tribute to the ingenuity of man's mind, a material testimony written in iron and steel and brass in which the Sages of old would read the declaration of the God-like something within us. I stood before a great breathing thing of gleaming metal that did its work with the regularity akin to the earth's daily revolution. I thought how little it would take to render this monster incapable of work. A few drops of water can scorch its oily joints and stop it in its way. One gleaming glare of Heaven's fire and it would become a useless, shapeless mass of iron. Surely the hand that planned it all must be longer lived than it is!

But suppose this is not so—suppose the soul mortal. The engine is mortal. In this soul, and engine would then be alike. The very dynamic value of the latter would then make it greater than the soul. Then the lesser would have produced the greater. A false conclusion, and the supposition which brought us to it must be false. Therefore, the soul is immortal. Verily, there are sermons in stones, books in running brooks—logic in a steam engine.

When the hair begins to come out in combing, it shows a weakness of the scalp that calls for immediate attention. The best preparation to arrest further loss of hair and restore the scalp to a healthy condition is Ayer's Hair Vigor.

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WHISKIES

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SCOTCH
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Royal Eagle
Bullock's Laid's
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