

INVENTIONS OF BOYS

MARCONI STUMBLED ON WIRELESS TELEGRAPHY.

Combination of a Child, a Negro, And a Saw Gave Us the Cotton-Gin.

Sir John Brown, who made the first rolled armor-plates for modern battleships, was but a lad of sixteen when the sight of a carriage worked by a spiral spring at a village fair, suggested to him the conical spring buffer for trucks, out of which, after a long struggle, he ultimately made a fortune.

Ed Whitney, the inventor of the cotton-gin, got the germ of his great idea from seeing, through the interstices of a hut, an old negro work a hand-saw among the freshly-picked cotton stored within. The teeth of the saw tore the lint from the seed easily and quickly, and young Whitney (he was barely thirteen at the time), realised at once that a machine working a number of similar saws simultaneously would revolutionise the cotton-growing industry.

He said nothing to anybody, but set to work building models and experimenting. His difficulties were enormous, for he not only had to make his own wheels, cogs, and so forth, but he had also first to forge his own tools, and even to manufacture the plant wherewith to color his many plans and drawings.

But he succeeded in the end, and though the outbreak of war and other hindrances prevented the invention from being actually placed upon the market until many years afterwards, the first complete cotton-gin ever constructed was built from those very models and plans, and with scarcely a single alteration.

THE SECRET OF CAST STEEL.

At Attercliffe, near Sheffield, in 1760, there lived a watchmaker named Huntsman, whose temper had often been tried by the defective quality of the watch springs then in use. He sometimes wondered if it were not possible to make these articles of like nature, and at last came to the conclusion that if he could only melt a piece of steel and cast it into an ingot, its composition would be the same throughout.

He experimented, and at last succeeded. The supply created the demand. And ere long Huntsman was turning out cast steel ingots by the hundred of tons, and reaping a fortune.

The workmen in the mills were paid very high wages, and were sworn to secrecy. Nor did they betray their trust—at least not wittingly. But one bitter night they gave shelter to a wan, half-frozen lad, dressed in tattered corduroys. He asked no questions. Indeed, he seemed dozing most of the time in the warm glow of the furnaces.

Nevertheless, when he went he took the secret of steel-casting with him, and within half-a-dozen weeks there were as many mill-owners in Sheffield working the new process.

THE SAFETY BICYCLE.

Mr. Harry Lawson, the inventor of the modern chain-driven bicycle, was, in 1869, an apprentice at the Phoenix Engineering Works in North London. Next door lived a man who had brought over from France one of the old original "boneshakers," a massive affair, weighing about 100 lb.

Young Lawson and another apprentice used to climb over the wall during the dinner hour for the purpose of having surreptitious rides on the machine. But Lawson, being of very short stature, could only reach the pedals with the greatest difficulty. So one day, during the owner's absence, he took the mechanism to pieces, and tried to devise some plan by which it could be adapted with equal facility to the use of either a big man or a little one.

As a result, two years later, the first "safety" bicycle came into being. It was built in a shed attached to a disused lime-kiln near Brighton, and carried secretly by night in a cart to Clayton Hill, where the initial trials took place.

Samuel Crompton, as a boy of sixteen, copied the best features of the spinning-machine invented by Hargreaves and Arkwright, added to them some of his own, and, after thirty months of anxious and secret experimenting, produced the first spinning mule—so-called because it was a kind of hybrid between Hargreaves' Jenny and Arkwright's waterframe.

THE RAW APPRENTICE LAD

was, however, no match in cunning for the cotton lords, who soon found out the secret of his new machine, and shamelessly robbed him of the fruits of his enterprise and ingenuity.

Many years afterwards, it is true, they used their influence to secure for him a Parliamentary grant of \$20,000, but he was then a broken-hearted and disappointed man, to whom the money came too late to be of any real service.

The late Sir Isaac Holden's inventions in connection with the wool-combing industry have almost obscured the fact that he was also originator of the lucifer match. This happened while filling the position of lecturer on chemistry at the Castle Street Academy, Reading. He used to rise at four in the morning in order to pursue his studies, and found the old-fashioned flint and steel extremely inconvenient. So, one day, he made a paste of phosphorus and other substances, stuck it on the end of a sliver of wood, and found it would

ignite on being rubbed against any rough substance.

Holden himself did not realise the importance of his discovery. Not so, however, a pupil of his to whom he showed it. This youngster, who chanced to be the son of a London manufacturing chemist, at once wrote to his father about it, and, shortly afterwards, lucifer matches were issued to the world.

THE HYDRAULIC CRANE.

Lord Armstrong, as a boy, was intended for the law, but as it happened there was a water-wheel of curious construction near the office where he worked, and the man who owned it explained its mechanism to the inquisitive lad. He also explained to him an idea he had for utilising the power of falling water in order to lift great weights.

A few brief words set young Armstrong thinking. A little later he started experimenting. And the result of it all was that there was perfected, in due course of time, the enormously powerful hydraulic crane, which has rendered possible the ambitious enterprises of the modern builder.

Last and most wonderful of all comes the case of the little Italian lad Guglielmo Marconi, who, through seeing a conjuror perform certain tricks by means of electrical agency, was enabled not so very long afterwards, to astonish the world with wireless telegraphy.

His first experiments were carried on in a field on his father's farm, and his apparatus, consisted merely of tin biscuit boxes set up on poles of varying heights, one of which was connected with a crude transmitter, and the other with an equally crude receiver, both of his own manufacture. This was in 1886, when he was in his fourteenth year; and he was barely twenty-one, a shy, modest, headless stripling, when he was in London explaining to the greatest scientists of the age the greatest discovery of the century.—Pearson's Weekly.

SMART SAWS.

Charity is a cheque drawn upon heaven.

In friendship we give our heart; in love we lend it.

Glory, like champagne, gives us intoxication and thirst.

One buries friendships more often than friends.

If you cannot inspire a woman with love of you, fill her above the brim with love of herself; all that runs over will be yours.

The lords of the earth have "pleasures," the people have "joy."

Adversity, which makes us indulgent towards others, makes them severe towards us.

The first love that enters the heart is the last that leaves the memory.

Man changes all his opinions save the good one that he has of himself.

In the eyes of men whose opinions we share, our vices are halved and our virtues doubled.

Ordinary people form the metal that the great man stamps with his image.

A man full of good qualities lacks often the one quality that would make them all valuable.

It is as difficult for a young woman to learn that she is plain as it is for her to be ignorant when she is pretty.

The less we have of power, the more we love to use it.

Religion is a hospital for world-wounded souls.

KEEP A-GOIN'!

If you strike a thorn or rose, Keep a-goin'!

If it hails or if it snows, Keep a-goin'!

'Taint no use to sit and whine, When the fish ain't on your line, Bait your hook and keep on tryin', Keep a-goin'!

When the weather kills your crop, Keep a-goin'!

When you tumble from the top, Keep a-goin'!

S'pose you're out o' every dime, Gettin' broke ain't any crime; Tell the world you're feelin' prime, Keep a-goin'!

When it looks like all is up, Keep a-goin'!

Drain the sweetness from the cup, Keep a-goin'!

See the wild birds on the wing! Hear the bells that sweetly ring! When you feel like singin',—sing! Keep a-goin'!

WHERE ENGLISHMEN EXCEL.

It is a somewhat remarkable fact that Englishmen are engaged as tea-tasters in nearly every part of the world. Russia is probably the greatest tea-drinking country, and nearly all the best tea goes there.

The Russian tea firms employ English tasters, and it seems to be generally accepted that they are more reliable than those of any other nationality. Tea-tasting is an "art" that requires great abstemiousness. In tasting tea, a taster does not swallow the liquid, but merely keeps it in the mouth for a few minutes. Sometimes one man will taste as many as thirty varieties or samples in the course of half an hour.

HARD SUBSTANCE.

The crown of a human tooth is covered by a brilliant white cap of enamel, which is not only the hardest tissue of the human body, consisting as it does of 96.5 per cent. of mineral and of 3.5 per cent. of animal matter, but also the hardest known organic substance.

THE RUSSIAN RETREAT

DRUNKEN ORGIES AS MUKDEN FALLS.

Description of Riot and Panic—There Was Vodka Enough For All.

This is the story of the orgy and the panic of the Russian evacuation and retreat from Mukden. Some features of it are almost incredible of belief, but I have photographs and signed statements to prove them, writes a correspondent.

The Russians were demoralized at the outset by the destruction of their stores March 3, when a large amount of supplies were burned around the Mituran headquarters of the army, on the extreme right. Vodka casks were opened with swords and hatchets, and the men knelt down to drink the muddy liquor, which was flowing ankle deep on the ground. Some used as goblets the cases of exploded Japanese shells which fell around them. Sometimes firearms were discharged accidentally, sometimes the report that the Japanese were but half a mile away caused a commotion, but the soldiers soon resumed their orgy, all disobeying their officers. Thousands of soldiers were lying around in drunken stupor, and even wounded officers were so intoxicated that they were only able to crawl around.

ALCOHOLIC DEMONS.

The storm enveloped the scene, giving the frenzied crowd the appearance of alcoholic demons battling in a hell of smoke. The soldiers developed Anglophobic sentiments that were dangerous for me, but Rikacheff, the Russian newspaper correspondent, helped me to escape.

A similar scene occurred at Fushan which the Russians call Quanshan, and afterwards at Mukden itself. On March 4 I returned to Mukden, where I found a remarkable assembly of armed and wounded Hunhuses in the Russian service. They all were young men, gorgeously dressed, and fierce as tigers. They draw their swords on the spectators on the slightest provocation, and the terror-stricken citizens of Mukden gazed at them from afar. I do not know why these men were assembled, or what became of them.

MUKDEN IN FLAMES.

On Friday morning, March 10, I found that Mukden had been evacuated during the night. The Russian settlement was burning and drunken soldiers were throwing handfuls of cartridges into the flames. I rode northwards along the railway. Several miles to the north I found 5,000 men, the debris of seven regiments, lying behind the railway embankment, under heavy fire from the east. Many corpses were lying about, and the wounded were neglected, and the fields were strewn for a dozen miles with provisions, rifles, cartridges and dead horses.

The leader of this force said that he had been farther north, but that the Japanese had driven him back. Everybody was dispirited, for the soldiers knew they were surrounded.

In the evening I went east with the intention of making a wide detour to avoid the Japanese. Wounded men were strewn thick on the ground, wailing, "Brothers, do not abandon us." I gave my horse to a wounded man, who had lost his own in the confusion of the retreat. I helped place other wounded soldiers on gun carriages until there was no room for more. Some of the men fell down asleep. Many intoxicated men lay on the road. Some were tortured to death by Chinese bandits, and I saw many corpses that had been stripped naked.

CORPSES STREW THE GROUND.

I walked all night over rifles and cartridges, tormented by thirst. Frequently I fell over corpses left on the ground. In brief intervals the Japs' searchlights swept the horizon toward the north. The Russians all ways tried to hide from this searchlight and all the men shivered whenever they saw it fixed on them like the gaze of a gigantic eye. Several villages were blazing afar off. Some Japanese scouts fired a few shots at close range toward midnight.

Dawn found me in the hilly country near Taliempu, 12 miles north of Mukden. The enemy was invisible and we thought we were saved, but when we were entering a side valley the firing began from the south.

We rushed wildly northward like frightened sheep, but were soon stopped by a sharp fusillade from an unseen enemy in the north. We were also fired upon from the east and shelled at close range from the heights to the westward, the shrapnel bursting among the soldiers, who rushed to and fro in panic. They seemed to imagine they were being fired upon by their own men, and raised loud cries of "Voi!" "Voi!" and uttered in loud, inarticulate wails the most dreadful sounds I ever heard.

BUGLES SOUND SURRENDER.

The officers finally succeeded in getting the men lined up in two shallow furrows, but, being absolutely powerless against the enemy's fire, the men threw away their rifles and waved white handkerchiefs, while the bugles sounded "Cease fire." It seemed hours, however, before the Japanese ceased firing. Meanwhile the Russian commander was killed and many officers and men wounded. The Russians became convinced

that the Japanese intended to give no quarter. The soldiers hitherto had suspected me, but now a deputation of them, weeping hysterically, asked me, being a British subject, to go and beg the Japanese to spare them. I replied that it was impossible.

Suddenly the firing ceased, and from the right and left two detachments of Japanese infantry seemed to rise out of the ground. They advanced rapidly, and when they were close I saw they wore the uniform of the Imperial Guards. They met the Russians like long-divided brothers.

JAPS FEAR RUSSIAN KISSES.

The Russians heartily shook hands with the Japanese and tried to kiss them. The Japanese, however, objected to the kisses, fearing the Russians wanted to bite them.

We reached Liao-Yang late at night. The city was quiet, but the Government offices were still open. The scene afforded a great contrast to Liao-Yang under Russian rule. The Japanese were living in the comfortable Russian houses at the station.

Thousands of dirty, ragged Russians were penned inside a fenced enclosure near the station, sleeping on the bare ground, without covering, without decent privacy, and under the contemptuous gaze of crowds of Japanese and Chinese who peered through the bars as if at a menagerie. Many of the Japanese held their noses on account, they said, of the evil odor emanating from the Russians. Words cannot convey an adequate idea of the tremendous humiliation the white race thus suffered in the eyes of the Chinese.

MANY RUSSIAN EXILES

THEY ARE THE BEST EDUCATED IN THE EMPIRE.

By One Who Has Voluntarily Left St. Petersburg Never to Return.

I am not a revolutionary, or in any way a dangerous character, but an advocate of moderate and prudent reform on strictly constitutional lines. I am well known in St. Petersburg, where I am a member of several learned societies, and on the "duma," or local town council. My father held a very high office in the Government service, and several of my sisters are to-day maids of honor to the Empress, writes an exile in Pearson's Weekly.

THEY ALL HELPED.

This incident happened in the streets of London, England. A gentleman hailed a bootblack for a shine. The lad came rather slowly for one of that lively gUILD, and before he could get his brushes out another larger boy ran up and pushed him aside, saying, "Here, you go and set down, Jimmy!" The gentleman was indignant at what he deemed a piece of outrageous bullying, and sharply told the new-comer to clear out.

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"Oh, that's all right," was the reply. "I'm only going to do it for him. You see, he's been ill in the hospital for more'n a month, and can't do much work yet, so us boys all turn in and give him a lift when we can."

"Is that so, Jimmy?" the gentleman asked.

"Yes, sir," wearily replied the boy, and, as he looked up, the pallid, pinched face could be discerned even through the grime that covered it. "He does it fur me, if you'll let him."

"Certainly, go ahead," and as the bootblack plied the brush the gentleman plied him with questions.

"You say all the boys help him in this way?"

"Yes, sir. When they ain't got no job themselves, and Jimmy gets one, they turns in and helps him, 'cause he ain't very strong yet, you see."

"What percentage do you, charge him on a job?"

"Hey?" queried the youngster. "I don't know what you mean."

"I mean what part of the money do you give him, and how much do you keep out of it?"

"You bet I don't keep none; I ain't such a sneak as that."

"So you give it all to him, do you?"

"Yes, I do. All the boys give up what they gets on his job. I'd like to catch any feller sneakin' off the poor chap, I would."

The shine being complete, the gentleman handed the urchin half a dollar, saying, "You're a pretty good fellow; so you keep ten cents and give the rest to Jimmy here."

"Can't do it, sir; it's his customer. Here, Jim." He threw him the coin, and was off like a shot after a customer of his own.

"Works well, don't it?" commented Jimmy, ten minutes later, turning a cart-wheel. "That makes two dollars."

VIOLIN MAKERS.

In the village of Mittenwald, in the heart of the Bavarian highlands, live men who manufacture the greater part of the world's supply of violins.

Mittenwald has taken the place of Cremona, although it may be another 200 years before its violins can be mentioned in the same breath with those of the famous Italian town. Of the 1,800 inhabitants of the village over 800 are exclusively occupied with the manufacture of violins, and the output reaches the incredible figure of 50,000 violins per annum. They are exported to all countries in the world, the better instruments going to England and America. One organization of makers alone exports 15,000.

Mother—"You must be patient with him." Daughter—"Oh, I am. I know it will take time for him to see that he can't have his own way."

"Do they make you feel at home at the Gwillises?" "Indeed they do! They quarrel right before me, just as if I were one of the family!"

Some of Russia's greatest men

have been exiled to Siberia. I could tell you the life-story of hundreds of them. My friend, Professor Kavalefshaya, under "administrative process," was exiled to Minnsinsk, in Eastern Siberia, and his wife, Maria, was deported to the mines of Kara. After several years of separation she was allowed to join her husband, but a change of governors taking place, she was sent back again to the mines. On her friend, Madame Sigida, another political exile, being flogged to death for striking the commandant, Madame Kavalefshaya COMMITTED SUICIDE.

Korobenko, a novelist whom I met frequently in St. Petersburg, was exiled on two occasions by administrative process. His wife shared his exile with him. On the first occasion he was sent to Tomsk, 2,000 miles from St. Petersburg, and on the second to Yakutsk, 5,000 miles away. Fortunately he managed to escape to the United States, where I believe he lives to-day.

Felix Volkhovsky, a poet of repute, was exiled for political reasons, but escaped, and is at present in London. Dr. Beilic was captured in Ivangerod on the charge of giving lessons to two ladies who were "politically untrustworthy." He was sent to Verkhojansk, 6,000 miles away, his faithful wife following him.

After traversing 4,000 miles, however, and coming to a place called Verkhohensk, which she believed was the place where she would find her husband, and discovering that she was still 2,700 miles from him, she became insane, and died in Tokutsh prison.

I could fill a volume with the painful details concerning political exiles I have known personally. But enough has been written. Besides these poor sufferers, every Continental city has numbers of intelligent Russians who have voluntarily exiled themselves. Thank Heaven, my reader, that you live in a country where freedom of speech, thought, and opinion are universal. They are a blessing beyond all price.

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