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Wonderful Adaptability In British Munition Works

Inventions Meet Each New Need as it Arrives—Special Safety Provisions for Protection of Women Workers

The wonderful adaptability of the munitioners is not the only revelation of the munition factory, says an English writer, for the marvelous ingenuity of the toolmakers and engineers of the country has been an equally amazing discovery.

The hands of the munition-makers are busily engaged upon turning out shells, shell-cases, fuses and gains at a remarkable rate that has only been rendered possible by the extraordinarily skillful jigs, tools, moulds, gauges and mechanism that the brains of the engineering world have produced.

In the production of shells the work is necessarily of the very finest; and on the occasion of a recent visit to a shell-making and munition factory, the writer was astounded at the marvelous adaptations that have been introduced to simplify the operation of the complicated machinery, and to enable unskilled women and girls to produce work of such high standard and precision as would previously have required the most expert workmanship.

Most of the work is, of course, repetition work, and the operator relies solely upon the tool-setter, not only for the actual work, but also for the various ingenious combination gauges, governing diameter and length, by which its accuracy is tested.

Elaborate attachments have been fitted to the existing machinery, rendering it not only "fool-proof" in the engineers' sense of the word, which means without fear of damage to the machine, but absolutely safe to the operator. This has become essential since the introduction of female labor, not only to protect untrained hands and fingers, or familiarity with danger only too often breeds fatal contempt—but also to safeguard against any possibility of the air or dust of the munition being caught by the revolving wheels.

One machine for folding cartridge-cases was entirely protected by strong fire gauge, which rendered any tampering an impossibility. Another for splitting the cartridge-charges was fitted with a finger-guard, or stop, which directly prevented the fingers from coming into contact with the press.

to Micrometers
The micrometer, a very delicate instrument requiring the most careful handling, has been almost superseded in most of the works by either simple indicator gauges or skilfully conceived tools known as "go" or "not go" gauges.

By this means, which merely requires passing of the instrument to be tested—say shell-cases, for instance—along a tool so contrived as accurately to measure each portion, the slightest variation—even the thousandth part of an inch in diameter or height or any effect—is immediately apparent from the fact that it will or will not "go." By this method a young girl was seen stringing 300 eighteen-pound shell cases a hour, where the same work done by a micrometer in the hands of a skilled man would take perhaps ten times that amount of time.

On the grinding machines also the skill of the engineer has adapted tools or easing the necessary parts, so constructed as to allow of insertion only one way—the right way. The correct angle is in this manner absolutely insured, and the drilling and tapping are necessarily accurate.

The introduction of female labor into the making-up of wooden cases for despatching the finished shells revived the ancient theory of woman's inability to see a hammer without courting serious injury to her hands and fingers; and no doubt it was that same fallacy that has been responsible for ingenious tools that bristled all likelihood of the nails escaping from their intended position. Any tool, having the appearance of a

pair of pliers, offered less harmful resistance to the straying hammer than the thumb of the munitioniere would have done.

Shell Filling
In the actual process of shell filling wonderful care and forethought have been expended, not only to simplify and expedite the work but also to protect the women workers from the dangers of any careless handling of high explosives. Daily the methods are becoming more and more perfect, until the dangers that certainly did exist in the earlier days have been almost completely eliminated.

In the process of mixing the various powders the innovations are most apparent, for where under the old methods the powder was mixed in such a manner to allow the dust to float about the room, it is now entirely enclosed during the mixing, and the operator works the simple mechanism, not only protected by steel shields, but actually outside the room.

Shields of mica, plate glass and steel are used extensively, and in almost every instance the work upon explosives is enveloped in steel boxes or tubes. In a great many instances the possibility of an explosion occurring in these tools has been anticipated and the worker safeguarded by running steel pipes directly from the tools into the ground.

Certain work upon the detonators that previously required more power than was regarded as advisable to expect of women and girls, is now modified to such an extent that a 600-lb. weight can be lifted by the little finger.

Everywhere in the "danger zone" or "front lines" as the munitioniers term it—for she is as proud, and rightly, too, of her work in this particular section as are our men of their weeks and months in the trenches, the women's clothes are fireproof, while the walls of the danger buildings are lined with asbestos for safety, the floors are covered with thick felt, and no hurrying is permitted there; even voices are lowered.

The atmosphere of peace and general air of stillness that pervades these regions is strangely in contrast with the din and clamor of battle that is the ultimate destination of the productions. Yet it is from these quiet shell-shops that success emanates, for our brave men at the front rely with confidence upon the women working quietly and unceasingly here at home for life and for victory.

Every woman worker is helping to keep up the supply of munitions for some man "out there"—and there are few indeed who have not some dear one fighting for whom we are only too eager and ready to work—who needs our every effort to keep the big guns busy.

It is this great incentive that keeps the women true and determined at their posts and truly one woman voiced the sentiment when she said proudly: "My man's a gunner!"

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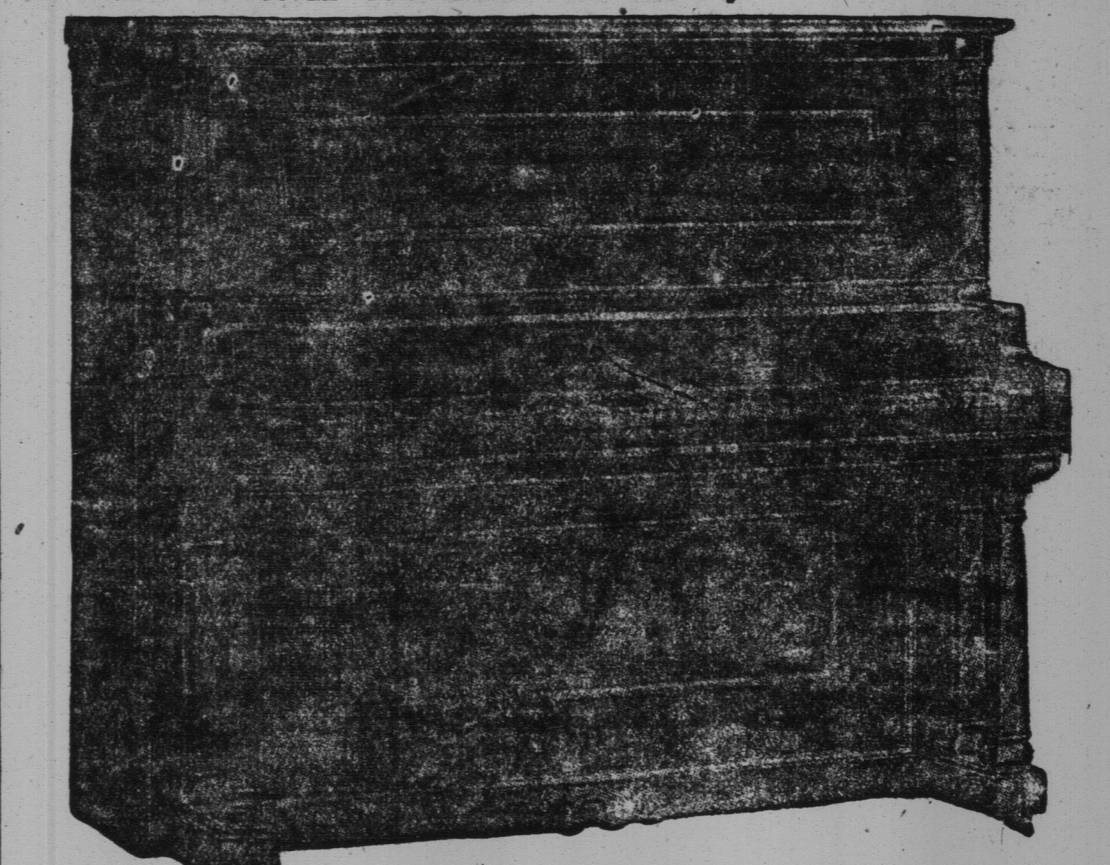
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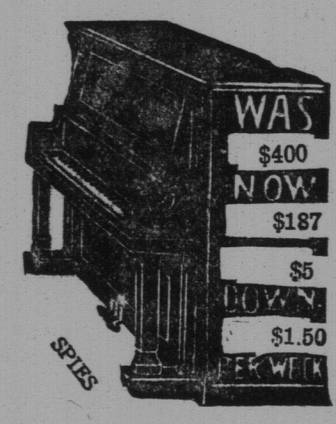
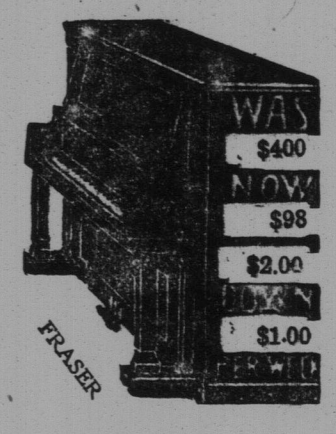
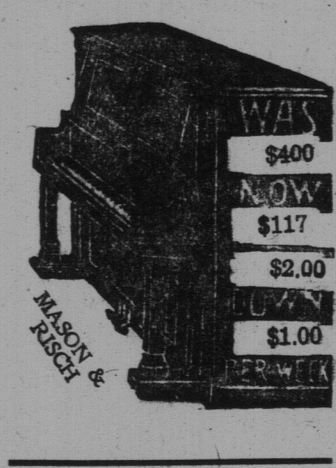
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