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THE MANUFACTURE OF COVERED BUTTONS.

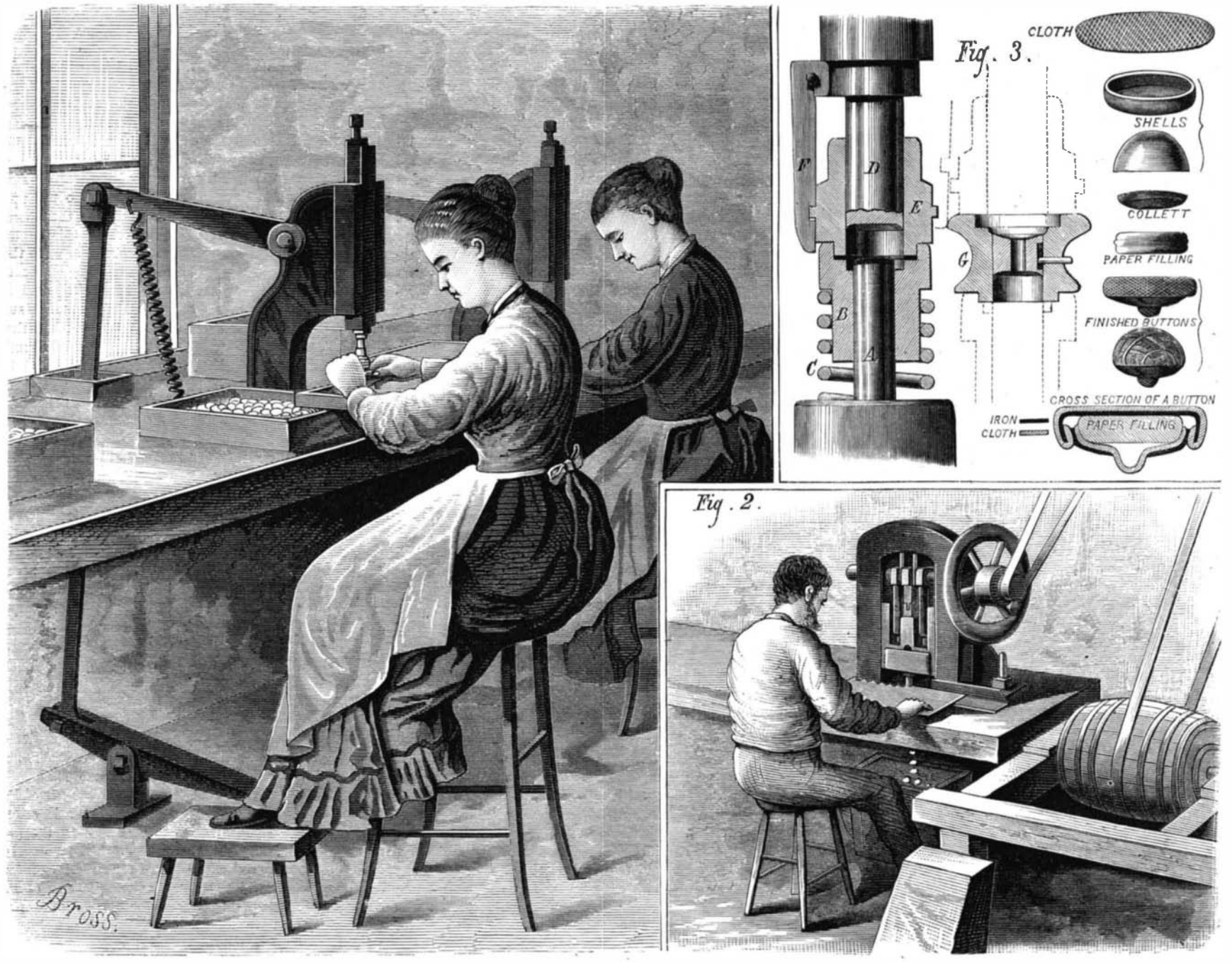
There is nothing particular intricate in the construction of a button, one of the ordinary cloth-covered type for instance, such as is on everybody's coat, to suggest the idea that the manufacture involves any very extensive preparation. But on the other hand, when it is remembered that every one wears buttons, that every man has perhaps a dozen or two constantly about him, and every woman, now that Dame Fashion has decreed that a multiplicity of buttons is an appropriate ornament, displays as many dozen as she conveniently can, it will be seen that the button must be the basis of a great industry. Besides, buttons are like pins, millions are made and nearly all containing in some portion metal which is virtually indestructible, and yet they disappear and no one knows whither. No wonder, then, that the factories at Waterbury, Conn., and Easthampton, Mass., alone produce buttons to the value of over $250,000 a year, and that according to the last census the annual product of all the button-making establishments in the country is valued at nearly $2,000,000.

We shall reserve the consideration of metal buttons to some other occasion, when an opportunity offers to enter into the details of the machinery used. For the present we propose to examine the commonest button of all, the cloth-covered object which the reader, if so disposed, may cut from an old coat and proceed to dissect while he reads the following description of its anatomy. After removing the outer epidermis of cloth, he will encounter the skeleton or metal shell; this off, the inner viscera or paper filling, and beneath that the tuft piece of cloth, are exposed, and last of all is the metal collet or under ring. Any one disposed to class the button zöologically may refer it to the turtle family of *trionychidæ*, "body enclosed between two or more or less shields, which are usually covered by a leathery skin. The carapace (upper shield) and plastron (lower shield) are more or less united along the sides." The construction of the button being thus understood—and to make it clearer we have engraved the parts dissected, as well as joined together, in Fig. 3—it remains to explain the ingenious way in which it is produced.

The first covered buttons were made on wooden moulds turned of wood in the lathe, the cloth being simply stretched over and sewed on the back. This is the home-made fashion of making buttons now, as our fair readers are abundantly well aware; but it is altogether too slow a process for the manufacture of the millions of buttons required for commerce, not to mention the fact that the finished work is unnecessarily clumsy. With the introduction of button-making machinery wooden moulds departed and iron shells took their place. Thin sheets of metal, known as "tagger's iron" (thickness No. 36 to No. 38, and quality according to the more or less fine grade of button to be made), are carried by hand rapidly under a descending punch, Fig. 2. This punch is double, the outer portion cutting out a circular blank of the proper size, while an inner punch descends and forces the blank into a die, so that its periphery is turned upward, or so that the entire blank is rendered hemispherical in shape. These two forms of shells are shown in Fig. 3. One machine, driven by steam power, will easily form 50 gross of shells per hour.

The shells are next annealed in an ordinary furnace, and then are conveyed to a horizontal revolving barrel, Fig. 2, where they are tumbled with sawdust until they are thoroughly cleaned from all dust and grease. The other part of the skeleton of the button is known as the collet. Inasmuch as the under side of this is exposed, one face of the iron plate is japanned. The piece, by a somewhat similar arrangement of punches to that already described, is first cut out in the form of a circle and then its inner part is punched out, leaving it in annular shape. There are still three more portions, namely, the cloth cover, the canvas tuft piece, which rests above the collet, and a portion of which protrudes through the central opening in the latter to furnish a tuft by which the button is sewed on the garment, and the inner filling. The last is made of specially prepared pasteboard, and in common with the other portions mentioned is simply punched into shape.

The grouping together of these various parts is effected in two operations. By the first, the collet and tuft piece are fastened. The tuft piece is laid in the collet under a press, which, descending, forces the fabric, as already stated, through the aperture in the metal, producing the nipple of cloth in the rear. The paper filling is then inserted, and the button is then ready for the final assembling. The machine for this purpose is represented in Fig. 1, and the details of its press in Fig. 3. A is a fixed mandrel. B is a sleeve thereon, supported by a spring, C. On the upper mandrel, D, is another sleeve, E, which is sustained by the catch, F. The lower face of the mandrel, D, is hollowed, and a projecting annular portion of the upper sleeve enters a corresponding portion of the lower one, E. In using the machine a shell is placed over the lower mandrel, and above it is laid the covering fabric. The operator then causes the upper mandrel to descend. The cloth is thus pressed down around the shell, and on the return upward movement both cloth and shell are carried up inside the sleeve, E. The operator now inserts the annular piece, G, in which there is a suitable cavity to receive the combined collet, tuft piece, and filler, the last being uppermost. The upper mandrel is again brought



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down and the shell is thus forced upon the collet, filler, etc., the cloth cover being at the same time turned under. Reference to the section of the finished button in Fig. 3 will make this clear. Nothing further remains but to attach the buttons by dozens to cards, or make them up for the market in any desired attractive way.

There is another variety of button belonging to the same class as the above, but termed "silk back" in contradistinction to "iron back." The face consists of shell and cover, while the back is composed of four layers, namely, a concave circular piece of tagger's iron, somewhat smaller than the shell, a pasteboard blank, a canvas blank, and, lastly, a silk back. These are put together in manner similar to that already described, and then by means of a press a nipple for purposes of attachment is formed on the back.

The City Button Works, of 116 Walker Street, this city, have courteously offered us the facilities for preparing the foregoing description and engravings.

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THE SCIENTIFIC AMERICAN SUPPLEMENT,

No. 90,

For the Week ending September 22, 1877.

THIERS AND CONTEMPORARY SCIENCE IN FRANCE.

To have it said that the period of his life marks an epoch in the history of his country, is perhaps as high fame as any man can hope to attain. Such, however, will be posterity's verdict in recording the biography of Louis Adolph Thiers. Born on April 16, 1797, of humble parentage, the lapse of the first twenty-five years of his life found him not merely unknown, but struggling for bare existence. His abilities, it is true, had shown themselves in literary contests, but his political proclivities, at a time when such opinions overshadowed all else, barred his advancement. The period of his progress dates from his entrance into journalism. From the editor's chair he passed to that of the historian; from the historian to the statesman is but a step, and on the accession of Louis Philippe, he became a cabinet minister. With his political life thence forward, which culminated in his being chosen President of the French Republic in 1871, it is not our province to deal.

The interval of eighty years (ending on the 30th of the present month), over which M. Thiers' existence has extended, will be remembered in the history of the French people, not alone as one of unexampled political changes. Despite the instability of governments, and in marked contrast therewith, the march of science in France has continued onward as unswervingly as in other countries the internal peace of which scarcely has been broken; and to contemporaries of the great statesman now deceased, with whose labors he was in full accord, whose friend, associate, and upholder he was, is owing the present leading place which France now holds among scientific nations. To recall the names of these men and their work is to review some of the grandest achievements in human progress. It brings before us Arago's magnificent investigations in magnetism and the polarization of light. Becquerel the elder's discovery of the relation between electricity and chemical affinity; that first step made by Becquerel the younger toward color photography; the demonstration of the influence of light on chloride of silver in the daguerreotype; the labors of Daguerre and the Niepces de St. Victor (of the last name, father and son), which, as all the world knows, resulted in the art of photography; Berthelot's discovery of acetylene and synthesis of alcohol; Balard's extraction of bromine from sea water; besides the splendid chemical work of Thénard, Despretz, Cagniard de la Tour, Berthollet, Pélouze, and Dumas. France still possesses Pasteur, first of living biologists and the uncompromising opponent of the spontaneous generation theory. The past labors of her modern physicists have included those of Gay Lussac, whose investigations extended over the whole field of science, but whose discoveries in the properties of air and other gases are of inestimable importance. In the same field belongs the work of Dulong, discoverer of the most violent of explosives, chloride of nitrogen, of Petit, and of Regnault. In Leverrier, discoverer of Neptune, and weigher of other worlds, France possesses the greatest of contemporary astronomers. In Cuvier and Geoffry St. Hilaire, the one the founder of the science of comparative anatomy, the other his no less able opponent and critic, she possessed naturalists whose fame can never be diminished. Such were a few of the men of science who have had in Thiers a friend who despite the engrossing activity of a turbulent political career, found time to master the results of their labors and to enrich therewith his already vast store of almost encyclopædic knowledge.

Throughout all Thiers' history—although it does not appear that he was himself intimately connected with scientific men—there can be traced the consequences of his association with scientific men, and his substantial appreciation of their merits. When he became Minister of Commerce and Public Works in 1832, procuring a grant of twenty million dollars, he carried out a system of internal improvements, which have been to France of incalculable benefit, while at the same time he encouraged national industries in a manner that infused new life into their every department. In 1833 he was elected to the French Academy, and soon after he became a member of the Academy of Moral and Political Science.

Although Thiers was not a scientist in one acceptation of the term, yet in the widest sense he merited the title in the highest degree. There is no science grander and nobler than the science of governing—the science of leading and directing others so as to secure the most good for all—and in that science Thiers stood preëminent.

SARGENT'S CASE.

Some very interesting and novel questions in relation to interference controversies, and of great importance to inventors, have lately arisen before the Patent Office, in the case of James Sargent.

This gentleman, in February, 1874, filed an application for a patent for an improvement in time-locks; but this application being defective, he withdrew the same, and, on the 12th of March, 1875, substituted for it a new application. Three days later, Emory Stockwell, assignor to the Yale Lock Manufacturing Company, filed, on behalf of said company, an interfering application. The interference thereupon declared was decided by the Examiner of Interferences in favor of Sargent, and from this decision no appeal was taken.

On the 2d day of June, 1875, John Burge, assignor to the said Yale Lock Manufacturing Company, filed on behalf of said company, an interfering application. An interference was accordingly declared between said applications, and a large amount of testimony was taken on both sides. The decision of the Examiner of Interferences was again in favor of Sargent. From this decision the unsuccessful party appealed to the Board of Examiners-in-Chief, who affirmed the decision of the Examiner below; and from this decision an appeal was taken to the Commissioner of Patents in person. In April, 1876, the Commissioner rendered his decision, affirming those of the Examiner of Interferences and of the Board of Examiners-in-Chief, in favor of Sargent.

Interfering applications with Sargent's were also filed by Pillard, August 13, 1875; by Lillie, April 28, 1876; and by Little, June 6, 1876. In all of these three last mentioned cases, the Examiner of Interferences decided the question of priority of invention in favor of Sargent. Pillard and Lillie did not appeal. Little appealed successively to the Board of Examiners-in-Chief and the Commissioner of Patents in person, and on both appeals the question of priority of invention was decided in favor of Sargent. The decision of the Commissioner in this last named case was rendered on the 9th day of July last, after which, every pending interference with Sargent's application having been finally disposed of, Sargent paid the final government fee, and demanded the issue of a patent.

Meanwhile, on the 4th day of June, 1877, John Burge, before mentioned, had commenced a suit in equity in the Supreme Court of the District of Columbia, under section 4,915 of the Revised Statutes, against Sargent, praying to be adjudged to be entitled to a patent for the invention which had been the subject-matter of his interference with Sargent, and praying also for an injunction restraining Sargent from taking out the patent until the determination of said equity suit. Immediately after the decision of the Commissioner in Little's case, a motion was made on behalf of Burge, before the Commissioner of Patents, *to suspend* the issue of a patent to Sargent until the determination of said equity suit.

This motion was fully and ably argued before the Commissioner. On the part of Burge, it was insisted that so long as a party to an interference was pursuing such remedies as were secured to him by express statutory enactment, his adversary should not be permitted to obtain, by the issuance of a patent, *prima facie* title to the very matter concerning which the entire interference controversy had been made; in other words, that the corpus of the litigation should be preserved throughout until the dissatisfied party had exhausted all his just legal remedies, or until, by his inaction, a conclusive presumption of abandonment of the contest should arise against him.

Sargent maintained, in opposition to this view, that, when a final judgment and award of priority is made by the Commissioner, the right of the successful party to an immediate grant of letters patent against his opponent is complete, and that this right could not be affected by the result, whatever it might be, of the equity suit.

The Commissioner rendered his decision upon this motion on the 24th of July last. He held that power was vested in him by section 4,904 of the Revised Statutes, to withhold the issue of a patent to a successful interference contestant, after final award in his favor by the highest tribunal within the Office, pending the result of an equity suit brought by his opponent; and that the occurrence of the word "may" in the phrase of such section, "*may* issue to the party adjudged the prior inventor," instead of the mandatory "shall," was not without significance in this connection, and reposed a discretion in the Commissioner as to the issue of the patent. He therefore suspended the application of Sargent pending the result of the equity suit.

From this order of the Commissioner of Patents, suspending the issue of letters patent, Sargent, on the 30th day of July last, presented his petitions in the form of a motion for the revocation of the order, to the Hon. Carl Schurz, Secretary of the Interior.

Sargent's counsel insists in the first place, that under this order of the Commissioner, Sargent suffers a very grave injury. That owing to the voluminous testimony to be taken, the equity suit cannot reasonably be expected to be carried through the Supreme Court of the District of Columbia in less than two years, and that if an appeal be taken to the Supreme Court of the United States, three more years will be consumed, and that thus Mr. Sargent's patent is liable to be suspended for at least five years longer, and that in the meantime the demand for time-locks will have become so fully supplied that his patent will be of little or no value.

They urge, in the second place, that the Secretary of the Interior has power to redress this injury. This argument rests mainly on three sections of the Revised Statutes.

Section 441 declares that "the Secretary of the Interior is charged with the supervision of the public business relating to the following subjects;" the fifth of which, in numerical order, is "Patents for Inventions." This, Sargent's counsel claims, makes it one of the primary duties of the Secretary of the Interior to oversee and give orders how and where patents for inventions shall be delivered.

Section 481 provides that "the Commissioner of Patents, under the direction of the Secretary of the Interior, shall superintend or perform all duties respecting the granting and issuing of patents directed by law." This, counsel argue, imports the order and command of the superior officer.

Section 483 provides that "the Commissioner of Patents, subject to the approval of the Secretary of the Interior, may from time to time establish regulations not inconsistent with law, for the conduct of proceedings in the Patent Office."

That the order in question amounts to nothing more or