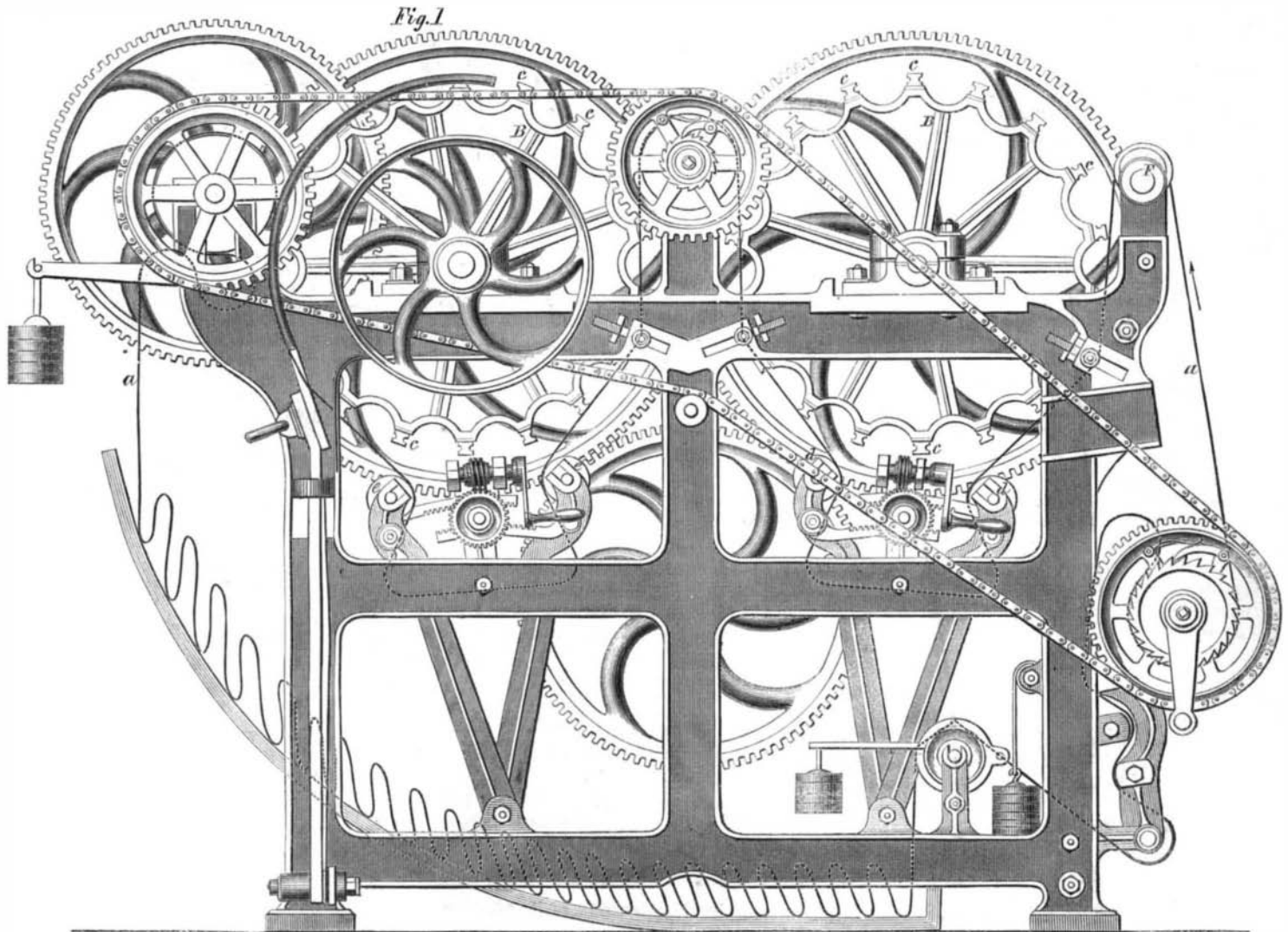


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## GESSNER'S GIG MILL.



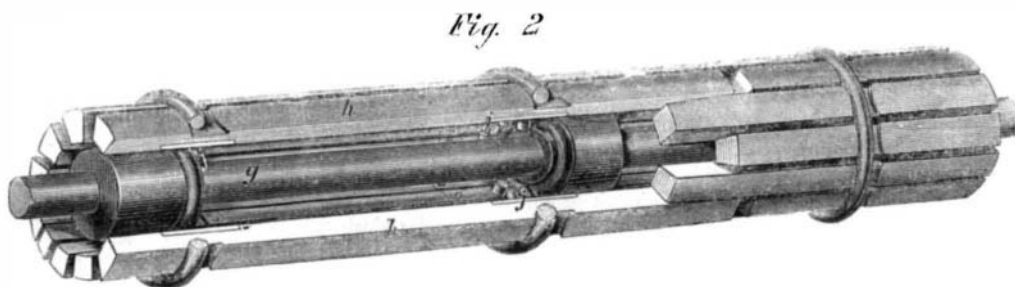
**Raising the Nap.**  
 "The more I think of it," says Teufelsdröckh, "it astonishes me the more, society is founded on cloth." As human nature is constituted, men are judged to a large extent by the surface which they present to the world; and among civilized nations the surface which the male portion of the community, after trying all known materials, prefer to exhibit is formed of a soft nap of sheep's wool. It would seem therefore that the mode in which this nap is formed must be a matter of universal interest. It is the purpose of this article to describe the process.

The nap on woolen cloth is formed by catching soft elastic hooks into the fabric and tearing them out; breaking a portion of the fibers and turning their ends outward. The hook most suitable for the purpose is found upon the seed vessels of a certain plant which is designated by botanists as the *Dipsacus fullanum*, but which is known among agriculturists and

manufacturers as the teasel. The inflorescence of this plant is whorled, forming a head or bur, and the scales of the receptacle terminate in a small, elastic, horny hook of precisely the character required for raising the nap or pile on woolen cloth. The teasel heads are of conical form two or three inches in length, and an inch to an inch and a half in diame-

and the process being finished by those that are new. The machine employed for teaseling cloth is called a gig mill, and the accompanying engravings illustrate one of these mills of improved construction invented by Ernst Gessner, of Aue, near Schneeberg in the Kingdom of Saxony. This gig has been used several years by the principal manufacturers of woolen cloth in Germany and other parts of Europe, and has been recently introduced into this country; in all places giving the most perfect satisfaction as is shown by certificates of the highest character.

Fig. 1, is an end view of the machine. The course of the cloth is indicated by the line, a. Several pieces of cloth are sewed



together end to end so as to form an endless belt, and then they are run through the machine a sufficient number of times to raise the nap; thus saving the labor of repeated introductions of the piece into the machine. The teasels are fastened to metal bars which are secured to the peripheries of the cylin-

ders, B B, at the points, *c c c*. The cloth passes into the machine in the direction indicated by the arrow, and it is pressed against the teasel cylinders by the rollers which surround them in such manner that it is brought in contact with the surface of each cylinder at four parts of its periphery, thus being subjected to the action of the teasel eight times in its passage through the machine.

The rollers, *d d*, and *e e*, which press the cloth against the teasel cylinders, are so supported that their positions may be varied to press the cloth more or less firmly against the teasels. To this end the journals of these rollers rest in a V-shaped frame pivoted at the apex so that the distance apart of the rollers may be varied at will by means of a rack on each limb of the frame meshing into a pinion which is geared to a worm screw, as shown.

In order to present a perfectly plain surface to the action of the teasels, it is necessary to subject the cloth to tension laterally as well as lengthwise and the novel and ingenious device by which this is effected is illustrated in Fig. 2. The roller, F, Fig. 1, over which the cloth passes before it first comes in contact with the teasel cylinder, B, is formed as shown in perspective in Fig. 2. The central core, *g*, is stationary, and the sheath of slats, *h h*, is caused to revolve around it by the cloth operating as a belt. The engraving represents a portion of the slats removed to show the central core or cylinder. This cylinder is surrounded by rings, *i i*, secured rigidly to its surface, not at right angles to its axis but at an inclination of some 70° and each slat has pins, *j j*, projecting from its inner side and resting against the sides of the rings, *i i*. Hence when the sheath of slats revolves around the stationary cylinder, the slats, besides their revolving motion, receive a reciprocating motion back and forth along the cylinder in a direction parallel with its axis. The slats are formed in two sets, one upon each end of the cylinder, and the cylinder is so adjusted upon the machine that the slats may be moving apart endwise on that side of the roller on which the cloth bears, and returning to their position more closely together on the opposite side. In other words the surface of the roller is constantly stretching lengthwise on that side of the cylinder which is in contact with the cloth, and contracting in length on the opposite side. It is plain that this action operates to extend the cloth sideways or increase its breadth. The slats are held upon the roller by elastic india-rubber bands.

A considerable number of these gigs have been sold in this country. The price is \$700 and the inventor claims that a machine for narrow goods will pay for itself in one year, and a machine for broad cloths in from one and a half to two years. He says that a machine for narrow goods will do as much work as six machines of the old style, and a machine for broad goods three and a half times as much as the old style gig. He also says that this gig makes better work with a saving of room, power and teasels. Certificates from the principal manufacturers of woolen cloths in this country as well as in Europe seem fully to sustain these claims.

The American agent for these gigs is Henry Kayser, who may be addressed at the Union Steam Works, corner of Second avenue and Twenty-second street, New York; where the machines are manufactured.

#### NOTES ON MILITARY AND NAVAL AFFAIRS.

##### THE BATTLES OF JUNE 26TH AND 27TH BEFORE RICHMOND.

Two of the severest fights that have yet taken place occurred in the neighborhood of Richmond on Thursday the 26th and Friday the 27th of June. They accompanied—either accidentally or with forethought on the part of the enemy—a change in the position of our army, and a few words in relation to this position will make all the operations intelligible.

Richmond, the old and beautiful capital of the State of Virginia, and at present the capital of the so-called Confederate States, is situated on the north bank of James River, a navigable stream which flows in a southeasterly direction, and empties into the mouth of Chesapeake Bay. At the distance of some 20 or 30 miles to the north east of James River is York River, flowing also southeasterly and emptying into Chesapeake Bay. Nearly midway between these two rivers is a much smaller stream, the Chickahominy, running in the same direction as the other

two, but about 40 miles below Richmond turning South and emptying into James River.

In the spring Gen. McClellan landed his army at the southeast end of the peninsula, or strip of land lying between the James and York rivers, and marched up toward Richmond, driving the enemy before him. He kept on the northeast side of the Chickahominy till he arrived within 8 or 10 miles of Richmond, when he threw a portion of his army across that stream. When he had got one division (Gen. Casey's) across, the enemy thought that they could overwhelm that division before the rest of the army could come to its rescue; the Chickahominy flowing at this place through a broad swamp and being crossed by only a few bridges. The attack was made with all of the enemy's force on the 31st of May and 1st of June, but our great superiority in artillery, combined with the steady valor of our troops, enabled Gen. Casey to maintain his position until reinforcements were sent to his aid, and the attack was repulsed.

Since that bloody battle, the principal portion of the army has been moved across the Chickahominy, and sometime since Gen. McClellan intimated an intention to take the remainder across, and abandon the ground on the north side of the Chickahominy altogether. In this case he would have to receive his supplies by the way of James River instead of the York as heretofore. Immense stores of ammunition and supplies had been carried up York River, and up one of its Southern branches, the Pamunkey, and landed at White House, from which place a railroad led right into McClellan's camp.

On Tuesday the 24th of June, McClellan ordered the stores at White House to be reshipped on board of the transports, of which some 700 of all sizes were lying in the Pamunkey, ready to be sent round up James River, to the new base of operations.

While this operation was in progress, the enemy, either wishing to take advantage of it, or else moving at the same time by a strange coincidence, marched out of their camp before Richmond in great force, crossed the Chickahominy above or at the west of our army, and attacked the portion of our forces still remaining at the north of the stream. These forces consisted of one corps only, that of General Fitz John Porter, comprising the divisions of McCall, Morrill and Sykes. General McCall's division was stationed at the extreme right and of course received the first attack. The attack was fully anticipated, and our men were all ready to receive it. The first Pennsylvania Rifles were on picket duty in the advance, and at about two o'clock in the afternoon of Thursday, June 26th, they found themselves suddenly enveloped by hosts of the enemy. They cut their way back to the army with the exception of company K, which was nearly all captured. McCall drew his men boldly out in the open field, and awaited the attack which was delivered by the enemy with not less boldness. At about six o'clock General McCall was reinforced by General Morrill's division, and the fight continued to rage till half past nine at night. It was one of the longest and fiercest battles that has yet occurred. General Porter and General McClellan were both on the field, and they saw our volunteers display the firm courage of veteran troops. It was the business of our troops simply to hold their position, which they stubbornly did till darkness put an end to the contest.

General McClellan gave orders that early the next morning the right wing should draw back toward the crossing of the Chickahominy, in accordance with the prearranged programme; his plans apparently not being diverted nor even checked by this furious onslaught of the enemy. His order directed that the corps should march to a certain position near Dr. Gains's mill, about six miles to the east, then not to yield this position on any condition.

At three o'clock in the morning of Friday, June 27th, the army took up its slow and orderly march to its designated position, which it reached at about 11 o'clock, A. M., fighting the pursuing enemy all the way. Arrived at the ground, the arms were stacked and the men threw themselves down to rest, many of them getting a short nap, a most valuable preparation for the terrible struggle that was yet to come.

The field of battle is a large one. Like Virginia land of similar area in this vicinity, it is made up

diversely of level meadows, undulating grain fields, woods, thick with underbrush and clear of it, and marshes and ravines. There are three large farm houses, each in sight of the other, each on a shaded hill, and each got up in the inevitable Virginia style of huge outdoor chimneys at either end. These were first used as headquarters by Generals Porter, McCall and Morrill, but afterward converted into hospitals. The open country, longitudinal in shape, is enveloped with woods.

By 11 A. M. each division and brigade, and regiment and gun was in its place. Some were in the broad, open field, and some under cover of the woods and hillsides. The whole presented an animated spectacle—the glorious Stars and Stripes floating in every direction; bright howitzers and bayonets glistening in the sunlight; batteries in readiness for action; cavalry companies eager for dashing charges; generals and their staffs in full uniform on their caparisoned horses, unmindful of the dangerous targets for the enemy's rifles their showy uniforms and equine decorations made them, and regiments of infantry with their arms stacked to be grasped and used at a moment's notice. It was intensely hot. If men suffered then, what must they have suffered when the contest for life and victory waxed hot and hotter a short time afterward, and when to the discomforts of heat were added those of dust and smoke?

A full hour was thus passed before the enemy made his appearance. At about noon the attack commenced, and again through all the afternoon and till half-past nine at night, these thousands of Americans were busy in the awful labor of slaughtering each other. During the battle reinforcements were sent for, and General Slocum's division, with General Palmer, French and Meagher's brigades, recrossed the Chickahominy to the aid of our troops. As on the evening before, night put an end to the contest, with our soldiers all in the positions to which they had been assigned.

In the meantime, the other portions of McClellan's great operation of changing his base had been moving forward with energy and regularity. Gen. Casey superintended the shipment of the stores at White House, on board of the immense fleet prepared to receive them, and as fast as a squadron was laden, it was taken in tow by a steamer and moved down the river. A large number of the runaway slaves of rebel owners were employed in this labor of shipping the stores, and Gen. Casey assured them that not one should be left behind to the vengeance of their masters. The shipment was guarded by gunboats and by a squadron of cavalry detailed for the purpose. The last of the transports was loaded at about 4 o'clock Saturday afternoon, and moved down the stream; a quantity of damaged hay and other worthless matter being set on fire. Nothing of any value, and not even a contraband was left behind. The protecting cavalry moved off to join Stoneman's division to which they belonged, and at about 7 o'clock in the evening the enemy made his appearance, but did not find the rich stores to capture which is supposed to have been the object of his two bloody but bootless battles.

A paymaster, who came from headquarters on Saturday, says that the last of our troops crossed the Chickahominy on Friday night, thus bringing to a successful conclusion the great movement of changing the base of operations.

##### EVACUATION OF JAMES ISLAND.

The engagement on James Island, near Charleston, mentioned by us some time since, proves to have been a decided and bloody repulse of our forces from an attack which they made on the enemy's intrenchments. General Benham, who led the attack, has been sent home by General Hunter, and the island has been evacuated; thus abandoning for the present the attack on Charleston.

##### VICKSBURG BOMBARDED.

The whole of the Mississippi River is now in our possession, with the exception of about four miles opposite the city of Vicksburg, in Mississippi. Commodore Davis has descended the stream to a point just above the city, and Commodore Farragut is just below with his fleet, including the bomb flotilla. The two commanders are in communication, and we have reports that the bombardment has commenced.

##### MORE TROOPS CALLED OUT.

The governors of eighteen States addressed a com-