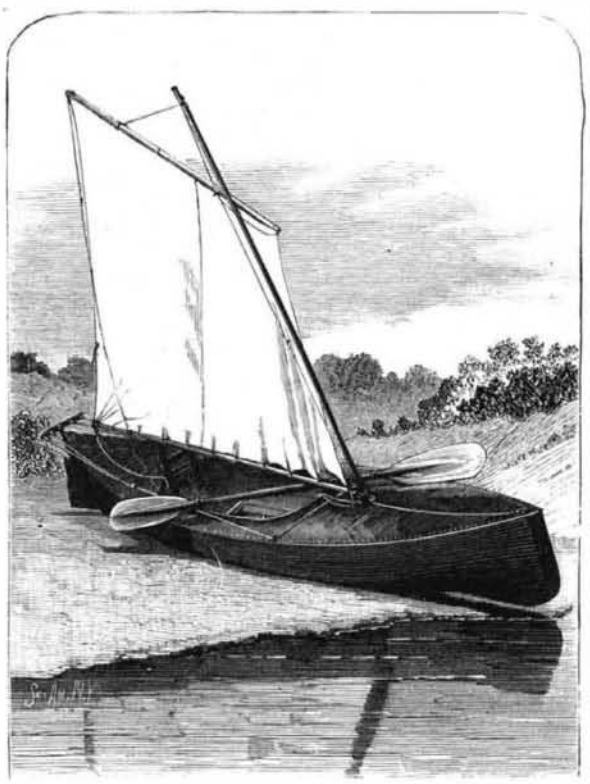
perties this light is much like gas. It is yellow, steady, and soft, and consequently not irritating to the eye. It has none of the blue rays incident to the voltaic arc arrangement, and the shadow cast by intervening objects is softened and mellowed at the margin. For practical purposes it is intended that the power of each lamp shall not exceed that of two ordinary gas jets.

The relative economy of this system of lighting we are unable to learn. "Approximate estimates" of cost make it much cheaper than gas; but in the absence of specific data for exact calculation, such estimates do not go far to satisfy the popular mind.

### THE RACINE CANOE.

The pretty little canoe shown in the annexed engraving is the outgrowth of the experience of the Racine Boat Company during the year 1879. It is made of birch, cherry, or cedar, according to the taste of the purchaser. Three sheets of the wood are cemented together with the grain of the inner sheet crossing the grain of the outer sheets, and the whole, while green, is pressed into the desired form under heavy pressure, making a body with but a single seam under the keel. The decks are made in the same way. The ends are nicely sheathed with brass, and the boat is finished with coach varnish, bringing out the beauty of the wood.



THE RACINE CANOE.

The boat thus made is very strong and not liable to injury with ordinary usage. It never leaks, and it is in every respect complete and well finished, and is of the most approved model.

The dimensions of the boat are as follows: Length, 13½ feet; beam 28 inches.

The boat shown in the engraving, when full rigged, weighs but 80 lb.

The parties building this, make open canoes, row boats, and shell boats on the same plan. They are finished with water-proof fillings and varnishes, and are very handsome and desirable. In a canoe similar to the one shown in the engraving, a trip was made late last season from Racine, Wis., to New Orleans, La., a distance of about twelve hundred miles, *via* lake, canal, and river.

Further information may be obtained by addressing the Racine Boat Company, Racine, Wis.

### THE FRANKLIN DRAUGHT REGULATOR.

The accompanying engraving represents the well known device in common use for operating a damper in the flue of a steam boiler by steam pressure. This device is substantially the same as that patented by Patrick Clark, in 1854, but it is combined with a recently patented improvement known as the Franklin regulator.

The improvement consists in erecting above the weighted lever, A, a plate, B, from which is suspended any desired number of weights ($a$, $a'$, $a''$) by rods which are furnished above the plates with thumbscrews, and are forked below so as to straddle the lever, A. The suspension rods and their weights may be so adjusted by the thumbscrews that the lever, when it rises under the pressure of steam, will, after reaching a given height, be loaded by one weight, and after overcoming this load and rising further, will receive another load, a third load being added by another weight after the lever reaches a still greater height.

When there is a slight excess of pressure of steam in the boiler, the lever, instead of being raised far enough to entirely close the damper, as in previous devices of this class, will be arrested in its upward movement by one of the weights, which gives the lever an additional load to carry, and to oppose the excess of pressure, the damper being closed to the limited extent determined by this additional load.

Should the pressure of steam in the boiler be reduced and resume its normal condition, the lever will fall to its original position, the weight will remain suspended clear of the lever, and the damper will be entirely open. If, on the other hand, there should be such an excess of pressure of steam as to raise the lever loaded by the first weight, it will, after rising a short distance, be further loaded with a second weight, and there will be a further contraction of the flue by the damper, a still further rise of the lever, resulting in the arresting of the latter by a third load and a further contraction of the flue.

The manufacturers claim every advantage that is gained by the use of other damper regulators without their disadvantages. In all other machines that have been applied to operate the damper by the action of the steam there are but two possible positions of the damper—it is either wide open or entirely closed; there must be no draught at all, or the full force. This has been the one defect that has prevented them from being thoroughly successful.

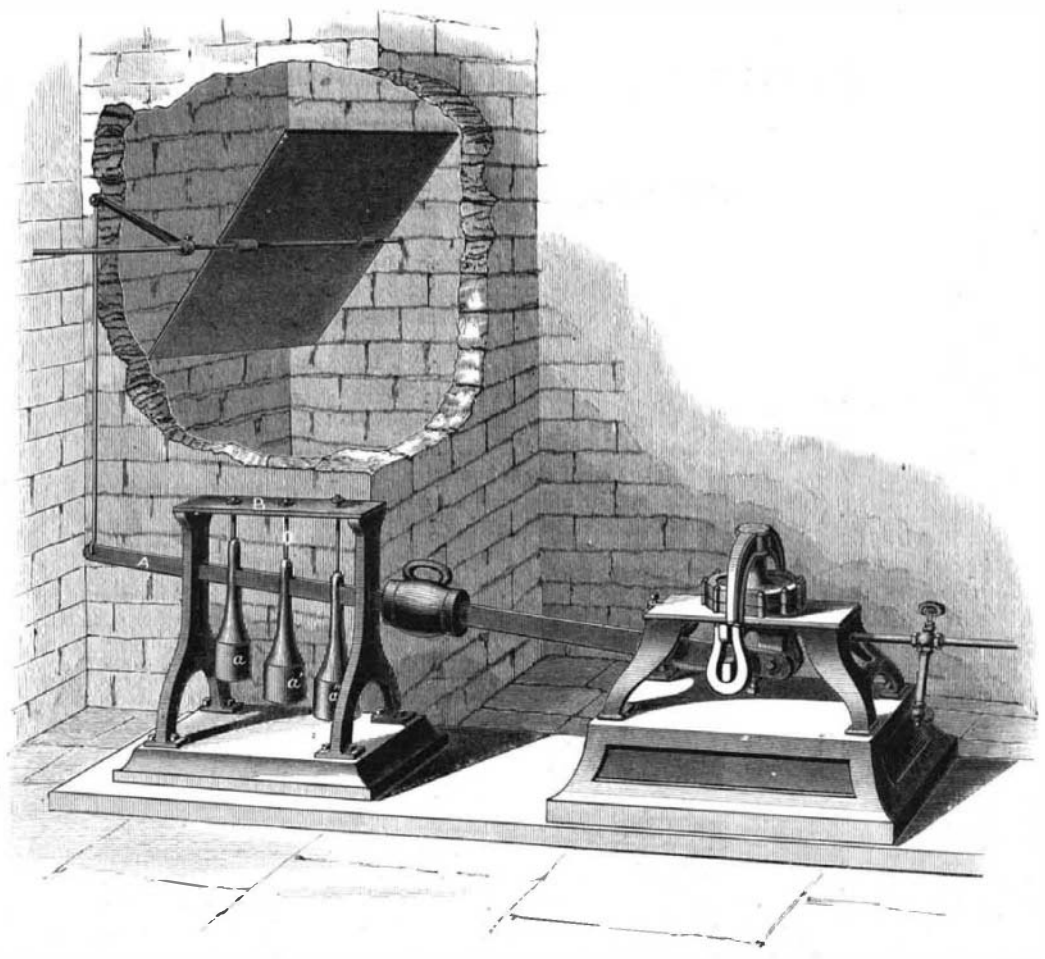
By this machine we are now able to absolutely control the working of boilers by keeping the damper always in that position which produces the normal pressure of steam, and by compensating for any rise or fall of pressure due to an irregularity in the use of steam by closing or opening the damper only as may be necessary.

Except in extreme cases, the damper is neither entirely open nor closed, but is maintained accurately in the position necessary to produce a draught corresponding to the normal working pressure.

This regulator is applicable to cases where an artificial draught is used by arranging it to regulate the motor. It must be admitted that economy of fuel is effected by having a constant uniform of draught proportioned nicely by the amount of steam it is desired to carry, which reduces the consumption of fuel to a minimum.

It is impossible for the pressure to run up rapidly, as the increasing pressures are met by a corresponding closing of the damper. In addition to these advantages a great saving of labor is effected, especially where the fireman's dutyis not confined to the care of his boilers alone—the steam pressure remains practically always at a constant point, and his time, except when coaling or feeding water, can be utilized in other work.

For further information apply to Turl's Iron Works, agents, foot of West 28th street, New York city.



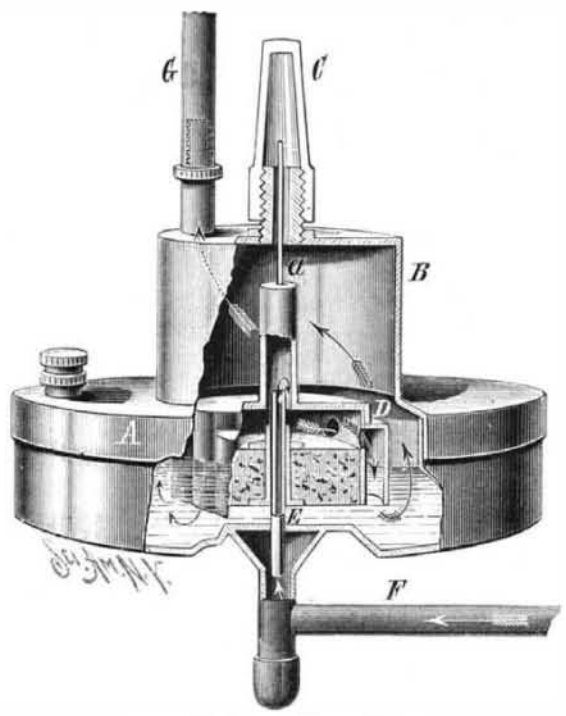

THE FRANKLIN DRAUGHT REGULATOR.

### The Alaska Fisheries.

The United States coast-survey schooner Tukan sails from San Francisco, in May, for Alaska, in charge of Mr. Tarleton H. Bean, who has been directed by the Commissioner of Fisheries to make a thorough examination of the character and resources of the Alaska sea and river fisheries.

### A NEW GAS ECONOMIZER.

The annexed engraving represents a novel device for enriching and economizing coal gas. It is simple and easily applied, and is said to be very efficient. On the top of the liquid-tight vessel, A, there is a dome, B, from the center of which a glass tube, C, projects. This tube is closed at the top, and at the bottom opens into the vessel, A. A float, D, having a cork bottom, slides upon a tube, E, which enters the vessel, A, at the bottom, and communicates with a pipe, F, leading from the gas meter. In the upper portion of the float there is a shallow chamber which communicates by small perforations with small vertical tubes arranged around




STRONG'S GAS ECONOMIZER.

the float. From the top of the float a needle, $a$, extends upward into the glass tube, C, and serves as an index of the movements of the float. The vessel, A, is provided with a filling tube, through which some of the lighter hydrocarbons are introduced into the vessel. The float rises and falls freely as the depth of the liquid varies in the vessel, but the weight of the float remaining the same its displacement is not affected by the quantity of liquid in the vessel, and the gas ejected into it from the float will always have the same quantity of liquid to rise through, thereby insuring uniformity in both the pressure and the quantity of gas supplied. Gas conveyed to the float through the tube, E, passes into the vertical tubes and rises up through the liquid as indicated by the arrows, and finally passes out through the tube, G, for distribution to the burners.

The gas is enriched by its passage through the hydrocarbon, and the light given by it is correspondingly increased.

This useful invention was recently patented by Mr. George T. Strong, of Port Hope, Ontario, Canada, from whom further information may be obtained.

### London Fogs.

The Londoners are, as usual at this season of the year, in great tribulation over their fog. On the theory that the steam from a kettle will disperse fog in a room, a writer in the *Lancet* believes that by sending out an army of steam engines on foggy mornings about the London streets, they might produce a cloudless sky. A most telling prospectus could be made out of the advantages of blue sky over yellow fog. The name of the company, *Capital and Labor* suggests, should be the "Fog Dispersing and Blue Sky Assurance Company," and a copy of the prospectus should be particularly sent to ladies and gentlemen known to suffer from bronchial affections. An army of puffing engines would, of course, be somewhat expensive, and it may be rather irritating to be awakened, say at the hour of 4 A. M., by a chorus of steam engines, but considerations of this kind ought not to be allowed to stand in the way of the realization of an idea which is at least unique.

### The Abolition of Labor.

In an extended study of the intellectual and industrial history of mankind (in the new Australian quarterly, the *Victorian Review*), Mr. James Smith says in summing up his conclusions:

In the earlier stages of human progress the race invents, only or chiefly, such implements and machines as are supplements to, or substitutes for, or multiplications of, muscular power. This is the aim or end of mechanism, which replaces manual labor by appliances that relieve the operative, while they increase the production of desirable objects. But as the cerebral development of the higher members of the family of man proceeds, invention takes a loftier flight and finds a wider scope. By giving us the telescope, the microscope, and the spectrum, it extends the power of vision, and endows us with something like another, and with certainly a finer, sense; while the telephone, microphone, and macrophone, are an extension of the faculty of hearing; and looms of every description, sewing machines, organs and pianofortes, type setting and type writing machines, and numerous other inventions of a similar character, may be regarded as an extension of the powers of touch. Ultimately science confers upon us the electric telegraph, which may be said to be an extension of the nervous system of every one of us: inasmuch as the thought which the brain transmits with such startling rapidity to the hand that writes the telegraphic message is transmitted with equal celerity, and by a similar agency, to any part of the world; so that, strictly speaking, the nerve centers of any person in communication with this agency are linked with fibers which cover the entire surface of the civilized globe.

Hence, if I have succeeded in making my meaning clear, the industrial development of the civilized races proceeds, *pari passu*, with their cerebral development. At first man toils laboriously, with nothing to help him in procuring the means of subsistence but the clumsy strength which inheres in his uncouth limbs. Then he constructs a few implements of the rudest and most primitive character. Then he gradually improves upon these, and learns how to forge metal and to fabricate tools. Then he becomes a mechanist; then he arrives at the art of manufacturing labor-saving machinery; then the discovery of the power residing in compressed steam enables him to make enormous strides in every department of industry; and the railroad, the steamship, and the electric telegraph virtually double or treble the term of his natural life, while indefinitely augmenting his strength. And so, as the laureate sings—

"Through the ages one increasing purpose runs,
And the thoughts of men are widen'd with the process of the suns."

Meanwhile, owing to the magnitude of the productive forces which are thus brought into active operation, there is an immense augmentation of their material results, and this, we must not omit to observe, is accompanied by a steady decrease in the amount of physical exertion which is necessary to accomplish those results. In the primitive ages of the world, bulk of frame, strength of limb, strenuousness of muscle, and robustness of thew and sinew count for much, both in war and in peace—both with the hunter who subsists by the chase, and with the husbandman who, at a later epoch, tills the ground. But, as the race advances, as the brain grows, and the nervous system is quicker and more sensitive to receive impressions from the outer world and to convey directions to the sensorial organs, and as the five avenues to the mind brighten and expand, mere bulk and muscle subside into minor importance. Manual labor is superseded by mechanical appliances; the artificer rises into an artist; the operative is transformed into the intelligent supervisor of machinery, which effects more in one hour than his unaided hands could have done in a year; and the progress of invention contains within itself the prophecy of the ultimate abolition of toilsome labor, and of its replacement by those "dumb elephants" who work for us day and night, with no other food than a little coal and water, and who are so docile that the hand of a little child can control, regulate, or suspend their movements. Are we not, then, approaching the millennium of the workingman, and drawing near the time when the very phrase itself will have lost the meaning which has so long attached to it, and will be conferred, as a title of honor, upon the real workers of the race—upon men with large and beneficially active brains—statesmen, inventors, teachers, natural philosophers, original thinkers, and all who, marching ahead of their generation, hold up the lamp of progress to enlighten the path of the multitude who follow in their steps?

For some years to come, perhaps, there will be a good deal of rough work, which will have to be done by rough hands; but, in the main, I believe the stream of tendency flows in the direction of emancipating the *élite* of the wages-earning classes from laborious and exhausting toil, and of enabling them to become the superintendents of machinery, emulating, in the perfection of its operation and results, the finest workmanship of human hands.

### A Comfort to Fat People.

No doubt, says the London *Lancet*, it is unpleasant to be excessively obese; but the morbid dread of fat which has in recent years become fashionable has no foundation in physiological fact. Fat answers two purposes; it acts as a non-conducting envelope for the body, and protects it from too rapid loss of heat, and it serves as a store of fuel. In the course of exhausting diseases, it not unfrequently happens that the life of a patient may be prolonged until the reserve of fat is exhausted, and then he dies of inanition. Fats supply the material of the heating process on which vitality mainly depends. In great excess it is inconvenient; but the external layings-on-of-fat is no certain measure of the internal development of adipose tissue; much less does a tendency to grow fat imply or even suggest a tendency to what is known as "fatty degeneration." It is time to speak out on this point, as the most absurd notions seem to prevail. Again, it is *not* true that special forms of food determine fat. That is an old and exploded notion. Some organisms will make fat, let them be fed on the leanest and scantiest and least saccharine descriptions of food; while others will not be "fattened" let them feed on the most "fattening" of diets. The matter is one in regard to which it is supremely desirable and politic to be natural, adapting the food taken to the requirements of health rather than substance. Simple food, sufficient exercise, and regular habits, with moderation in the use of stimulants, compose the maxim of a safe and healthy way of life.

### Perseverance and Health.

We believe there is a great deal of truth and wisdom in what our excellent contemporary, the *Sanitarian*, says on the above subject: A man who inherits wealth may begin and worry through three score and ten years without any definite object. In driving, in foreign travel, in hunting and fishing, in club houses and society, he may manage to pass away his time; but he will hardly be happy. It seems to be necessary to health that the powers of a man may be trained upon some subject and steadily held there day after day, year after year, while vitality lasts. There may come a time in old age when the fund of vitality will have sunk so low that he can follow no consecutive labor without such a draught upon his forces that sleep cannot restore them. Then, and not before, he should stop work. But so long as a man has vitality to spare upon work it must be used, or it will become a source of grievous, harassing discontent. The man will not know what to do with himself; and when he has reached such a point as that, he is unconsciously digging a grave for himself, and fashioning his own coffin.

Life needs a steady channel to run in—regular habits of work and of sleep. It needs a steady, stimulating aim—a tend toward something. An aimless life can never be happy, or, for a long period, healthy. Said a rich lady to a gentleman still laboring beyond his needs: "Don't stop; keep at it." The words that were in her heart were: "If my husband had not stopped, he would be alive to-day." And what she thought was doubtless true. A greater shock can hardly befall a man who has been active than that which he experiences when, having relinquished his pursuits, he finds unused time and unused vitality hanging upon his idle hands and mind. The current of his life is thus thrown into eddies, or settled into a sluggish pool, and he begins to die.

### Injurious Effects from Vulcanite Plates.

Samuel Sexton, M.D., in an article published in the *American Journal of the Medical Sciences*, for January, 1880, states that vulcanite plates produce diseases that are more frequently the source of reflex aural disease than any others worn. They have been in use for over twenty years, and their adoption is very general. The constituents of this are caoutchouc, the sulphur required in the vulcanizing process, and vermilion or the sulphide of mercury, used for the color it imparts. The quantity of the latter ingredient is believed to be equal in weight to both the other substances mentioned; accurate knowledge, however, is withheld by the manufacturers.

The gradual disintegration of these plates, as they are worn in the mouth, liberates a salt of mercury whose poisonous effects are well known. But besides yielding a poison, they are otherwise injurious to health. Inquiries from dentists elicit the fact that at least one-third of all those who attempt to wear them experience great irritation of the mouth, an irritation that is frequently accompanied by hypersecretion of the buccal fluid. The sufferer usually lays aside the plate until informed of the necessity of becoming accustomed to its presence by uninterrupted use. Vulcanite is a non-conductor of heat, and the effect of its contact with the highly sensitive tissues of the mouth is to produce hyperæmia and inflammation. Another source of injury is the very close contact of these plates, which is maintained by atmospheric pressure, and may favor the absorption of their substance.

### Dirt and Bodily Heat.

The part which the skin plays in the regulation of bodily heat is not adequately estimated. The envelope of complicated structure and vital function which covers the body, and which nature has destined to perform a large share of the labor of health preserving, is practically thrown out of use by our habit of loading it with clothes. It is needless to complicate matters by allowing it to be choked and encumbered with dirt. If the skin of an animal be coated with an impervious varnish, death must ensue. A covering of dirt is only less inimical to life. We are not now speaking of dirt such as offends the sense of decency, but of those accumulations of exuded matter with which the skin must become loaded if it is habitually covered and not thoroughly cleansed. The cold bath is *not* a cleansing agent. A man may bathe daily and use his bath towel even roughly, but remain as dirty to all practical intents as though he eschewed cleanliness; indeed the physical evil of dirt is more likely to ensue, because if wholly neglected, the skin would cast off its excrementitious matter by periodic perspirations with desquamation of the cuticle. Nothing but a frequent washing in water, of at least equal temperature with the skin, and soap can insure a free and healthy surface. The feet require especial care, and it is too much the practice to neglect them. The omission of daily washings with soap and the wearing of foot coverings so tight as to compress the blood-vessels and retard the circulation of the blood through the extremities, are the most common causes of cold feet. The remedy is obvious: dress loosely and wash frequently.—*Lancet.*

### Gas and Electricity.

In his recent inaugural address before the Society of Telegraph Engineers, London, President W. H. Preece said:

The electric light has been making considerable progress, and is gradually forcing itself into practical use, in spite of many of the drawbacks to its employment that have yet to be removed. The lamp of the future has not yet been produced, though steadiness and duration have very much advanced during the past twelve months. There is very little room for improvement in the generating machine, for both the Siemens and Gramme machines convert about 90 per cent of the energy thrown into them into electric currents, and this is a duty which no other kind of machine can show.

One of its most notable and useful applications has been on board ship, to further the operations during the night in laying and repairing cables. I was present on board the steamship Dacia, in the Mediterranean, when this was done, and the success was unequivocal.

The Brush machine has recently been introduced into this country, and its performances are certainly wonderful. It produces an electromotive force of over 800 volts, and I have seen it maintain 20 very steady arcs joined in series. 16 appear to be its efficient limit, and this number of lamps, giving over 1,000 candle power, are easily maintained by an expenditure of 13½ horse power. The performances of the Brush light are certainly the most advanced form the electric light has yet taken. There are over 800 of these lights in the United States; and it is worthy of notice that it has quietly crept into existence without the aid of the ubiquitous and omniscient newspaper correspondent, or the transmission of any sensational telegrams, to the detriment and discomfort of gas shareholders.

It is assumed by many that the electric light is devoid of heat, but Professor Dewar has shown that a Siemens arc radiates heat equivalent to 3 horse power per minute. Moreover, the use of such powerful currents, unless carefully directed, are dangerous to life and limb, and may even, unless properly protected, result in fire.

Gas is not going to be affected by the electric light. The proper function of gas is to generate heat. 94 per cent of the ingredients of gas are consumed in generating heat, and only 6 per cent in producing light. It is remarkable that so amenable and tractable an agent for heating purposes has not been more utilized, but the fact is that the public is ignorant of its properties, careless of its employment, and callous of its defects. It is not too much to say that 50 per cent of the gas manufactured is absolutely wasted for illuminating purposes by the wild extravagance with which it is burnt, and by the want of those systems of regulation which have been introduced to compensate for irregularities and excesses of pressure.

### Feather Plush.

For some time past the ingenuity of several manufacturers has alighted upon the idea of utilizing feathers as a material for weaving fabrics in various ways. We thus saw recently two samples of feather cloth which had come from France, and which consisted, apparently, of the down of feathers interwoven with fine woolen warp, in one case throwing the feathers to one surface, and in the other laying them upon both sides; the latter, especially, was a very interesting and exceedingly light cloth, which we understand is used in France for chest protectors, and is for that purpose more agreeable, though perhaps not so durable, as flannel or felt.

From a foreign patent we see that one manufacturer has protected a machine by means of which he produces a cloth or felt, in which he mixes finely broken feathers with wool, and then cards and felts them together. The machine he uses for the purpose is a combination of the opener and scutcher as used in cotton mills, and the fur formers employed in hat works. The feathers, which may be of any cheap kind, are placed upon a feed table, whence they pass under a drum set laterally with steel knives, which break the feathers; from this drum they pass between three small rollers and a superposed fluted and chased iron roller with a to-and-fro motion endways, as well as a revolving motion, and by which the reduced feathers are ground quite small, and, falling upon a traveling apron, pass on to a spiked drum running in a cage, whose office is to reduce any pieces which have escaped the action of the rollers. The pounded feathers fall to the bottom of the machine, whence a fan sends them into a proper receptacle, where the feathers are mixed at once with wool. They may be blown direct upon the card table of a carding engine, which, in that case, must have a cover as is usual in carding cotton.

The mixture of feathers and wool can, of course, be made in any proportion. The inventor states that he has obtained the best results by felting the cloth; the laps made by the carding engines are jointed by friction under the influence of steam, then milled, dried, and subjected to the action of steam at a high temperature in a steam chamber, which latter action is said to thoroughly amalgamate the feathers and the wool.—*Textile Manufacturer.*