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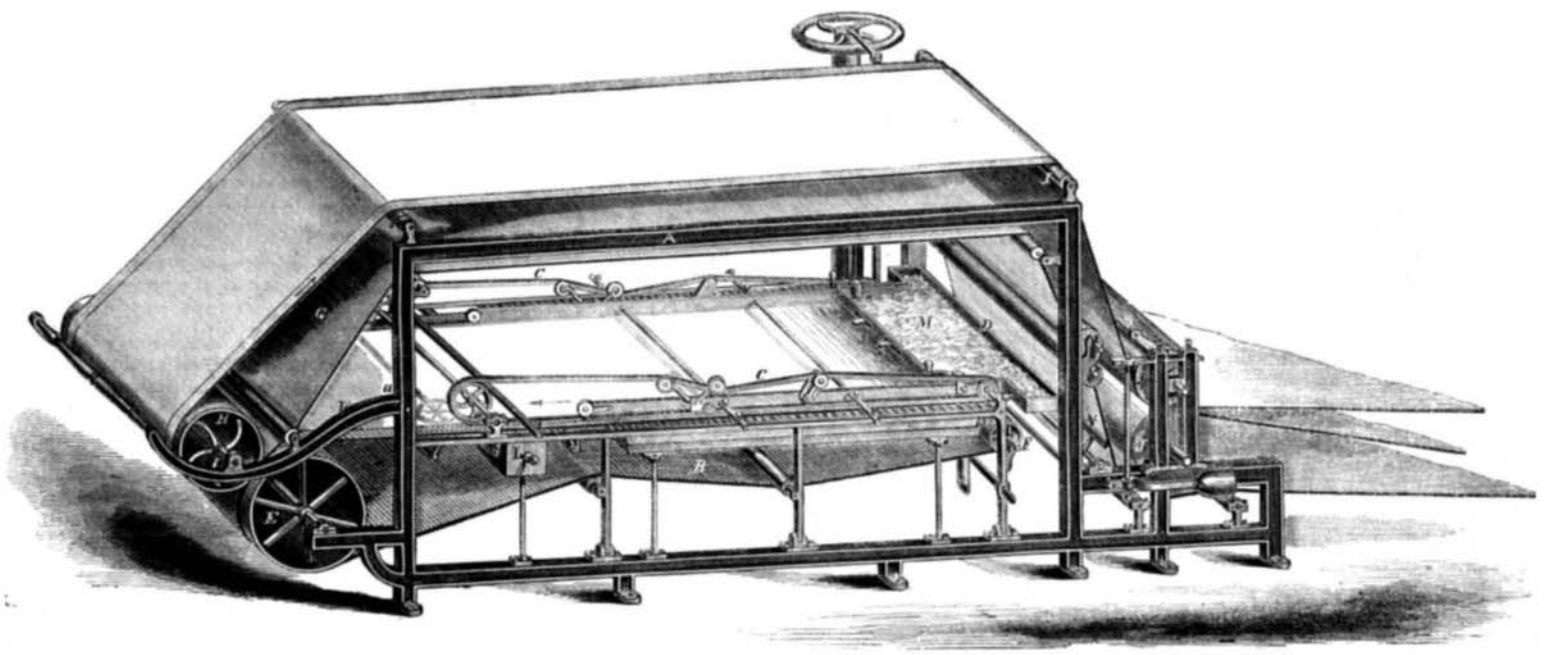
Improvements in Paper Machinery.

The accompanying engraving illustrates some improvements in the Fourdrinier machine for forming sheets of paper from the pulp, recently invented by James Harper, of East Haven, Conn. The objects of these improvements and their nature will be understood from a brief description of the machine.

The pulp, M, flows from the trough, D, upon the upper leaf of the endless apron of wire cloth, B, by which it is carried along in the direction indicated by the arrow, over the suction boxes, L, being thus freed from a considerable portion of its water, to the roller, E, where it comes in contact with the endless blanket of felt cloth, G, which takes it from off the wire cloth and carries it back to the front end of the machine, where it is delivered to the aprons that conduct it to the drying cylinders.



HARPER'S MODIFICATION OF THE FOURDRINIER MACHINE.

In the Fourdrinier machine, as ordinarily constructed, the pulp passes between pressure rollers at the point where it is transferred from the wire cloth to the blanket, and this involves the necessity of having rollers with solid peripheries covered with felt, in order to prevent the paper from being forced through the meshes of the apron and adhering to it, and even with this precaution the apron is injured by the pressure and rapidly worn out. To obviate this difficulty is the object of Harper's modification.

To this end the blanket, G, is allowed to press upon the paper pulp only with sufficient force to take it up, while the pressure is given by the rollers, J J, at the opposite end of the machine. In consequence of this arrangement, the roller, E, may be formed of wire cloth, through the meshes of which the superabundant water escapes as the paper is couched.

For the successful operation of this modification it is necessary that the couching felt should be kept clean, and this is effected by the revolving beater, N, operating in connection with jets of water.

One of these machines has been in operation nearly two years at East Haven, Conn., where it may be examined at any time. The inventor claims that it combines all the advantages of the Fourdrinier, with the economy of cylinder machines.

The patent for this invention was granted March 14, 1862, and further information in relation to it may be obtained by addressing the manufacturers, Rice, Barton & Co., at Worcester, Mass.

American Locomotives.

At the conclusion of an able paper by Mr. Zerah Colburn, on the "Traction of Locomotives," published lately in the London *Engineer*, he says:—In this lengthy communication I shall not trouble you with details of the mechanical construction of the engines. I purpose no further than to say I have ventured upon nothing new. My connection with locomotive building commenced fifteen years ago, and all this time I have been seeking, both as a designer and constructing engineer, to prove all things and to hold fast to that which is good. I have not only seen a vast variety of patterns of locomotives, but have had a tolerably wide field of observation for ascertaining their economical qualities. I have tried to divest myself of everything like prejudice, especially national prejudices; but I cannot lose sight of the fact that engines built on the American plan are the cheapest in first cost; and it is a mere matter of the comparison of statistics of working to prove that more work is got out of them for less money than for any other engines made anywhere.

Commenting on this the *Railway Times* says:—We believe in this, not only that Mr. Colburn speaks the thought of an impartial judge in this matter, but that he states facts very easy of proof. Certainly no one is better able to judge correctly in this department of engineering. The peculiar features of the American engine have been developed directly from the nature of the roads upon which they have been built to run, and from the work required of them. Whenever a new railway has been constructed, which in its grades, curves or other elements has called for a modification of the old pattern, such modification has been at once forthcoming. Besides such improvements, which may be called simply anatomical, our machinists have been introducing such changes as the increasing weight of trains and change of fuel demanded, in the furnace, boiler and steam consuming apparatus. The Bissel truck, spread wheels, horizontal cylinder, Griggs's wooden blocks, and other like innovations are slowly but steadily getting entire possession of the field. In every land where our locomotives have had a fair trial, they have been a credit to the mechanical engineers of America. Besides the improved pattern on which the latter engines are built, and completing the perfection of this department of railway operation, is the method of registering the individual performance of engines, and the monthly reports of the machine department, by which an engine is at once called to account for delinquencies, and shamed out of a low performance by comparison with its more active and economical fellow laborers. When the other departments of railway operation shall come up to the standard of improvement exhibited by the locomotive, we shall have nothing to be ashamed of in the results of the new mode of transport.

Polytechnic Association of the American Institute.

The next monthly meeting of the Polytechnic Association takes place on Thursday evening, September 11. The appointed subject is Highways, and as those who moved and seconded the adoption of this subject take a zealous interest in it, the discussion promises to be unusually intelligent and interesting.

BOTTGER, the great chemist, recommends chemists to use gun cotton as a filter for concentrated acids and liquids decomposable by organic matters. He employs it with the greatest advantage for filtering concentrated nitric acid, fuming sulphuric acid, chromic acid, permanganate of potash, and even concentrated solutions of potash, and aqua regia. He states that properly prepared gun cotton is only attacked at the ordinary temperature by acetic ether.