

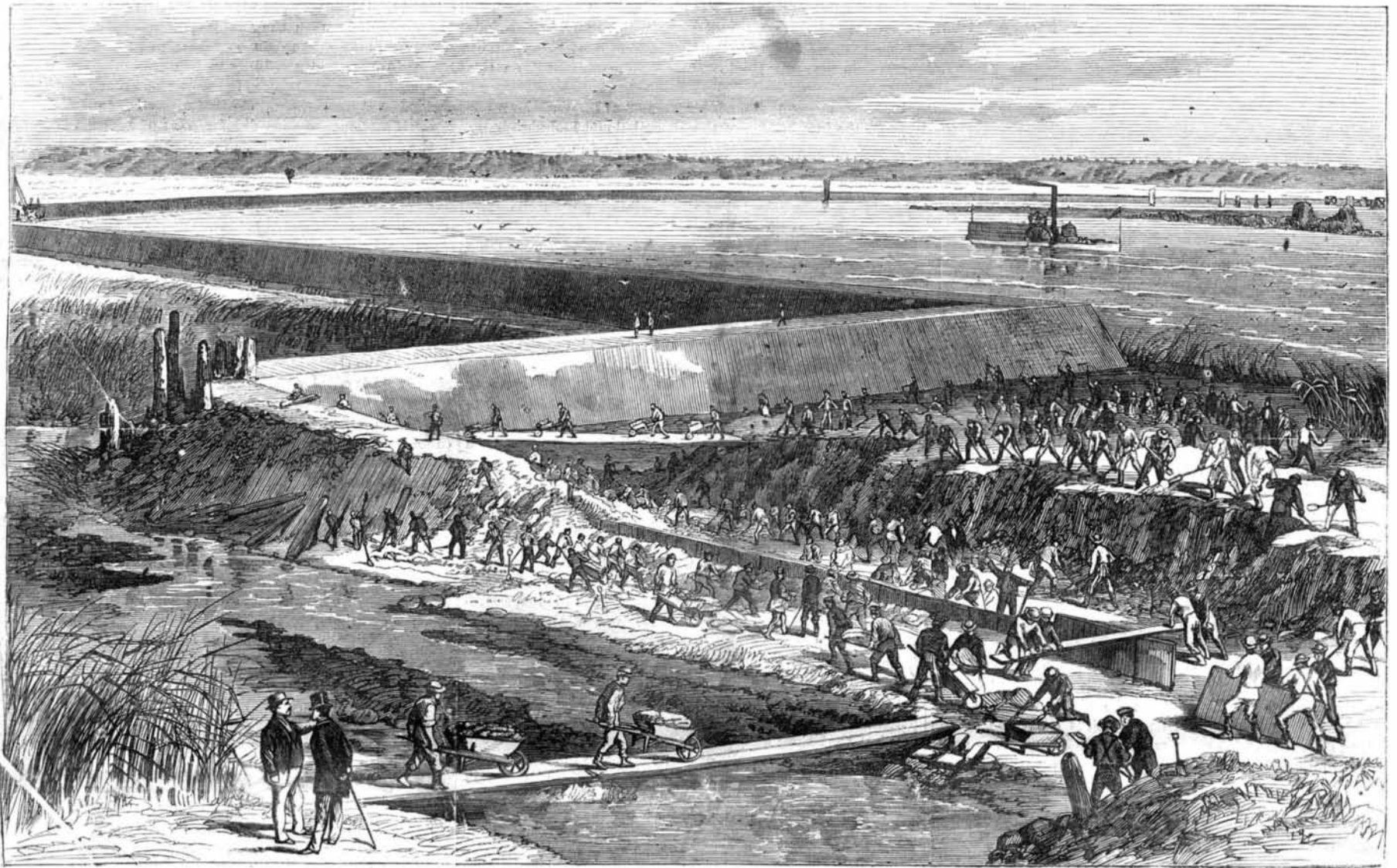
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DIKING AND DRAINING THE NEW JERSEY MEADOWS.



SETTING A PLATE.

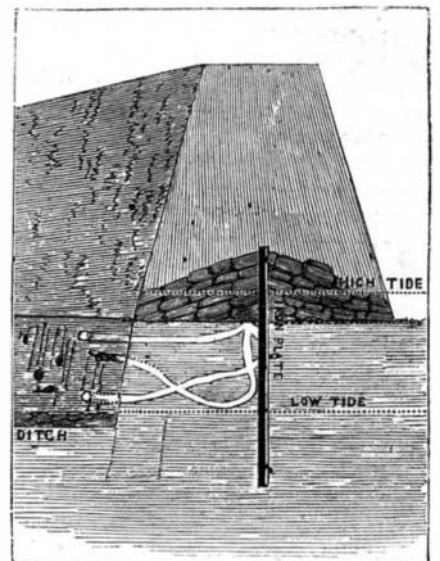
Diking and Draining Salt Marshes.

The draining of swamp lands is not a new idea. Such lands are not only unproductive of anything which can subserve any important purpose, but they are productive of numerous evils. Teeming with miasms, the home of mischievous and annoying insects they are blotches upon the otherwise fair face of nature. To render them fruitful, and productive of good rather than evil, is a problem for which a solution has been anxiously sought, but heretofore only partially obtained. No system applicable to all cases has been discovered, and only three methods have been adopted in the past to any great extent; viz., the slow process of pumping, ditching, and the erection of dikes or levees. These methods are not only expensive at the outset, but inefficient and costly to maintain. The dikes of Holland are embankments made with heavy timbers and filled in with stone, the surfaces being covered with bundles of flags and reeds fastened down by stakes. Also piles are driven into



CRISELING.

the sand and protected by planking, as well as by earth, turf and stones. In some places wicker work is used to cover and protect slopes, and the willow is cultivated extensively to supply the material for this purpose. In places of great exposure, walls of masonry with piles driven upon the side towards the sea, are used to protect the embankments from the action of the waves



SECTION OF EMBANKMENT.

The fens of Lincolnshire and the Bedford level are examples of the reclaiming of worthless and unproductive swamp lands and transforming them into fertile and productive fields.

These works are, however, not the results of private enterprise. In order to complete them, it was necessary to seek and obtain governmental aid.

An annual expense of \$30,000 each is required to keep the dikes of Helder and West Cappel, at the western extremity of the island of Walcheren, in repair. The annual expenditure in Holland for maintaining its dikes and

the regulation of its water level is from two to two and one half millions dollars. Watchmen to patrol the dikes and to give the alarm when danger threatens, and engineers to apply the proper means in cases of emergency, are constantly employed.

As we have said, these measures are only partially successful. Water percolates through such artificial embankments,

Even if practically water-proof at the outset, the rats and land crabs soon destroy their integrity, and what they commence the action of the tides accelerates, and thus the necessity of constant watchfulness and repair arises. The want of an impenetrable core which should defy the whole tribe of borers, individually or unitedly, has caused the failures in the science of draining which have hitherto marked its progress.

The iron dike invented by Mr. S. B. Driggs, of New York, seems to put an effectual barrier in the way of these destructive agents. It is constructed by driving iron plates into the soil and joining them end to end, thus presenting an unbroken and impenetrable iron wall, which may be extended to any required length, and the durability of which is unquestionable. If, from causes not taken into account, repairs should ever be needed, the replacing of one of these plates is an operation quickly and easily effected.

The invention of iron dikes seemed to be singularly applicable to the drainage of the Newark meadows. Accordingly, Mr. Driggs, purchased and secured, notwithstanding difficulties arising from the various owners and the opposition of the Tide Water Co., of New Jersey, 5,000 acres of these lands. This Tide Water Co. had most exclusive and oppressive privileges granted to them by charter; one of which was the power to reclaim any land at will, and to tax the owner twelve dollars per acre in perpetuity. Mr. Driggs fought this scheme of extortion until he obtained the entire abrogation of their iniquitous charter. At this stage of proceedings, Mr. Driggs secured the hearty cooperation of Mr. Samuel W. Pike, of opera house fame, who saw sufficient promise in the system to give it his most earnest and hearty support. The work was now prosecuted with great vigor, and the result has been that owners of land only a few months since valued at fifty dollars an acre, have in some cases recently refused offers of enormously increased prices. The accompanying description, together with the cuts, will give a good idea of the nature of this improvement.

We have already said that these dikes are constructed with iron plates driven into the soil. The plates are so constructed and driven as to form a continuous wall. They are of cast iron, as thin and sharp at the bottom as the metal will run. They are made of sufficient width to reach both the high and low water marks, and are pressed or driven into the soil by any convenient power. The weight of workmen transferred by means of an ordinary fence rail, or blows upon the tops with stones, is sufficient in very soft mucky soils, while in stiff soils some superior force might in some cases prove necessary. The plates are so joined to each other as to prevent their overlapping, and the earth forced into the joints renders them sufficiently tight. When the turf is too tough and unyielding to drive these broad plates with facility, it is cut by a process called chiseling. After the plates are driven to a sufficient depth, a large and deep ditch is excavated on the inland side, into which other cross ditches empty. The earth thrown up over the iron wall forms a fine substantial embankment, covering the portion of the iron left exposed in driving. The bank is protected from the action of weather by grass and such creeping plants as have long interlacing roots.

To prevent oxidation, the iron used is refined so little as to be scarcely changed in character from the crude metal. It is well known that refining iron increases its tendency to oxidize, and it is claimed that the iron used for these plates will at least rust so slowly as not to materially affect their durability.

It is claimed that this improvement is applicable not only to dikes, but to banks of canals.

There can be little doubt as to its applicability to the reclamation of the large tracts of waste swamp lands to be found in Mississippi, Louisiana, Arkansas, Missouri, Tennessee, and other parts of the United States. Experience has proved the extraordinary fertility of lands thus reclaimed, and the benefit of iron dikes may thus prove to be a boon not only to our own country, but to the world at large.

POWERS OF THE COMMISSIONER OF PATENTS.

A singular case has lately arisen in the Patent Office, which from the frequent opportunities of its occurrence involves consequences of considerable general importance.

The owner of a patent applies to the office for a reissue, and is met by the answer that there appears upon the records of the office an assignment of the whole patent to another party, who has already obtained a reissue. To this he replies that the assignment is a forgery, and at the request of the office, substantiates his statement by satisfactory proofs, and claims that the Commissioner should at least again reissue the patent, and place him upon an equal footing with the forged assignee.

The Commissioner rejoins, that this is impossible. First, because he has no power judicially to consider the question as to who is the owner of the patent, aside from the records of his office, and, second, because the original patent having been surrendered by the fraudulent assignee, it has now no existence to be again surrendered for a reissue, and that the only remedy for the rightful owner is in the courts.

It becomes our duty to consider these questions in their order:

First—What are the powers of the Commissioner of Patents in determining who is the assignee of a patent upon the application by a person of that class for a reissue?

The provisions of the Patent Law upon the subject of reissues, in this instance, are as follows:

After detailing the prerequisites of a reissue, the act continues, "and in case of his (the patentee's) death, or any assignment by him made of the original patent, a similar right shall rest in his executors, administrators, or assignees," Act of 1836, §13.

The power here conferred upon the Commissioner to re-issue a patent to the assignee thereof, necessarily invokes the power to determine who is an assignee. Of this there is no dispute, indeed the objectors in this case concede the right, though they insist that the Commissioner can have resort only to the records in his office for information.

Let us inquire, then, whether such is the limitation of evidence in this instance.

The powers of the Commissioner of patents are largely judicial. Questions of novelty, utility, adequate compensation, equivalent devices, and construction are under his constant supervision.

In no single case is he expressly limited by law to the information on hand in his office. Indeed by far the greater number of classes of questions presented to him, depend upon information wholly outside his records.

The Act of 1836 (sec. 11), provides, "that every patent shall be assignable in law, * * which assignment * * shall be recorded in the patent office within three months from the execution thereof."

What was the purpose of this enactment? Was the recording for the information of the Commissioner? Judge Story in a leading case in Massachusetts, where the effect of not recording an assignment was fully discussed, supplies us with the answer. The learned judge there says, "Why should an assignment be recorded at all? Certainly not for the benefit of the parties or their privies, but solely for the protection of purchasers who should become such *bona fide*, for a valuable consideration, without notice of any prior assignment." (Pitts vs. Whitman, 2 Story, 609). And this is the settled law to-day. If, then, "Every assignment shall be recorded" "solely for the protection of purchasers," under what color of right can the Commissioner say that the enactment impliedly limits him to the record itself for evidence.

But again, the Act says, in case of the patentee's death, or any assignment by him, a similar right shall rest in his executors, administrators, or assigns.

Suppose a patentee dies, and his administrator applies for a reissue, must not the Commissioner determine if the party applying is the administrator; and in order to do this is he confined by any requirements of the Patent Law to any records in his office to determine the fact? Manifestly not, for there are no such records, the whole range of legal evidence which might be adduced in a Court of Justice is at hand to aid him in his decision. Primary and secondary evidence of all kinds in their appropriate places is open to his inspection. And if this is the case with an executor or administrator, why should we apply a different rule to the assignee who is mentioned by the Act in the same breath.

And again, many assignments are incapable of record, and yet it seems hard that such assignees, the legal owners of a patent, should be precluded from the benefit of a reissue by the fact that their assignments are not recorded, which will be the case if the Commissioner is limited to his record, such as assignees in bankruptcy, insolvency, or receivers. Or a veritable assignee may have lost or been deprived of his assignment, and may be unable either to procure a copy or a new original, yet it can hardly be the policy of the law to deny to him the whole benefit of his patent, by refusing to admit other legitimate proof of his ownership as a foundation for an application for reissue.

This very objection of being limited to the records of his office was made by the Commissioner in the analogous case of *ex parte* Dyson, decided on appeal from the patent office in 1860, and Judge Dunlop then held that "the legislature has not said by what proof the applicant shall show that his invention claimed on reissue is the same invention made and intended to be patented on his original application. He is not limited by the statute to prove it by the specification, models or drawings, any legal proof to show it to be the same invention, whether found in the record or *alibunde*, ought to be received and weighed by the patent office. No authority is given to the patent office to limit the applicant's proof, if it is such as upon the law of evidence is held sufficient to prove facts before other legal tribunals." If, then, the applicant for a reissue is not limited to his specifications, drawings and model, upon the question of identity, why should he be confined to the record of assignments upon the question of ownership.

If, then, these authorities and illustrations have any weight, it would seem to be an undeniable proposition, that upon an application for a reissue of a patent, the Commissioner is not confined to the record alone to determine the legal ownership of the patent, but may resort to all those ordinary departments of evidence which afford themselves to every one charged with the decision of judicial questions, indeed, any other construction would lay the Patent Law open to the charge of depriving citizens of their right to a reissue (which is their *property*), without "due process of law."

This view is strengthened by referring to the provision of the law of 1861, (chap. 88), which provides "that the Commissioner of Patents may establish rules for taking affidavits and depositions required in cases pending in the patent office," supplying him with ample facilities for satisfying his mind of any doubts in this or similar cases, a provision evidently intended to apply to proceedings before the office different from the "contested cases" mentioned in section 12 of the Act of 1839, or the subsequent clauses of the Acts of 1861. It remains then, only to consider under this head the question whether the record can be contradicted by evidence *alibunde*.

The evidence being admissible as above shown, there is no rule which will prohibit its use in the correction of the record.

The rule of the common law which prohibits the contradiction of a writing by parol evidence is one of interpretation merely, when the only question at issue is one of construction,

but has no applicability to cases where the existence or authenticity of the instrument is disputed. (Greenleaf on evidence, §284. Act of 1839, or the subsequent clauses of the Act of 1861.)

We come, therefore, to the second question proposed, as an objection to the reissue under consideration.

Does the fact that the original patent has been surrendered by the fraudulent assignee form any obstacle to its reissue?

It is satisfactorily proven that the patent had been surreptitiously obtained from the owner for the purpose of surrender. The surrender, therefore, was made by a person having no authority to make it, and was of consequence a nullity. It is one of the greatest absurdities to allege, that any person can, by falsely simulating another, rightfully deprive him of his property. But if no valid surrender of the patent was made, the proceedings upon the reissue to the fraudulent assignee were void, for a reissue can only be granted after a valid surrender (Act of 1836, sec. 13), and the original patent, therefore, still continues in force. In the case of French vs. Rodgers, decided in Pennsylvania, in 1851, Judges Grier and Kane held that "if a reissue was invalid for want of authority to make it, the surrender is ineffective for want of authority to accept it." Indeed, it has frequently been adjudged in the analogous case of the surrender of a patent, upon an insufficient basis of fact for a reissue, and the reissue being void in consequence, that the original patent continued in force, notwithstanding its delivery to the patent office. (Woodworth vs. Edwards, 3 Woodbury & Minot, 127.) The mere fact of possession by the office is nothing unless there was a valid surrender.

We have now seen that the surrender of a patent by a fraudulent holder is no bar to the legal title of the true owner. And that the Commissioner of Patents is not restricted to the records of his office in determining who is the assignee.

It would appear, therefore, to be his duty, upon being satisfied of the fact of the forgery of the assignment, by means of those ample provisions for securing evidence in cases before him, contained in the acts of 1839 and 1861, to reissue the patent to the party whom he is convinced is the rightful owner, thereby remedying the wrong that has been done him, at least so far as to place him on an equality with the wrong doer.

There are some badges of fraud upon the face of the forged papers in the particular instance before us, which need not be adverted to in this discussion of the general principles of the case; we will only remark in conclusion that it seems peculiarly appropriate, that where, as is at present the case, the door is left wide open for the perpetration of frauds of this nature, by the lack of any provision of the Patent Law for the identification of grantors and grantees of patents, prior to their assignments, that there should be a simple and summary method of correcting errors resulting from so manifest a defect.

THE GREAT AERONAUTICAL EXHIBITION.

The much talked of Aeronautical Exhibition, opened at the Crystal Palace, London, the 25th ult., with a large number of machines immediately and remotely connected with the subject of air navigation. Machines with wings, screw propellers, and tails, more or less in imitation of the structure of birds, seem to form the foreground of this collection of mechanico-ornithological devices. It is not our intention to reiterate the opinions in regard to the practicability of aeronautical machines, which have often been published in our columns. The exhibition inaugurated by the Aeronautical Society is a very good representation of the progress thus far attained. The secretary of the society in a communication to "The Engineer" says:

"It should be borne in mind, in the event of any ridiculous theory being illustrated in some of the objects now to be seen, that the study of aeronautics has been hitherto left to a class for the most part uneducated in mechanical laws, who have in consequence been wholly unable to give practical effect to their views, since they could neither themselves construct the apparatus they required, nor did there exist any organized scientific society from whose published proceedings they could gather confirmation or condemnation. Eminent naturalists, for instance, ignoring mechanical laws, have recognized as the main feature in the buoyancy and flight of birds, air cells and other peculiarities which render them of the same specific gravity as the atmosphere. The attempt to elucidate such a theory by any model would be quite as ridiculous as anything likely to be shown at this exhibition." Still it is hoped "if the ideas enunciated in some of the excellent papers read before the Society, do not result in some mechanical arrangements which shall to some extent be effective, that they will otherwise lead to more promising investigation."

The machines and devices exhibited are divided into seven classes: Class I. includes light engines and machinery.

In this class we notice

Rotary engine made of steel, one-horse power; dimensions, two feet by eighteen inches, and one foot high; weight about sixty pounds. Motive power, gun cotton.

A one-horse power turbine injector steam engine, weighing less than twelve pounds, with inclined vanes showing its adaptation for aerial purposes, with rudder and gear for working.

Light engine and machinery for aerial purposes, about half-horse power. Cylinder two inches in diameter, three-inch stroke; generating surface of boiler, three and one half feet; starts at one hundred pound pressure in three minutes, works two propellers of three feet diameter about three hundred revolutions per minute. With three and a half pints of water