

To encourage men to seek for new devices, for instance, for increasing the comfort and safety of travelers by rail, the United States declare that the inventor of such a device shall enjoy—if he wants it—the exclusive right for a term of years to make, use, and sell his invention. In their private capacity the managers of railway corporations have a perfect right to decline to buy or use any and every invention, whether intended for railways or otherwise, without giving a reason to anybody. As railway managers they have no such right, nor is it good policy for them to assume it.

The charter of a railway company is, in a sense, equivalent to a patent. It is granted by the people—just as a patent is—for a specific purpose, namely, the public convenience and profit. It conveys certain privileges, not for the benefit of the railway managers, but because they are essential to the attainment of the end aimed at. The road has, for example, the right of way through an inventor's farm, and in their official capacity its managers can demand what they cannot as private citizens. With official privilege goes official responsibility. As they have a right to take the inventor's land for the public good, if such be the case, so they are morally, if not legally, bound to use his invention, if the public good demands it. They cannot safely play fast and loose with official rights and responsibilities, demanding the one and shirking the other, as suits their personal pleasure and profit. The public gives, and it may take away, to the pecuniary loss of those who misuse the public trusts confided to them.

There is another view of this matter which anti-patent associations may profitably take into account. Since its foundation the government of the United States has manifested a desire to multiply and improve our industrial arts by the encouragement of new inventions. Experience has proved the desire to be a wise one, and has practically justified the means adopted to attain the objects of that desire, especially the means which costs least and yields the most—the granting of patents for new inventions. More than ever before the American people are now satisfied that the encouragement of invention pays.

Are they likely, then, to be pleased with the systematic discouragement of invention—the organized thwarting of the popular will, to say nothing of the attendant hazarding of public comfort and safety—by corporations which owe the possibility of their existence to public grants of privilege?

At the last meeting of the Car Builders' Association certain draw-bar appliances were substantially condemned, so far as it could be done by that body, simply because they were patented. The *National Car Builder* tersely puts their position in this wise:

"A freight brake is wanted—something that will enable a locomotive engineer to handle a long, loaded train as easily as he does his throttle lever. The thing is invented, let us suppose, and the inventor asks the association to give it their formal approval. The members reply, collectively: It is an excellent invention—all we want or could expect, and more too—but we cannot recommend it, because it is patented. Annul or cancel the patent, and make the brake public property, free to all, and we will sound its praises through the length and breadth of the land."

In refusing to "recommend" an invention, the association substantially declares the determination of its members not to use it in building or equipping cars.

We would respectfully suggest that action of this sort is as hazardous as it is unjust and unwise.

If inventions looking to the public benefit are thus to be killed, for the sole reason that they are patented, the public, which offers the patent as encouragement to invention, may take steps to prevent or punish such conspiracies against the public weal and will. And in retaliating it is quite possible for the people to be too severe in their enactments compelling the adoption of improvements. We should prefer to have inventions left to force their way by inherent excellence; but if they should ever be pushed into use by legislative enactments, those who have conspired to nullify the patent law as it stands will have only themselves to blame for the change.

EXTRACTION OF OILS BY MEANS OF SOLVENTS.

The extraction of oils and fats by means of the solvents, benzine, gasoline, and bisulphide of carbon, has grown up to be an important industry in the United States during the past ten years. At the present time, the capital invested in business is probably about \$500,000, and the number of independent factories, four to six. The solvents employed are the petroleum benzines of the lowest boiling points, and the gasolines, the latter being used in the cases where it is necessary to remove all traces of the solvent from the finished products. Bisulphide of carbon was once used on a considerable scale for the extraction of oil from corn (maize) under the theory that the oil from corn would be much more valuable for the production of alcohol and starch. The industry, however, was discontinued mainly by reason of the high cost of the bisulphide and the risk in its use from inflammability and unhealthfulness. It is not likely that bisulphide of carbon will come into extensive use in this country, so long as the supply of petroleum is continued. It is well known that it is a much more rapid solvent than the petroleum products, but it is believed that this advantage is more than overbalanced by the objections to it. The petroleum, when heated to the normal boiling point or over, are nearly as rapid as the bisulphide.

The materials operated upon with benzine are especially the residues from fat rendering, and castor oil seed cake or

pomace. The largest establishment of this kind is at Philadelphia, and is carried on by a joint stock company, under the patents of Adamson. The dissolving cylinders are horizontal—one say 8 feet in diameter and 20 feet long. The cylinders are provided with a railway, and the material is brought into the cylinders closely packed on trucks or cars. At the bottom of the cylinders are steam pipes traversing the whole length. When the cylinders are charged and their doors bolted on, benzine is let in so as to cover the steam pipes, the steam is let on, the benzine evaporizes, and condenses through the material, dissolves the fat, and the solution falls down to the bottom. The solvent again vaporizes and rises again to extract more oil. The dissolving cylinders or extractors are provided with suitable instruments to determine the temperature, height of the solution, etc. The fat or oil, after distilling off its solvent, undergoes a special refining treatment. The favorite raw material for this process is "beef scrap" and "pork scrap," containing 12 to 15 per cent of fat, which is practically extracted in the process. The residues are ground and used as fertilizers, under the name of azotine, and contain about 15 per cent of ammonia. The extraction process lasts from 24 to 36 hours. The extraction of oil from castor pomace is conducted in all respects as above. The fats and oils resulting from the process are mostly used as lubricants for machinery, and are not of the quality needed for good soap.

The works at Philadelphia have suffered severely from fire, having been at least twice wholly consumed. It is evident from the fact that they are just reconstructed that the industry is found to be profitable.

About ten years since an incorporated company began the manufacture of extract of hops under the plans of Professor Charles A. Seeley, making use of gasoline of specific gravity 80° to 90° B., as the solvent. The industry has steadily and healthily grown, and promises to become of the first importance. The useful matter of the hops by this process is completely extracted, is of small bulk compared with the hops, and is not at all deteriorated by keeping. The extractors of Seeley's system are vertical, are charged at the top, and discharged at the bottom. They are heated by steam, being jacketed on the lower half for that purpose, and the pressure of the vapor of the solvent serves as the motive force for discharging the solution into a separator or still. The apparatus is so constructed that the solvent travels in a circuit and does not go out of the connected parts of the apparatus. The separator or still consists of a vertical iron coil surrounded by steam, into which the solution is fed at the top. During the descent of the solution, the solvent is volatilized and escapes through a stand pipe to the condenser, while the oil or extract of hops, etc., flows away at the bottom.

Gasoline, according to the above plan, has been used upon meat scraps, cotton waste, seed cake, etc., quite successfully, as to the quality of the produce from it, as it is wholly free from petroleum contamination. In respect of the quality of the produce, gasoline is probably to be preferred to bisulphide of carbon, and in first cost and ease of working it is also plainly superior.

The oil extracting industry by means of solvents may be considered as firmly established in America, and as promising a very great extension in the near future. There are at present 20 to 50 patents relating to the industry, and there is no doubt that it will continue to employ the talent of inventors.

THE POLICY OF PATENT LAWS.

At the recent meeting of the Social Science Association at Saratoga, Mr. Frederic H. Betts, of this city, read a paper tracing at considerable length the historical development of patent laws, and traversing with singular skill and cogency the arguments of those who oppose the theory and practice of granting patents for new and useful inventions. The positions taken by Mr. Betts are those which have been advocated in detail, over and over again, in this paper—those which every friend of industrial progress and the rights of inventors will justify and applaud. And he developed his thesis so coherently, so forcefully, and with such aptness of illustration, that his paper makes the most readable and convincing argument for maintaining the integrity of our patent law that we have seen for a long time. In view of the probable renewal of the assault upon our patent system in Congress next winter, the paper is as timely as it is admirable.

In every congressional district the friends of the patent system—that is, as to its underlying principle and policy—should see to it that their representatives do not go to Washington without an opportunity, at least, for becoming acquainted with the actual standing of patent rights in law and equity and sound industrial policy, as therein set forth.

Mr. Betts begins by sketching the early history of patent rights for inventions, tracing meanwhile the development of the idea that patents are to be regarded as a fair bargain, the inventor contracting to contribute a new item to the stock of common knowledge of practical utility for purposes of trade, the public offering in return the means of retaining the exclusive use of the invention for a term of years. He then takes up and answers the objections raised against patent laws, both theoretical and practical, and proves the claims of inventors to be consistent with natural justice. He shows that the right of property in ideas, so far from being exceptional in the case of patents for invention, is widely recognized among men, and that its increasing recognition is one

means of estimating progress in civilization. To the objection that inventions are intangible, incapable of precise definition, and unsuited to be the basis of property rights, he replies by showing that all civilized men recognize and respect incorporeal rights. The difficulty of defining the exact limits of such rights may be great, but that has never been successfully urged as a reason for their abolition. Of all incorporeal rights, that of character and reputation is the least capable of measurement, yet for that very reason it has been most jealously guarded.

The objection that any individual inventor is but one of many working in the same field, all drawing from the common stock of knowledge and experience, and that to grant a patent to the first claimant is to set up a barrier to further progress, is considered at length and effectually disposed of. The alleged fact of the frequent simultaneous invention of the same device by several independent workers is shown to be untrue; and the asserted hindrance to progress by patenting the successive steps of it, is equally shown to be inconsistent with common experience.

On the contrary, the evidence is abundant that the grant of patents directly and powerfully promotes the progress of science and the arts.

Particularly interesting and valuable is the review of the growth and progress of ideas in respect to patents as shown in judicial decisions and legislative enactments—a development of a true appreciation of the rights of inventors, due not to mere change of sentiment, but to an increasingly full and exact understanding of the nature of trade and the proper province of laws in relation to it. This section will be found of special value in combating those reactionists who so boldly assert that the progress of thought is in a direction opposed to the principles underlying patent laws.

In closing, Mr. Betts proves statistically the exact coincidence of industrial progress with the increase in patent rights. Patents and trade go hand in hand. Take away the motive of invention and an important ally of improvement is destroyed. This has been the experience of industrial nations the world over. And American experience has shown that the more widely that motive is brought to bear on all classes, the more accessible patents are made to the multitude, the more rapid will be industrial progress, the more steadfast and general the country's industrial prosperity.

Mr. Betts' paper will be found in full in this week's issue (No. 197) of the SCIENTIFIC AMERICAN SUPPLEMENT.

The Movement of Breadstuffs and Provisions.

The movement of breadstuffs continues extremely active. The receipts of flour at this port the week ending Sept. 23, were 104,361 barrels, chiefly by rail. The receipts of grain were:

	By Canal.	Railroad.	Coastwise.	Total.
Wheat, bush.....	1,239,400	817,770	200	2,057,370
Corn, bush.....	1,075,450	45,850	1,121,300
Oats, bush.....	28,000	150,015	178,015
Rye, bush.....	204,800	7,602	400	212,802
Barley, bush.....	12,000	29,068	588	41,656
Total bush.....	2,560,550	1,050,305	1,188	3,612,043

The clearances of sailing vessels and steamers carrying breadstuffs from this port, the week ending Sept. 19, numbered one hundred and five. The total grain export was 50,643 barrels of flour; 2,329,279 bushels of wheat; 973,506 bushels of corn; 44,317 bushels of oats; and 107,613 bushels of rye.

During the same week there were exported 4,529 barrels of pork; 6,259,932 pounds of bacon; 3,293,122 pounds of lard; 2,466 pounds of beef; 611,005 pounds of butter; 2,684,468 pounds of cheese; and 917,021 pounds of tallow.

The Highest Telegraph Station.

A telegraph station has been lately established at the Ryffel Hotel, under the Ryffelhom, in the Valais. It is about 8,500 feet above the level of the sea, and is the highest telegraph station in Europe. A Swiss paper has claimed that it is the highest telegraph station in the world, but this is a mistake. The station on Pike's Peak, in the Rocky Mountains, is 14,000 feet above sea level, and is, therefore, something higher than that at the Ryffel Hotel.

The Ship of the Future.

After pointing out the great faults and failures of the present style of ocean vessels, a writer in the *American Ship* avers that the ship of the future will carry no ballast. If a sailing vessel, her sail area and displacement will be so well balanced that, if the rudder were lost or disabled, the vessel could be guided on her course by her sails. The center of effort of sails and of gravity of vessel will be adjustable, so as to harmonize with the gripping influences of the lee line of flotation.

The ships of the future will be profitable, for they will be built for and under a specific service, on scientific principles; they will be designed, built, loaded, and navigated, as they have never been, with direct reference to their equilibrium of stability, the safety of vessel and cargo, with the lives of those on board. The rating characterization of vessels will then be determined by an international, or an independent, board; the British Lloyds will have passed away, only to be remembered as a corrupt organization. The material of vessels will be steel for metallic, and bent timber frames for wooden vessels. Under this new dispensation of genius, ocean, mail, and passenger steamers will be non-sinkable, and make their Atlantic trips in six instead of seven-and-a-half days, with a roll angle not exceeding eight degrees.