OVERHEAD STEAM CRANES FOR DOCK PURPOSES.

The Middlesbrough docks, Yorkshire, England, which have recently been made by the North Eastern Railway Company to accommodate their greatly increased shipping traffic, possess many points of interest and novelty, prominent among which is the system of steam cranes employed, a system which we illustrate herewith.

It was found that no fixed crane could be kept constantly employed at Middle sbrough on account of the great variation in the length of the ships, steamers, etc., while, furthermore, as the total area of quay room would be, in the first instance, somewhat limited, the space occupied by a fixed crane would be attended with serious inconvenience. The same objection existed to the adoption of the ordinary construction of portable cranes, involving a separate line of rails for them to travel on. There was also the further condition that the cranes must be capable of loading and discharging vessels, the sides of which were 15 feet to 20 feet above the level of the quay, as rapidly as lighters, which would frequently be 20 feet below the quay level, and that in both cases the driver should have a clear view of his work. Under these circumstances it was decided to state the leading

them to give tenders and prices forwhat appeared to them best adapted to fulfil these conditions. The design adopted, says Engincering, to which we are indebted for the engraving, was that sent in by Messrs. Appleby Brothers, of London: this design, as will be seen from the engraving, consisting of a traveling staging gantry, on which is mount. ed a steam crane of the same construction as that sent by the firm to the Vienna Exhibition (see page 95 of our volume XXIX.), and which is in successful use at so many of the docks and harbors in England and on the Con-

tinent. The traveling staging of each crane has a span of 23 feet, center to center of rails, one of the latter being laid close to the edge of the quay, and the other in the 6 feet between rails. The clear hight is 17 feet 6 inches, which allows the uninterrupted cir. culation of locomotives and all kinds of rolling stock on each of the two lines of rails which are spanned by the gantry. The tra veling wheels are 12 feet, center to center. The fra ming is composed of a pair of timber uprights, braced and strengthened bycast iron brack-

ets, and two wrought iron plate girders, which are connected to the tim- | ble on its gantry, so that it will travel from end to end, all | in full bearing will produce not less than three tuns; and when ber uprights by four wrought iron plate brackets, strength ened with angle irons. A strong carriage, with the necessary roller path and brackets for the gear required to transmit the traveling motion, which will shortly be referred to, is firmly bolted at the extreme end of the girders nearest to the dock, while the girders are planked over so as to form a store for coal and water. The crane, and the whole of the substructure, is designed for a working load of 3 tuns at the maximum radius of 21 feet from center of crane post to the plumb line of the lifting chain, while the crane itself is, as has already been stated, of precisely the same construction as those which have given satisfactory working results elsewhere, with apparatus for altering the radius by steam | and large buildings.

from a maximum of 24 feet to a minimum of 14 feet The traveling motion is transmitted from the crane en gines by suitable gear and shafts to the traveling wheels, and warping drums or capstans are fitted on a countershaft on the inner side of each frame, so that these warping drums can be driven independently of the traveling wheels. This simple addition is found to effect a very large saving in manual labor and time.

Another great advantage which has been demonstrated by practice is that the cranes can be so readily concentrated at any point where they may be required; and indeed, as is shown in the engraving, three of these cranes are brought to load a long screw steamer having three hatchways; this is evidently a most important consideration with owners and shippers, especially under circumstances which so frequent ly arise where great dispatch is essential. Or two cranes can be brought together for any exceptional heavy lift. The cranes were tested with the maximum working load of 5 tuns, and subsequently for speed, when each crane delivered 50 tuns per hour from the trucks into the steamer's hatch-

The arrangement we have described may be modified with conditions to various manufacturers of cranes, and invite advantage under some conditions by making the crane porta-

It might at first sight appear that the road to carry these cranes must be of unusual strength, but on further consideration it will be seen that this is not absolutely necessary, because the base obtained is so large that there is comparatively little strain on the road, in fact, probably no more than on a line of rails of the ordinary gage, carrying a portable crane of the usual type, working the same loads at the same radius. Several of these cranes have been in successful operation for some time past, and a number more are in course of construction for the Middlesbrough Docks.

The system, evidently, has great advantages urder the conditions above named, as well as for working in crowded railway stations, or in stone quarries, timber yards, etc., and it appears singular that an arrangement at once so simple and efficient should, until now, not have been brought into more extensive use, especially for dock and railway traffic.

Sumae.

Sumac is largely used in tanning the finer kinds of leather, especially in the manufacture of the hard grained moroccos and similar goods. It is also employed as the base of many colors in calico and de laine printing. Probably the consumption of this article throughout the country for all purposes

aggregates more than 20,000 tuns, of which about two thirds are imported from Sicily, not because just as good sumac caunot be grown in this country, but because, until a few years ago, our people did not know its value, or in what way to prepare it for the market. The sumacs of Virginia. Maryland, and Tennessee in particular are said to be the best in the world, and even their worst varieties have been officially pronounced by experts to be better than any imported from Sici-

Almostevery farmer has a clump of these bushes. They are called by some "shoemake," by others "red shoemake." Probably many farmers may have tried to kill them by cutting down. If they have, they know how difficult a task it is. It grows like asparagus, all the better for being cut; and when once started upon a lot and cut close once a year, it is as easy to cut as corn fodder.

The only trouble is in curing it properly. This must be done with all the care that is bestowed upon tobacco or hops. Exposure, after cutting, to a heavy dew injures it, and a rain storm detracts materially from its It is cut when in full leaf; and when properly dried is ground, leaves and sticks together. An acre

OVERHEAD STEAM CRANES AT MIDDLESBROUGH DOCKS, ENGLAND,

that case being transmitted through a square shaft with tumbler bearings. This construction is especially valuable for use on a jetty where vessels lay on each side; to suit these conditions, the gantry is made to span the whole width of the jetty, and to travel over the ordinary lines of rails and roadway. Another modification of the system consists in having the crane fixed on an ordinary overhead traveler gantry, orit may be made to travelacross the gantry; in such a case the fixed staging may be constructed of square timber, or of columns and girders; this class of traveling crane has been rather extensively used in the construction of public works

the other motions being retained, and the traveling motion in | fit for market, it is worth from eighty to one hundred dollars a tun. The "manufacturers," as the curers are called, pay one cent a pound for it in a green state.

A sumac mill costs about \$3,000. The Commissioner of Agriculture gave an outline of a mill in his report for 1869. If thirty farmers would unite in an effort to establish a sumac mill, each planting out a few acres, says the Ohio Farmer, we have no doubt the enterprise would prove far more remunerative than either corn or wheat, and be the means of inaugurating a new enterprise in their State. There is no danger of an overstock. The demand is daily increasing, for hemlock is growing scarce, and every day new tanneries and dye houses are going into operation.

The Commissioner of Agriculture advises to plant in rows in order to cultivate between, either by seed or cutting of the roots. We should advise cuttings by all means, as sumac is as tenacious of life as the blackberry or horse radish. It will never need but one planting, and the crop can be gathered any time from July to the time of frost. If it is cut later in the season, and annually, the leaves and the stocks can be ground together. If the cutting is delayed until the stock has formed into solid wood, the leaves must be stripped from the stock, and the stock is thus wasted. It is doubtful if anything is gained in the weight of leaves after the middle of July, at which time almost every tree has completed what is called "first growth" for the season. An auction sale of 1,406 bags of Sicily sumac, damaged on the voyage of importation, recently took place in Philadelphia, and will serve to indicate the value of the article: 102 bags sold at \$53 per tun; 37 bags sold at \$45; 178 bags at \$72; 200 bags at \$59; 221 at \$66; 531 at \$49, and 137 bags at \$30 per tun.

ARTIFICIAL ALIZARINE. - Messrs. Lucius and Brüning oxydize anthracene by a mixture of nitric acid and bichromate of potash; the anthraquinone thus formed is boiled with nitric acid, whereby nitrothraquinone is formed; this is then treated with an alkali, and the alizarine formed precipitated by an acid. Purpurin is contained in the product thus formed, for which reason the dye thus produced is said to be superior to that made in other colorfactories.—Reimann's Fürberzeitung.

E. L. C. says that the experiment in the wear of gold coin, reported in our issue of January 17, was not conducted in a manner to produce a correct result, as the gold coins used were heavier than the silver ones, which of course would cause greater wear on the gold. The correct way to test them would be to take a gold coin and a silver one of the same weight, regardless of size; then weigh out 20 pounds of each, and proceed in the manner desc.ibed.

KANGAROO AND ALLICATOR SKINS.—The hides of kangaroos are imported in considerable quantities from Australia to San Francisco, where they are tanned. They give a leather quite thin, much more supple than calf skin, and yet less permeable to water. Alligator skin from the South has been used for some time in this city for the manufacture of heavy boots for winter wear.

THE use of Epsom salts is found to give brighter tints to certain aniline colors, especially primula and methyl violet. Sulphurous acid is also beneficial for these colors, the tints being brighter and less readily rubbed off.

SAFFRANIN.-If mixed with strong sulphuric acid, this dyestuff developes a fine blue tint, becoming emerald green by addition of a little water. By suitable additions of water and acid, nearly all the prismatic colors can be produced.

In some recent experiments on the droera, it was found that the leaves could reach round and catch a fly anywhere within half an inch of the plant. The flies have to be tied, as it takes the leaves about an hour to get round.

DECISIONS OF THE COURTS.

United States Circuit Court---Southern District of New York.

PATENT GRAIN AND GRASS HARVESTERS.—CYRENUS WHEELER JR., t6.
CYRUS H. MCCORMICK.

[In Equity—Before Woodruff, Judge.]

tentee may maintain a suit at law upon his patent in his one name, ghhels under a contract to assign it too hers, it it bas not been ex-

although he is under a contract to assign the order of the couted.

But equity regards that as already done which the patentee has agreed to do, and requires that the proposed assignees be made parties to a bill in chancery brought against infringers.

If the other parties to such a contract release to the patentee all their interest in the patent, he may maintain a bill in his own name for all subsequent infringements, but not for those committed previous to the release.

Neithercan be recover damages for any infringements committed after he has sold and assigned the patent.

The pendency of a suit upon a patent in one district is no bar to the prosecution of a suit upon it in another, whatever may be the effect of a recovery in such foreign suit.

covery in such foreign suit. A patent covers only the devices which are claimed, although others are described oy way of explaining them or illustrating the way in which they

described by way of explaining them or illustrating the way in which they operate.

When a patent is relsaved in several divisions, no one of them is void, because they every one describe all the mechanism shown in the original, provided the claim in each is for a different device, which is claimly described, and there is no conflict between them.

An inventor may claim in one patent a combination of devices when they are so connected as to operate in a certain way; and in another he may claim in combination with some of those devices another one especially by means of which the operation so described is produced.

An inventor may have distinct patents for several distinct devices, although he might have included them all in one, making a separate claim for each device.

for each device.

Although a patent has expired and the device covered by it can be used only in connection with other devices embraced in a patent still in life, the latter devices cannot be used without the consent of the patentee, though in connection with the drst.

WOODRUFF, Circuit J .:

inconnection with the first.

Woodday for the complainant contests the legal principles urged in support of this branch it defense. The contest is rather whether there is any foundation of fact upon which it rests; whether, according to a just control of this branch its defendant in grass and grain harvesters, fer which he had made application hisrach is. Iss. 6 m the first harvesters, fer which he had made application hisrach is. Iss. 6 m the first harvesters, fer which he had made application hisrach is. Iss. 6 m the first harvesters, fer which he had made application hisrach is. Iss. 6 m the first harvesters, fer which he had made application hisrach is. Iss. 6 m the first harvesters, fer which he had made application hisrach is such as a control of the fermion of the ferm

est, he, the said Wheeler, then had in the several letters patent and patent interests in the bill of complaint herein mentioned and therein set forth, as the property of the said Wheeler. This assignment and transfer the defendant relies upon as a partial defense—that is to say, as a bar to any decree for an accounting too rwith the complainant for any profits arising from infringements committed after the date of the said assignment, and as a bar to the granting of any injunction herein upon the prayer of this complainant.

Possibly in the defendant's answer some other grounds of defense were

and as a bar to the granting of any injunction herein upon the prayer of this complainant.

Possibly in the defendant's answer some other grounds of defense were suggested, but not all of the supposed defenses were insisted upon on the hearing.

suggested, but not all of the supposed defenses were insisted upon on the hearing.

1. The objection founded upon want of necessary parties rests upon two agreements, one of which goes, asis claimed, tother ight of the complainant to maintain this suit without joining other parties. That agreement was entered into by the complainant Wheeler and others of the first part, and Cornelius Aultman and others of the second part, on the 2th of December, 1860, to continue in force for ten years. It is the same agreement that was urged as a defense as against Aultman in the suit of Aultman 2s. Holley et al. It is called in that suit and in this the "consolidation contract." In deciding the case of Aultman 2s. Holley, at this present term, I have considered the same objection which is now urged here, and held that that agreement did not disable Aultman to maintain a suit in his own name, upon his patents included within the scope of that agreement. The same reasons apply to the present complainant, and my opinion in the case on this point must be taken as my opinion in this, and may, if either party so desfres, be inserted in this place, mutatis mutandis, as part of this opinion.

party so desfres, be inserted in this place, managed with the compinion.

The other agreement was entered into by and between Wheeler, the com
The other agreement was entered into by and others, on the 25th of Oc-The other agreement was entered into by and between Wheeler, the containant, and Henry Morgan, Allen, Mosher and others, on the 25th of October, 1859. It recites hat he had theretofore entered into certain agreements with the others, relating to his pateuts for harvesters, and in the agrees to obtain a reissue of his patents, and that upon obtaining such reissue he will execute to such several other parties assignments to convey to them undivided shares or interests in all said patents now held by him, and all relissues and renewals and extensions of the same; to the same eighteen one hundredths; and to another, seventeen one hundredths; and to another, seventeen one hundredths; so that the said several parties shall become joint owners thereof (certain specified States evented), that the income derived from the exception that the said several parties shall become joint owners thereof (certain specified States excepted); that the income derived from the excepting states shall be divided in like proportions. Among other numerous detailed provisions showing the considerations moving between the partier, is one that Wheeler and Morgan, when the reissues have been obtained and the deeds of assignment are executed, are authorized to make sales of territorial rights, give licenses, to prosecute for infringements, compromise and settle claims for infringements, ctc., they to render accounts, etc., to the others, and pay to the several others their proportionate share.

promise and settle claims for infringements, ctc., they forender accounts, etc., to the others, and pay to the several others their proportionate share.

By a supplement another firm was admitted to share, with one of the firms who were included in the agreement, certain of the advantages secured thereby.

The defendant, in his allegation of defect of parties, names a part only of the persons with whom his agreement was made, and on recurring to the consolidation contractit appears that he has only name a those who were parties to that couract also. This makes it quite apparant that the objection in the answer refers only to the consolidation contract, and has insertence to the agreement of October, 1859; nevertheless, I cannot say that an objection in the answer that Morgan and Mosher and some others specified are necessary parties does not warrant the production of this agreement of October, 1859, and any claim in respect to the specified persons which that agreement will sustain. It cannot be denied that that agreement made them equitable joint owners of the patents now in question with the complainant Wheeler. When the relessues were obtained it was the plain duty of Wheelerto make and deliver to the others such assignments as the agreement provided for, and such as would have invested them with the legal titlefor invited in the same at its whom his legal title for the joint benefit. In equity, their title was (in the absence of any proof of a release, reassignment, or of a revision of the agreement) as clear as his was at law. To this extent equity would regard that as done which ought to be done, and in equity their equitable title and immediate right to share the proceeds of a recovery made them necessary parties to a suit to recover for and to restrain infringements, if that objection is raised.

True, the complainant testifies that this agreement, "as far as the transfer of increst in the patents, as called for in that writing, was never acted upon." This is not sufficient to avoid the effect of the ag

True, the complainant testifies that this agreement, "as far as the transfer of increst in the patents, as called for in that writing, was never acted upon." This is not sufficient to avoid the effect of the agreement; it does not show that any change was made in the relations of the parties to the reliseued patents.

Their equitable titles in the shares, severally stipulated to each, became vested upon the procurement of the reliseues, subject only to an accounting with certain of the parties mentioned. To vest the legal title and reso on their equitable rights. Proof that the agreement, in so far as it called for a transfer of the legal title and reso on their equitable rights. Proof that the agreement, in so far as it called for a transfer of the legal title, was not acted upon, does not show that it was in any manner defeated, or that it was resclinded, or that anything occurred to interfere with or interrupt its full force and effect in equity; while, on the other hand, the express admission bythe complainant, in his testimony, that other writings were executed, not followed by showing what those writings were, leaves the defendant at liberty to insist upon the full force of his objection, and to presume that, had the complainant produced those writings, the equitable title of those absent partieswould not be less clear. It is, however, proved that on the 8th and 9th of July, 1888, releases were executed to the complainant by Morgan, Mosher, and certain other persons, who, by express stipulation herein, are admitted to have then been the owners of all the interest of the parties to the said agreement in question, excepting, of course, Wheeler himself. By these so called releases the parties still and relinquish to the complainant, his helr's and assigns, any have, or claim either in law or in equity, in or to said patents, and any refused to such the series of the equitable interest to the hard and held by the said Wheeler and his legal representatives to the full end of the term for which said Letters Pat

mowing machines—viz., those in which the rise and fall of the finger bar are effected by a vibration of the frame of the machine around the gear center, and the highing of the finger bar to one end or corner of that frame, so that it may rise and fall with it. It is the use of a laterally projecting finger bar in connection with such a frame, and hinged thereto, and also hinged so as to permit the rise and fall of either end, which is the subject of this patent. In comparison with this, take either of the claims say the first in reissue, numbered 875:

In combination with the hinged bar H and the finger bar, the intermediate shoe M hinged to said bar H, substantially in the manner and for the purpose setforth.

Here is a limited claim to the shoe confined to its connection with the oscillating bar H and the finger bar, in the manner pointed out in the specification. It is clear that the claim in number 2,610 might be infringed without the employment of this specific combination, and it is equally clear that the claim last above recited would not be infringed by the use of the shoe M in any other manner or combination than with the oscillating bar H, mentioned therein.

It is true that the devices specified in each claim may be so used as to infringe both, but one may be used, and may infringe one of the claims and not infringe the other. As already suggested, the fact that the specification in each patent described the whole is not material. This is flustrated where there is but one patent, and of course but one specification, and yet the patentee, by his several claims, separates the devices, and, as may be lawfully done, claims the whole as an aggregate, and each separately.

A like comparison, instituted in reference to the other several claims in

arately.

Alike comparison, instituted in reference to the other several claims in these reissues, leads to the same conclusion. In some the several and tnese reissues, leads to the same conclusion. In some the several and separate character of the devices is more plainly apparent than in others; but I think they are none of them liable to the objection that the complainant has taken more than one patent for the same device or combination.

bination.

In a certain sense it may be said that a patent for a combination of several new devices includes them all; but this does not forbid the patentee from claiming the combination, and also claiming the several devices which enter into it, if he be the inventor of each, and they are useful by themselves or in other combinations.

It is not to my mind very clear that the complainant might not have secured all to which he was entitled by relevant his original patents, and claiming separately therein each device, or combination of devices, which he has claimed underseveral reissues. But the law permitshim to divide his patent, and I find no sufficient ground for pronouncing the reissues invalid.

Aground of defence, depending substantially useful.

he has cisimed under several releases. But the law permits him to divide his patent, and 1 find no sufficient ground for pronouncing the releasues invalid. A ground of defence, depending substantially upon the point last considered, arises out of the fact alleged in the answer, that release numbered 1898, which was founded upon the original patent of December 5, 1854, has not been extended. The term of the original patent, and of course the term of this release, expired December 8, 1868; whereupon it is claimed that inasmuch as the invention patented by that release became, on the expiration of the term, public property, and the defendant therefore became entitled to use it, first, that the defendant is not liable for any infringement since that time by the use of anything included in that patent; and, secondly, that that release does in fact embrace within it the devices included in the other reissues, and so the defendant is not table at all, or, if at all, he isnot liable unless it be for infringements prior to that date. In the first place, the defendant is not such for violating any rights secured to the complainant by the release of patents 80. In the next place, the whole proposition falis if reissue numbered 80 embraces only a distinct and separate device not included in the other reissues, so as to be free from the objections alreadyconsidered. I will not enquire whether that relessue was invalid, either as not embracing a patentable invention, or because the device which was the special subject of that patent was not new, or not the invention of the patentee. Nor will it be necessary to inquire whether the treissue was found in order to avoid the conclusion sought to be drawn from the expiration of that patent, except the special device claimed in it, and that the patent did not include the device embraced in the other reissues upon which this suit is brought.

Bearing in mind that a patent includes no more than the patentee claims therein, it will be seen that a glishough, asin other reissues, the sp

Its spellcation to use, the claim thereupon is:

The use of two hinges substantially as described, whereby the finger beam may be folded to the main frame, in the manner substantially as set forth.

Walving, as before, the question of the validity of this patent, it is manifest that the devices claimed in the other reissues do not recessarily permit such folding of the finger beam to the frame. They, or some of them, provide for the ries and fail of the finger beam at either or both ends, and fur its oscillation, so as to elevate or depress the points of the fingers, but neither of them describe a construction or use adapted to this folding of the finger bar sidewise against the frame. That is only described and provided for in the specification of this reissue 880, and it is doubtful, at least, whether the machine, as described and shown in the original patent, had any such capacity. Be that as it may, the special feature, not included in the other reissues, and in nowise essential to the operation of the devices which are therein patented, is pointed out in the specification of reissue 880, and it is the special location of the hinge by which the shoe or socket piece is hinged to the oscillating bar. The device consists in so extending the place of that hinge sidewise towards the inner or grain side of the machine as that it may clear the frame when turned or folded. All the other functions of the oscillating bar, mentioned in other reissues, might be effective, and the finger bar might rise and fall at either or both ends in actual use for mowing, and, so far as desired, in reaping, without this capacity of folding to the side of the main frame. This special location is dewise of the frame admitting of such folding, is the specific device covered, or this reissue, and whether such mere location involved any patentable quality or not it does not in itself so include the other devices that the termination of the exclusive right to employ the specific location involves also the right to use the other devices at

on defeat the sulf altogether. I must, berefore, hold the oblection, for want of parties, wailt to this extent—vie, that the complainant, if entite, wailt of this extent—vie, that the complainant, if entitle the defender, cannot require the relief of the parties of the partie

be intringed are the dist, jourth, alth, sixth, and eighth. I confine the decimin to those claims, to those claims, without further detailed discussion of the numerous points and arguments most ably presented by the counsel in this case, I must content myself with saying that, after a laborious examination of the case, I am of opinion that the complainant is antitied to a decree in conformity with the foregoing opinion, declaring the infringement and directing an account of profits; but for reasons above stated that account must begin with the date of the releases from Morgan and others, July 8, 1868, and inasmuch as the complainant has, since the filing of the bill in this case, and on the 3d of July, 1872, assigned and transferred all hisright, title, and interest in these patents to Cornelius Aultman, as alieged in the defendant's supplemental answer, the account must terminate with the last named date, after which the complainant has no interest in the profits of the defendant's infringement, and no interest to be protected by injunction. The usual reference will be made to take such account, and the amount reported must be decreded to the complainant with costs.

George Harding. for complainant.**

George Harding, for complainant.

Henry Baldwin Jr., and Charles F. Blake, for defendant.