

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 Middlesbrough 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 conditions to various manufacturers of cranes, and invite them to give tenders and prices for what appeared to them best adapted to fulfil these conditions. The design adopted, says *Engineering*, 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 or gantry, on which is mounted 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 Continent.

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 height is 17 feet 6 inches, which allows the uninterrupted circulation of locomotives and all kinds of rolling stock on each of the two lines of rails which are spanned by the gantry. The traveling wheels are 12 feet, center to center. The framing is composed of a pair of timber uprights, braced and strengthened by cast iron brackets, and two wrought iron plate girders, which are connected to the timber uprights by four wrought iron plate brackets, strengthened 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 tons 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

from a maximum of 24 feet to a minimum of 14 feet.

The traveling motion is transmitted from the crane engines 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 frequently 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 tons, and subsequently for speed, when each crane delivered 50 tons per hour from the trucks into the steamer's hatchway.

The arrangement we have described may be modified with 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 under 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.

Sumac.

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

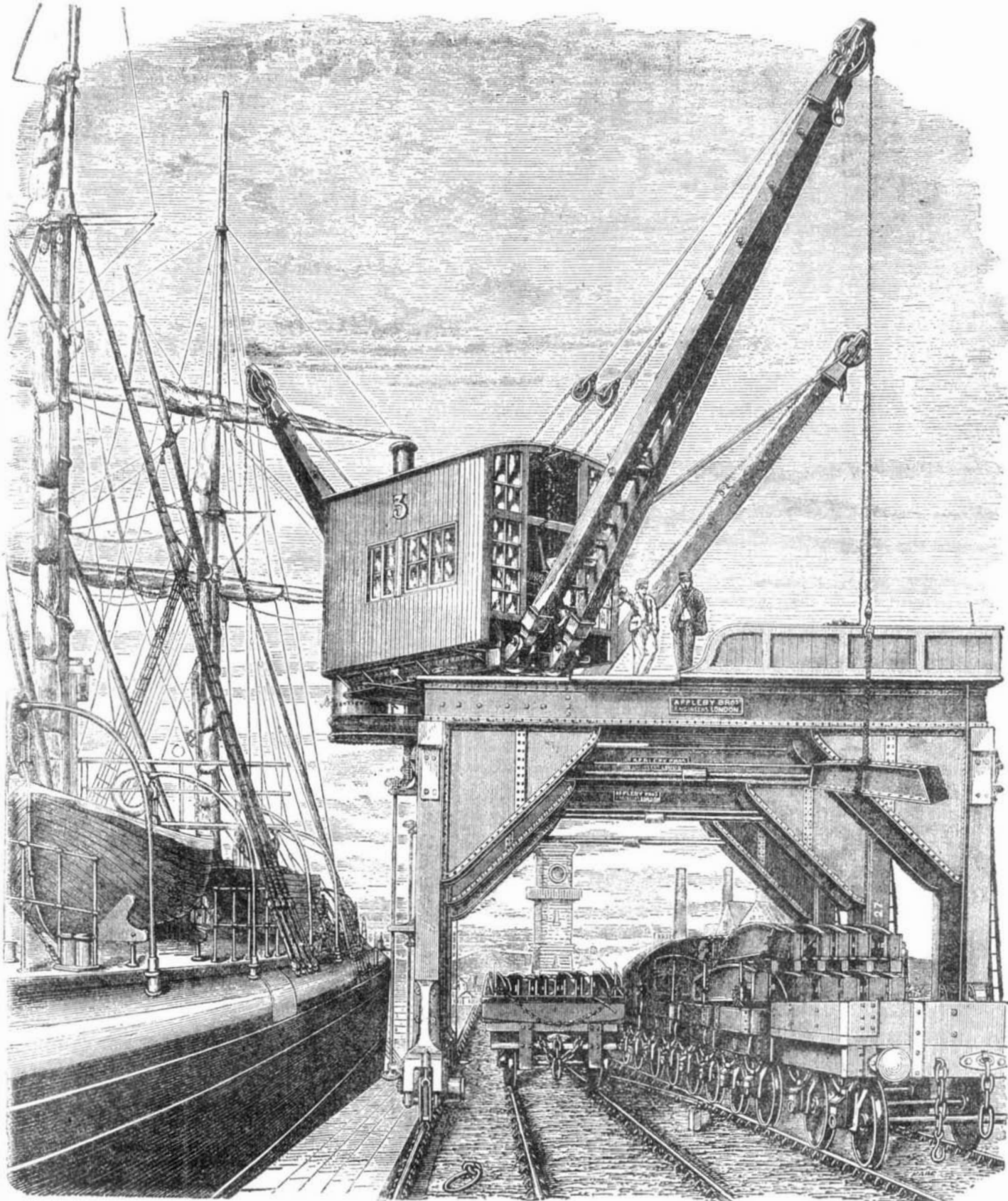
aggregates more than 20,000 tons, of which about two thirds are imported from Sicily, not because just as good sumac cannot be grown in this country, but because, until a few years ago, our people did not know its value, or in what way to prepare it for the market. The sumacs of Virginia, Maryland, and 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 Sicily.

Almost every farmer has a clump of these bushes. They are called by some "shoemaker," by others "red shoemaker." 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 value. It is cut when in full leaf; and when properly dried is ground, leaves and sticks together. An acre

in full bearing will produce not less than three tons; and when fit for market, it is worth from eighty to one hundred dollars a ton. 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.



OVERHEAD STEAM CRANES AT MIDDLESBROUGH DOCKS, ENGLAND.

ble on its gantry, so that it will travel from end to end, all the other motions being retained, and the traveling motion in 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, or it may be made to travel across 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 and large buildings.

ble on its gantry, so that it will travel from end to end, all the other motions being retained, and the traveling motion in 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, or it may be made to travel across 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 and large buildings.

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 Büning oxidize anthracene by a mixture of nitric acid and bichromate of potash; the anthraquinone thus formed is boiled with nitric acid, whereby nitroanthraquinone 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 color factories.—*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 described.

KANGAROO AND ALLIGATOR 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 develops 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 GRASS AND GRASS HARVESTERS.—CYRENUS WHEELER JR., vs. CYRUS H. MCCORMICK.

[In Equity—Before Woodruff, Judge.]

A patentee may maintain a suit at law upon his patent in his own name, although he is under a contract to assign to others, if it has not been executed.

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.

Neither can he 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 recovery in such foreign suit.

A patent covers only the devices which are claimed, although others are described by way of explaining them or illustrating the way in which they operate.

When a patent is released in several divisions, no one of them is void, because they every one describe all the mechanism shown in the original, provided the claims in each is for a different device, which is clearly 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.

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 first.

WOODRUFF, Circuit J.;

On the 5th of December, 1854, the complainant, Cyrenus Wheeler, Jr., received from the United States a patent for an improvement in grass and grain harvesters, for which he had made application March 16, 1854. On the 7th of November, 1859, he surrendered his patent for the purpose of obtaining releases thereof in divisions, and on the 3d of January, 1860, the patent was released in seven divisions, numbering 875, 876, 877, 878, 879, 880, and 881. Of these the release numbered 876 was surrendered on the 8th of April, 1867, and on the 14th of May thereafter was again released, numbered 2,610.

On the 6th of February, 1855, another patent was granted to the complainant for an improvement in grain and grass harvesters, which was also afterward surrendered and released June 5, 1860, and again surrendered and on the 23th of May, 1867, was again released, numbered 2,632.

For the alleged infringement of the released patents numbered 875, 877, 878, 879, 2,610, and 2,632, this suit is brought.

The answer sets up probably as many grounds of defense as the ingenuity of counsel could suggest. It denies that the complainant invented the devices originally patented, and denies that a machine constructed in accordance with his patents is a practicable machine, or has any useful or patentable quality. It denies the validity of the several releases on various grounds; avers that other parties were at the time interested in the patents; and that the complainant surrendered them, and obtained releases without their authority, consent, or concurrence; and alleges that the releases were obtained without any legal or justifiable grounds therefor; that they embrace devices not shown in the original patent, specifications, drawings, or models and which were not of the complainant's invention; that some of the releases are for the same devices patented in others; that one of the releases has expired, without extension, which included all the distinctive peculiarities shown in the original patent. It objects that other persons are jointly interested with the complainant in the patents, and that the suit is defective for want of the presence of such persons as parties. It denies the validity of the extension of the patents beyond the term for which they were originally granted. It avers the commencement of a suit in Illinois by the complainant against the defendant and another, for infringing the same patents on the 25th of May, 1869, which is still pending. It denies infringement by the defendant at any time since January 2, 1860, or that he has made or sold within the southern district of New York any infringing machines.

The defendant has moreover interposed a supplemental answer setting up, as a partial defense, that since this suit was commenced, to wit, on the third day of July, 1872—the complainant, Wheeler, sold, assigned, transferred, and set over to Cornelius Aultman all the right, title and inter-

est, he, 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 to or with the complainant for any profits arising from the assignments committed after the date of the said assignment, and 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.

1. The objection founded upon want of necessary parties rests upon two agreements, one of which goes, as is claimed, to the right 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 27th of December, 1860, to continue in force for ten years. It is the same agreement that was urged as a defense against Aultman in the suit of Aultman vs. Holley et al. It is called in that suit and in this the "consolidation contract." In deciding the case of Aultman vs. Holley, at this present term, I have considered the same objection which was 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 that case on this point must be taken as my opinion in this, and may, if either party so desires, be inserted in this place, *mutatis mutandis*, as part of this opinion.

By the agreement entered into by and between Wheeler, the complainant, and Henry Morgan, Allen, Mosher, and others, on the 25th of October, 1859. It recites that he had theretofore entered into certain agreements with the others, relating to his patents for harvesters, and in it he agrees to obtain a release of his patents, and that upon obtaining such release 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 a release and renewal and extensions of the same, and to the said Morgan, fourthly, to others to be named, one fifthly, to others to be named, one sixthly, to others to be named, one seventhly, to others to be named, one eighthly, to others to be named, one ninthly, to others to be named, one tenthly, to others to be named, one eleventhly, to others to be named, one twelfthly, to others to be named, one thirteenthly, to others to be named, one fourteenthly, to others to be named, one fifteenthly, to others to be named, one sixteenthly, to others to be named, one seventeenthly, to others to be named, one eighteenthly, to others to be named, one nineteenthly, to others to be named, one twentiethly, to others to be named, one twenty-firstly, to others to be named, one twenty-secondly, to others to be named, one twenty-thirdly, to others to be named, one twenty-fourthly, to others to be named, one twenty-fifthly, to others to be named, one twenty-sixthly, to others to be named, one twenty-seventhly, to others to be named, one twenty-eighthly, to others to be named, one twenty-ninthly, to others to be named, one thirtiethly, to others to be named, one thirty-firstly, to others to be named, one thirty-secondly, to others to be named, one thirty-thirdly, to others to be named, one thirty-fourthly, to others to be named, one thirty-fifthly, to others to be named, one thirty-sixthly, to others to be named, one thirty-seventhly, to others to be named, one thirty-eighthly, to others to be named, one thirty-ninthly, to others to be named, one fortiethly, to others to be named, one forty-firstly, to others to be named, one forty-secondly, to others to be named, one forty-thirdly, to others to be named, one forty-fourthly, to others to be named, one forty-fifthly, to others to be named, one forty-sixthly, to others to be named, one forty-seventhly, to others to be named, one forty-eighthly, to others to be named, one forty-ninthly, to others to be named, one fiftiethly, to others to be named, one fifty-firstly, to others to be named, one fifty-secondly, to others to be named, one fifty-thirdly, to others to be named, one fifty-fourthly, to others to be named, one fifty-fifthly, to others to be named, one fifty-sixthly, to others to be named, one fifty-seventhly, to others to be named, one fifty-eighthly, to others to be named, one fifty-ninthly, to others to be named, one sixtiethly, to others to be named, one sixty-firstly, to others to be named, one sixty-secondly, to others to be named, one sixty-thirdly, to others to be named, one sixty-fourthly, to others to be named, one sixty-fifthly, to others to be named, one sixty-sixthly, to others to be named, one sixty-seventhly, to others to be named, one sixty-eighthly, to others to be named, one sixty-ninthly, to others to be named, one seventiethly, to others to be named, one seventy-firstly, to others to be named, one seventy-secondly, to others to be named, one seventy-thirdly, to others to be named, one seventy-fourthly, to others to be named, one seventy-fifthly, to others to be named, one seventy-sixthly, to others to be named, one seventy-seventhly, to others to be named, one seventy-eighthly, to others to be named, one seventy-ninthly, to others to be named, one eightiethly, to others to be named, one eighty-firstly, to others to be named, one eighty-secondly, to others to be named, one eighty-thirdly, to others to be named, one eighty-fourthly, to others to be named, one eighty-fifthly, to others to be named, one eighty-sixthly, to others to be named, one eighty-seventhly, to others to be named, one eighty-eighthly, to others to be named, one eighty-ninthly, to others to be named, one ninetiethly, to others to be named, one ninety-firstly, to others to be named, one ninety-secondly, to others to be named, one ninety-thirdly, to others to be named, one ninety-fourthly, to others to be named, one ninety-fifthly, to others to be named, one ninety-sixthly, to others to be named, one ninety-seventhly, to others to be named, one ninety-eighthly, to others to be named, one ninety-ninthly, to others to be named, one hundredthly, to others to be named, one hundred-firstly, to others to be named, one hundred-secondly, to others to be named, one hundred-thirdly, to others to be named, one hundred-fourthly, to others to be named, one hundred-fifthly, to others to be named, one hundred-sixthly, to others to be named, one hundred-seventhly, to others to be named, one hundred-eighthly, to others to be named, one hundred-ninthly, to others to be named, one hundred-tenthly, to others to be named, one hundred-eleventhly, to others to be named, one hundred-twelfthly, to others to be named, one hundred-thirteenthly, to others to be named, one hundred-fourteenthly, to others to be named, one hundred-fifteenthly, to others to be named, one hundred-sixteenthly, to others to be named, one hundred-seventeenthly, to others to be named, one hundred-eighteenthly, to others to be named, one hundred-nineteenthly, to others to be named, one hundred-twentiethly, to others to be named, one hundred-twenty-firstly, to others to be named, one hundred-twenty-secondly, to others to be named, one hundred-twenty-thirdly, to others to be named, one hundred-twenty-fourthly, to others to be named, one hundred-twenty-fifthly, to others to be named, one hundred-twenty-sixthly, to others to be named, one hundred-twenty-seventhly, to others to be named, one hundred-twenty-eighthly, to others to be named, one hundred-twenty-ninthly, to others to be named, one hundred-thirtiethly, to others to be named, one hundred-thirty-firstly, to others to be named, one hundred-thirty-secondly, to others to be named, one hundred-thirty-thirdly, to others to be named, one hundred-thirty-fourthly, to others to be named, one hundred-thirty-fifthly, to others to be named, one hundred-thirty-sixthly, to others to be named, one hundred-thirty-seventhly, to others to be named, one hundred-thirty-eighthly, to others to be named, one hundred-thirty-ninthly, to others to be named, one hundred-thirtiethly, to others to be named, one hundred-thirty-firstly, to others to be named, one hundred-thirty-secondly, to others to be named, one hundred-thirty-thirdly, to others to be named, one hundred-thirty-fourthly, to others to be named, one hundred-thirty-fifthly, to others to be named, one hundred-thirty-sixthly, to others to be named, one hundred-thirty-seventhly, to others to be named, one hundred-thirty-eighthly, to others to be named, one hundred-thirty-ninthly, to others to be named, one hundred-thirtiethly, to others to be named, one hundred-thirty-firstly, to others to be named, one hundred-thirty-secondly, to others to be named, one hundred-thirty-thirdly, to others to be named, one hundred-thirty-fourthly, to others to be named, one hundred-thirty-fifthly, to others to be named, one hundred-thirty-sixthly, to others to be named, one hundred-thirty-seventhly, to others to be named, one hundred-thirty-eighthly, to others to be named, one hundred-thirty-ninthly, to others to be named, one hundred-thirtiethly, to others to be named, one hundred-thirty-firstly, to others to be named, one hundred-thirty-secondly, to others to be named, one hundred-thirty-thirdly, to others to be named, one hundred-thirty-fourthly, to others to be named, one hundred-thirty-fifthly, to others to be named, one hundred-thirty-sixthly, to others to be named, one hundred-thirty-seventhly, to others to be named, one hundred-thirty-eighthly, to others to be named, one hundred-thirty-ninthly, to others to be named, one hundred-thirtiethly, to others to be named, one hundred-thirty-firstly, to others to be named, one hundred-thirty-secondly, to others to be named, one hundred-thirty-thirdly, to others to be named, one hundred-thirty-fourthly, to others to be named, one hundred-thirty-fifthly, to others to be named, one hundred-thirty-sixthly, to others to be named, one hundred-thirty-seventhly, to others to be named, one hundred-thirty-eighthly, to others to be named, one hundred-thirty-ninthly, to others to be named, one hundred-thirtiethly, to others to be named, one hundred-thirty-firstly, to others to be named, one hundred-thirty-secondly, to others to be named, one hundred-thirty-thirdly, to others to be named, one hundred-thirty-fourthly, to others to be named, one hundred-thirty-fifthly, to others to be named, one hundred-thirty-sixthly, to others to be named, one hundred-thirty-seventhly, to others to be named, one hundred-thirty-eighthly, to others to be named, one hundred-thirty-ninthly, to others to be named, one hundred-thirtiethly, to others to be named, one hundred-thirty-firstly, to others to be named, one hundred-thirty-secondly, to others to be named, one hundred-thirty-thirdly, to others to be named, one hundred-thirty-fourthly, to others to be named, one hundred-thirty-fifthly, to others to be named, one hundred-thirty-sixthly, to others to be named, one hundred-thirty-seventhly, to others to be named, one hundred-thirty-eighthly, to others to be named, one hundred-thirty-ninthly, to others to be named, one hundred-thirtiethly, to others to be named, one hundred-thirty-firstly, to others to be named, one hundred-thirty-secondly, to others to be named, one hundred-thirty-thirdly, to others to be named, one hundred-thirty-fourthly, to others to be named, one hundred-thirty-fifthly, to others to be named, one hundred-thirty-sixthly, to others to be named, one hundred-thirty-seventhly, to others to be named, one hundred-thirty-eighthly, to others to be named, one hundred-thirty-ninthly, to others to be named, one hundred-thirtiethly, to others to be named, one hundred-thirty-firstly, to others to be named, one hundred-thirty-secondly, to others to be named, one hundred-thirty-thirdly, to others to be named, one hundred-thirty-fourthly, to others to be named, one hundred-thirty-fifthly, to others to be named, one hundred-thirty-sixthly, to others to be named, one hundred-thirty-seventhly, to others to be named, one hundred-thirty-eighthly, to others to be named, one hundred-thirty-ninthly, to others to be named, one hundred-thirtiethly, to others to be named, one hundred-thirty-firstly, to others to be named, one hundred-thirty-secondly, to others to be named, one hundred-thirty-thirdly, to others to be named, one hundred-thirty-fourthly, to others to be named, one hundred-thirty-fifthly, to others to be named, one hundred-thirty-sixthly, to others to be named, one hundred-thirty-seventhly, to others to be named, one hundred-thirty-eighthly, to others to be named, one hundred-thirty-ninthly, to others to be named, one hundred-thirtiethly, to others to be named, one hundred-thirty-firstly, to others to be named, one hundred-thirty-secondly, to others to be named, one hundred-thirty-thirdly, to others to be named, one hundred-thirty-fourthly, to others to be named, one hundred-thirty-fifthly, to others to be named, one hundred-thirty-sixthly, to others to be named, one hundred-thirty-seventhly, to others to be named, one hundred-thirty-eighthly, to others to be named, one hundred-thirty-ninthly, to others to be named, one hundred-thirtiethly, to others to be named, one hundred-thirty-firstly, to others to be named, one hundred-thirty-secondly, to others to be named, one hundred-thirty-thirdly, to others to be named, one hundred-thirty-fourthly, to others to be named, one hundred-thirty-fifthly, to others to be named, one hundred-thirty-sixthly, to others to be named, one hundred-thirty-seventhly, to others to be named, one hundred-thirty-eighthly, to others to be named, one hundred-thirty-ninthly, to others to be named, one hundred-thirtiethly, to others to be named, one hundred-thirty-firstly, to others to be named, one hundred-thirty-secondly, to others to be named, one hundred-thirty-thirdly, to others to be named, one hundred-thirty-fourthly, to others to be named, one hundred-thirty-fifthly, to others to be named, one hundred-thirty-sixthly, to others to be named, one hundred-thirty-seventhly, to others to be named, one hundred-thirty-eighthly, to others to be named, one hundred-thirty-ninthly, to others to be named, one hundred-thirtiethly, to others to be named, one hundred-thirty-firstly, to others to be named, one hundred-thirty-secondly, to others to be named, one hundred-thirty-thirdly, to others to be named, one hundred-thirty-fourthly, to others to be named, one hundred-thirty-fifthly, to others to be named, one hundred-thirty-sixthly, to others to be named, one hundred-thirty-seventhly, to others to be named, one hundred-thirty-eighthly, to others to be named, one hundred-thirty-ninthly, to others to be named, one hundred-thirtiethly, to others to be named, one hundred-thirty-firstly, to others to be named, one hundred-thirty-secondly, to others to be named, one hundred-thirty-thirdly, to others to be named, one hundred-thirty-fourthly, to others to be named, one hundred-thirty-fifthly, to others to be named, one hundred-thirty-sixthly, to others to be named, one hundred-thirty-seventhly, to others to be named, one hundred-thirty-eighthly, to others to be named, one hundred-thirty-ninthly, to others to be named, one hundred-thirtiethly, to others to be named, one hundred-thirty-firstly, to others to be named, one hundred-thirty-secondly, to others to be named, one hundred-thirty-thirdly, to others to be named, one hundred-thirty-fourthly, to others to be named, one hundred-thirty-fifthly, to others to be named, one hundred-thirty-sixthly, to others to be named, one hundred-thirty-seventhly, to others to be named, one hundred-thirty-eighthly, to others to be named, one hundred-thirty-ninthly, to others to be named, one hundred-thirtiethly, to others to be named, one hundred-thirty-firstly, to others to be named, one hundred-thirty-secondly, to others to be named, one hundred-thirty-thirdly, to others to be named, one hundred-thirty-fourthly, to others to be named, one hundred-thirty-fifthly, to others to be named, one hundred-thirty-sixthly, to others to be named, one hundred-thirty-seventhly, to others to be named, one hundred-thirty-eighthly, to others to be named, one hundred-thirty-ninthly, to others to be named, one hundred-thirtiethly, to others to be named, one hundred-thirty-firstly, to others to be named, one hundred-thirty-secondly, to others to be named, one hundred-thirty-thirdly, to others to be named, one hundred-thirty-fourthly, to others to be named, one hundred-thirty-fifthly, to others to be named, one hundred-thirty-sixthly, to others to be named, one hundred-thirty-seventhly, to others to be named, one hundred-thirty-eighthly, to others to be named, one hundred-thirty-ninthly, to others to be named, one hundred-thirtiethly, to others to be named, one hundred-thirty-firstly, to others to be named, one hundred-thirty-secondly, to others to be named, one hundred-thirty-thirdly, to others to be named, one hundred-thirty-fourthly, to others to be named, one hundred-thirty-fifthly, to others to be named, one hundred-thirty-sixthly, to others to be named, one hundred-thirty-seventhly, to others to be named, one hundred-thirty-eighthly, to others to be named, one hundred-thirty-ninthly, to others to be named, one hundred-thirtiethly, to others to be named, one hundred-thirty-firstly, to others to be named, one hundred-thirty-secondly, to others to be named, one hundred-thirty-thirdly, to others to be named, one hundred-thirty-fourthly, to others to be named, one hundred-thirty-fifthly, to others to be named, one hundred-thirty-sixthly, to others to be named, one hundred-thirty-seventhly, to others to be named, one hundred-thirty-eighthly, to others to be named, one hundred-thirty-ninthly, to others to be named, one hundred-thirtiethly, to others to be named, one hundred-thirty-firstly, to others to be named, one hundred-thirty-secondly, to others to be named, one hundred-thirty-thirdly, to others to be named, one hundred-thirty-fourthly, to others to be named, one hundred-thirty-fifthly, to others to be named, one hundred-thirty-sixthly, to others to be named, one hundred-thirty-seventhly, to others to be named, one hundred-thirty-eighthly, to others to be named, one hundred-thirty-ninthly, to others to be named, one hundred-thirtiethly, to others to be named, one hundred-thirty-firstly, to others to be named, one hundred-thirty-secondly, to others to be named, one hundred-thirty-thirdly, to others to be named, one hundred-thirty-fourthly, to others to be named, one hundred-thirty-fifthly, to others to be named, one hundred-thirty-sixthly, to others to be named, one hundred-thirty-seventhly, to others to be named, one hundred-thirty-eighthly, to others to be named, one hundred-thirty-ninthly, to others to be named, one hundred-thirtiethly, to others to be named, one hundred-thirty-firstly, to others to be named, one hundred-thirty-secondly, to others to be named, one hundred-thirty-thirdly, to others to be named, one hundred-thirty-fourthly, to others to be named, one hundred-thirty-fifthly, to others to be named, one hundred-thirty-sixthly, to others to be named, one hundred-thirty-seventhly, to others to be named, one hundred-thirty-eighthly, to others to be named, one hundred-thirty-ninthly, to others to be named, one hundred-thirtiethly, to others to be named, one hundred-thirty-firstly, to others to be named, one hundred-thirty-secondly, to others to be named, one hundred-thirty-thirdly, to others to be named, one hundred-thirty-fourthly, to others to be named, one hundred-thirty-fifthly, to others to be named, one hundred-thirty-sixthly, to others to be named, one hundred-thirty-seventhly, to others to be named, one hundred-thirty-eighthly, to others to be named, one hundred-thirty-ninthly, to others to be named, one hundred-thirtiethly, to others to be named, one hundred-thirty-firstly, to others to be named, one hundred-thirty-secondly, to others to be named, one hundred-thirty-thirdly, to others to be named, one hundred-thirty-fourthly, to others to be named, one hundred-thirty-fifthly, to others to be named, one hundred-thirty-sixthly, to others to be named, one hundred-thirty-seventhly, to others to be named, one hundred-thirty-eighthly, to others to be named, one hundred-thirty-ninthly, to others to be named, one hundred-thirtiethly, to others to be named, one hundred-thirty-firstly, to others to be named, one hundred-thirty-secondly, to others to be named, one hundred-thirty-thirdly, to others to be named, one hundred-thirty-fourthly, to others to be named, one hundred-thirty-fifthly, to others to be named, one hundred-thirty-sixthly, to others to be named, one hundred-thirty-seventhly, to others to be named, one hundred-thirty-eighthly, to others to be named, one hundred-thirty-ninthly, to others to be named, one hundred-thirtiethly, to others to be named, one hundred-thirty-firstly, to others to be named, one hundred-thirty-secondly, to others to be named, one hundred-thirty-thirdly, to others to be named, one hundred-thirty-fourthly, to others to be named, one hundred-thirty-fifthly, to others to be named, one hundred-thirty-sixthly, to others to be named, one hundred-thirty-seventhly, to others to be named, one hundred-thirty-eighthly, to others to be named, one hundred-thirty-ninthly, to others to be named, one hundred-thirtiethly, to others to be named, one hundred-thirty-firstly, to others to be named, one hundred-thirty-secondly, to others to be named, one hundred-thirty-thirdly, to others to be named, one hundred-thirty-fourthly, to others to be named, one hundred-thirty-fifthly, to others to be named, one hundred-thirty-sixthly, to others to be named, one hundred-thirty-seventhly, to others to be named, one hundred-thirty-eighthly, to others to be named, one hundred-thirty-ninthly, to others to be named, one hundred-thirtiethly, to others to be named, one hundred-thirty-firstly, to others to be named, one hundred-thirty-secondly, to others to be named, one hundred-thirty-thirdly, to others to be named, one hundred-thirty-fourthly, to others to be named, one hundred-thirty-fifthly, to others to be named, one hundred-thirty-sixthly, to others to be named, one hundred-thirty-seventhly, to others to be named, one hundred-thirty-eighthly, to others to be named, one hundred-thirty-ninthly, to others to be named, one hundred-thirtiethly, to others to be named, one hundred-thirty-firstly, to others to be named, one hundred-thirty-secondly, to others to be named, one hundred-thirty-thirdly, to others to be named, one hundred-thirty-fourthly, to others to be named, one hundred-thirty-fifthly, to others to be named, one hundred-thirty-sixthly, to others to be named, one hundred-thirty-seventhly, to others to be named, one hundred-thirty-eighthly, to others to be named, one hundred-thirty-ninthly, to others to be named, one hundred-thirtiethly, to others to be named, one hundred-thirty-firstly, to others to be named, one hundred-thirty-secondly, to others to be named, one hundred-thirty-thirdly, to others to be named, one hundred-thirty-fourthly, to others to be named, one hundred-thirty-fifthly, to others to be named, one hundred-thirty-sixthly, to others to be named, one hundred-thirty-seventhly, to others to be named, one hundred-thirty-eighthly, to others to be named, one hundred-thirty-ninthly, to others to be named, one hundred-thirtiethly, to others to be named, one hundred-thirty-firstly, to others to be named, one hundred-thirty-secondly, to others to be named, one hundred-thirty-thirdly, to others to be named, one hundred-thirty-fourthly, to others to be named, one hundred-thirty-fifthly, to others to be named, one hundred-thirty-sixthly, to others to be named, one hundred-thirty-seventhly, to others to be named, one hundred-thirty-eighthly, to others to be named, one hundred-thirty-ninthly, to others to be named, one hundred-thirtiethly, to others to be named, one hundred-thirty-firstly, to others to be named, one hundred-thirty-secondly, to others to be named, one hundred-thirty-thirdly, to others to be named, one hundred-thirty-fourthly, to others to be named, one hundred-thirty-fifthly, to others to be named, one hundred-thirty-sixthly, to others to be named, one hundred-thirty-seventhly, to others to be named, one hundred-thirty-eighthly, to others to be named, one hundred-thirty-ninthly, to others to be named, one hundred-thirtiethly, to others to be named, one hundred-thirty-firstly, to others to be named, one hundred-thirty-secondly, to others to be named, one hundred-thirty-thirdly, to others to be named, one hundred-thirty-fourthly, to others to be named, one hundred-thirty-fifthly, to others to be named, one hundred-thirty-sixthly, to others to be named, one hundred-thirty-seventhly, to others to be named, one hundred-thirty-eighthly, to others to be named, one hundred-thirty-ninthly, to others to be named, one hundred-thirtiethly, to others to be named, one hundred-thirty-firstly, to others to be named, one hundred-thirty-secondly, to others to be named, one hundred-thirty-thirdly, to others to be named, one hundred-thirty-fourthly, to others to be named, one hundred-thirty-fifthly, to others to be named, one hundred-thirty-sixthly, to others to be named, one hundred-thirty-seventhly, to others to be named, one hundred-thirty-eighthly, to others to be named, one hundred-thirty-ninthly, to others to be named, one hundred-thirtiethly, to others to be named, one hundred-thirty-firstly, to others to be named, one hundred-thirty-secondly, to others to be named, one hundred-thirty-thirdly, to others to be named, one hundred-thirty-fourthly, to others to be named, one hundred-thirty-fifthly, to others to be named, one hundred-thirty-sixthly, to others to be named, one hundred-thirty-seventhly, to others to be named, one hundred-thirty-eighthly, to others to be named, one hundred-thirty-ninthly, to others to be named, one hundred-thirtiethly, to others to be named, one hundred-thirty-firstly, to others to be named, one hundred-thirty-secondly, to others to be named, one hundred-thirty-thirdly, to others to be named, one hundred-thirty-fourthly, to others to be named, one hundred-thirty-fifthly, to others to be named, one hundred-thirty-sixthly, to others to be named, one hundred-thirty-seventhly, to others to be named, one hundred-thirty-eighthly, to others to be named, one hundred-thirty-ninthly, to others to be named, one hundred-thirtiethly, to others to be named, one hundred-thirty-firstly, to others to be named, one hundred-thirty-secondly, to others to be named, one hundred-thirty-thirdly, to others to be named, one hundred-thirty-fourthly, to others to be named, one hundred-thirty-fifthly, to others to be named, one hundred-thirty-sixthly, to others to be named, one hundred-thirty-seventhly, to others to be named, one hundred-thirty-eighthly, to others to be named, one hundred-thirty-ninthly, to others to be named, one hundred-thirtiethly, to others to be named, one hundred-thirty-firstly, to others to be named, one hundred-thirty-secondly, to others to be named, one hundred-thirty-thirdly, to others to be named, one hundred-thirty-fourthly, to others to be named, one hundred-thirty-fifthly, to others to be named, one hundred-thirty-sixthly, to others to be named, one hundred-thirty-seventhly, to others to be named, one hundred-thirty-eighthly, to others to be named, one hundred-thirty-ninthly, to others to be named, one hundred-thirtiethly, to others to be named, one hundred-thirty-firstly, to others to be named, one hundred-thirty-secondly, to others to be named, one hundred-thirty-thirdly, to others to be named, one hundred-thirty-fourthly, to others to be named, one hundred-thirty-fifthly, to others to be named, one hundred-thirty-sixthly, to others to be named, one hundred-thirty-seventhly, to others to be named, one hundred-thirty-eighthly, to others to be named, one hundred-thirty-ninthly, to others to be named, one hundred-thirtiethly, to others to be named, one hundred-thirty-firstly, to others to be named, one hundred-thirty-secondly, to others to be named, one hundred-thirty-thirdly, to others to be named, one hundred-thirty-fourthly, to others to be named, one hundred-thirty-fifthly, to others to be named, one hundred-thirty-sixthly, to others to be named, one hundred-thirty-seventhly, to others to be named, one hundred-thirty-eighthly, to others to be named, one hundred-thirty-ninthly, to others to be named, one hundred-thirtiethly, to others to be named, one hundred-thirty-firstly, to others to be named, one hundred-thirty-secondly, to others to be named, one hundred-thirty-thirdly, to others to be named, one hundred-thirty-fourthly, to others to be named, one hundred-thirty-fifthly, to others to be named, one hundred-thirty-sixthly, to others to be named, one hundred-thirty-seventhly, to others to be named, one hundred-thirty-eighthly, to others to be named, one hundred-thirty-ninthly, to others to be named, one hundred-thirtiethly, to others to be named, one hundred-thirty-firstly, to others to be named, one hundred-thirty-secondly, to others to be named, one hundred-thirty-thirdly, to others to be named, one hundred-thirty-fourthly, to others to be named, one hundred-thirty-fifthly, to others to be named, one hundred-thirty-sixthly, to others to be named, one hundred-thirty-seventhly, to others to be named, one hundred-thirty-eighthly, to others to be named, one hundred-thirty-ninthly, to others to be named, one hundred-thirtiethly, to others to be named, one hundred-thirty-firstly, to others to be named, one hundred-thirty-secondly, to others to be named, one hundred-thirty-thirdly, to others to be named, one hundred-thirty-fourthly, to others to be named, one hundred-thirty-fifthly, to others to be named, one hundred-thirty-sixthly, to others to be named, one hundred-thirty-seventhly, to others to be named, one hundred-thirty-eighthly, to others to be named, one hundred-thirty-ninthly, to others to be named, one hundred-thirtiethly, to others to be named, one hundred-thirty-firstly, to others to be named, one hundred-thirty-secondly, to others to be named, one hundred-thirty-thirdly, to others to be named, one hundred-thirty-fourthly, to others to be named, one hundred-thirty-fifthly, to others to be named, one hundred-thirty-sixthly, to others to be named, one hundred-thirty-seventhly, to others to be named, one hundred-thirty-eighthly, to others to be named, one hundred-thirty-ninthly, to others to be named, one hundred-thirtiethly, to others to be named, one hundred-thirty-firstly, to others to be named, one hundred-thirty-secondly, to others to be named, one hundred-thirty-thirdly, to others to be named, one hundred-thirty-fourthly, to others to be named, one hundred-thirty-fifthly, to others to be named, one hundred-thirty-sixthly, to others to be named, one hundred-thirty-seventhly, to others to be named, one hundred-thirty-eighthly, to others to be named, one hundred-thirty-ninthly, to others to be named, one hundred-thirtiethly, to others to be named, one hundred-thirty-firstly, to others to be named, one hundred-thirty-secondly, to others to be named, one hundred-thirty-thirdly, to others to be named, one hundred-thirty-fourthly, to others to be named, one hundred-thirty-fifthly, to others to be named, one hundred-thirty-sixthly, to others to be named, one hundred-thirty-seventhly, to others to be named, one hundred-thirty-eighthly, to others to be named, one hundred-thirty-ninthly, to others to be named, one hundred-thirtiethly, to others to be named, one hundred-thirty-firstly, to others to be named, one hundred-thirty-secondly, to others to be named, one hundred-thirty-thirdly, to others to be named, one hundred-thirty-fourthly, to others to be named, one hundred-thirty-fifthly, to others to be named, one hundred-thirty-sixthly, to others to be named, one hundred-thirty-seventhly, to others to be named, one hundred-thirty-eighthly, to others to be named, one hundred-thirty-ninthly, to others to be named, one hundred-thirtiethly, to others to be named, one hundred-thirty-firstly, to others to be named, one hundred-thirty-secondly, to others to be named, one hundred-thirty-thirdly, to others to be named, one hundred-thirty-fourthly, to others to be named, one hundred-thirty-fifthly, to others to be named, one hundred-thirty-sixthly, to others to be named, one hundred-thirty-seventhly, to others to be named, one hundred-thirty-eighthly, to others to be named, one hundred-thirty-ninthly, to others to be named, one hundred-thirtiethly, to others to be named, one hundred-thirty-firstly, to others to be named, one hundred-thirty-secondly, to others to be named, one hundred-thirty-thirdly, to others to be named, one hundred-thirty-fourthly, to others to be named, one hundred-thirty-fifthly, to others to be named, one hundred-thirty-sixthly, to others to be named, one hundred-thirty-seventhly, to others to be named, one hundred-thirty-eighthly, to others to be named, one hundred-thirty-ninthly, to others to be named, one hundred-thirtiethly, to others to be named, one hundred-thirty-firstly, to others to be named, one hundred-thirty-secondly, to others to be named, one hundred-thirty-thirdly, to others to be named, one hundred-thirty-fourthly, to others to be named, one hundred-thirty-fifthly, to others to be named, one hundred-thirty-sixthly, to others to be named, one hundred-thirty-seventhly, to others to be named, one hundred-thirty-eighthly, to others to be named, one hundred-thirty-ninthly, to others to be named, one hundred-thirtiethly, to others to be named, one hundred-thirty-firstly, to others to be named, one hundred-thirty-secondly, to others to be named, one hundred-thirty-thirdly, to others to be named, one hundred-thirty-fourthly, to others to be named, one hundred-thirty-fifthly, to others to be named, one hundred-thirty-sixthly, to others to be named, one hundred-thirty-seventhly, to others to be named, one hundred-thirty-eighthly, to others to be named, one hundred-thirty-ninthly, to others to be named, one hundred-thirtiethly, to others to be named, one hundred-thirty-firstly, to others to be named, one hundred-thirty-secondly, to others to be named, one hundred-thirty-thirdly, to others to be named, one hundred-thirty-fourthly, to others to be named, one hundred-thirty-fifthly, to others to be named, one hundred-thirty-sixthly, to others to be named, one hundred-thirty-seventhly, to others to be named, one hundred-thirty-eighthly, to others to be named, one hundred-thirty-ninthly, to others to be named, one hundred-thirtiethly, to others to be named, one hundred-thirty-firstly, to others to be named, one hundred-thirty-secondly, to others to be named