the described membrane carrying an attached piece of metal. Let it cover a variable resistance transmitter instead of a magneto transmitter, because that substitution may be found suggested in another part of the specification. But if anything in the description of the method of and apparatus for transmitting speech is *characteristic of and essential to* Bell's invention, it is this, that *the current* from transmitting station to receiving station on which the required electrical changes are to be impressed, is a current traversing the coils of an electro-magnet, and that the operative power for vibrating the receiving diaphragm is the varying magnetism so produced in that electro-magnet.

No such current is employed by Dolbear for transmitting speech. No magnetism is used by him for reconverting the electrical changes into sonorous air changes. His method is new, because based upon a mode of using electricity not at the time of Bell's patent known to be practicable, and is substantially and fundamentally different from Bell's. His apparatus is new, and it is essentially different from Bell's for the same reason.

The only resemblance between Bell and Dolbear is in the fact that each produces, *somehow*, electrical changes in the line conductor corresponding with the sonorous air changes made by speaking, and reconverts those electrical changes, *somehow*, into sonorous air changes at the receiving station. But this cannot be validly patented by Bell (even if his specification would bear such a construction) because it is, under another form of words, patenting the use of electricity for transmitting speech, and this, it is agreed, cannot be done.

Mr. Wheeler H. Peckham for the Molecular Telephone Company.

It is, of course, apparent to the court at this time, that there is a very considerable difference in the position occupied by the several parties defendant to this litigation. My learned friend, who represents the Dolbear interest, has stated with considerable emphasis that he speaks alone for that interest.

That interest would be entirely subserved, possibly better subserved by such a decision as should find that the Bell patent was valid in its broadest construction, and that their defence alone that they did not infringe was valid, because there then would be left the Bell Telephone Company and the Dolbear Telephone Company as the sole possessors of the field. On the other hand, if the Drawbaugh defence should prevail alone and by itself, while, for the moment, the field is thrown open to all, very plausible applications could be made to Congress for a grant by a special patent to that inventor, of a privilege such as has been enjoyed by the Bell Company. On the other hand, the Molecular Company and all other companies which stand in similar position, depend solely upon the ground that this Bell patent must be limited to the sphere of a magneto telephone, and that, in so far as its claims are broader than that, it has been anticipated by an anticipation of general avail to all.

[*Mr. Peckham*, after controverting various positions taken by Mr. Dickerson and Mr. Storrow, and after analyzing the inventions of Reis and others prior to Bell, with the aid of plans and models, concluded as follows touching Bell's inventions and patents:]

All those things were before Mr. Bell came. Now, what did Mr. Bell do? Mr. Bell, adopting the magneto method of effecting electrical results, *took the apparatus of Reis and adapted it to that magneto method;* he did not do anything else. You have here substantially the equivalent of the Reis apparatus, with a little difference in shape; it is adapted to the magneto method; this, the Reis apparatus, is adapted to the variation of a constant current made by a battery; this, Fig. 7 of Bell patent, on the contrary, makes its current itself; when you speak there is a current, and when you do not speak there is none — or when you vibrate this diaphragm in whatever way you choose, there is a current, and when the diaphragm is still there is none.

Now, I will call your Honors' attention very briefly, I necessarily must, to things that have been done by Mr. Bell, and to some few clauses in his patent, and also to some few clauses in

the specification prepared by him and sent abroad, and which has been alluded to in other arguments during this case for other purposes, in order to show that by the term "method" in the fifth claim of his patent, he, Mr. Bell, meant the magneto method and nothing else, and that the broader meaning was given to the word by his lawyer and not by him. Mr. Bell says that he first determined to devote himself to carry out to a practical result his conception as to multiple telegraphy, and when he came over to America he devoted himself constantly to the investigation of magneto electricity. He early had the idea, and he expressed it very soon in some letters, that magneto currents, the magneto method, if once the currents were strong enough, could be availed of for multiple telegraphy and also for the purposes of transmission of speech. The two things were in his mind together; but he was so strongly weighed down, as it were, with the mental conviction that the magneto currents would be insufficient to produce any practically useful result, that he never tried the experiment. His multiple telegraph instruments at first were of the same character as Varley's; that is, they were actuated by the making and breaking of a primary circuit which induced undulations in the secondary circuit, and in that way operated the receiving reed. Now, that was Mr. Bell's apparatus. That was his way that he had in mind. It was to develop this magneto system, wherein the work is done by varying the electromotive force, so that he might avail of it for purposes of multiple telegraphy, and at the same time for purposes of speech, if it should be carried out. Now, without reference to what went before that, I will call your Honors' attention to the first letter Mr. Bell writes upon this subject.

He had been, up to this time, experimenting or devising, as is the language he uses, devising multiple telegraph instruments. He had not carried them out in any concrete machine. "Devising" is his term for thinking of them. He then writes:

"Another experiment has occurred to me, which, if successful, will pave the way for still greater results than any yet obtained. The strings of a musical instrument in vibrating

undergo great changes of *molecular tension;* in fact, the vibration represents the struggle between the tension of the string and the moving force impressed upon it. I have read somewhere that the resistance offered by a wire to the passage of an electrical current is affected by the *tension of the wire.* If this is so, *a continuous current of electricity* passed through a vibrating wire should meet with a varying resistance, and hence a pulsatory action should be induced in the current. If this turns out to be the case, the oscillations of the current should correspond in *amplitude,* as well as in the rate of movement, to the vibrations of the string. One consequence would be that the *timbre* of a sound should be transmitted. The *plan* for transmitting timbre that I explained to you before, viz., causing permanent magnets to vibrate in front of electro-magnets, is generally defective on account of the feebleness of the induced currents. If the *other plan* is successful, the strength of the current can be increased *ad libitum* without destroying the *relative intensities of the vibrations.*"

He went on and tried that experiment and it failed. He did not try it with a vibrating diaphragm. He did not try it in any way to see whether *the voice* could have any effect in such work. He merely tried pulling the string or twisting the string, the wire; and it failed to give any sound whatever. No sound whatever was carried, and that experiment and that idea were dropped just then and there.

Now, your Honors will see what it is that Mr. Bell called his *method* at that early period. He draws, in that letter, a clear and plain distinction between the two methods, the one his magnet method, which he has not carried out to any practical result, because of his apprehension of the feebleness of the currents, and the other this method by varying the resistance, and in that way producing results at the receiving end, which he calls the other method. He speaks of them in that letter as "plans"; your Honors will see that when he is asked a question, immediately after giving the letter, and saying that he had made the experiments, he says on page 1606 (Comps. proof, Peop. Rec.), in speaking of that letter:

"When I speak in this letter of my '*plan* for transmitting timbre,' I mean *my method* of transmitting articulate speech."

So that, at that early period, we find Mr. Bell drawing this strong, plain, clear distinction between these *two methods*, these *two plans*, the one the magnet method, the other the varying resistance method.

On the second of June Mr. Bell made the discovery that these magneto currents, which he had before regarded as too feeble to carry out successfully to any practical purpose his plan to operate by the magneto method, were not so feeble as he supposed. He discovered and found that they might be used for some practical purpose, and then he immediately drops, and you never hear anything more of the plan or method which he had referred to in this letter of transmitting by varying the resistance, and the experiment which he tried, the experiment having completely failed. From that moment you never at any time, up to the issue of this patent, hear of any plan or the discussion of any plan for effecting the result by variable resistance. On the 2d of June he finds out by the accidental discovery that has been alluded to in the course of this argument that the magneto instruments are not so feeble as he supposed, and thereupon from that moment he goes on, in the course of experiments devoted to the perfection and carrying out of the magneto method, which, by that accidental discovery, he had found to be sufficient for his purposes. It is availed of principally for the purposes of multiple telegraphy. It perfects his system of multiple telegraphy. It is carried out in that.

I will now turn to the letter of Mr. Bell, or before I do that I will turn to his answer, and I want to read a few of these lines :

"At that time" — that is, in the summer of 1874 — "I proposed to take advantage of magneto-electric currents produced by the vibration of an armature actuated by the voice of a speaker, so that the electrical current employed would *be produced* by the action of the voice itself and not *independently of it;* hence the reproduced vibrations would necessarily be very much feebler than the originals, and it was questionable in my mind how far they would be of practical value. During the winter of 1874 and the spring of 1875 this feeling led

me to seek *some method* by which the voice, instead of producing the electrical current used, should merely modify a current produced by other means. In May, 1875, I devised" — the word "devised" means that he thought out — "a *method* of varying the resistance of a galvanic circuit by the action of the voice in the hope that this would obviate the supposed insufficiency of the magneto-electric currents to produce practically operative effects. I was still carrying on experiments and researches regarding *this method* when the accidental discovery made on the 2d of June, 1875, already testified to, proved that the insufficiency of the magneto-electric current to produce audible effects was a mistake."

And then he goes on with his invention with regard to the magneto-electric currents.

On July 1, 1875, he writes Mr. Hubbard:

"The experiment to which I alluded when I saw you last promises to be a grand success. On singing this afternoon in front of a stretched membrane attached to the armature of an electro-magnet, the varying pitch of the voice was plainly perceptible at the other end of the line, no battery nor permanent magnet being employed."

"When the vibrations are received upon another stretched membrane in place of a steel spring, it is possible, nay, it is probable, that the 'timbre' of the sound will be perceived. I hope to try the experiment to-morrow afternoon."

That was written about a month after he had made this discovery, and it is the first time that there is anything in print or any letter written by him to indicate that he intended to make another stretched membrane, or two stretched membranes. The first he had made immediately after the discovery of June 2d was with but a single membrane, an instrument substantially like that. It had not any cone here and it was received on a reed, a vibrating reed, a steel reed alone.

After that we find Mr. Bell writing the letter of August 14th, on page 263 of our brief. What does he do here? It is the same thing. Mr. Storrow commented upon this letter as giving the idea to the world; it had not been put in a concrete form; there had been no directions given by which anybody

could follow it out, but he said the great idea that was at the bottom of all telephony, that lay at the basis of this science, was given in this letter. I submit to your Honors, that this letter gave simply the idea of telephonic or telegraphic action, telegraphic work, *by means of the magneto current.*

"On glancing back over the line of electrical experiments, I recognize that the *discovery* of *the magneto electric current generated* by the vibration of the armature of an electro-magnet in front of one of the poles, *is the most important point* yet reached. I believe that it is the key to still greater things. The effects produced, though slight in themselves, appear to me so great, in proportion to their cause, that I feel sure that the future will discover means of utilizing *currents obtained* in this way on actual telegraph lines. So important does it seem to me to protect *the idea* that I think some steps should be taken immediately towards obtaining a caveat or patent, for the use of *a magneto-electric current*, whether obtained in the way stated above (by the vibration of permanent magnets in front of electro-magnets), or in any other way. I should wish to protect it specially as a means of transmitting, simultaneously, *musical notes* differing in *intensity* as well as in pitch. I can see clearly that the magneto-electric current will not only permit of an actual copying of *spoken utterances*, but of the simultaneous transmission of *any* number of musical notes, (hence messages) without confusion. The more I think of it the more I see that the method of making and breaking contact so many times per second is only the *first stage* in the development of the idea. When we can create a pulsatory action of a current, which is the *exact equivalent* of the aerial impulses, we shall certainly obtain exactly similar results." The making and breaking method, above referred to, he testifies, is that of his multiple telegraph system.

And your Honors will remember that he had spoken in the letters before, spoken in his testimony there, of the benefit, the desirable point, the essential element of this magneto current as being a current which was the creature of the voice, created by it.

Now I want your Honors to turn from that — he did noth-

ing after that; he did nothing after this letter or after these experiments of June 2d, prior to the taking out of his patent, in the way of experiments, other than two or three experiments made in the early part of July, and which resulted in merely obtaining a sort of muttering effect; but I want you to look now, and it is all that I shall have time to call your Honors' attention to: first, to the draft specifications and claims of Mr. Bell, and, second, to his George Brown specification or copy application. The draft specifications are shown in our brief on pages 267 to 269. These are drafts made by him for his specification, and they show what was in the man's mind at the time, the idea that he had, or what he thought was really the invention which had come to him.

In the first one he speaks of his invention consisting in the employment of a vibratory or undulatory current and "of a method of and apparatus for producing electrical undulations." It *is the method for* producing. On the other side, there is a short paragraph in which he speaks about "inducing undulation in a continuous voltaic circuit *by the motion of bodies capable* of effecting a current." And on the next page a draft of a claim apparently is "*the method of inducing* (impressing) undulations in a continuous voltaic current." That is the method that was in his mind.

And then he has a third claim, which he puts in this place, and it would be a claim for a speaking telephone; but your Honors will see what kind of a claim it is that is here. This claim is:

"The phonautograph, whereby two or more vocal or other sounds, differing in pitch, loudness, and timbre, can be transmitted singly or simultaneously."

That did not come into his patent. That was left out. He says nothing of that character at all in the patent.

On the other side is:

"The *method of* and apparatus for transmitting simultaneously sounds differing in timbre as well as in pitch and loudness. The method of and apparatus for transmitting vocal utterances."

And the next claim is:

"In illustration of *the method* of creating a vibratory current of electricity. I shall show and describe one form of apparatus designed to produce undulations in a continuous voltaic current. But I wish to state here that the same effect may be produced in many other ways, all that is necessary being to influence the current *by the vibration or motion of bodies capable of affecting the current.*"

Now those are rough drafts or notes of drafts that he made in preparing it, drawing his specification of this patent furnished by Bell and presented by him when he was being examined as a witness in the case. I am going to refer now to the Brown paper. I am not referring to this paper as a branch of the argument made by Mr. Hill or for any such purpose as Mr. Hill used it. I am referring to it simply as showing the point that was in the mind of this man up to the time this specification was drafted, up to the time when this was delivered to Mr. Brown and carried away by him, and as helping us in the construction of the 5th claim of the patent itself as it now stands. He says:

"Undulatory currents of electricity may be produced in other ways than that described above, *but all the methods depend* for effect upon the vibration or motion of bodies capable of inductive action."

Now that is the statement in the George Brown paper. What is his claim? Claim 4 — "the method of and apparatus for transmitting vocal or other sounds telegraphically, by" — in brackets — "inducing in a continuous voltaic circuit" — that is the end of the brackets — "causing electrical undulations similar in form to the vibrations of the air accompanying said vocal or other sounds, the whole for operation substantially as herein shown and described."

Now, your Honors, the question is, What is the construction of that claim numbered here four, numbered five in the patent, as actually issued. Your Honors will see here that he had stated at this time, in the body of the specification, that all these methods for producing undulations depended upon the vibration or motion of bodies capable of inductive action; and then he says in his claim based upon that statement in his

specification, that he claims "the method of and apparatus for transmitting vocal or other sounds telegraphically by causing electrical undulations," as therein described.

Now, how is it, by causing electrical undulations? Why, causing them in the only way and the only manner in which he had stated in the specification they could be caused or could be produced. That is the claim as he fixes it there.

Now, if we turn to the patent itself, we find that the fifth claim is substantially identical with the fourth claim in that George Brown specification. "It is the method of and apparatus for transmitting vocal or other sounds telegraphically," as therein described, "by causing electrical undulations similar in form."

This patent contains in the specification what was not contained in the George Brown copy. It contains a statement that

"Electrical undulations may also be caused by alternately increasing and diminishing the resistance of the circuit or by increasing and diminishing the power of the battery," &c.

But is it supposed, your Honors, that the patentee thought when he put those words or that feature into the specification, that he in any way affected or intended to affect the fifth claim, which was the fourth claim in the George Brown specification? By no means; because, when he puts this new matter of specification in this patent, he puts in another claim, to correspond to the new matter which he had put into the specification of the patent. This other claim which he has put in is the fourth claim of the patent of the method of producing undulations in a continuous volatile current by gradually increasing and diminishing the resistance of the circuit."

That is not put in as a claim having any connection with the production of sound, or having any connection with undulations which are produced by sound waves. It is put in as a simple claim, in and by itself, for the production of those undulations. It is not a claim upon which this suit is founded, and it is not a claim which has any validity, because that thing had been done in the year 1873 with precision by Mr.

Edison, in a patent which I have already alluded to, where he put his electrodes in water or glycerine or other liquid. So that we have here the specifications as prepared and taken by George Brown, speaking of a production of or causing electrical undulations, which, by the terms of the specification is necessarily confined to the magneto method, because the specification says that there is no other method; and then when we have by some means, whatever they may be, whether fair or unfair, fraudulent or honest, new thoughts from Gray or from himself, or whatever may be the reason, the idea suggested to him and put into his patent that electrical undulations can be caused by the variations of the resistance of the circuit, we find a claim put in to correspond to that; but we do not find any change or any variation whatever of the fifth claim.

Your Honors will see that there is not in that patent to be found anywhere from the beginning to the end any suggestion that there is any other method, or any other way of causing electrical undulations by sound waves than the one which is pointed out and illustrated by Fig. 7. All these prior methods of producing electrical undulations have reference to and are involved in the production of multiple telegraphy, or the production of telegraphy in some way, whether multiple or single. Some of them are ways that it is absolutely impossible to use in connection with the production of sound waves; as, for instance, the vibration of a wheel with magnets on the periphery before the poles of a magnet; that cannot possibly be used as a means of producing the undulations of the sound waves.

Mr. Charles P. Crosby for the Overland Company.

An action was brought by the Bell Telephone Company, in the month of November, 1884, against the Overland Telephone Company, a company incorporated under the laws of the State of New York; and very soon thereafter, or about that time, an action was brought in the Circuit Court of the United States, for the District of New Jersey, and one also in