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Interview with Carl Beust

Carl Beust
CARL BEUST

Interviewed by
Nicholas Hussong

on
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Okay, today is March the ninth, 1967. My interview is with Mr. Carl Beust on Charles F. Kettering. It's okay.

I first became acquainted with Mr. Charles F. Kettering when he came to Dayton from connections with National Cash Register Company, as an inventor. He had been a student at the Ohio State University, and it was through the authorities at the Ohio State University that the company first became, came in contact with him. The problem which brought Mr. Kettering to Dayton was as follows: Up to 1904, the cash registers had always been manually operated and there was no cash register on the market which was electrically operated. And attempts had been made to operate the cash register electrically, but without any considerable success. To electrically operate a cash register is an entirely different problem from operating a fan or a washing machine or a similar piece of equipment. Because in those cases, those machines have no starting or definite stopping point. And you can turn the current into them, and operate them without regard for any point of starting or stopping. With a cash register an operation of a cash register has a definite cycle of movement, and the operation consists of starting it, at a given point and ending at a given point. And the mechanism must be picked up when all the mechanism is at rest at it's own position, and dropped off in operation when it has reached the conclusion of the cycle. This offers quite a problem because the starting and stopping point of an operation must be precise. It does, it is not an indefinite construction. Mr. Kettering was, had been, a student at Ohio State University and when Colonel Deeds went to see Professor Cole at Ohio State University, he consulted Cole with the view too of getting some young electrical engineer
who Cole could recommend as having latent inventive ability, and arranged to have him come with the company, in the capacity of an electrical engineer. Professor Cole had previously been at Denison University, where he had been one of Colonel Deeds' professors, Colonel Deeds was an electrical engineer, and had given this the question of an electrical driving mechanism for a cash register considerable thought, but was too involved in other matters of the company to spend much time on the development of the driving mechanism for the cash register. Cole had no hesitancy in recommending Kettering who he said was a very unusual young man, and one who he felt would fit right into the question of developing a machine of the character which the NCR wished to build at that time. Mr. Kettering came to Dayton and started in on his study of the machine with a view to determining what the design would have to have. It had to be a motor which was of low voltage, a motor which would have great starting power because of the fact that a cash register of the type which the motor was to be in, embodied in is, was a piece of mechanism which was difficult to operate and it would be quite a load on the motor to start it suddenly at a given point and then drop it as suddenly when the operation was completed. There was no other motor available at the time, which would accomplish that result. It also had to be a motor that could fit in to the mechanism in such a way that it would not look like a beehive hanging on the cash register, but would, it could fit into the design of the register in such a way that it would not detract from the appearance of the machine. This operated, this gave certain problems in the matter of design which were not required in other lines of machine. I required a motor that could not be over about three inches wide. And with a motor within those dimensions it would be, give a motor which would be placed on the machine at the opposite end from the printing mechanism, and when finished and the cabinet placed on the machine, one could not tell that
it was really a motor drive for the cash register, and would have the same appearance as the hood or the printing mechanism on the opposite end of the machine. This was one of the matters which rendered the job rather difficult before Kettering started on the work, and it was the point in the design of a motor which served as a sort of a deterrent, in the design and selection of a motor for the propose. Kettering worked on the motor and altogether it took about two to three years from the time he first came to the company, where he first had to embark on the study of the cash register to which the machines had, the motors had to be added, and to determine the characteristics of the cash registers, and to determine what the characteristics of the motor would have to be. The machines were finally ready for the market in 1907 and it was quite a boost to the cash register business, because of the fact that the machine with motors were in great demand, as many places of business such as department stores and other installations where fast operation and accurate operation was needed, as the old crank operated registers were objected to a great deal by merchants because of the slow operation and the tiring of the operation on the clerk, many of them who were girls and were unable to operate the machines by hand. After the completion of the motor on the cash register, Kettering's attention was directed to other things in electrical line. Principle among which were an okay credit system for department stores. There was a great demand of for some system of okaying charge accounts and charge purchases and he finally developed a telephone system for use in department stores which employed a, a telephone located at the clerk's counter and equipped with an okay stamp and the way it was used was that the clerk on waiting on a charge customer would call the central office and there the credit manager would take the information regarding the purchaser and the amount of the purchase, and
decide whether it was proper to okay the sale and charge. And would merely operate a control button at the central office which would operate the stamped telephone and okay the credit sale. There was a great demand for this type of equipment in department stores and also in banks where the, many the, the tellers at the windows in banks would often get a check on an account that they wanted to determine whether or not the amount was good and that the customer was the person presenting the check actually had the sufficient and on deposit to cover the amount of the share. He could call the bookkeeping office and determine whether the man had sufficient balance to cover the check which was being presented for cashing. By this time, Kettering had become so enthused with the construction of cash registers and accounting machines in general, that he began to turn to the construction of the registers themselves, because the demands were made on the register for machines which would have greater capacity in the classification of accounts. So that they could get a breakdown of the purchasers along the line of classes of goods, departments and so forth, so that a better accounting system could be used for the different departments in the stores. At that time, the only cash register which the company was making, which had multiple total mechanisms, was a machine which had nine totals which were mounted on a drum which was rotated by the movement of a hand labor, which would bring a single total into position to be operated on. Now the, a total mechanism consisted of a series of adding wheels, one for each denominational order, and they were operated on by a driving mechanism which consisted of operating the gear segment, and only one counter or totalizer at a time could be brought into position to be operated on. This was rather a slow operation because of the fact that there were times the stores wanted further breakdown, in view of the fact that they wanted to get
the account charged to the department, furthermore as to whether it was a cash or a charge sale. They wanted to get at entry of the amount as to the clerk making the sale and other information of that kind, so that it would require the multiple entry of the amount into the machine instead of a single entry which would be entered into a number of total houses at the same time. So he was working on the development of the totalizer mechanism, which would permit of a distribution of the amount into all of the divisions that, accounting which the business would need. And he hit upon a plan of an entirely new plan of the arrangement of the adding wheels in a cash register. Which consisted of having nine sets of adding wheels on a single shaft, which was slid longitudinally in the machine. And the total would be brought into position of engagement with the operation gears. Now he could get nine totals on one shaft with the movement of all to engage any one of the nine totals would require only a maximum movement of the shaft of about one inch, and that was very simple to handle automatically. The machine would not depend upon a positioning of the large drum, which was about six inches in diameter, which had been previously used in cash registers. Then he developed a machine which, which the actuating mechanism was in the form of a large gear, and sections that was about six inches in diameter, and he would have three of the sliding shafts with three sets of totals in, and each sets of total would be positioned according to the clerk's key which he depressed, that part into which he wishes to depress, and whether it was a cash or a charge. So that they could enter the amount of the transaction on three totalizers at the same time, thereby saving all of the multiple operation that was ordinarily required when they had single totals that had to be engaged independently. This type of totalizing mechanism is known as an interspersed total. Because of the fact that in the arranging of
the totals on the wheel, on the shaft, he was able to group all of the wheels in a way that all of the unit's wheels were together side by side. All of the ten wheels were together, all of the dollar wheels were together, all the tens of dollars wheels were together, and the first wheel of each group would be the other mechanism, would be another totalizing mechanism. And that way the shaft could be engaged with the first set of wheels and then primarily in about an eighth of an inch of movement would bring an entirely different set of wheels in line with the operating mechanism, so that the amount would be registered upon a different totalizer. That's one of the bases of an entirely new line of machines. And a line of machines which is used today. And is really the heart of the higher grade type of cash registers which are on the market today. And that dates from the early development work that Mr. Kettering did while he was with the company. He was still working on that machine when he retired from the company in 1908. And by that time, he had become interested in the starter for automobiles which he was working on at nights, and the Deeds, out at, behind Colonel Deed's house over on Central Avenue. Now the, there's a point of similarity between the starter, starter on an automobile, and a motor on a cash register, in this respect: that when you press your foot down on a starting button on a cash register, the motor gets the charge from the battery and picks up the entire load of turning over the engine instantly. It doesn't start churning slowly, get a heavy surge, and that's the same way with a cash register. So that it had to be a motor which could cope with that problem of picking up a maximum load at the very start that the current is shot into the motor, and then be released when, as soon as the motor is, as soon as the engine is operating. Of course we know that it took several years for the starter to be developed and put in final form to be used commercially,
was in 1912 on the Cadillac car. And in the meantime, that business had expanded to a point where several other men such as Mr. William Chryst who had been Mr. Kettering's assistant at the factory, went down with him and working on the starter because Mr. Chryst was also an electrical engineer, a man who was self-trained. Can you turn that off for a minute while I stop this talk out here.

NH Of course.

(break in tape)

CB Now all during Mr. Kettering's work, I was in frequent touch with him because of the fact that I was employed in a patent law department. And that department was very closely associated with all the development work. And I came in contact with Mr. Kettering probably several times a day. As well as I did with the other inventors at the factory. And we used to talk about his plans and his developments. And then frequently after you got to know him pretty well, we both lived in Dayton View, and we used to walk to town together, because street car facilities were poor from the factory, down Third and Main. And we used to walk downtown together very frequently. And he talked then a lot of the ideas he had of the great possibilities of things that were yet to be developed, including television, radio, everything along electrical lines and the starter. On automobiles. Someday he had, he had the idea from the very start, of some day somebody was going to develop a device for automobiles whereby you could just press a button on the automobile, and bang you'd get the engine started. That's just the way he would express it, you know. He was an enthusiastic fellow, very enthusiastic, and he never lost that enthusiasm from the time he came with the company to the time he passed away. He was a very interesting man, very tolerant of all the questions you could ask him. He wasn't annoyed by questioning. He was never annoyed by explaining
with what we used to call baby talk. Because those of us that weren't
engineers or weren't electrical engineers particularly, didn't know the
theories back of a lot of things that he was working on. He would explain
in detail and explain in such a way that he could make even those of us
that knew very little of the subject could understand what it was all
about. And he was never too tired or too busy to go out of his way to
explain those things to a person that was working with him on the subject.
And in that way, he grew to be extremely well liked by everybody in the
organization. That was one of the most likeable fellows that ever came into
the organization. There was another thing that he was known for. When
he came with the company, he I would say initiated the practice of real
engineering. Now there's a difference between inventing and engineering.
And a man can invent who is not an engineer. You can take a man like
Leonardo da Vinci, who, with his old notebooks that they find now and then,
used to make crude sketches of ideas that he'd have. Some of them never
reached completion, most of them never reached completion. But they had a
basic idea that rambled through his mind. Well, that's the way a lot of those
inventions used to start. And a lot of the stuff was cut and dry, cut and try.
It wasn't designed. But Kettering was an engineer, and from the very start,
he designed a thing in his mind. Everything was laid out, and the parts
and everything were made from his drawings, and when they went to put in a
machine, they worked. There was no cut and try to his work. He was a real
designing engineer. It was, it wasn't a cut and try. Of course there were
corrections that had to be made at times, like an, every kind of a job.
Particularly a job that had never been tried before. But the high degree of
engineering and design skill was developed from the time he came with the
company. It exists today, down there. But fifty years ago it wasn't so.
He would, used to come in with sketches that were just like Leonardo da Vinci so far as his ideas were concerned. I know he would come in with an idea that he developed in his mind, and wanted to know whether there was anything like that that ever been done. And we'd make a search on it. Sometimes a sketch was on his cuff. Might be on his shirt bosom. It might be on a theater program. Most anything he had at hand, he'd sketch on. And he'd sit down at the theater and he'd design on his, on a theater program. He'd be at theater with his wife, and he'd be sketching an invention while she was enjoying the show. (laughter) He'd pay no attention to the show. But he, he really can be credited with guiding the work, inspiring others in the line of development work with a company, into the practice of doing real designing. And real engineering. Rather than just cut and try practice that used to go on in there for years. I think that a lot of that earlier work, there were a few if any drawings made on a job. It was just cut out of metal and whittled out. He explained to one of the mechanics what they wanted and the fellow would whittle it out. With him, no. It was all on paper, and designed and designed to work, and you could see it work on paper. You soon learned as when you work with drawings, if you ever worked with drawings, you soon learn to see a machine work, and see the parts move. At least that's the reaction you'd get from looking at the drawing. And he was one that drew really good, do a job in that way. And when a job came out of that department, there wasn't any, you didn't have to worry about; it was going to work. And anybody that wanted to take a device that he wasn't satisfied, it was perfect and ready for the market, and they wanted to insist on tooling and making some like it to sell. He'd wreck it first. He wouldn't let you have it. He wouldn't let the factory have it, he wouldn't let the management have it. He was the final
word, when anything went out of his department. As to whether it was ready, he was not afraid to say that this is no good, you can't have it. It wasn't perfect in his mind, the sales of selling in, didn't get it. And selling in sometimes are anxious to get something, they, they're inclined to take a chance, but not with him. He'd kick a thing to pieces I think before he'd let them have it. Are there any questions you have?

NH You mentioned that he had some rather visionary ideas, like television and radio transmitting sound, and pictures. Do, can you recall any other ideas that he had that he might have worked on and that he would have commented.

CB No, I don't think he worked on those. He, he felt sure that somebody was going to develop it sometime, but he concentrated on his, his immediate problems. I don't think he did any radio work or television work. But he insisted that some day you could sit at home and turn a knob or press a button and listen to an opera, or play of some kind, and see it. And his predictions are correct, as we all know. He had enough vision to foresee a thing like that, even though he didn't try to do it. He had enough confidence in the future of electricity and the electrical field and he was an electrical man, pure and simple. Where Colonel Deeds was an electrical engineer, his engineering is more in the line of heavy machinery, and it was not of the type that had the limitations that the application of a motor to a cash register would have. Such as a precise starting point, and a precise stopping point. He was interested in a great amount of developptive work in the line of sugar making machinery, in other words, he was interested in Cuba. Who is today, Rentschler family in Hamilton, was interested in that.

NH This is Deeds you're talking about. Sir, this is Colonel Deeds you're talking about now.
CB Yes, he was also interested in, he would...
(break in tape)
(end of side one)
(start of side two)
CB ...in that.
NH This is Deeds you're talking about. Sir, this is Colonel Deeds you're talking about now.
CB Yes, he was also interested in, he would came here with the Thresher Electric Company. And they were motor people, of course the motor, as a starting and stopping point only when you turn the juice into it, an ordinary motor. And generators which don't have a definite starting and stopping point. He, he developed the shredded wheat plant up in...
NH Oh, really?
CB Yes, he, for Kellogg's. He left the NCR about 1899, and went up to Battle Creek, and built the shredded wheat plant, for Kellogg and then came to the NCR. He was gone about two years, on that. He preferred coming back with NCR.
NH Did you see Mr. Kettering very much after he left NCR?
CB Oh, yes.
NH (unintelligible)
CB Yes. Because in the prosecution of patent applications, you frequently have to consult with the inventor whose inventions are covered with, by the applications that you're prosecuting, for the patent office. And when he was downtown in the Delco I went down to see him frequently on that such matters. And oh, my, if you contact with him, I would say all the way through for years. And then, for about ten years, I was president of the Miami Valley Hospital Board of Trustees. And he was the, not only the, the leader
and a promoter and a financier who paid the bill, on this fever therapy for venereal diseases. But he was in and out of the hospital right along in connection with that fever therapy work, and I was contact with him during all of that time, cause he was interested in this, in the work, he would come in and see the cases of patients they had in the cabinets that were under treatment with fever therapy. Those of the cabinets in which a man is thrown into every fever, in order to cure him of it. Of venereal diseases. He financed that very well all the way through, did a lot of financial, find a lot of financing of research work in the oh, I forget what they called the department. It was, was the department where they did all of the research work on diseases and determination of conditions of tissues that were removed from patients and all that. What do they call that? The name slips my mind. But he was very much interested in that for years.

NH With what invention did he have the most trouble in having it work? Did you run into any problems lined up with other patents?

CB Well, for mercy sakes, of course you always have trouble with patents. There's always something, when he started on the starter for example, he wasn't the only one working on the starters. There were other men, working on starters. There was two or three of the automobile companies that put starters on their machines. One of them had a bee hive hanging on the outside in front of the radiator, about this big around sticking out about that far. And they had a motor in there, and a spring and some trip, tripping mechanism to release the spring, and the spring would suppose to turn over the motor, and I don't know what the whole rigamarole. If the spring broke were, he were in trouble. Worst than that I haven't had at all. You know for years after the starter was developed and put on cash, on automobiles, they still put cranks on them. Because that was like for instance suspenders and belts, you want to be sure. And it wasn't until probably oh, I think they put start,
or put cranks on machines that were equipped with starters till the late teens. I know they used to furnish cranks up to 1917, '18, '19 on in there. They're still furnishing them. Cadillac started with the starter in 1912 and the first Cadillac I owned was in 1919 and they furnished a crank. There was a crank there. I always remember, this isn't for record...

NH Do you want me to shut it off?

CB For this, yes.

NH Okay.

(break in tape)

CB I think Ket was worshipped by all of the men that ever worked with him. I never heard anybody that disliked him. I never heard anything like that. He had men work down there they'd work all night if they started on a job, he'd work right there with him. He never rested. He never asked them to do anything that he wouldn't do. He was an unusual man in that respect. Extremely generous. Well, I think that covers about all I can give you.

NH Fine, do you want to make any summation, Sir, would you like to summarize Mr. Kettering's personality or attitudes or anything like that?

CB Oh, I don't think there's anything to summarize, I think what I've said there is.

NH Okay, fine, thank you very much Mr. Beust.

CB It's alright.

NH It's been very interesting.

CB It's alright.

(break in tape)

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